Lexicon of Geologic Names of the United States for 1968–1975

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MAJOR STRATIGRAPHIC AND TIME DIVISIONS

Subdivisions in Use by the U. S. Geological Survey			Age estimates commonly used for boundaries (in million years)[1/]	
Era or Erathem	System or Period	Series or Epoch	(A)	(B)
Cenozoic	Quaternary	Holocene		
		Pleistocene	1.5-2	1.8
	Tertiary	Pliocene	ca. 7	5.0
		Miocene	26	22.5
		Oligocene	37-38	37.5
		Eocene	53-54	53.5
		Paleocene	65	65
Mesozoic	Cretaceous[3/]	Upper (Late) Lower (Early)	136	
	Jurassic	Upper (Late) Middle (Middle) Lower (Early)	190-195	
	Triassic	Upper (Late) Middle (Middle) Lower (Early)	225	
Paleozoic	Permian[3/]	Upper (Late) Lower (Early)	280	
	Pennsylvanian[3/]	Upper (Late) Middle (Middle) Lower (Early)	320[2/]	
	Mississippian[3/]	Upper (Late) Lower (Early)	345	
	Devonian	Upper (Late) Middle (Middle) Lower (Early)	395	
	Silurian[3/]	Upper (Late) Middle (Middle) Lower (Early)	430-440	
	Ordovician[3/]	Upper (Late) Middle (Middle) Lower (Early)	ca. 500	
	Cambrian[3/]	Upper (Late) Middle (Middle) Lower (Early)	570	
Precambrian	Time subdivisions of the Precambrian: Precambrian Z--base of Cambrian to 800 m.y. Precambrian Y--800 m.y. to 1,600 m.y. Precambrian X--1,600 m.y. to 2,500 m.y. Precambrian W--older than 2,500 m.y.			

GEOLOGIC NAMES COMMITTEE, U. S. GEOLOGICAL SURVEY, 1972

1/ Estimates for ages of time boundaries are under continuous study and subject to refinement and controversy. Two scales are given for comparison:

(A) Geological Society of London, 1964, The Phanerozoic time-scale; a symposium: Geol. Soc. London, Quart. Jour., v. 120, suppl., p. 260-262.

(B) Berggren, W. A., 1972, A Cenozoic time-scale--some implications for regional geology and paleobiogeography: Lethaia, v. 5, no. 2, p. 195-215.

In addition to these, a useful time scale for North American mammalian stages is given by:

Evernden, J. F., Savage, D. E., Curtis, G. H., and James, G. T., 1964, Potassium-argon dates and the Cenozoic mammalian chronology of North America: Amer. Jour. Sci., v. 262, p. 145-198.

2/ From Table 1: Correlation chart for the Carboniferous of north-west Europe, Russia, and North America: Geol. Soc. London, 1964[1/], p. 222.

3/ Includes provincial series accepted for use in U. S. Geological Survey reports.

Terms designating time are in parentheses. Informal time terms--early, middle, and late--may be used for the eras, for periods where there is no formal subdivision into Early, Middle, and Late, and for epochs. Informal rock terms--lower, middle, and upper--may be used where there is no formal subdivision of an era, system, or series.

LEXICON OF GEOLOGIC NAMES OF THE UNITED STATES 1968-1975

By Gwendolyn W. Luttrell, Marilyn L. Hubert, Wilna B. Wright, Virginia M. Jussen, and Roger W. Swanson

INTRODUCTION

This lexicon of new geologic names is a record of lithostratigraphic units in the United States, Puerto Rico, Panama Canal Zone, and American Samoa introduced into the literature in the years 1968 through 1975. It also contains a few names introduced before 1968 but not included in previously published lexicons. This volume is the latest in a series of lexicons published by the U.S. Geological Survey as a means of keeping the geologic profession informed on the status of geologic names in the United States.

The following publications list the geologic names introduced in the United States before 1968:

Wilmarth, M. Grace, 1938, Lexicon of geologic names of the United States: U.S. Geol. Survey Bull. 896, 2 v.

Wilson, Druid, Sando, William J., and Kopf, Rudolph W., 1957, Geologic names of North America introduced in 1936-1955: U.S. Geol. Survey Bull. 1056-A, 405 p.

Keroher, Grace C., and others, 1966, Lexicon of geologic names of the United States for 1936-1960: U.S. Geol. Survey Bull. 1200, 3 v.

Keroher, Grace C., 1970, Lexicon of geologic names of the United States for 1961-1967: U.S. Geol. Survey Bull. 1350, 848 p.

Changes in the status of geologic names used in publications of the U.S. Geological Survey are published annually in "Changes in Stratigraphic Nomenclature" by the U.S. Geological Survey, in the U.S. Geological Survey Bulletin series Contributions to Stratigraphy.

SELECTION OF NAMES FOR THE LEXICON

A formal lithostratigraphic unit should be established in accordance with the "Code of Stratigraphic Nomenclature" of the American Commission on Stratigraphic Nomenclature, published by the American Association of Petroleum Geologists, Inc., Tulsa, Oklahoma, 1970. Proper establishment requires publication, in a recognized scientific medium, of a definition that includes a statement of intention to designate a formal unit; a name; definition of the unit in a type section, locality, or area; distinguishing characteristics; definition of boundaries and contact relationships; dimensions; and geologic age. Ideally, only names that meet these standards are included in the lexicon. However, some names that have become established in the literature through use, although not formally proposed, are included because they seem to have been intended as formal names. Names proposed in abstracts and geologic guidebooks that are not part of a regularly issued formal series, or names used only in figures, tables, and map explanations are not included.

EXPLANATION OF ANNOTATION FORMAT

This lexicon introduces a new and intentionally compact format that covers all information necessary for proper establishment of a geologic name but that omits other information.

Each name has been annotated using an outline format that has 10 numbered categories. A key to the format and an explanation of abbreviations and conventions used in the text are given here.

Name (not numbered)--The name of a lithostratigraphic unit consists of a geographic name and the rank or lithology of the unit. Alternate or additional rank or lithology is separated from the first by a "/". Geologic name data have also been entered on a computer for purposes of review and cross checking. So that each name can be identified by the computer, a unique identifier is assigned, which consists of a 4-letter mnemonic derived from the geographic part of the name and a 2-digit sequence number. This identifier is noted at the far right of the geologic name line and is included in this lexicon as an aid in requesting update information by those who have access to the computer. That information may be had by others on request. A "U" preceding the mnemonic shows that the name has been adopted for use by the U.S. Geological Survey; this is indicated also by boldface type for the geologic name.

1. Age--Designated by system and series terms such as "Cenozoic" or "Lower Devonian." Informal terms follow the system or series, such as "Paleozoic, lower" or "Eocene, upper." Provincial series appear in parentheses following the series, such as "Lower Pennsylvanian (Morrowan)." A chart showing major stratigraphic and time divisions used by the U.S. Geological Survey in the years 1968 through 1975 is on page iv.

2. Geographic extent--The State or country in which the unit was first described is listed first, followed, in parentheses, by the geographic area of the State in which the type locality occurs. Then follow the other States in which the unit has been described. The geographic areas were established by constructing a rectangle framed by the maximum and minimum latitudes and longitudes of a State and by dividing length and height by 3 to give 9 equal areas: NW, NC, NE, EC, C, WC, SW, SC, and SE. Not all these areas are present in some irregularly shaped States.

3. Reference--Generally the first published article that contains a formal proposal or good description of the new name unit. The author, date, publication name, and page numbers are given.

4. Lithology--A brief statement of principal rock types found in the unit.

5. Color--The main colors of the unit.

6. Thickness--In meters at the type section; a range is given if known.

7. Texture, structure, distinctive features--Grain size, bedding, jointing, fossils, organic matter, cinder cone, turbidite, or other diagnostic attributes.

8. Subdivisions--Both formally named and informal subdivisions, from older to younger.

9. Adjoining units--Including type of contact, if known, from older to younger.

10. Type section, locality, or area--Given as described by the author. The geographic feature for which the unit was named is described if known.

ACKNOWLEDGMENTS

The authors wish to acknowledge contributions to the work by former staff members Georgianna D. Conant and the late Robert G. Bates, the guidance of George V. Cohee and Norman F. Sohl, and the lexicon staff assistance of Susan M. Kingsbury.

Abel Gap Formation (Talladega Group) ABGP01
1. Paleozoic
2. Alabama (NE)
3. Bearce, D. N., 1973, Alabama Geol. Soc. Guidebook 11, p. 10-21
4. Siltstone and sandstone with distinctive phyllitic and pyritic quartzite intervals
5. Gray
6. Range 1500-2100 m
9. Overlies Heflin Phyllite (Talladega Group); underlies Chulafinnee Schist (Talladega Group)
10. Type section: Abel Gap, on Alabama Highway 49 (Skyway Road) near town of Abel, Cleburne County.

Absaroka Supergroup/Volcanic Supergroup U ABRK03
1. Eocene
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, 33 p.
4. Andesitic and basaltic volcanics
6. 1500 m
8. Washburn Group, Sunlight Group, Thorofare Creek Group
9. Unconformably underlies Junction Butte Basalt
10. Type area: Absaroka volcanic field, Yellowstone National Park, Park County, Wyo.

Academy Church Shale Member (Springer Formation) ACMC01
1. Lower Pennsylvanian (Morrowan)
2. Oklahoma (SC)
3. Straka, J. J., II, 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 6, p. 1087-1099
5. Gray, black
6. 76.2 m
7. Blocky, with interbedded brittle beds
9. Overlies Lake Ardmore Member (Springer Formation); underlies Primrose Sandstone Member (Golf Course Formation)
10. Type locality: E1/2NE1/4NW1/4SE1/4, and W1/2NW1/4NE1/4SE1/4 sec. 1, T. 3 S., R. 2 E., Carter County.

Adams Formation ADMS01
1. Holocene
2. Alaska (SE)
3. McKenzie, G. D., 1970, Ohio State Univ. Inst. Polar Studies Rept. 25, p. 53-65
4. Clay, sandy silt, with intercalated clayey till
6. 66 m
7. Glaciolacustrine deposits, massive to rhythmically bedded
9. Overlies, with sharp contact, lower member of Van Horn Formation; gradationally underlies Berg Formation
10. Type section: SE shore of Adams Inlet, lat 58°53′ N., long 135°47′54" W.; top of section, elevation 199 m, is 1.9 km N. 30° E. of top of Tree Mountain.

Adamstown Granite ADMS02
1. Upper Ordovician
2. Maine (WC)
3. Green, J. C., and Guidotti, C. V., 1968, in Zen, E-an, White, W. S., Hadley, J. B., and Thompson, J. B., Jr., eds., New York, Interscience Publishers, p. 262
4. Porphyritic adamellite
7. Deformed and metamorphosed pluton
10. Type section: NC part of Oquossoc Quadrangle, lat 45° N., long 70°50′-55′ W., Oxford County.

Adamstown Member (Frederick Limestone) U ADMS06
1. Upper Cambrian
2. Maryland (NC)
3. Reinhardt, Juergen, 1974, Maryland Geol. Survey Rept. Inv. 23, p. 24-30
4. Limestone, with breccia zones
5. Gray
6. 325 m
7. Fine-grained, laminated
9. Overlies Rocky Springs Station Member; underlies Lime Kiln Member
10. Type section: Measured section W of Lime Kiln in Frederick Valley, Frederick County. Named for town of Adamstown.

Adobe Town Member (Washakie Formation) U ADBT01
1. Eocene
2. Wyoming (SW)
3. Roehler, H. W., 1973, U.S. Geol. Survey Bull. 1369, p. 14-17
4. Alternating mudstone and sandstone
5. Green, gray, red
6. 700 m
7. Fluvial basin deposits
9. Unconformably overlies Kinney Rim Member (Washakie Formation) in W and Laney Member (Green River Formation) in E; underlies Browns Park Formation
10. Type section: Exposed on slopes of N-trending dry wash in NW1/4 sec. 29 and W1/2 sec. 20, T. 13 N., R. 97 W., Sweetwater County. Named for Washakie Basin.

Afton Basalt (Potrillo Volcanics) AFTN01
1. Pleistocene
2. New Mexico (SC)
3. Hoffer, J. M., 1975, Texas Jour. Sci., v. 26, no. 3, p. 379-390
7. Craters and depressions
9. Overlies mid-Pleistocene La Mesa surface
10. Type locality: S and SE of Afton, approximately 40 km SW of Las Cruces, T. 26 S., R. 1 W., Dona Ana County.

Agricola Schist-Gneiss/Schist (Dadeville Complex) AGCL01
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 27
4. Schist, gneiss, amphibolite
7. Complexly interlayered
9. Overlies Smith Mountain Ultramafics
10. Type locality: Near Agricola, S of Dadeville, Tallapoosa County.

Aiken Member (Budden Canyon Formation) AIKN01
1. Lower Cretaceous
2. California (NW)
3. Dailey, D. H., 1973, California Univ. Pubs. in Geol. Sci., v. 106, p. 9-10
4. Mudstone
5. Gray
6. 760 m
7. Fossil plants
9. Overlies Huling Member; underlies Bald Hills Member
10. Type locality: Aiken Gulch, tributary of Middle Fork of Cottonwood Creek, approximately 3.2 km S of Roaring River, and along Roaring River, secs. 32-35, T. 30 N., R. 7 W., Shasta County.

Akalura Drift U AKRL01
1. Pleistocene
2. Alaska (SC)
3. Karlstrom, T. N. V., 1969, in Karlstrom, T. N. V., and Ball, G. E., eds., Toronto, Ontario, Ryerson Press, p. 20-54
4. Glacial drift
10. Type locality: Akalura Lake, Kodiak Island.

Alamos Tonalite ALMS05
1. Upper Jurassic
2. California (SC)
3. Weaver, D. W., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 12-13
4. Quartz diorite
9. Intrusive into Santa Cruz Island Schist
10. Type locality: 3.2 km N of Alamos Anchorage, SC Santa Cruz Island. Probably named for Canada del Alamos.

Alkali Gulch Formation AKGC02
1. Middle Pennsylvanian (Des Moinesian)
2. Utah (SE), Colorado
3. Northrop, S. A., 1973, New Mexico Geol. Soc. Guidebook 24, p. 159
4. Limestone, dolomite, shale, sandstone, anhydrite, salt
6. 34 m
7. Cyclic deposits
9. Overlies Pinkerton Trail Formation; underlies Barker Creek substage of Four Corners stage
10. Type area: Subsurface, Aneth area to Lisbon area, Paradox Basin, San Juan County, Utah.

Allen Ranch Breccia Member (Segovia Formation) ALRC02
1. Lower Cretaceous (Comanchean)
2. Texas (C)
3. Rose, P. R., 1972, Texas Bur. Econ. Geology Rept. Inv. 74, p. 40
4. Limestone
6. 7 m
9. Overlies Burt Ranch Member; underlies "Gryphaea" bed member
10. Type locality: Roadcuts on U.S. Highway I-10, 1.6 km W of intersection with U.S. Highway 290, Kimble County. Named for exposures in bed of Allen Creek, on Allen Ranch, E of U.S. Highway 83, Kimble County.

Alligator Back Formation U AGBK01
1. Precambrian Y
2. North Carolina (NC), Virginia
3. Rankin, D. W., Espenshade, G. H., and Shaw, K. W., 1973, Am. Jour. Sci., v. 273-A, p. 17-19
4. Gneiss with interlayered schist and amphibolite
9. Conformably overlies Ashe Formation
10. Type locality: Exposures on Bluff Mountain (Alligator Back) in Whitehead Quadrangle, lat 36°25′2" N., long 81°11′2" W., Alleghany County, N.C.

Almond Trondhjemite ALMD03
1. Mississippian, Pennsylvanian
2. Alabama (EC)
3. Neathery, T. L., and Reynolds, J. W., 1975, Alabama Geol. Survey Bull. 109, p. 32-34
5. Gray, white
7. Phacoliths, sills, dikes
9. Intruded into Wedowee Group rocks
10. Type area: Crooked Creek area, near town of Almond, Randolph County.

Alsea Formation U ALSE01
1. Oligocene
2. Oregon (WC)
3. Snavely, P. D., Jr., MacLeod, N. S., Rau, W. W., Addicott, W. O., and Pearl, J. E., 1975, U.S. Geol. Survey Bull. 1395-F, p. F1-F21
4. Siltstone and sandstone, with interbedded tuff
5. Gray
6. Range 50-1100 m
9. Overlies Nestucca Formation; underlies Yaquina Formation
10. Type section: N side of Alsea Bay, Oregon Coast Range, SW1/4 sec. 8, T. 13 S., R. 11 W., Lincoln County.

Alum Creek Porphyry AMCK02
1. Tertiary
2. Colorado (SC)
3. Calkin, W. S., 1971, New Mexico Geol. Soc. Guidebook 22, p. 235-245
4. Quartz monzonite porphyry
7. Small stock
10. Type locality: Along Alum Creek, SE of Lookout Mountain, Conejos County.

Alum Mountain Formation ALMM02
1. Oligocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 238
4. Andesite and latite
7. Flows and flow breccia
9. Overlies Tadpole Ridge Quartz Latite; underlies Bloodgood Canyon Rhyolite
10. Type locality: Alum Mountain, NE Grant County.

Amik Lake Granite AKLK03
1. Precambrian X
2. Michigan (NW)

3. Taylor, W. E. G., 1967, Northwestern Univ. Rept. Inv. 13, p. 2
4. Porphyritic granite
5. Gray
9. Intrudes Michigamme River Granite
10. Type locality: Between Champion and Republic, Marquette County.

Ammons Formation (Great Smoky Group) AMNS01
1. Precambrian Z
2. North Carolina (WC)
3. Mohr, D. W., 1973, Am. Jour. Sci., v. 273-A, p. 41-71
4. Metasediments, schist
6. 1500 m
7. Thin-bedded, laminated
8. Horse Branch Member
9. Conformably overlies Grassy Branch Formation (Great Smoky Group); conformably underlies Dean Formation (Great Smoky Group) or Nantahala Formation
10. Type section: Both sides of Little Tennessee River from mouth of Nantahala River N to mouth of Grassy Branch, Swain County. Named for Ammons Branch, which flows into Little Tennessee River W of Southern Railroad bridge.

Amygdaloid Island Flow (Portage Lake Volcanics) U AMGI01
1. Precambrian Y
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C18
4. Trap, andesite basalt
5. Gray
6. < 15 m
9. Oldest of 12 named flows of Portage Lake Volcanics on Isle Royale; erupted before Hill Point Flow
10. Type locality: On promontory S of Crystal Cove at E end of Amygdaloid Island, N shore of E Isle Royale, Keweenaw County.

Anderson Formation ADRS01
1. Paleocene
2. California (WC)
3. Ditzler, C. C., 1972, San Joaquin Geol. Soc. Selected Papers, v. 4, p. 21-25
4. Sandstone
6. 61 m
9. Overlies Martinez Shale; underlies "Meganos C shale"
10. Type section: Signal, Upham No. 1 well, Sherman Island Gas Field, sec. 26, T. 3 N., R. 2 E., Sacramento County.

Anderson Metagabbro ADRS14
1. Paleozoic
2. South Carolina (NW)
3. McConnell, K. I., and Griffin, V. S., Jr., 1973, South Carolina Div. Geology Geol. Notes, v. 17, no. 3, p. 68-82
4. Metagabbro and amphibolite
10. Type locality: Extends from town of Anderson to about 22.5 km NNE, Anderson County.

Andrew Lake Formation U ADLK01
1. Eocene, upper
2. Alaska (SW)

3. Scholl, D. W., Greene, H. G., and Marlow, M. S., 1970, Geol. Soc. America Bull., v. 81, no. 12, p. 3584
4. Sandstone, siltstone, and shale interlayered with mafic flows and sills
6. 850 m
9. Overlies Finger Bay Volcanics; unconformably underlies upper Cenozoic eruptive rocks
10. Type locality: Low cliffs along E shore of Andrew Lake, N Adak Island.

Angelica Arkose U AGLC01
1. Lower Cretaceous
2. Arizona (SC)
3. Cooper, J. R., 1971, U.S. Geol. Survey Prof. Paper 658-D, p. D26-D29
4. Arkosic sequence of interbedded feldspathic sandstone, siltstone, and conglomerate
6. 1500 m
9. Disconformably overlies Whitcomb Quartzite; unconformably underlies Demetrie Volcanics
10. Composite type locality: Exposure along Angelica Wash: middle part in secs. 10 and 11, T. 17 S., R. 12 E; basal part 7.2 km E of Helmet Peak in sec. 10, T. 17 S., R. 13 E; upper part W of Angelica Wash in S1/2 secs. 10 and 11, and SW1/4 sec. 12, T. 17 S., R. 12 E; Twin Buttes Quadrangle, Pima County.

Angelo Member (Green River Formation) U ANGL03
1. Eocene, lower
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 31-32, 45-46
4. Limestone, calcareous shale, mudstone, chert, minor sandstone and oil shale beds
5. Weathers white
6. 59 m, range 0-60 m
7. Lacustrine basin deposits; fossiliferous
9. Conformably overlies Fossil Butte Member (Green River Formation); conformably underlies Bullpen Member (Wasatch Formation)
10. Type section: On bluff overlooking Angelo Ranch, W of South Fork Twin Creek, NW1/4 sec. 1, T. 20 N., R. 118 W., Lincoln County.

Angora Peak Sandstone Member (Astoria Formation) AGPK01
1. Miocene
2. Oregon (NW), Washington
3. Niem, A. R., 1975, Ore Bin, v. 37, no. 2, p. 17-36
4. Sandstone, conglomerate, siltstone
5. Gray, orange-yellow
6. 300 m
7. Laminated, crossbedded
10. Type locality: 1.6 km S of Hug Point State Park, Clatsop County, Oreg. Named for Angora Peak.

Antimony Tuff Member (Mount Dutton Formation) U ANMN01
1. Miocene, lower
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B14

5. Brown
6. 20 m
7. Densely welded crystal-poor ash-flow tuff
9. Intercalated with unnamed volcanic breccia member of Mount Dutton Formation
10. Type section: E end of Kingston Canyon, NE of town of Antimony, sec. 29, T. 30 S., R. 2 W., Piute County.

Antioch Limestone Member (Dugger Formation) ANTC02
1. Middle Pennsylvanian
2. Indiana (WC)
3. Shaver, R. H., and others, 1970, Indiana Geol. Survey Bull. 43, p. 5
4. Conglomeratic limestone
6. 1.9 m
9. Overlies unnamed coal bed 6 m above Alum Cave Limestone Member; underlies Bucktown Coal Member
10. Type section: NE1/4SE1/4NW1/4 sec. 24, T. 8 N., R. 8 W., near Antioch Church, Sullivan County.

Antoine Formation ANTN05
1. Tertiary
2. Washington (NE)
3. Marjaniemi, D. K., and Robius, J. W., 1975, Lucius Pitkin, Inc., 64 p.
4. Conglomerate in arkosic sand matrix
6. 290 m, range 290-370 m
9. Overlies Siwash Formation
10. Type section: Along Antoine Creek NE of Tonasket in Okanogan River valley, sec. 26, T. 38 N., R. 27 E., Okanogan County.

Apache Leap Tuff U APLP03
1. Miocene, lower
2. Arizona (C)
3. Peterson, D. W., 1969, U.S. Geol. Survey Geol. Quad. Map GQ-818
4. Nonwelded tuff grading upward to densely welded vitrophyre and porphyritic tuff
5. Gray, black
6. 610 m, range < 150-610 m
9. Overlies Whitetail Conglomerate or Tertiary lava flows; conformably underlies Big Dome Formation
10. Type section: Queen Creek Canyon and Oak Flat, sec. 36, T. 1 S., R. 12 E., and secs. 28, 29, 30, and 31, T. 1 S., R. 13 E., Pinal County.

Apache Spring Quartz Latite APSP03
1. Oligocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 235-236
4. Quartz latite ash-flow tuff
6. > 760 m
10. Type locality: Sec. 36, T. 11 S., R. 18 W., Catron County.

Apsey Conglomerate Member (Galiuro Volcanics) U APSY01
1. Miocene
2. Arizona (SE)
3. Krieger, M. H., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-668

6. Range 0-122 m
7. Cliff-forming, thin-bedded
9. Overlies Hells Half Acre Member (Galiuro Volcanics); disconformably underlies Gila Conglomerate
10. Type locality: Apsey Camp on Ash Creek, sec. 25, T. 5 S., R. 17 E., Pinal County.

Araby Formation U ARBY01

1. Lower and Middle Cambrian
2. Maryland (NC)
3. Reinhardt, Juergen, 1974, Maryland Geol. Survey Rept. Inv. 23, p. 5-11
4. Metasiltstone with phyllite
5. Tan
6. > 100 m
7. Highly cleaved and mottled, fossiliferous
9. Overlies Ijamsville Phyllite or Harpers Formation; underlies Rocky Springs Station Member (Frederick Formation)
10. Type section: On Baltimore and Ohio Railroad E of Frederick Junction. Named for Araby, SW of Frederick, Frederick County.

Aravaipa Member (Galiuro Volcanics) U ARVP01

1. Miocene
2. Arizona (SE)
3. Krieger, M. H., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-668
4. Rhyolitic ash-flow tuff
6. Range 60-90 m
9. Overlies unnamed units or Holy Joe Member (Galiuro Volcanics); underlies unnamed units of Galiuro Volcanics
10. Type locality: Aravaipa Canyon, NE1/4 sec. 17, T. 6 S., R. 18 E., Pinal County.

Ardath Shale (La Jolla Group) U ARDT01

1. Eocene, middle
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 716-717
4. Silty shale
5. Olive-gray
6. 70 m
7. Richly fossiliferous
10. Type section: On E side of Rose Canyon, 800 m S of Ardath Road intersection with U.S. Highway I-5, San Diego County.

Argo Gneiss ARGO03

1. Precambrian W
2. Minnesota (NC)
3. Griffin, W. L., and Morey, G. B., 1969, Minnesota Geol. Survey Spec. Pub. Ser. SP-8, p. 12-13
5. Brown
7. Fine- to medium-grained, massive to thin-bedded
9. Overlies gneiss of Knife Lake Group in S, and Ely Greenstone
10. Type locality: Exposures in roadcuts 0.8 km W of Argo Cemetery on St. Louis County Highway 21, C Isaac Lake Quadrangle.

Argyle Till/Till Member (Winnebago Formation) ARGL02

1. Pleistocene (Wisconsinan)
2. Illinois (NC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey

Bull. 94, p. 63-64
4. Sandy cobble and pebble till
5. Salmon to reddish-brown
7. Loosely compacted
9. Overlies Juda Gravel or unnamed silts of Winnebago Formation; underlies Plano Silt Member or younger deposits
10. Type section: Rock Valley College section, 8 km SW of Argyle, SW1/4NW1/4SW1/4 sec. 10, T. 44 N., R. 2 E., Winnebago County, Ill.

Arnold River Formation ADRV01
1. Middle Ordovician
2. Canada (Quebec), Maine
3. Marleau, R. A., 1968, Quebec Dept. Nat. Resources Geol. Rept. 131, 55 p.
4. Metasandstone
5. Gray
6. > 1000 m
7. Crystalline, foliated
9. Unconformably underlies Seboomook Formation
10. Type locality: N of International Boundary near junction of Arnold River and Morin Brook, Quebec, Canada.

Asaga Formation ASAG01
1. Pliocene
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 444-446
4. Basalt breccia, tuff, flows, cinders
7. Volcanic cones buried by lava from two coalescing shields
9. Underlies Tuafanua Formation
10. Type area: Exposures on both sides of Asaga Strait which separates Ofu and Olosega Islands.

Ashdown Tuff U ASDN01
1. Miocene, lower
2. Nevada (NW)
3. Noble, D. C., McKee, E. H., Smith, J. G., and Korringa, M. K., 1970, U.S. Geol. Survey Prof. Paper 700-D, p. D24-D25
4. Densely welded devitrified porphyritic tuff
5. Tan to brown
6. 60 m
7. Cliff-forming
10. Type locality: Canyon walls of Cove Creek, NE1/4 sec. 2, T. 42 N., R. 27 E., Humboldt County. Named for Ashdown Mine on W side of Pine Forest Range.

Ashe Formation U ASHE01
1. Precambrian Z
2. North Carolina (NC), Virginia
3. Rankin, D. W., 1970, in Fisher, G. W., and others, eds., New York, Interscience Publishers, p. 232-233
4. Metasedimentary and metavolcanic rocks
6. > 3000 m
7. Layered
9. Nonconformably overlies Cranberry Gneiss; conformably underlies Alligator Back Formation
10. Type locality: Along South Fork of New River between bridge along North Carolina Highway 163 and nonconformity at base of

formation 23.7 km NNE along Ashe-Alleghany County line, lat 36°31′20" N., long 81°19′50" W., N.C.

Attean Quartz Monzonite U ATTN03
1. Lower Ordovician
2. Maine (WC)
3. Albee, A. L., and Boudette, E. L., 1972, U.S. Geol. Survey Bull. 1297, p. 21-28
4. Porphyritic quartz monzonite with large K-feldspar phenocrysts
5. Pink, green
9. Intrudes granofels and diorite; intruded by Ordovician or younger rocks; unconformably underlies Upper Silurian metasedimentary rocks
10. Type locality: Along line trending S. 70° W. from unnamed islands in SW part of Attean Pond to summit of Attean Mountain, Attean Quadrangle, Somerset County. Named for Attean Pond and Attean Mountain in Attean Township.

Atwell Gulch Member (Wasatch Formation) U ALGC01
1. Paleocene and Eocene(?)
2. Colorado (WC)
3. Donnell, J. R., 1969, U.S. Geol. Survey Bull. 1274-M, p. M6-M8
4. Claystone with siltstone and sandstone lenses
5. Variegated
6. Range 210-560 m
9. Overlies Ohio Creek Formation; underlies Molina Member (Wasatch Formation)
10. Type locality: Along Atwell Gulch approximately 8 km N of Mesa, Mesa County.

Auburn Gneiss (Opelika Complex) ABRN06
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 32
4. Gneiss and schist
7. May represent turbidite sequence
10. Type area: Near Auburn, Lee County, Ala.

Augustine Volcanics U AGSN04
1. Pleistocene and Holocene
2. Alaska (C)
3. Detterman, R. L., 1973, U.S. Geol. Survey Geol. Quad. Map GQ-1068
4. Volcaniclastic rocks
5. Gray
6. Range 1- > 100 m
9. Overlies upper Tertiary sedimentary rocks
10. Type locality: Augustine Island, Iliamna B-2 Quadrangle.

Auld Lang Syne Group U ALGS01
1. Upper Triassic and Lower Jurassic
2. Nevada (NW)
3. Burke, D. B., and Silberling, N. J., 1973, U.S. Geol. Survey Bull. 1394-E, p. E1-E14
4. Sandstone
6. 7620 m
8. Grass Valley, Osobb, Dun Glen, Winnemucca, Raspberry, O′Neill, Singas, Andorno, and Mullinix Formations

9. Overlies Star Peak Group; unconformably underlies Tertiary volcanic rocks
10. Type section: Extends from sec. 32, T. 34 N., R. 37 E., to secs. 23 and 24, T. 34 N., R. 36 E., Rose Creek Quadrangle, Pershing County. Named for Auld Lang Syne Peak in sec. 12, T. 33 N., R. 36 E., Dun Glen Quadrangle.

Aults Run Sandstone Member (Greene Formation) U ALSR01
1. Lower Permian
2. Ohio (EC), Pennsylvania, West Virginia
3. Berryhill, H. L., Jr., 1963, U.S. Geol. Survey Prof. Paper 380, p. 63-65
6. 6 m, range 6-9 m
9. Overlies Jollytown A coal bed; underlies undifferentiated strata of Greene Formation
10. Type section: Upper 6 m of N bank of new cut for U.S. Highway 40 about 122 m W of NE corner of sec. 27, East Richland Township, Belmont County, Ohio.

Awatubi Member (Kwagunt Formation) AWTB01
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, 1243-1260
4. Argillaceous shale and mudstone
6. 344 m
9. Overlies Carbon Butte Member; underlies Walcott Member
10. Type section: Awatubi Canyon, E Grand Canyon, lat 36°13′ N., long 111°50′ W., Coconino County.

Bacon Creek Member (Hell Creek Formation) BCCK02
1. Upper Cretaceous
2. North Dakota (SW), Montana
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 22
4. Shale, bentonite
5. Variegated
6. 36 m, range 22-36 m
7. Forms rugged badlands
9. Overlies and interfingers with Marmarth Member; underlies Huff Member
10. Type section: W of Bacon Creek, SE1/4 sec. 23, T. 133 N., R. 106 W., Slope County, N. Dak.

Badger Creek Tuff U BGCK01
1. Oligocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C13-C15
4. Tuff
5. Gray, brown, buff
6. 95 m, range 95-244 m
9. Overlies Antero Formation; underlies coal and unnamed latite flow
10. Type locality: Valley of East Badger Creek, NE1/4 sec. 12, T. 50 N., R. 10 E., 17.7 km NE of Salida, Cameron Mountain Quadrangle, Fremont County.

Badger Spring Granodiorite U BGSP07
1. Precambrian

2. Arizona (C)
3. Anderson, C. A., 1972, U.S. Geol. Survey Bull. 1345, p. 22-24
9. Intrusive into Bumblebee Granodiorite and Spud Mountain Volcanics (Big Bug Group); underlies Hickey Formation in part
10. Type locality: Badger Spring Wash, E of Cordes, Bradshaw Mountains, Mayer Quadrangle, Yavapai County.

Baggot Rocks Granite BGRK03
1. Precambrian X
2. Wyoming (SC)
3. Hills, F. A., Gast, P. W., Houston, R. S., and Swainback, I. G., 1968, Geol. Soc. America Bull., v. 79, no. 12, p. 1763-1767
4. Granite cut by diabase dikes and pegmatite
7. Massive to foliated
10. Type locality: Baggot Rocks, T. 15 N., R. 83 W., Carbon County.

Baird Mountain Limestone Member (Northview Formation) BRDM03
1. Lower Mississippian (Kinderhookian)
2. Missouri (SC), Arkansas, Oklahoma
3. Thompson, T. L., and Fellows, L. D., 1969, Missouri Geol. Survey and Water Resources Rept. Inv. 45, p. 20-23
4. Argillaceous limestone
5. Red
6. Range 0.3-1.5 m
7. Crinoidal, conodont-bearing
10. Type section: Quarry on W side of Baird Mountain, SW1/4NW1/4 sec. 26, T. 22 N., R. 22 W., Table Rock Dam Quadrangle, Taney County, Mo.

Bakers Bridge Granite U BKBG06
1. Precambrian X
2. Colorado (SW)
3. Barker, Fred, 1969, U.S. Geol. Survey Bull. 1272-F, p. F2-F3
4. Granite and alaskite
5. Red
7. Massive, medium- to coarse-grained
10. Type locality: Bakers Bridge, which spans Animas River 24.1 km NW of Durango, Hermosa Quadrangle, La Plata County.

Bancroft Limestone U BCRF07
1. Middle Cambrian
2. Idaho (SE), Utah
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 23
4. Oolitic limestone with claystone partings
5. Green
6. 160 m, range 90-160 m
7. Thin-bedded, fossiliferous
9. Overlies Lead Bell Shale or its Cub Tongue in E; underlies Blacksmith Limestone
10. Type locality: Along E side of Portneuf Range, SW1/4 sec. 7, T. 10 S., R. 39 E., Bancroft Quadrangle, Bannock and Caribou Counties, Idaho. Named for town of Bancroft.

Banner Formation BNNR01
1. Pleistocene
2. Illinois (NC)

3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 48-49
4. Till
6. 90 m
7. Glacial outwash deposit
8. Harkness Silt Member, Lierle Clay Member (W Illinois), Sankoty Sand Member, Mahomet Sand Member (C Illinois)
9. Overlies Enion Formation
10. Type section: Borrow pit, SW1/4SW1/4NE1/4 sec. 31, T. 7 N., R. 6 E., Peoria County. Named for town of Banner, Fulton County.

Baptism River Lava/Basalt (North Shore Group) BPRV01
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P.K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 320
4. Basalt
6. 90 m
9. Intruded by dikes and plutons of Beaver Bay Complex; overlies Gooseberry River Basalt; underlies Palisade Rhyolite Flow
10. Type locality: Near mouth of Baptism River, Lake County.

Bardstown Member (Drakes Formation) U BRDS07
1. Upper Ordovician
2. Kentucky (C)
3. Peterson, W. L., 1970, U.S. Geol. Survey Bull. 1294-A, p. A36-A41
4. Limestone
5. Green-gray
6. Range 3.5-12 m
7. Fossiliferous
9. Conformably overlies Rowland Member; underlies Saluda Dolomite Member
10. Type section: Roadcut along U.S. Highway 150, 2.25 km NE of Fredericktown, Maud Quadrangle, Nelson County. Named for exposures near Bardstown.

Baring Granite BRNG14
1. Lower Devonian
2. Maine (EC)
3. Spooner, C. M., and Fairbairn, H. W., 1970, Geol. Soc. America Bull., v. 81, no. 12, p. 3664
7. Small pluton
10. Type area: Near town of Baring, Calais area, Washington County.

Barney Creek Amphibolite (North Snowy Group) BRCK78
1. Precambrian W
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 10-14
4. Metamorphosed basaltic flows and tuffs
5. Black, dark-gray
6. Range 60-240 m
9. Adjacent to George Lake Marble
10. Type section: Exposures on crest of ridge W of South Fork of Pine Creek at head of Barney Creek, Beartooth Mountains, Park County.

Barnum Till BRNM01
1. Pleistocene
2. Minnesota (NE)
3. Wright, H. E., Jr., Mattson, L. A., and Thomas, J. A., 1970, Minnesota Geol. Survey, Geol. Map Ser. GM-3, p. 24-26
5. Red
10. Type locality: Thomson and Nickerson moraines S and SW of Carlton, Carlton County. Named for town of Barnum.

Barrancas Limestone Member (Magueyes Formation) U BRCS01
1. Lower Cretaceous
2. Puerto Rico (C)
3. Briggs, R. P., 1969, U.S. Geol. Survey Bull. 1274-O, p. 015-019
4. Limestone with fossiliferous mudstone at base
5. Dark-gray
6. 60 m
7. Thick-bedded, finely crystalline, fossiliferous
9. Conformably overlies Torrecilla Breccia(?); underlies unnamed portion of Magueyes Formation
10. Type locality: Quarry centering on 44,170 N., 164,110 E., Barrio Barrancas, Barranquitas Quadrangle.

Barrazas Formation U BRZS02
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F16-F17
4. Volcanic sandstone with volcanic breccia and calcareous mudstone
5. Gray
6. 1100 m
7. Marine deposited, thin- to thick-bedded, fine- to coarse-grained
9. Probably overlies Tabonuco Formation; interfingers with and conformably underlies Hato Puerco Formation
10. Type locality: Quebrada Maracuto, 55,390 N., 204,500 E., 1 km WSW of Cerro Gordo, Gurabo Quadrangle. Named for Barrio Barrazas.

Barrel Springs Formation BSPG05
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 6-7
4. Rhyolite, vitrophyre, vitric tuff
6. 32 m, range 32-81 m
9. Overlies Sheep Pasture or Merrill Formation; underlies Jones, Wild Cherry, or Mount Locke Formation
10. Type locality: NW flank of High Peak, Jeff Davis County.

Barros Tuff Member (Torrecilla Breccia) U BRRS03
1. Lower Cretaceous
2. Puerto Rico (C)
3. Briggs, R. P., 1969, U.S. Geol. Survey Bull. 1274-O, p. 012-013
4. Tuff and breccia interlayered with tuffaceous sandstone and siltstone
5. Yellowish-brown to reddish-brown

6. 100 m, range 0-120 m
7. Thick-bedded, coarse- to fine-grained
9. Lies at top of Torrecilla Breccia; underlies Robles Formation
10. Type section: Along foot trail that descends ridge 1 km NW of Orocovis, 44,280 N., 156,120 E., to 44,380 N., 155,850 E., Orocovis Quadrangle. Named for Barrio Barros, NW of Orocovis.

Bartine Member (McColley Canyon Formation) BRTN14
1. Lower Devonian
2. Nevada (NE)
3. Murphy, M. A., and Gronberg, E. C., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 131
4. Limestone
5. Gray, yellowish
6. Range 64-177 m
9. Conformably overlies Kobeh Member; conformably underlies Coils Creek Member
10. Type section: Main ridge extending SW from peak of Lone Mountain, accessible from U.S. Highway 50, Eureka County. Named for Bartine Ranch, several km SW.

Barton Mountain Formation BRNM10
1. Precambrian
2. New York (NE)
3. Turner, B. B., 1971, Bull. Volcanologique, v. 34, no. 4, p. 781-789
4. Granitic gneiss
5. Pink, gray
6. Range 0-1000 m
7. Volcanic origin indicated by augen-shaped zones of plagioclase
10. Type locality: S Adirondack Mountains, N of Thirteenth Lake, Essex County.

Bassett Formation BSST02
1. Precambrian
2. Virginia (SC)
3. Conley, J. F., and Henika, W. S., 1973, Virginia Div. Mineral Resources Rept. Inv. 33, p. 10-11
4. Biotite gneiss
10. Type locality: Along Smith River between Firestone and North Bassett in Martinsville West and Bassett Quadrangles; on both sides of river along Virginia Highway 57 at Stanleytown and along Highway Alternate 57 between Rock Run and Blackberry Creek, Henry County. Named for exposures at Bassett.

Batavia Member (Henry Formation) BTVI01
1. Pleistocene
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 71
4. Gravel
6. 6 m
7. Formed as outwash plain along fronts of moraines
9. Underlies Richland Loess or Mackinaw Member (Henry Formation)
10. Type locality: Exposures in gravel pits 12.8 km N of Batavia, SW1/4 sec. 1, T. 40 N., R. 8 E., Kane County.

Bateman Formation BTMN01
1. Eocene

2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 27-28
4. Sandstone with coal beds
5. Gray
6. 460 m
7. Marine and continental deposits; crossbedded and current-sorted
9. Overlies Elkton Formation
10. Type section: Along Rader Creek and Waggoner Creek roads between Old Blue Lookout and Rainy Peak in S part of Elkton Quadrangle, Douglas County. Named for Bateman Lookout in Tyee Quadrangle.

Bates Mountain Tuff U BSMN01

1. Oligocene or Miocene
2. Nevada (C)
3. Stewart, J. H., and McKee, E. H., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-730
4. Unwelded pumice tuff, vitrophyre, and densely welded tuff
6. 180 m
9. Unconformably overlies unnamed tuff units and Fish Creek Mountains Tuff(?)
10. Type section: E flank of Bates Mountain, from center sec. 35, T. 20 N., R. 46 E., W to top of Bates Mountain in center sec. 34, T. 20 N., R. 46 E., Lander County.

Batestown Till Member (Wedron Formation) BTSN01

1. Pleistocene
2. Illinois (EC), Wisconsin
3. Johnson, W. H., Gross, D. L., and Moran, S. R., 1971, Ohio State Univ. Press, p. 184-216
5. Gray
6. 4 m
9. Overlies Glenburn Till Member (Wedron Formation) or Vandalia Till Member (Glasford Formation); underlies Snider Till Member (Wedron Formation)
10. Type section: Emerald Pond Section, NE1/4SW1/4SW1/4 sec. 33, T. 20 N., R. 12 W., Vermilion County, Ill. Named for the town of Batestown.

Bathtub Formation U BTTB01

1. Lower Cretaceous
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C9-C10
4. Volcanic-sedimentary rocks including boulder-conglomerate, sandstone, and rhyolitic and andesitic tuffs and flows
6. Range 460-700 m
9. Disconformably overlies Temporal Formation; unconformably underlies Bisbee Formation
10. Type locality: Unnamed valley tributary to Temporal Gulch, immediately SE of ranch in Temporal Gulch, sec. 23, T. 21 S., R. 15 E., Santa Cruz County.

Bathtub Graywacke U BTTB03

1. Lower Cretaceous
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. B., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 25-29

4. Graywacke with interbeds of siltstone, shale, and conglomerate
5. Gray to green
6. Range 750-1300 m
9. Conformably overlies Kongakut Formation; conformably underlies Tuktu Formation (Nanushuk Group)
10. Type section: 0.8 km W of type section for Kongakut Formation on N flank of Bathtub Ridge, lat 69°05′30" to 69°06′15" N., long 142°18′ W.

Baughman Member (Tyee Formation) BGMN03
1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 20-22
4. Sandstone
6. 760 m
7. Massively bedded
9. Overlies Hubbard Creek Member
10. Type locality: Ridge W of Hubbard Creek on which Baughman Lookout is situated, Douglas County.

Baxter Springs Member (Boone Formation) U BXSP02
1. Upper Mississippian
2. Oklahoma (NE), Kansas
3. McKnight, E. T., and Fischer, R. P., 1970, U.S. Geol. Survey Prof. Paper 588, p. 40-50
4. Glauconitic limestone, chert
6. Range 1-34 m
8. 3 informal units
9. Overlies Short Creek Oolite Member; conformably underlies Moccasin Bend Member
10. Type section: W bluff of Spring River about 300 m S of Kansas-Oklahoma State Line, 3.2 km S of Baxter Springs, Kans., in Ottawa County, Okla.

Bayshore Clay Member (Tamiami Formation) BYSR01
1. Pliocene
2. Florida (EC)
3. Hunter, M. E., 1968, Gulf Coast Assoc. Geol. Socs. Trans. 18, p. 439-450
4. Phosphatic sandy clay
5. White to tan
6. 0.3 m
9. Overlies Hawthorn Formation; underlies Murdock Station Member (Tamiami Formation)
10. Type section: Canal bank on Bayshore Waterway, 0.8 km S of U.S. Highway 41, sec. 3, T. 40 S., R. 21 E., Port Charlotte, Charlotte County.

Bear Bluff Formation BBLF01
1. Pliocene
2. South Carolina (EC), North Carolina
3. Du Bar, J. R., Johnson, H. S., Jr., Thom, Bruce, and Hatchell, W. O., 1974, in Oaks, R. Q., Jr., and Du Bar, J. R., eds., Utah State Univ. Press, p. 156-158
4. Calcareous sand, sandy limestone
5. Gray to cream
6. 3 m, range 3-45 m
7. Fossiliferous, coarse-grained

9. Unconformably overlies Pee Dee Formation; underlies Canepatch, Conway, or Waccamaw Formation
10. Type section: L bank of Waccamaw River at Bear Bluff, SW Nixonville Quadrangle, Horry County, S.C.

Beardsley Gneiss Member (Prospect Formation) BRDL04
1. Middle and Upper Ordovician
2. Connecticut (SW), New York
3. Crowley, W. P., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 32-33
4. Homogeneous gneiss with pink pegmatite veins
9. Overlies Pumpkin Ground Member (Prospect Formation); interfingers with Golden Hill Schist Member (Prospect Formation); underlies Ansonia Gneiss
10. Type locality: Hills of Beardsley Park E of Bunnels Pond, Bridgeport, Fairfield County, Conn.

Bearhead Rhyolite (Keres Group) U BRHD01
1. Pliocene, middle
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P4-P8
7. Flows, domes, shallow intrusions
8. Peralta Tuff Member
9. Unconformably overlies Paliza Canyon Formation (Keres Group); underlies gravel deposits
10. Type locality: Exposures on Bearhead Peak, Jemez Mountains, Santo Domingo Pueblo Quadrangle, Sandoval County.

Bear Wallow Diorite Complex U BRWL01
1. Jurassic
2. California (NW)
3. Irwin, W. P., Wolfe, E. W., Blake, M. C., Jr., and Cunningham, C. G., Jr., 1974, U.S. Geol. Survey Geol. Quad. Map GQ-111
4. Hornblende diorite to biotite-hornblende quartz diorite
9. Intrudes younger Rattlesnake Creek terrane
10. Type locality: Mouth of Rattlesnake Creek, NE1/4 sec. 19, T. 1 S., R. 8 E., Pickett Peak Quadrangle, Trinity County. Named for Bear Wallow Meadow in NC Pickett Peak Quadrangle.

Bearwallow Mountain Formation BRLM04
1. Miocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 234
4. Basalt, latite, basaltic andesite
6. 300 m
9. Overlies Double Springs Andesite, Railroad Canyon Rhyolite, or Wall Lake Latite; intertongues with John Kerr Peak Quartz Latite and Jordan Canyon Rhyolite; intruded by Pelona Latite
10. Type locality: Bearwallow Mountain, Mogollon Mountains, Catron County.

Beaver Member (Mount Dutton Formation) U BEVR03
1. Oligocene, upper and (or) Miocene, lower
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B14-B15
4. Dacite porphyry

5. Pink, gray
6. Range 100-250 m
9. Intercalated with unnamed flow-volcanic member of Mount Dutton Formation
10. Type section: 8 km S of town of Beaver, SW1/4 sec. 12, T. 30 S., R. 7 W., Beaver County.

Beaver Creek Volcanics BVCK01
1. Pliocene and Pleistocene
2. Arizona (C)
3. Scholtz, J. F., 1969, Geol. Soc. America Bull., v. 80, no. 12, p. 2637-2644
4. Basaltic lavas with dacite and andesite flows and rhyolite intrusive bodies
6. 300 m
10. Type section: Walls of Stoneman Lake in Wet Beaver Creek drainage basin, T. 16 N., R. 8 E., Coconino County.

Beaverdam Amphibolite BVDM03
1. Paleozoic, middle
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 20-21
4. Actinolite-tremolite
5. Dark-green to gray
9. Occurs in layers in Roopville Formation (Heard Group)
10. Type locality: Along Beaverdam Creek, SW Randolph County.

Beecher Gneiss BCHR06
1. Precambrian W
2. Wisconsin (NE)
3. Dutton, C. E., and Bradley, R. E., 1970, U.S. Geol. Survey Misc. Geol. Inv. Map I-631, sheet 4
4. Granitic gneiss, locally porphyritic
5. Pink to gray
7. Coarse-grained, finely foliated
9. Intrusive into Miscauno Formation; overlies McAllister Formation; unconformably underlies Quinnesec Formation or Pemene Formation
10. Type locality: Not stated. Name attributed to J. W. Trow.

Beechers Bay Member (Monterey Formation) BCRB01
1. Miocene
2. California (SC)
3. Avila, F. A., and Weaver, D. W., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 53-55
4. Vitric ash tuff, rhythmically bedded sandstone, siltstone, and shale, and conglomerate breccia
5. Gray, buff, reddish-black
8. 3 informal lithofacies
9. Conformably overlies San Miguel Volcanics; underlies shale member of Monterey Formation
10. Type locality: Beechers Bay, NE Santa Rosa Island.

Beemerville Nepheline Syenite BMVL01
1. Upper Ordovician
2. New Jersey (NC)

3. Justus, P. S., 1972, Natl. Assoc. Geology Teachers, Eastern Sec., Field Trip Guidebook, Trip 4, p. 1-25
4. Nepheline syenite
7. Intrusive complex with lamprophyre dikes and volcanic breccia pipes
8. Rutano Hill Breccia
10. Type locality: Mass of rock 2.8 km long and 0.4 km wide trending NE about 2.4 km NW of Beemerville, Sussex County.

Beers Spring Formation BSPG06

1. Oligocene
2. Utah (SW)
3. Conrad, O. G., 1969, Utah Geol. and Mineralog. Survey Spec. Studies 29, p. 15-19
4. Andesite tuff, dacite tuff (ignimbrites), intercalated tuffaceous sandstone (middle member) and volcanic conglomerate (upper member)
5. Green (upper member)
6. 113 m
7. Tuffs vitric, porphyritic; sandstone coarse, gravelly, cliff-forming, showing torrential crossbedding
8. 3 unnamed members
9. Overlies Sawtooth Peak Formation or Indian Peak Formation; underlies Needles Range Formation
10. Type section: Lower and middle members, 6.5 km W of Sawtooth Peak, SE1/4 sec. 24, T. 28 S., R. 19 W.; upper member, 1.5 km NE of Beers Spring, SW1/4 sec. 10, T. 26 S., R. 18 W., Beaver County.

Belcher Hill Formation BLCH02

1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 135-137
4. Schist and schist-quartzite with quartz and pegmatite lenses
5. Gray
6. Range 2400-3700 m
9. Overlies Ralston Buttes Formation; underlies Crawford Gulch Formation
10. Type locality: NE1/4 sec. 7 and SW1/4 sec. 6, T. 3 S., R. 70 W., Jefferson County.

Belgium Member (Banner Formation) BLGM01

1. Pleistocene
2. Illinois (EC)
3. Johnson, W. H., 1971, Illinois Geol. Survey Circ. 457, p. 1-16
4. Silt
5. Brown
6. 1 m
9. Overlies Hegeler Till Member; underlies Harmattan Till Member
10. Type section: Harmattan Strip Mine No. 2, SE1/4SW1/4SW1/4 sec. 34, T. 20 N., R. 12 W., Danville, Vermilion County. Named for town of Belgium.

Bell Creek Gneiss U BLCK37

1. Precambrian W
2. Michigan (NC)
3. Cannon, W. F., and Simmons, G. C., 1973, U.S. Geol. Survey Jour. Research, v. 1, no. 2, p. 165-172

4. Granitic gneiss
6. > 300 m
9. Intruded by Compeau Creek Gneiss
10. Type locality: Along valley of Bell Creek and in exposures along pipeline in secs. 32 and 33, T. 47 N., R. 28 W., Greenwood Quadrangle, Marquette County.

Belleview Member (Pismo Formation) U BLLV07
1. Pliocene, upper
2. California (SC)
3. Hall, C. A., Jr., 1973, California Div. Mines and Geology Map 24
4. Interbedded claystone and sandstone
5. White, gray, brown
6. 198 m
9. Concordantly overlies Gragg Member; unconformably underlies Squire Member
10. Type section: Along access road to U.S. Highway 101 near site of old Belleview School, 150 m NE of town of Miles, T. 31 S., R. 12 E., San Luis Obispo County.

Bell Harbor Lava (North Shore Group) BLHB01
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317
4. Quartz tholeiite, trachybasalt, basalt
6. 85 m
9. Overlies Palisade Rhyolite; underlies Schroeder Basalt
10. Type locality: W of Little Marais and NE of Ilgen City, Lake County.

Bell Island Sandstone/Member (Tyonek Formation) BLID06
1. Miocene
2. Alaska (C)
3. Hartman, D. C., Pessel, G. A., and McGee, D. L., 1971, Alaska Geol. Survey Spec. Rept. 5, p. 3
9. Overlies West Foreland Formation; correlated with Hemlock Conglomerate; occurs at base of or underlies Tyonek Formation
10. Type section: B. A. Bell Island well, T. 15 N., R. 7 W., Cook Inlet Basin.

Bellona Bed (Tully Limestone) BLLN05
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 40
4. Limestone
6. < 0.1 m
7. Contains large rugose and tabulate corals
9. Overlies Taughannock Falls Bed; underlies Moravia Bed
10. Type locality: Kashong Creek bed, Bellona, Yates County.

Bellows Field Formation BLFD01
1. Pleistocene
2. Hawaii (NC)
3. Lum, Daniel, and Stearns, H. T., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 11
4. Limestone
5. Cream

6. 18 m
7. Crossbedded, recrystallized dunes
9. Unconformably overlies Kaena Formation; unconformably underlies Waimanalo Formation
10. Type locality: SE Oahu. Named for Bellows Air Field.

Bell Springs Member (Nugget Sandstone) U BSPG09
1. Upper Triassic (?)
2. Wyoming (SC), Colorado
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D16-D17
4. Calcareous sandstone, with shale and siltstone interbeds and basal conglomerate
5. Red, green
6. 64 m, range 0-73 m
7. Ripple-laminated, ledge-forming
9. Disconformably overlies Popo Agie Formation; gradationally underlies upper part of Nugget Sandstone NW of type section; eastward, unconformably underlies and is progressively truncated by Sundance Formation
10. Type section: 2.4 km NE of Bell Springs, NW1/4SE1/4 sec. 9, T. 23 N., R. 88 W., Rawlins Peak Quadrangle, Carbon County, Wyo.

Beluga Formation (Kenai Group) BLUG01
1. Tertiary
2. Alaska (C)
3. Calderwood, K. W., and Fackler, W. C., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 4, p. 739-754
4. Claystone, sandstone
5. Gray
6. 1300 m
9. Unconformably overlies Tyonek Formation; unconformably underlies Sterling Formation
10. Type section: Standard Oil of California, Beluga River No. 1 well, (212-35), SW1/4NW1/4 sec. 35, T. 13 N., R. 10 W., Seward Meridian, Cook Inlet.

Benchmark Iron-Formation (Nemo Group) U BCMK01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Taconite
9. Unconformably(?) overlies Boxelder Creek Quartzite (Nemo Group); unconformably underlies Estes Conglomerate
10. Type locality: NE of village of Benchmark, W1/2 sec. 7, T. 3 N., R. 5 E., Black Hills, Lawrence County.

Bennington Drift/Till BNNG01
1. Pleistocene
2. Vermont (SW)
3. Stewart, D. P., and MacClintock, Paul, 1969, Vermont Geol. Survey Bull. 31, p. 60-70
4. Silty and sandy till
5. Blue-gray to gray
10. Type locality: Exposed at surface in small area between Bennington and Brattleboro, Bennington Quadrangle, Bennington County.

Berg Formation BERG01
1. Holocene
2. Alaska (SE)
3. McKenzie, G. D., 1970, Ohio State Univ. Inst. Polar Studies Rept. 25, p. 65-70
4. Sand (lower member), gravel (upper member)
6. 130 m, range 69-130 m
7. Medium- to coarse-grained; outwash, deltaic, and fluvial-plain deposits
8. 2 unnamed members
9. Gradationally overlies Adams Formation; underlies Glacier Bay Formation
10. Type section: N bank of Berg Creek 2 km E of Adams Inlet, lat 58°54′39" N., long 135°45′24" W.; top of section, elevation 265 m, is 6.2 km N. 35° E. of top of Tree Mountain.

Berkshire Highlands Gneiss Complex/Complex BKHG01
1. Precambrian
2. Connecticut (NW)
3. Gates, R. M., and Christensen, N. I., 1965, Connecticut Geol. and Nat. History Survey Quad. Rept. 17, 38 p.
7. Interlayered
9. Underlies Waramang Formation
10. Type locality: West Torrington Quadrangle, Litchfield County.

Bermont Formation U BRMN16
1. Pleistocene
2. Florida (EC)
3. Du Bar, J. R., 1974, in Oaks, R. Q., Jr., and Du Bar, J. R., eds., Utah State Univ. Press, p. 206-231
4. Sandy shell marl
5. Gray
6. 3 m
7. Unconsolidated
9. Unconformably overlies Caloosahatchee Formation; underlies Fort Thompson Formation
10. Type locality: Shell Creek, Bermont Quadrangle, Charlotte County.

Berry Clay Member (Glasford Formation) BRRY01
1. Pleistocene (Illinoian)
2. Illinois (C), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 54
4. Accretion-gley of clay, silt, and pebbles
5. Gray
6. Range 0.6-1.6 m
9. Overlies various other members of Glasford Formation; underlies Roxana Silt, Robein Silt, Peoria Loess, or Wedron Formation
10. Type section: Roadcut 4.8 km W of Berry, NW1/4SE1/4NW1/4 sec. 34, T. 15 N., R. 4 W., Sangamon County, Ill.

Berry Run Member (Catskill Formation) U BRRN07
1. Upper Devonian
2. Pennsylvania (EC)
3. Epstein, J. B., Sevon, W. D., and Glaeser, J. D., 1974, Pennsylvania Geol. Survey, Atlas 195 cd, p. 182-185
4. Sandstone and siltstone
5. Gray, red

6. 300 m
7. Crossbedded
9. Overlies Sawmill Run Member; underlies Clarks Ferry Member
10. Type section: W side of Lehigh River along former railroad, Carbon County. Named for Berry Run.

Biederman Argillite (Kandik Group) U BDRM01
1. Lower Cretaceous
2. Alaska (NE)
3. Brabb, E. E., 1969, U.S. Geol. Survey Bull. 1274-I, p. I16-I21
4. Argillite, with thin interbeds of siltstone and sandstone
5. Grayish-black
6. 300 m, range 300 to 3000 m
7. Rhythmically bedded to massive, folded and faulted, axial-plane cleavage common, fossils scarce
9. Conformably overlies Keenan Quartzite (Kandik Group); underlies Kathul Graywacke (Kandik Group)
10. Type section: Biederman Bluff face, W side of Yukon River 6.4 km NW of mouth of Kandik River, NW1/4 sec. 32, T. 7 N., R. 25 E., Charley River B-4 Quadrangle.

Big Basin Member (John Day Formation) BGBS03
1. Oligocene
2. Oregon (C)
3. Fisher, R. V., and Rensberger, J. M., 1972, California Univ. Pubs. Geol. Sci., v. 101, p. 9
4. Claystone
5. Red
6. 45 m
9. Unconformably overlies Clarno Formation; underlies Turtle Cove Member (John Day Formation)
10. Measured section: Middle Mountain area of Big Basin, SE1/4 sec. 17, T. 11 S., R. 26 E., Picture Gorge Quadrangle, Grant County.

Big Bug Group U BGBG01
1. Precambrian X
2. Arizona (C)
3. Anderson, C. A., Blacet, P. M., Silver, L. T., and Stern T. W., 1971, U.S. Geol. Survey Bull. 1324-C, p. C7-C8
4. Volcanic rocks
6. 6000 m
8. Green Gulch, Spud Mountain, and Iron King Volcanics
10. Type locality: Exposures along Big Bug Creek, W of Big Bug Mesa, Mount Union Quadrangle, Yavapai County.

Big Creek Formation (Lemhi Group) U BGCK14
1. Precambrian Y
2. Idaho (EC)
3. Ruppel, E. T., 1975, U.S. Geol. Survey Prof. Paper 889-A, p. 5-7
4. Quartzite
5. Gray
6. 3100 m
7. Fine-grained
9. Gradationally overlies West Fork Formation; underlies Apple Creek Formation
10. Type area: Upper reaches of Big Creek in SC Patterson Quadrangle, Lemhi Range, Lemhi County.

Big Cypress Group (Marquesas Supergroup) BGCP01
1. Lower Cretaceous (Comanchean)
2. Florida (SE)
3. Winston, G. O., 1971, Florida Bur. Geology Spec. Pub. 15, p. 9
4. Cyclic series of limestone, dolomite, anhydrite
6. 410 m
8. Dollar Bay Formation
9. Overlies Ocean Reef Group; underlies Naples Bay Group
10. Type section: Collier Corp. Humble No. 1 well, sec. 27, T. 50 S., R. 26 E., Collier County. Named for Big Cypress Swamp.

Big Dome Formation U BGDM03
1. Miocene
2. Arizona (SE)
3. Krieger, M. H., Cornwall, H. R., and Banks, N. G., 1974, U.S. Geol. Survey Bull. 1394-A, p. A6-A7
4. Alluvium
6. 122 m
9. Conformably overlies Apache Leap Tuff or unconformably overlies San Manuel Formation; unconformably underlies Quiburis Formation
10. Type locality: Big Dome on W side of Mineral Creek, W1/2 sec. 25, T. 3 S., R. 13 E., Sonora Quadrangle, Pinal County.

Bigelow Brook Formation (Brimfield Group) U BGBK01
1. Ordovician (?) to Lower Devonian (?)
2. Connecticut (NE), Massachusetts
3. Pease, M. H., 1972, U.S. Geol. Survey Geol. Quad. Map GQ-1023
4. Schist, gneiss
5. Brown to gray
6. > 5200 m
7. Banded
8. Lower, middle, upper members
9. Underlies Hamilton Reservoir Formation (Brimfield Group); in fault contact with Southbridge Formation on NW
10. Composite type section: 1. Lower and middle members in lower section NE of Black Pond fault along line from point on Crystal Brook Pond trending N. 29° W. to where unpaved road crosses quadrangle border in Eastford Quadrangle, Windham County, Conn. 2. Middle and upper members in upper section along line from intersection of North Ashford Road and unnamed road trending N. 54° W. to point NW of Lead Mine Brook and S of Sustek Road in Westford Quadrangle, Windham County, Conn.

Big Sandy Formation U BGSD01
1. Pliocene
2. Arizona (WC)
3. Sheppard, R. A., and Gude, A. J., III, 1972, U.S. Geol. Survey Bull. 1354-C, p. C1-C10
4. Mudstone with interbedded tuffs
5. Green, brown
6. 75 m
9. Unconformably overlies unnamed Tertiary sediments; unconformably underlies Quaternary sediments
10. Type section: 3.2 km E of Wikieup along line between secs. 24 and 25, T. 16 N., R. 13 W., Wikieup Quadrangle, Mohave County. Named for Big Sandy River, tributary to Bill Williams River.

Big Spencer Rhyolite U BGSP05
1. Lower Devonian
2. Maine (NC)
3. Rankin, D. W., 1968, in Zen, E-an, White, W. S., Hadley, J. B., and Thompson, J. B., Jr., eds., New York, Interscience Publishers, p. 362-363
4. Welded rhyolite tuff
6. 430 m
10. Type locality: Exposures on Big Spencer Mountain, Piscataquis County.

Bilyeu Member (Borden Siltstone)/(Warsaw Shale) BLYU01
1. Upper Mississippian (Meramecian)
2. Illinois (C)
3. Lineback, J. A., 1968, Illinois Geol. Survey Circ. 425, p. 5, 17, 28
4. Sericitic quartz siltstone
6. 31 m
7. Coarser grained than surrounding sediments; subsurface lenticular topset unit within deltaic sequence
9. Lies within upper part of Borden Siltstone at type well and to SE; lies within upper part of Warsaw Shale to NW, where Keokuk Limestone underlies the Warsaw Shale
10. Type section: National Petroleum Company No. 1-A Bilyeu, Halden et al. south well, depth-interval 493-524 m, Assumption Consolidated field, NW1/4NW1/4SW1/4 sec. 10, T. 13 N., R. 1 E., Christian County. Named for Bilyeu Cemetery, 3.2 km N of type well.

Birds Member (Wilhelmi Formation) BRDS08
1. Lower Silurian (Alexandrian)
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 13-14
4. Dolomite
5. Gray
6. 6 m
9. Overlies Schweizer Member (Wilhelmi Formation) or Maquoketa Group; underlies Elwood Formation
10. Type section: Lower part exposed in Schweizer West section; upper part exposed in Schweizer North section, Channahon Quadrangle, Will County. Named for railroad siding at Birds, 3.2 km N of type section.

Black Cat Member (Traveler Rhyolite) U BCKC09
1. Lower Devonian
2. Maine (NC)
3. Rankin, D. W., 1968, in Zen, E-an, White, W. S., Hadley, J. B., and Thompson, J. B., Jr., eds., New York, Interscience Publishers, p. 360-361
4. Welded rhyolitic ash-flow tuff
6. 2400 m
9. Overlies Pogy Member
10. Type locality: Exposures on slopes of N peak of Black Cat Mountain, Piscataquis County.

Black Dragon Member (Moenkopi Formation) BKDG01
1. Lower Triassic
2. Utah (SE)
3. Blakey, R. C., 1974, Utah Geol. and Mineralog. Survey

Bull. 104, p. 13-22
4. Sandstone, siltstone
5. Red, gray
6. 63 m
7. Laminated, thin-bedded, slope-forming
9. Overlies Kaibab Formation; underlies Sinbad Limestone Member (Moenkopi Formation)
10. Type locality: Black Dragon Canyon in NE section of San Rafael Swell, T. 21 S., R. 13 E., Emery County.

Blackrock Canyon Limestone U BKKC01
1. Precambrian Z
2. Idaho (SE)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 585
4. Limestone, interbedded with quartzite and minor variegated argillite
6. 160 m
7. Fine-grained
9. Overlies Pocatello Formation; underlies Papoose Creek Formation
10. Type section: E side of lower Blackrock Canyon, 12 km SE of Pocatello, sec. 14, T. 7 S., R. 35 E., Bannock County.

Black Sulphur Tongue (Green River Formation) U BKSP04
1. Eocene
2. Colorado (NW)
3. Duncan, D. C., Hall, W. J., Jr., O'Sullivan, R. B., and Pipiringos, G. N., 1974, U.S. Geol. Survey Bull. 1394-F, p. F10-F11
4. Marlstone
5. Gray
6. 9 m, range 6-18 m
9. Intertongues with Uinta Formation; merges to E with main body of Green River Formation
10. Type section: Northern Piceance Creek Basin, NW1/4SW1/4SW1/4 sec. 23, T. 2 S., R. 98 W., Rock School Quadrangle, Rio Blanco County.

Blakely Harbor Formation BKHB01
1. Miocene or Pliocene
2. Washington (WC)
3. Fulmer, C. V., 1975, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists-Soc. Econ. Geologists, Pacific Secs., Paleogene Symposium and Selected Tech. Papers, p. 210-271
4. Basaltic conglomerate with coal beds
6. 1000 m
7. Massive
9. Overlies Blakeley Formation
10. Type section: Along shore of Blakely Harbor, N along E beach of Bainbridge Island toward village of Winslow, and E offshore at Blakely Rocks, Kitsap County.

Blanding Formation BLDG05
1. Lower Silurian
2. Illinois (NW)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 35-36
4. Dolomite

5. Brownish-gray
6. 16 m
9. Overlies Tete des Morts Formation in N; Mosalem Formation in S; conformably underlies Sweeney Formation
10. Type section: Royal Princess Section in Mississippi River Bluffs, Jo Daviess County. Named for village of Blanding, 4.8 km S of type section.

Blickensderfer Quartz Monzonite U BCKF15

1. Cretaceous
2. Washington (NE)
3. Miller, F. K., 1974, Washington Div. Geology and Earth Resources Geol. Map GM-7, p. 4
5. Gray to white
6. Range 1524-1829 m
7. Pluton
9. Intrudes Belt Supergroup rocks
10. Type locality: Headwaters of Blickensderfer Creek, sec. 33, T. 34 N., R. 45 E., Newport 1 Quadrangle, Pend Oreille County.

Blind Brook Formation BDBK01

1. Middle Ordovician
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 27-28
4. Pyritiferous slate
5. Gray
6. 2100 m
9. Conformably overlies Munsungun Lake Formation; unconformably underlies Spider Lake Formation
10. Type locality: S side of main Great Northern Paper Company road, approximately 230 m E of its crossing with Blind Brook, T. 10 R. 9, Mooseleuk Lake Quadrangle, Piscataquis County.

Blind Bull Formation U BLDB02

1. Upper Cretaceous
2. Wyoming (SW)
3. Rubey, W. W., 1973, U.S. Geol. Survey Bull. 1372-I, p. I25-I34
4. Sandstone and siltstone with coal beds
5. Gray to buff
6. 1900 m
8. Divided into upper and lower units by tongues of Hilliard Shale
9. Overlies Aspen Shale; correlative with Frontier Formation and Hilliard Shale
10. Type section: Along divide between Horse Creek and Hoback River, 4.8 km N of Blind Bull coal mine, from SW1/4 sec. 18, T. 35 N., R. 115 W., to S1/2 sec. 23, T. 35 N., R. 116 W., Afton Quadrangle, Lincoln County.

Blizzard Member (Foreknobs Formation) BLZD03

1. Upper Devonian
2. West Virginia (EC), Maryland, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-54
4. Sandstone, siltstone, shale
5. Greenish-gray
6. 220 m, range 177-220 m
9. Overlies Briery Gap Sandstone Member; underlies Pound Sandstone Member
10. Type section: Along road beside Briery Gap Run near Judy Gap

leading from U.S. Highway 33 toward Spruce Knob, Pendleton County, W. Va. Named for stream within 3 km of type section.

Bloodgood Canyon Rhyolite BDGC01
1. Oligocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 234-237
4. Rhyolite ash-flow tuff
6. 610 m
9. Overlies Alum Mountain Formation; underlies Double Springs Andesite
10. Type locality: Bloodgood Canyon, secs. 5 and 6, T. 13 S., R. 14 W., Grant County.

Blue Meadows Tuff Member (Isom Formation) U BLMD02
1. Oligocene, upper and (or) Miocene, lower
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B12
4. Vitric welded tuff
5. Red
6. 8 m
9. Overlies Needles Range Formation; underlies Baldhills Tuff Member (Isom Formation)
10. Type locality: On N side of S fork of Sandy Creek in N Markagunt Plateau about 11 km NW of Panguitch and E of Blue Meadows, SE1/4NE1/4 sec. 31, T. 33 S., R. 6 W., Iron County.

Blue Mesa Tuff U BLMS01
1. Oligocene, upper
2. Colorado (WC)
3. Olson, J. C., Hedlund, D. C., and Hansen, W. R., 1968, U.S. Geol. Survey Bull. 1251-C, p. C8-C17
4. Quartz latite ash-flow tuff
5. Reddish-brown to white
6. 73 m, range 0-73 m
7. Densely welded, devitrified, porphyritic; forms jointed vertical cliffs
9. Unconformably overlies Ute Ridge Tuff and older Tertiary volcanics or Precambrian rocks; underlies Dillon Mesa Tuff
10. Type locality: Cliffs in rim of Blue Mesa on S side of Black Canyon above Blue Mesa Dam, Gunnison County.

Bluffer Pond Formation BFPD01
1. Middle Ordovician
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 19-23
4. Volcanics
5. Gray
6. 1200 m
8. Ragged Mountain Member
9. Conformably overlies Chase Lake Formation; conformably underlies Munsungun Lake Formation; unconformably underlies Spider Lake Formation
10. Type locality: Along main Great Northern Paper Company road from 1.2 to 4.8 km N of Pillsbury Pond, T. 8 R. 11, Spider Lake Quadrangle, Piscataquis County. Named for Bluffer Pond.

Bobcat Member (Harebell Formation) U BBCT01
1. Upper Cretaceous
2. Wyoming (NW)
3. Love, J. D., 1973, U.S. Geol. Survey Prof. Paper 734-A, p. A17-A27
4. Quartzite conglomerate in sandstone matrix
5. Varicolored
6. 1393 m
9. Overlies unnamed member of Harebell Formation; underlies Pinyon Conglomerate
10. Type section: Base of section is at water level on East Fork of Pilgrim Creek about 1.6 km SW of Bobcat Ridge, extending WSW for 4.4 km to top of high point at 2700 m overlooking N fork of Pilgrim Creek, NC Teton County.

Boehls Butte Formation (Belt Supergroup) U BLSB01
1. Precambrian Y
2. Idaho (NW)
3. Hietanen, Anna, 1968, New York State Mus. and Sci. Service Mem. 18, p. 372-376
4. Anorthosite, andalusite-kyanite-sillimanite schist, quartzite
6. > 1100 m
7. Occupies 340 sq. km in center of anticlinal structure, forms lenslike masses and layers
9. Base not exposed; conformably underlies Prichard Formation
10. Composite section: Monumental Buttes, T. 43 N., R. 5 E., and E side of Floodwood Creek, T. 42 N., R. 4 E, Boehls Butte Quadrangle and vicinity, Clearwater and Shoshone Counties.

Bokan Mountain Granite U BKNM01
1. Upper Triassic or Lower Jurassic
2. Alaska (SE)
3. MacKevett, E. M., Jr., 1963, U.S. Geol. Survey Bull. 1154, p. 33-39
7. Small stock or boss
10. Type section: Hill 2302 on SW flank of Bokan Mountain, S Prince of Wales Island.

Bone Basin Member (Renova Formation) BNBS01
1. Oligocene
2. Montana (SW)
3. Kuenzi, W. D., and Fields, R. W., 1971, Geol. Soc. America Bull., v. 82, no. 12, p. 3373-3394
4. Alternating limestone, mudstone, siltstone
5. Gray
6. 300 m
10. Type section: Bluffs E of Jefferson River, NW1/4NW1/4 sec. 33, T. 1 N., R. 4 W., Jefferson County. Named for Bone Basin Creek SE of Renova.

Bon Homme Gravel BNHM02
1. Pleistocene
2. South Dakota (SE)
3. Christensen, C. M., 1974, South Dakota Geol. Survey Bull. 21, pt. 1, p. 11-13
5. Pink
6. 8 m
7. Cross and horizontal bedding
10. Type section: Gravel pit on W side of road, E side of section

line, SW1/4SW1/4SW1/4SW1/4 sec. 7, T. 93 N., R. 57 W., Yankton County. Named for Bon Homme Colony in NE Bon Homme County.

Bonita Canyon Formation BNCN01
1. Oligocene
2. Nevada (C)
3. Bonham, H. F., 1970, Nevada Bur. Mines Map 38
4. Volcanic breccia and tuff
6. Range 370-490 m
9. Unconformably overlies Underdown Tuff; unconformably underlies Toiyabe Quartz Latite
10. Type area: Exposures in and adjacent to Bonita Canyon on E flank of Shoshone Mountains, Nye County.

Bonney Canyon Member (San Andres Formation) BNCN04
1. Lower Permian (Leonardian)
2. New Mexico (SE)
3. Kelley, V. C., 1971, New Mexico Bur. Mines and Mineral Resources Mem. 24, p. 12-13
4. Dolomite
5. Gray
6. Range 45-90 m
7. Thin-bedded
9. Overlies Rio Bonito Member; underlies Fourmile Draw Member
10. Type locality: N side of Hondo Canyon, sec. 24, T. 11 S., R. 20 E., Pecos County. Named for Bonney Canyon on tributary of Hondo River, S of Riverside.

Borrego Pass Lentil (Crevasse Canyon Formation) BRGP01
1. Upper Cretaceous
2. New Mexico (NW)
3. Correa, A. C., 1970, Mtn. Geologist, v. 7, no. 2, p. 99-102
4. Quartzose sandstone
5. White to buff
6. 20 m, range 0-36 m
7. Fine-grained; conglomeratic at base of trough cross-bedding units; trace fossils at top of lentil; ledge-forming
9. Overlies Dilco Coal Member (Crevasse Canyon Formation); underlies and intertongues with Mulatto Tongue (Mancos Shale)
10. Type section: Cliff 6.8 km SW of Borrego Pass and 1.6 km E of county road from Prewitt to Borrego Pass Trading Post, sec. 21, T. 15 N., R. 11 W., McKinley County.

Boston Drift/Till BSTN04
1. Pleistocene (Wisconsinan)
2. Ohio (SW)
3. Rosengreen, T. E., 1974, Ohio Div. Geol. Survey Rept. Inv. 92, p. 5
4. Calcareous till
5. Yellowish-brown
6. Range 2-3 m
7. Sparse pebbles and cobbles in compact, uncemented silt loam matrix
9. Overlies Rainsboro Drift/Till; underlies surface loess cap
10. Type section: Along Blinco Branch, 3.4 km E of Boston and 210 m S of U.S. Highway 50, Highland County.

Boston Cliffs Member (Choptank Formation) BCLF01
1. Miocene

2. Maryland (EC), Virginia
3. Gernant, R. E., 1970, Maryland Geol. Survey, Rept. Inv. 12, p. 20-22
4. Sand
5. Brown
6. 4.6 m, range 1-4.6 m
7. Fossiliferous
9. Gradationally overlies St. Leonard Member; underlies Conoy Member
10. Type section: Boston Cliffs along Choptank River, 2.9 km SSE of Dover Bridge on Maryland Highway 331, Talbot County, Md.

Boston Ranch Formation (Reynolds Basin Group) BSRC01
1. Miocene and Pliocene
2. Idaho (SW)
3. McIntyre, D. H., 1972, Idaho Bur. Mines and Geol. Pamph. 151, p. 50
4. Altered vitric tuff, diatomite pumicite, and breccia
6. 63 m
10. Type locality: Conical hill on Boston Ranch N of Farrot Creek, on border between secs. 10 and 11, T. 2 S., R. 4 W., Owyhee County.

Bouse Formation U BOUS01
1. Pliocene
2. Arizona (SW), California, Nevada
3. Metzger, D. G., 1968, U.S. Geol. Survey Prof. Paper 600-D, p. D126-D135
4. Clay, cyclically interbedded with silt and sand; basal limestone; encrusting tufa
5. Green, grayish-orange, white
6. 227 m, range 66-233 m
7. Marine to brackish-water sequence; outcrops coated with amorphous greenish clay
8. Includes Cibola beds of E. D. Wilson (1962)
9. Unconformably(?) overlies Kinter Formation and older rocks; unconformably underlies Pliocene to Holocene alluvium of Colorado River
10. Type section: U.S. Geol. Survey test well LCRP 27, depth-interval 40-270 m, NE1/4NE1/4NE1/4 sec. 31, T. 7 N., R. 21 W.; 2 reference sections for outcrops: S of Bouse Wash, SW1/4 sec. 26 and SE1/4 sec. 27, T. 8 N., R. 20 W.; SE of Cibola, secs. 9 and 16, T. 2 S., R. 23 W.; Yuma County, Ariz.

Bowers Quartz Diorite (Horseshoe Basin Group) BWRS01
1. Lower Cretaceous
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3032-3034
5. Gray
7. Pluton
10. Type locality: T. 39 N., R. 25 E., Okanogan County.

Box Canyon Formation BXCN02
1. Oligocene
2. Nevada (C)
3. Cook, H. E., 1968, Geol. Soc. America Mem. 116, p. 117-118
4. Dacite tuff, dacite lapilli tuff
6. 113 m

7. Vitric to crystal-vitric, non-welded to moderately welded, each member contains intensely welded zone; excellent stratigraphic marker
8. 2 unnamed members
9. Unconformably overlies Italian Springs Formation; unconformably underlies olivine basalt of Little Fish Lake
10. Type section: Hot Creek Range, at NE juncture of Hot Creek Canyon and Box Canyon; except for upper 15 m of upper member, which is best exposed 0.4 km to W, on W side Box Canyon; SW1/4 T. 8 N., R. 49 E., Nye County.

Boxelder Creek Quartzite (Nemo Group) U BXCK01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Orthoquartzite and quartz-mica schist
7. Crossbedded
9. Unconformably overlies Little Elk Granite; unconformably(?) underlies Benchmark Iron-Formation (Nemo Group)
10. Type locality: Along Boxelder Creek, sec. 20, T. 3 N., R. 5 E., Black Hills, Lawrence County.

Boyds Creek Amphibolite/Mafic Complex (Dadeville Complex) BDCK08
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 30-31
4. Massive amphibolite, layered hornblende-migmatite, metagabbro, norite, hornblendite, pyroxenite
10. Type locality: S Chambers County.

Boyer Ranch Formation BRRC03
1. Lower and Middle Jurassic
2. Nevada (NC)
3. Speed, R. C., and Jones, T. A., 1969, Geol. Soc. America Bull., v. 80, no. 12, p. 2554
4. Sandstone, conglomerate
6. Range 0-110 m
8. Informal conglomerate and sandstone members
10. Type area: N Clan Alpine Mountains, 3.2 km N of Shoshone Creek, Churchill County. Named for Boyer Ranch in Dixie Valley.

Bramwell Member (Bluestone Formation) U BRML03
1. Upper Mississippian
2. West Virginia (SW), Virginia
3. Englund, K. J., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-745
4. Shale, siltstone
5. Gray
6. 31 m
9. Overlies red and blue members above Glady Fork Sandstone Member (Bluestone Formation); underlies member of Pennsylvanian age at top of Bluestone Formation
10. Type section: W side of West Virginia Highway 102 at Bluestone, 1.2 km NW of Bramwell, Mercer County, W. Va.

Brandy Cove Member (Perry Formation) BDCV01
1. Upper Devonian

2. Canada (New Brunswick), Maine
3. Schluger, P. R., 1973, Geol. Soc. America Bull., v. 84, no. 8, p. 2535-2536
4. Conglomerate, sandstone, minor mudstone
5. Red
6. 85 m, range 85-457 m
7. Becomes finer grained upward in section
9. Overlies Loring Cove Basalt Member; underlies Joes Point Member
10. Type section: Brandy Cove, on NE bank of St. Croix River, 4 km NW of St. Andrews, Charlotte County, New Brunswick, Canada.

Brant Lake Gneiss BRLK02
1. Precambrian Y
2. New York (NE)
3. Bickford, M. E., and Turner, B. B., 1971, Geol. Soc. America Bull., v. 82, no. 8, p. 2333-2341
7. Core rock of two dome structures
10. Type locality: E of Brant Lake in NE Bolton Landing Quadrangle, Warren County.

Brazos Basalt BRZS01
1. Holocene
2. New Mexico (NC)
3. Doney, H. H., 1968, New Mexico Bur. Mines and Mineral Resources Bull. 92, p. 53-56
7. Cinder cones and related basalt lava
10. Type area: Canyon of Rio Brazos in N Cebolla Quadrangle, Rio Arriba County.

Breakwater Trachybasalt (North Shore Group) BRKR08
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316-318
5. Brown
6. 110 m
7. Columnar, granular
9. Overlies Grand Marais Rhyolite; underlies Good Harbor Bay Andesite
10. Type locality: Harbor at Grand Marais, Cook County.

Brenna Formation/Member (Coleharbor Formation) BRNN04
1. Pleistocene
2. North Dakota (NE), Minnesota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 5-7
4. Clay
5. Gray-black
6. 45 m
9. Overlies Falconer and Huot Members; unconformably underlies Sherack and Poplar River Members
10. Type section: Boring No. 3, Witmer Hall, University of North Dakota, SE1/4SE1/4SE1/4 sec. 5, T. 151 N., R. 50 W., Grand Forks, Grand Forks County, N. D. Named for Brenna Township.

Brennan Basin Member (Duchesne River Formation) BRBS05
1. Eocene and Oligocene
2. Utah (NE)
3. Anderson, D. W., 1972, Utah Geol. and Mineralog. Survey

Bull. 97, 29 p.
4. Sandstone
5. Yellow-gray and red
6. Range 222-540 m
9. Overlies Uinta Formation; conformably underlies Dry Gulch Creek Member (Duchesne Formation)
10. Type section: Extends from small wash 210 m E of Green River near center sec. 17, T. 7 S., R. 21 E., N across Brennan Basin along Green River, up Twelvemile Wash to Halfway Hollow, and up Halfway Hollow to center sec. 13, T. 5 S., R. 19 E., Uintah County.

Briery Gap Sandstone Member (Foreknobs Formation) BRGP04
1. Upper Devonian
2. West Virginia (EC), Maryland, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-54
5. Yellow-gray
6. 36 m, range 20-36 m
7. Contains marine fossils and plant debris, crossbedded
9. Overlies Mallow Member; underlies Blizzard Member
10. Type section: Measured section 2, along road beside Briery Gap Run, near Judy Gap, leading from U.S. Highway 33 toward Spruce Knob, Pendleton County, W. Va.

Broad Canyon Formation BRDC02
1. Middle and Upper Cambrian and Lower Ordovician
2. Nevada (C)
3. Washburn, R. H., 1970, Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, p. 275
4. Limestone, argillite, phyllite
6. > 610 m
7. Intensely deformed
9. Conformably overlies Gold Hill Formation; underlies Antelope Valley Limestone
10. Type locality: Exposures in Broad Canyon, S of Kingston Canyon, S Lander County.

Brockie Lake Conglomerate (Copper Basin Group) BKLK02
1. Lower and Middle Pennsylvanian
2. Idaho (SC)
3. Paull, R. A., Wolbrink, M. A., Volkmann, R. G., and Grover, R. L., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1395-1398
5. White
6. 660 m, range 585-735 m
9. Conformably overlies Muldoon Canyon Formation; gradationally underlies Iron Bog Creek Formation
10. Type section: NE1/4SW1/4NE1/4 sec. 8, T. 4 N., R. 22 E., to center of W1/2 sec. 9, T. 4 N., R. 22 E., Custer County. Named for Brockie Lake.

Brooks Mountain Formation BRKM01
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ., Bur. Econ. Geology Quad. Map 36, p. 10-11
4. Trachyte
5. Brown

6. 300 m
10. Type section: W side of Brooks Mountain, measured upward from quartz trachyte sill to top of mountain, Davis Mountains, Jeff Davis County.

Brookville Diabase/Syenite BKVL07
1. Upper Triassic
2. New Jersey (NW), Pennsylvania
3. Barker, D. S., and Long, L. E., 1969, Jour. Petrology, v. 10, no. 2, p. 202-221
6. 500 m
7. Diabase sill with occurrence of syenite at top of sill
9. Intrudes Lockatong Argillite
10. Type locality: Not stated. Named for town of Brookville, Hunterdon County, N.J.

Browns Canyon Formation U BRSC01
1. Oligocene and Miocene
2. Colorado (C)
3. Van Alstine, R. E., 1969, U.S. Geol. Survey Prof. Paper 626, p. 18-20
4. Tuffaceous siltstone, with conglomeratic arkose at base
5. Brown and gray
6. Range 1-15 m
7. Thin-bedded, folded and faulted, contains plant fossils
9. Unconformably overlies Precambrian gneissic quartz monzonite; upper contact not exposed; considered younger than Nathrop Volcanics, older than Dry Union Formation
10. Type locality: Erosion remnants on both sides of County Road 60, secs. 22, 27, and 28, T. 51 N., R. 8 E., Chaffee County. Named for Browns Canyon of Arkansas River.

Browns Hole Formation (Brigham Group) U BRHL10
1. Precambrian Z
2. Utah (NC)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 592
4. Basalt (lower member), quartzite (upper member)
5. Reddish-brown
6. Range 86-185 m
7. Massive or scoriaceous (basalt); fine- to medium-grained, crossbedded (quartzite)
8. 2 unnamed members
9. Overlies Mutual Formation (Brigham Group); conformably underlies Geertsen Canyon Quartzite (Brigham Group)
10. Type section: Along Middle Fork of Ogden River on slopes NW of Browns Hole, 11 km NE of Huntsville, near center sec. 14, T. 7 N., R. 2 E., Weber County.

Brule River Basalt/Rhyolite (North Shore Group) BLRV02
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. M., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
5. Pink to gray
6. 1400 m
9. Overlies Hovland Lava; underlies Marr Island Lava
10. Type locality: At mouth of Brule River, Cook County.

Brush Creek Limestone Member (Gothic Formation) BRCK79
1. Middle Pennsylvanian
2. Colorado (WC)
3. Bartleson, Bruce, 1972, Colorado School Mines Quart., v. 67, no. 4, p. 187-248
5. Gray
6. 85 m
9. Overlies Taylor River Limestone Member; underlies Crystal River Siltstone Member or Hot Springs Conglomerate Member
10. Type locality: Along W bank of Middle Brush Creek, 10.4 km NE of Crested Butte, sec. 14, T. 13 S., R. 85 W., Gunnison County.

Bryant Knob Formation (Edgewood Group) BRKB03
1. Lower Silurian
2. Missouri (NE), Illinois
3. Thompson, T. L., and Satterfield, I. R., 1975, Missouri Geol. Survey Rept. Inv. 57, p. 97-99
4. Limestone
7. Bioclastic
8. Lower unnamed unit; upper Kissenger Limestone Member
9. Overlies Noix Limestone; underlies Bowling Green Dolomite
10. Type section: Kissenger roadcut on Missouri Highway 79, 1.6 km N of Kissenger, 8 km S of Clarksville, 1.6 km NE of topographic feature known locally as Bryant Knob, SW1/4 sec. 35, T. 53 N., R. 1 E., Pike County, Mo.

Brynt Draw Member (Popo Agie Formation) U BRDR04
1. Upper Triassic
2. Wyoming (C), Colorado
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D15
4. Silty claystone, silty sandstone
5. Red, grayish-yellow
6. 6 m
7. Weathers to rough, fluted badland slopes
9. Overlies Crow Mountain Sandstone or Jelm Formation, gradationally underlies Lyons Valley Member (Popo Agie Formation)
10. Type section: Dallas anticline (reference section for Popo Agie Formation), 11 km SE of Lander, SE1/4 sec. 13 and SW1/4 sec. 12, T. 32 N., R. 99 W., Fremont County. Named for Brynt Draw, tributary to Little Popo Agie River.

Buck Mountain Quartzite U BCKM22
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Orthoquartzite and quartzose slate
9. Overlies Roberts Draw Limestone; conformably underlies Gingrass Draw Slate
10. Type locality: Buck Mountain, sec. 15, T. 2 N., R. 5 E., Black Hills, Pennington County.

Buck Mountain Formation (Newby Group) BCKM23
1. Lower Cretaceous
2. Washington (NC)
3. Barksdale, J. D., 1975, Washington Div. Geology and Earth Resources Bull. 68, p. 24-27

4. Interlayered volcanic and volcaniclastic rocks
6. 4400 m
8. Three unnamed members
9. Unconformably overlies Twisp Formation; unconformably underlies Goat Creek Formation
10. Type section: 1.6 km E of summit of Buck Mountain, at Buck Lake, sec. 22, T. 36 N., R. 21 E., to ridge separating Second and Third Creeks, sec. 29, T. 36 N., R. 21 E., Okanogan County.

Buckskin Breccia U BCKK08
1. Miocene, lower
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B15
6. 30 m, range 30-170 m
7. Volcanic mudflow breccia
9. Overlies Isom Formation; underlies Bear Valley Formation; intercalated with Mount Dutton Formation
10. Type section: E of Buckskin Valley in Markagunt Plateau, SW1/4NE1/4 sec. 26, T. 32 S., R. 6 W., Iron County.

Bucktown Coal Member (Dugger Formation) BCKN01
1. Middle Pennsylvanian
2. Indiana (SW)
3. Shaver, R. H., and others, 1970, Indiana Geol. Survey Bull. 43, p. 27-28
4. Coal bed with shale parting layer
6. Range < 0.1-1.2 m
9. Overlies Antioch Limestone Member
10. Type locality: Abandoned strip mines 1.6 km ESE of Bucktown, sec. 1, T. 6 N., R. 8 W., Sullivan County.

Buffards Formation BFRD03
1. Silurian
2. Virginia (C)
3. Brown, W. R., 1969, Virginia Div. Mineral Resources Rept. Inv. 10, p. 32-35, 48
4. Conglomeratic quartz-muscovite schist, phyllite
6. 460 m
7. Stretched-pebble and bedding cleavage lineations indicate synclinal structure; forms ridges in NE-SW-trending belt
9. Unconformably overlies Arvonia Formation; upper contact not exposed
10. Type locality: Buffards Mountain, at summit near water tower, 5.6 km NW of Dillwyn, Buckingham County.

Bug Formation U BUG 01
1. Pliocene or Pleistocene
2. Wyoming (C)
3. Love, J. D., 1970, U.S. Geol. Survey Prof. Paper 495-C, p. C88
4. Claystone
5. Green, white
6. 38 m
9. Unconformably overlies Split Rock Formation
10. Type section: 3.2 km SW of Bug Ranch headquarters, SW1/4SE1/4 sec. 5, T. 30 N., R. 87 W., Miller Spring Quadrangle, Natrona County.

Bulldog Hollow Member (Fowkes Formation) U BDGH01
1. Eocene
2. Wyoming (SW), Utah
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 35-37, 41, 46-47
4. Tuffaceous and ash sandstone and mudstone
5. Green, white, brown
6. 73 m, range 60-610 m
7. Sandstone contains biotite and magnetite; fossiliferous
9. Gradationally overlies Sillem Member; underlies Gooseberry Member
10. Type section: N of Sage, in W1/2 sec. 33, T. 22 N., R. 119 W., Lincoln County, Wyo. Named for extensive exposures along Bulldog Hollow, S of Sage.

Bullfrog Mountain Formation (Anarchist Group) U BFGM01
1. Upper (?) Permian
2. Washington (NC)
3. Rinehart, C. D., and Fox, K. F., Jr., 1972, Washington Div. Mines and Geology Bull. 64, p. 10-11
4. Slate and metasiltstone
5. Gray
6. 1500 m
9. Conformably overlies Spectacle Formation (Anarchist Group); unconformably(?) underlies Kobau Formation or Palmer Mountain Greenstone
10. Type locality: Bullfrog Mountain, NE of Palmer Lake, C Loomis Quadrangle, Okanogan County.

Bullpen Member (Wasatch Formation) U BLPN02
1. Eocene
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 21-22, 28, 43-44
4. Mudstone, limestone, sandstone
5. Varicolored, banded
6. 54 m, range 54-120 m
7. Sandstone coarse-grained, conglomeratic
9. Conformably overlies Angelo Member (Green River Formation); grades laterally, to W, into Tunp Member (Wasatch Formation); disconformably underlies Sillem Member (Fowkes Formation)
10. Type section: NW1/4 sec. 1, T. 20 N., R. 118 W., Lincoln County. Named for exposures capping bluffs S of Bullpen Creek.

Bull Ridge Member (Madison Limestone/Mission Canyon Limestone) U BRDG12
1. Upper Mississippian
2. Wyoming (WC), Montana
3. Sando, W. J., 1968, Geol. Soc. America Bull., v. 79, no. 12, p. 1855-1857
4. Limestone, dolomite
6. Range 12-37 m
7. Brecciated
9. Underlies Darwin Sandstone Member (Amsden Formation)
10. Type locality: Valley of Bull Lake Creek, SE1/4NW1/4NE1/4 sec. 11, T. 2 N., R. 4 W., Fremont County, Wyo.

Bumblebee Granodiorite U BMBB01
1. Precambrian

2. Arizona (C)
3. Anderson, C. A., 1972, U.S. Geol. Survey Bull. 1345, p. 21-22
9. Intrudes Spud Mountain Volcanics; intruded by Badger Spring Granodiorite; underlies Hickey Formation
10. Type locality: Along lower part of Bumblebee Creek, Mayer Quadrangle, Yavapai County.

Bunker Hill Formation (Lynchburg Group) BKHL01
1. Precambrian Y
2. Virginia (NE)
3. Furcron, A. S., 1969, Georgia Geol. Survey Bull. 80, p. 74-75
4. Arkosic biotite gneiss
9. Unconformably overlies Marshall Granite and Lovingston Gneiss; unconformably underlies Fauquier Formation and Catoctin Greenstone
10. Type locality: Exposed at settlement of Bunker Hill on Virginia Highway 55, between Marshall and The Plains, Fauquier County.

Burt Ranch Member (Segovia Formation) BRRC05
1. Lower Cretaceous (Comanchean)
2. Texas (C)
3. Rose, P. R., 1972, Texas Univ. Bur. Econ. Geology Rept. Inv. 74, p. 35
4. Marly limestone
6. 18 m
9. Overlies Fort Terrett Formation; underlies Allen Ranch Member (Segovia Formation)
10. Type section: Locality 9 on Chalk Creek, 17.7 km S of Junction, part of old Dr. Fred Burt Ranch, Kimble County.

Bushnell Rock Member (Lookingglass Formation) BRCK81
1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 12-14
4. Conglomerate
6. 300 m
9. Overlies Roseburg Formation; underlies Tenmile Member (Lookingglass Formation)
10. Type locality: Ridge extending from Tenmile Creek E across Porter Creek to Alexander Butte, Douglas County.

Buttonbed Sandstone Member (Temblor Formation) U BNBD01
1. Miocene
2. California (SC)
3. Dibblee, T. W., Jr., 1973, U.S. Geol. Survey Prof. Paper 764, p. 22-23
5. Gray
6. Range 0-150 m
9. Overlies or intertongues with Media Shale Member (Temblor Formation); conformably underlies Gould Shale Member (Monterey Shale)
10. Type locality: In Carneros Creek, sec. 32, T. 28 S., R. 20 E., Temblor Range, Kern County. Named for its exposure on Buttonbed Hill, sec. 9, T. 29 S., R. 20 E.

By-Day Member (Eureka Valley Tuff) U BYDY01
1. Miocene, upper

2. California (EC), Nevada
3. Noble, D. C., Slemmons, D. B., Korringa, M. K., Dickinson, W. R., Al-Rawi, Yehya, and McKee, E. H., 1974, Geol. Soc. America Geology, v. 2, no. 3, p. 139
4. Tuff
6. 35 m, range 35-61 m
9. Overlies Tollhouse Flat Member; underlies unnamed upper member
10. Type locality: Exposures on N bank of By-Day Creek, lat 38°16′20" N., long 119°18′45" W., Mono County, Calif.

Byers Island Member (Keyser Limestone) BILD16
1. Upper Silurian
2. Pennsylvania (C), Virginia, West Virginia
3. Head, J. W., III, 1972, Pennsylvania Geologists Field Conf. Guidebook 37, p. 100
6. 28.3 m
7. Nodular beds
9. Grades laterally into Tonoloway Limestone, Big Mountain Shale Member (Keyser Limestone), or Clifton Forge Sandstone Member (Keyser Limestone); underlies Jersey Shore Member (Keyser Limestone)
10. Type locality: Not stated. Named for exposures along Susquehanna River, NE of Selinsgrove, Snyder County, Pa.

Cabrillo Formation (Rosario Group) U CBRL01
1. Upper Cretaceous
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 712-713
4. Sandstone and cobble conglomerate
6. 81 m
7. Massive, crossbedded
10. Type section: S tip of Point Loma Peninsula near Cabrillo National Monument, on sea cliffs 250 m E of new Point Loma Lighthouse where base is 30 m above mean sea level and top is at top of cliff, San Diego County.

Cactus Quartz Monzonite CCTS05
1. Tertiary
2. Utah (SW)
3. McKelvey, G. E., 1973, Utah Geol. Assoc. Pub. 3, p. 60
5. Dark-gray
7. Medium-grained, holocrystalline, generally unaltered; stock and dike
9. Intrudes Paleozoic sedimentary rocks
10. Type area: Imperial Mine area, 2.4 km NW of Frisco, San Francisco Mountains, Beaver County.

Caddy Canyon Quartzite (Brigham Group) U CDCN01
1. Precambrian Z
2. Idaho (SE), Utah
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 585-586, 591
4. Vitreous orthoquartzite with interbeds of argillite and dolomite
5. Purple to maroon
6. 910 m
9. Conformably overlies Papoose Creek Formation; gradationally

overlies Kelley Canyon Formation; underlies Inkom Formation
10. Type section: Caddy Canyon, N of Portneuf River, about 13 km SE of Pocatello, sec. 13, T. 7 S., R. 35 E., and sec. 18, T. 7 S., R. 36 E., Bannock County, Idaho.

Caesars Head Quartz Monzonite U CRHD02
1. Paleozoic
2. South Carolina (NW), North Carolina
3. Hadley, J. B., and Nelson, A. E., 1970, U.S. Geol. Survey Bull. 1324-A, p. A23-A24
4. Quartz monzonite and granodiorite
7. Intrusive bodies
10. Type locality: Hogback Mountain, 8 km E of Poinsett Reservoir, NE Greenville County, S.C. Named for exposures along U.S. Highway 276 near Caesars Head, NW Greenville County.

Cahokia Alluvium CHOK01
1. Quaternary
2. Illinois (SC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 75-77
4. Silt, clay, sand
6. 14 m, range 3-23 m
7. Floodplain and alluvial fan deposits
9. Locally underlies Grayslake Peat, Lacon Formation, Parkland Sand, or Peyton Colluvium
10. Type section: Illinois Geol. Survey test hole 2, depth-interval 0-13.7 m, 4.8 km SW of Cahokia and 1.3 km S of center of East Carondelet, St. Clair County.

Cajul Volcanics (Bermeja Complex) CJUL01
1. Lower Cretaceous (?)
2. Puerto Rico (SW)
3. Mattson, P. H., 1973, Geol. Soc. America Bull., v. 84, no. 1, p. 22-23
4. Feldspathic basaltic lava, chert, tuff
5. Purplish-red, red-brown
7. Finely crystalline, pillow structures, deeply weathered
9. Cut by dikes and sill of Maguayo Porphyry
10. Type locality: Exposures 150 m S of highway bridge, Quebrada Cajul, 16,680 N., 77,890 E., W Sierra Bermeja.

California Creek Member (Totatlanika Schist) U CFCK02
1. Mississippian(?)
2. Alaska (EC)
3. Wahrhaftig, Clyde, 1968, U.S. Geol. Survey Bull. 1254-E, p. E14-E16
4. Schist, gneiss with interbeds of black, carbonaceous slate
5. Gray, weathers white to buff
6. > 900 m
9. Overlies Moose Creek Member; underlies Chute Creek Member
10. Type locality: California Creek, Fairbanks A-4 Quadrangle.

Calvert Beach Member (Choptank Formation) CVBC01
1. Miocene, middle
2. Maryland (EC), Virginia
3. Gernant, R. E., 1970, Maryland Geol. Survey Rept. Inv. 12, p. 10-13
4. Sand

5. Green to blue
6. Range 3.6-4.8 m
7. Muddy, fine-grained
9. Overlies Calvert Formation; gradationally underlies Drumcliff Member (Choptank Formation)
10. Type section: Calvert Cliffs, along W shore of Chesapeake Bay at Calvert Beach, Calvert County, Md.

Camarones Sandstone U CMRS01

1. Upper Cretaceous
2. Puerto Rico (NE)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 19-21
4. Tuff and tuffaceous wacke interstratified with siltstone
5. Dark-gray
6. > 680 m
7. Well-stratified
8. Mamay Lava Member
9. Interfingers with Santa Olaya Lava; conformably underlies Tortugas Andesite
10. Type section: Exposures along road and adjacent creeks near NW edge of Barrio Mamey E of Quebrada Camarones, 55,205 N., 187,180 E., to 54,480 N., 187,720 E., Aguas Buenas Quadrangle.

Camas Valley Member (Flournoy Formation) CMVL01

1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 19
4. Sandstone, siltstone
6. 460 m
7. Thin, rhythmically bedded
9. Overlies White Tail Ridge Member (Flournoy Formation); underlies Tyee Formation
10. Type locality: Camas Valley, Douglas County.

Cambalache Formation U CMBC01

1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F22-F27
4. Andesitic volcanic breccia, sandstone, and mudstone
5. Blue-green, gray
6. Range 350-600 m
7. Thin to thick bedded
8. Toma de Agua Vitrophyre Member
9. Conformably and gradationally overlies Hato Puerco Formation; conformably underlies Canóvanas Formation
10. Type locality: Roadcut on unpaved road in SE corner of Barrio Canóvanas, 54,450 N., 210,975 E., Quebrada Cambalache, NE Gurabo Quadrangle.

Cambria Felsite U CMBR04

1. Oligocene
2. California (SC)
3. Ernst, W. G., and Hall, C. A., Jr., 1974, Geol. Soc. America Bull., v. 85, no. 4, p. 523-532
4. Felsite and tuff
6. 115 m
9. Unconformably overlies Franciscan rocks; unconformably

underlies Lospe, Vaqueros, Sandholdt, or Pismo Formation
10. Type section: Scott Rock, 1200 m NW of Coast Union High School, near Cambria, Cambria Quadrangle, San Luis Obispo County.

Camelback Mountain Quartzite U CBKM01
1. Precambrian Z and Lower Cambrian
2. Idaho (SE)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 586
4. Vitreous orthoquartzite
5. White
6. 1070 m
7. Massive, locally crossbedded
9. Conformably overlies Mutual Formation; conformably and transitionally underlies Gibson Jack Formation
10. Type section: E slope of Wild Horse Mountain, secs. 22 and 23, T. 7 S., R. 34 E, Bannock County. Named for exposures on Camelback Mountain, 6.4 km E of Pocatello.

Camp Hill Granite (Dadeville Complex) CMPH01
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 28-29
4. Gneisses ranging in composition from granite to quartz monzonite
10. Type locality: Camp Hill, Tallapoosa County.

Canaan Formation CANN01
1. Lower and Middle Silurian
2. Maine (C)
3. Ludman, Allan, and Griffin, J. R., 1974, New England Intercollegiate Geol. Conf. Guidebook 66, Trip B-3, p. 160-161
4. Siltstone, shale
5. Buff-brown and gray-green
7. Interbedded
9. Interfingers with Sangerville and Waterville Formations
10. Type area: Sparse outcrops in small area at junction of Skowhegan, Pittsfield, Waterville, and Burnham Quadrangles, Somerset County.

Canaan Peak Formation U CNPK01
1. Upper Cretaceous and Paleocene(?)
2. Utah (SC)
3. Bowers, W. E., 1972, U.S. Geol. Survey Bull. 1331-B, p. B10-B20
4. Conglomerate, sandstone
5. Gray, brown, pink
6. Range 12-300 m
9. Unconformably overlies Kaiparowits Formation; underlies Pine Hollow or Wasatch Formation
10. Type section: On S face of Canaan Peak at head of Wahweap Creek, SE1/4NW1/4 sec. 9, T. 37 S., R. 1 E., Garfield County.

Cañada Formation CAND01
1. Eocene
2. California (SC)
3. Doerner, D. P., 1969, in Weaver, D. W., and others, Am. Assoc.

Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 17-18
4. Shale, siltstone, with volcanic cobble conglomerate at base
5. Gray
6. 420 m
9. Unconformably overlies Pozo Formation; conformably underlies Jolla Vieja Formation
10. Type locality: Area between Well Canyon and upper part of Alegria Canyon, Santa Cruz Island.

Canada Lake Formation CDLK01
1. Precambrian Y
2. New York (EC)
3. McLelland, James, 1972, New York Geol. Assoc. Guidebook 44, Trip E, p. E1-E27
4. Gneiss
6. Range 600-900 m
9. Overlies Irving Pond Formation; underlies Green Lake Formation
10. Type locality: Exposed along State Highway 29A-10 at E end of Canada Lake, Fulton County.

Cancel Breccia U CNCL01
1. Lower to Upper Cretaceous
2. Puerto Rico (NC)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 13-14
4. Tuff breccia, flow breccia, lavas, tuff
5. Reddish- to purplish-gray
6. > 2000 m
7. Massive, nonmarine
9. Conformably overlies El Ocho Formation; unconformably underlies Santa Olaya Lava
10. Type section: Valley of Rio Bayamon, from quarry on W side of river in Barrio Guaraguao, 56,600 N., 183,475 E., S to outcrops in river, 55,540 N., 183,590 E. Named for Quebrada Cancel, Naranjito Quadrangle.

Canepatch Formation U CNPC01
1. Pleistocene, middle
2. South Carolina (EC), North Carolina
3. Du Bar, J. R., Johnson, H. S., Jr., Thom, Bruce, and Hatchell, W. O., 1974, in Oaks, R. Q., Jr., and Du Bar, J. R., eds., Utah State Univ. Press, p. 139-173
4. Sand, clay, silt, peat
6. Range < 10-21 m
9. Unconformably overlies Bear Bluff or Waccamaw Formation; unconformably underlies Socastee Formation
10. Type section: Sec. WA 20, S bank of Intracoastal Waterway near Canepatch Swamp, 10.4 km NE of Myrtle Beach, Horry County, S.C.

Cane Valley Limestone Member (Fort Payne Formation) U CNVL21
1. Lower Mississippian
2. Kentucky (SC)
3. Kepferle, R. C., and Lewis, R. Q., Sr., 1974, U.S. Geol. Survey Bull. 1394-A, P. A63-A70
4. Limestone interbedded with dolomitic siltstone and shale
5. Gray
6. 63 m
9. Overlies Knifley Sandstone Member (Fort Payne Formation)
10. Type section: Shamrock stone quarry along Butler Branch, 5.6

km SSE of Cane Valley and 2.9 km N of Columbia on Kentucky Highway 55, Adair County.

Cannonville Member (Entrada Sandstone) CNVL10
1. Middle Jurassic
2. Utah (SC)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 16-20
4. Sandstone, siltstone
5. Gray, red, varicolored
6. 44 m, range 44-134 m
7. Banded, crossbedded
9. Overlies Gunsight Butte Member; unconformably underlies Escalante Member
10. Type section: At Cannonville, in Paria amphitheater, sec. 16, T. 37 S., R. 2 W., Garfield County.

Canóvanas Formation U CNVS01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F27-F30
4. Volcanic sandstone and mudstone
5. Gray
6. Range 100-450 m
7. Medium- to coarse-grained
9. Conformably overlies Cambalache Formation; conformably underlies Martín González Lava
10. Type locality: Exposures along Quebrada Cambalache extending 700 m upstream from point where stream leaves Gurabo Quadrangle, 59,120 N., 211,420 E., to 58,540 N., 211,390 E. Named for exposures in Barrio Canóvanas.

Canovas Canyon Rhyolite (Keres Group) U CVSC01
1. Pliocene
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P5-P6
4. Rhyolite flows, tuffs, domes, and associated intrusions
6. Range < 30-275 m
9. Overlies basalt of Chamisa Mesa or Santa Fe Formation; underlies Paliza Canyon Formation
10. Type locality: Bear Springs Peak, E1/2 Jemez Quadrangle, Sandoval County. Named for Canovas Canyon.

Canyon Lake Member (Superstition Tuff) U CNLK01
1. Miocene
2. Arizona (C)
3. Stuckless, J. S., and Sheridan, M. F., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3236-3238
4. Quartz-latite ash-flow tuff
5. Red
6. 180 m
7. Densely welded
9. Overlies Geronimo Head Formation; underlies rhyolitic conglomerate
10. Type section: Canyon Lake, 1 km NW of village of Tortilla Flat, Maricopa County.

Cape Deceit Formation CPDC01
1. Pleistocene
2. Alaska (NC)
3. Guthrie, R. D., and Matthews, J. V., Jr., 1971, Quaternary Research, v. 1, no. 4, p. 474-510
4. Silt with gravel, sand, and peat
5. Gray-green
6. Range 4-5 m
9. Unconformably underlies Inmachuk or Deering Formation
10. Type area: Along 250 m of shoreline between Cape Deceit and Deering, Kotzebue Sound, Seward Peninsula.

Cape Foulweather Basalt U CPFL02
1. Miocene, middle
2. Oregon (NW), Washington
3. Snavely, P. D., Jr., MacLeod, N. S., and Wagner, H. C., 1973, Geol. Soc. America Bull., v. 84, no. 2, p. 405-410
4. Tholeiitic basalt flows, breccia, and dikes, sills and irregular intrusive bodies
5. Gray
6. > 150 m
9. Unconformably overlies Astoria Formation or Depoe Bay Basalt
10. Type locality: Along 7 km of coast from Otter Crest on Cape Foulweather, 4 km S of Depoe Bay, N to Government Point, Lincoln County, Oreg.

Cape Sebastian Sandstone CPSB01
1. Upper Cretaceous
2. Oregon (SW)
3. Dott, R. H., Jr., 1971, Oregon Dept. Geology and Mineral Industries Bull. 69, p. 31-38
4. Sandstone with conglomerate lenses in lower half
5. Tan
6. 243 m
7. Massive, with boxwork or honeycomb weathering in sea cliffs
9. Unconformably overlies Otter Point Formation; underlies Hunters Cove Formation or Roseburg Formation
10. Type section: S side of first headland immediately N of Cape Sebastian on line between secs. 25 and 36, T. 37 S., R. 15 W., Curry County.

Cap Rock Member (Ash Hollow Formation) CPRK01
1. Miocene
2. Nebraska (NC), South Dakota
3. Skinner, M. F., Skinner, S. M., and Gooris, R. J., 1968, Am. Mus. Nat. History Bull. 138, art. 7, p. 409
4. Gravel, sand, clay, ash indurated into caliche beds
6. 9 m
9. Overlies Burge Member (Valentine Formation)
10. Type locality: Burge Quarry, on E side of Snake River, N1/2NE1/4SE1/4 sec. 15, T. 32 N., R. 30 W., Cherry County, Nebr.

Capron Till/Till Member (Winnebago Formation) CPRN02
1. Pleistocene (Wisconsinan)
2. Illinois (NE), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 64
6. 2 m

9. Overlies Plano Silt Member (Winnebago Formation); underlies Robein Silt or Peoria Loess
10. Type section: Roadcut 4.8 km N of Capron, NE1/4SE1/4SE1/4 sec. 23, T. 46 N., R. 4 E., Boone County, Ill.

Carbon Canyon Member (Galeros Formation) CRBC03
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1248-1250
4. Limestone, shale, sandstone
5. Varicolored
6. 471 m
9. Overlies Jupiter Member; underlies Duppa Member
10. Type section: Carbon Canyon W fork and mid-Chuar Canyon, E Grand Canyon, lat 36°10′ N., long 111°50′ W., Coconino County.

Cardiff Coal Member (Carbondale Formation) CRDF01
1. Middle Pennsylvanian (Des Moinesian)
2. Illinois (NE)
3. Peppers, R. A., 1970, Illinois Geol. Survey Bull. 93, p. 42-48
6. 3.6 m
7. Locally developed channel coal
9. Overlies No. 2 coal; underlies Lowell coal
10. Type locality: Coal mines 1.6 km from village of Cardiff, secs. 22 and 23, T. 30 N., R. 8 E., Livingston County.

Card Sound Dolomite CDSD01
1. Upper Cretaceous
2. Florida (SE)
3. Winston, G. O., 1971, Gulf Coast Assoc. Geol. Socs. Trans. 21, p. 28
5. Tan to gray
6. 430 m
9. Overlies Marquesas Supergroup
10. Type section: Sinclair No. 1 Williams well, sec. 24, T. 59 S., R. 40 E., 2.4 km SE of Card Sound on Biscayne Bay, Monroe County.

Carey Dolomite U CREY01
1. Lower and Middle Devonian
2. Idaho (C)
3. Skipp, B. L., and Sandberg, C. A., 1975, U.S. Geol. Survey Jour. Research, v. 3, no. 6, p. 691-698
5. Gray
6. > 148 m
7. Finely crystalline with birdseye porosity, fossiliferous
9. Overlies Milligen Formation; underlies Jefferson Formation
10. Type section: Measured section 1, sec. 10, T. 1 N., R. 22 E., Blaine County. Named for town of Carey.

Carman Sandstone Member (Etchegoin Formation) U CRMN01
1. Pliocene, upper
2. California (SC)
3. Berryman, W. M., 1973, U.S. Geol. Survey Bull. 1332-D, p. D15-D23
4. Sandstone, siltstone

5. Gray
6. Range 275-650 m
7. Includes important petroleum reservoirs in sandstone beds
8. Four informal sand zones
9. Overlies Tupman Shale Member (Etchegoin Formation); underlies San Joaquin Formation
10. Type section: Unit Operation Naval Petroleum Reserve No. 1 (NPR-1) well 324-19R, depth-interval 640-1030 m, W part of Elk Hills oil field, San Joaquin Valley, NW1/4 sec. 19, T. 30 S., R. 23 E., Kern County. Named derived from old Standard Oil Hay-Carman Camp in sec. 36, T. 30 S., R. 23 E., where discovery well of Elk Hills oil field was drilled in 1919.

Carmi Member (Equality Formation) CRMI01
1. Pleistocene
2. Illinois (SE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 74
4. Silt and clay
6. Range 1.5-15 m
7. Glaciolacustrine deposits, well-bedded
9. Overlies Wadsworth Till Member (Wedron Formation); underlies South Haven or Winnetka Member (Lake Michigan Formation)
10. Type section: Along Crooked Creek, 8 km NE of Carmi, NE1/4SW1/4 sec. 21, T. 4 S., R. 10 E., White County.

Carpenter Falls Bed (Tully Limestone) CPFL04
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 25
4. Limestone
6. 2.7 m
9. Overlies Vesper Bed; underlies Smyrna Bed
10. Type locality: Carpenter Falls, Cayuga County.

Carpenter Pond Formation (East Branch Group) CPPD01
1. Upper Silurian and Lower Devonian
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 30-31
4. Volcanic
5. Gray
6. > 240 m
9. Intertongues with Chandler Pond Formation; unconformably overlies Munsungun Lake Formation; underlies Third Lake Formation
10. Type section: NW Carpenter Pond on Great Northern Paper Co. road from Haymock to Carpenter Mountains, Spider Lake Quadrangle, T. 7 R. 11, Piscataquis County.

Carpenter Ridge Tuff U CPRG01
1. Oligocene, upper
2. Colorado (SW)
3. Olson, J. C., Hedlund, D. C., and Hansen, W. R., 1968, U.S. Geol. Survey Bull. 1251-C, p. C8-C14
4. Devitrified welded tuff
5. Brown to gray
6. 73 m, range 52-90 m
9. Overlies Crystal Lake Tuff or Fish Canyon Tuff; underlies Hinsdale Formation

10. Type locality: Carpenter Ridge, NE of Sapinero Mesa, SW Cebolla Quadrangle, Gunnison County.

Carrabassett Formation CRBS01
1. Lower Devonian
2. Maine (WC)
3. Boone, G. M., 1973, Maine Geol. Survey Bull. 24, p. 30-38
4. Pelitic metamorphic rocks
6. 1600 m
8. Four informal members: metapelite, schist, metapelite, and metaquartzite
9. Conformably overlies Madrid Formation; underlies Seboomook Formation
10. Composite type locality: 1. Falls and outcrops on Reed Brook and in Carrabassett River; 2. State Highway 16-27 0.2 km S of Kingfield-Carrabassett Valley Township line; 3. State Highway 16-27 in roadcut overlooking Carrabassett River opposite Clay Brook; 4. E valley wall of Carrabassett River 0.95 km from Spring Farm, Franklin County.

Carraizo Breccia U CRRZ08
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 31-34
4. Volcanic breccia of lava and pumice, volcanic wacke, tuffaceous siltstone
5. Greenish- to reddish-gray
6. > 1400 m
7. Massive
9. Isolated by faults from other stratigraphic units
10. Type locality: Quarry NE of dam on Rio Loiza, 55,100 N; 196,200 E., Barrio Carraizo, EC Aguas Buenas Quadrangle.

Carringtons Pond Member (Hartland Formation) CGPD02
1. Middle and Upper Ordovician
2. New York (SE), Connecticut
3. Hall, L. M., 1968, New England Intercollegiate Geol. Conf. Guidebook 60, no. 2, Trip D-6, p. 5
4. Interlayered schist and gneiss
5. Brown, white
9. Overlies amphibolite member; underlies white gneiss member
10. Type locality: N side of State Highway 119, through IBM parking lot from exit ramp from U.S. Highway I-87 leading to Hutchinson River Parkway, White Plains, Westchester County, N.Y.

Carter Sandstone Member (Pierre Shale) U CRTR02
1. Upper Cretaceous
2. Colorado (NC)
3. Izett, G. A., Cobban, W. A., and Gill, J. R., 1971, U.S. Geol. Survey Prof. Paper 684-A, p. A14, A17-A18
4. Sandstone with calcareous concretions in upper beds
6. Range 9-20 m
7. Ridge-forming, fine-grained, massive.
9. Overlies and underlies unnamed shale units of Pierre Shale
10. Type locality: A few km S of Carter Creek in NW1/4NW1/4 sec. 20 and SW1/4SW1/4 sec. 17, T. 3 N., R. 80 W., Kremmling Quadrangle, Grand County.

Carter Canyon Ash Bed (Helvas Canyon Member of Gering Formation) CRRC01
1. Miocene
2. Nebraska (WC)
3. Vondra, C. F., Schultz, C. B., and Stout, T. M., 1969, Nebraska Geol. Survey Paper 18, p. 1,4
4. Volcanic ash and marl
5. White
6. 1.2 m
10. Type locality: Helvas Canyon, E of Carter Canyon and S of Mitchell Pass, 4.3 km W and 9 km S of Gering, NW1/4NE1/4NW1/4 sec. 6, T. 20 N., R. 55 W., Scottsbluff Quadrangle, Scotts Bluff County.

Carter Caves Sandstone U CRCV01
1. Upper Mississippian
2. Kentucky (NE)
3. Englund, K. J., and Windolph, J. F., Jr., 1971, U.S. Geol. Survey Prof. Paper 750-D, p. D99-D104
4. Quartzose and conglomeratic sandstone
5. White
6. 14 m, range < 12-14 m
9. Disconformably overlies Newman Limestone or Borden Formation; conformably underlies Newman Limestone (as a lens) or unconformably underlies Lee Formation
10. Type section: In cliff just below and W of State Highway 182 about 0.8 km N of junction with U.S. Highway 60, Grahn Quadrangle, Carter County.

Casa Diablo Till CDBL01
1. Pleistocene
2. California (C)
3. Birkeland, P. W., and Janda, R. J., 1971, Geol. Soc. America Bull., v. 82, no. 9, p. 2498
10. Type section: Roadcut location 360 m due S of center of sec. 3, T. 3 S., R. 28 E., E Sierra Nevada, Mono County.

Case Hill Bed (Mottville Member of Skaneateles Formation) CSHL07
1. Middle Devonian
2. New York (C)
3. Grasso, T. X., 1968, Jour. Paleontology, v. 42, no. 1, p. 84-87
4. Rugose and tabulate coral
6. Range 0.4-0.6 m
10. Type locality: Case Hill, SW side of Tully Valley, 4 km W of village of Cardiff, at top of first waterfall in first ravine W of and parallel to Case Road, Onondaga County.

Cash Creek Quartzite U CCRK23
1. Lower or Middle Cambrian
2. Idaho (C)
3. Hobbs, S. W., Hays, W. H., and Ross, R. J., Jr., 1968, U.S. Geol. Survey Bull. 1254-J, p. J18-J19
5. Varicolored
6. 377 m, range 337-400 m
10. Type section: Steep cliffs on W side of Squaw Creek 0.4 km S of mouth of Cash Creek, T. 12 N., R. 17 E., Custer County.

Cassia Dolomite (Dove Creek Group) CSSI01
1. Paleozoic

2. Idaho (SC)
3. Armstrong, R. L., 1968, Geol. Soc. America Bull., v. 79, no. 10, p. 1302-1304
5. Gray
6. 610 m
9. Overlies Dayley Creek Quartzite; underlies View Formation
10. Type locality: N part of Albion Range, Cassia County.

Castle Butte Member (Leadville Limestone) CSLB01
1. Upper Mississippian
2. Colorado (WC)
3. Nadeau, J. E., 1972, Colorado School Mines Quart., v. 67, no. 4, p. 90-94
4. Limestone
7. Fossiliferous
9. Overlies Redcliff Member (Leadville Limestone); underlies Belden Shale
10. Type area: Exposures in Castle Butte on Aspen Mountain, Pitkin County.

Cathead Mountain Charnockite CDMN01
1. Precambrian
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 10
6. 610 m
10. Type locality: Exposed in roadcuts along State Highway 30, 3 km N of where road crosses Sacandaga River near town of Northville, and along State Highway 10 near road to Shaker Place between Pine and Piseco Lakes, Fulton County.

Cave Basalt CAVE01
1. Holocene
2. Washington (SW)
3. Greeley, Ronald, and Hyde, J. H., 1972, Geol. Soc. America Bull., v. 83, no. 8, p. 2399
7. Pahoehoe lava flow containing many lava-tubes
10. Type area: SW flank of Mount St. Helens, Skamania County. Named for Ape Cave, sec. 8, T. 8 N., R. 5 E.

Cedar Gulch Formation CDGC02
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 147-148
4. Granite gneiss with pegmatite and quartz lenses
6. 1200 m
9. Gradationally overlies Golden Gate Canyon Formation; underlies Clear Creek Canyon Formation
10. Type area: SW1/4 sec. 20 and NE1/4 sec. 29, T. 3 S., R. 70 W., Jefferson County.

Celada Formation U CELD01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F44-F45
4. Pillow lavas, volcanic breccias, sandstone, and mudstone
5. Grayish-green

6. > 600 m
9. Conformably overlies Infierno Formation
10. Type locality: Roadcut on Route 181, 2 km NW of Celada, 50,350 N., 200,700 E., SW Gurabo Quadrangle.

Centralhatchee Formation (Heard Group) CRLC05
1. Precambrian and Paleozoic, lower
2. Georgia (WC), Alabama
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 16-17
4. Interlayered metagraywacke and schist
5. Reddish-orange
9. Gradationally adjoins Glenloch Formation (Heard Group) to N
10. Type area: Exposures near Centralhatchee, Heard County, Ga.

Central Plateau Member (Plateau Rhyolite) U CLPL03
1. Pleistocene
2. Wyoming (NW), Idaho, Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B13-B14
4. Postcaldera rhyolite lava flows and domes
8. 18 flows and domes
9. Overlies Falls River Basalt and Mallard Lake and Upper Basin Members (Plateau Rhyolite); encloses Shoshone Lake Tuff Member (Plateau Rhyolite)
10. Type area: Central Plateau, in middle of Yellowstone Caldera, Yellowstone National Park, Park County, Wyo.

Cerro Bravo Andesite U CRBV01
1. Upper Cretaceous (?)
2. Puerto Rico (NE)
3. Pease, M. H., Jr., and Briggs, R. P., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-733
4. Pyroxene andesite porphyry
7. Coarse-grained intrusive sheet
9. Cuts Hato Puerco and Cambalache Formations
10. Type area: Range of hills extending from Cerro Bravo, hill in E Rio Grande Quadrangle, to Cerro El Faro.

Chama-El Rito Member (Tesuque Formation) CMER01
1. Pliocene
2. New Mexico (NC)
3. Galusha, Ted, and Blick, J. C., 1971, Am. Mus. Nat. History Bull. 144, art. 1, p. 64-67
4. Sandstone interbedded with lenses of volcanic gravel
5. Purple, buff
6. 12 m
9. Overlies Pojoaque Member; underlies Ojo Caliente Sandstone Member
10. Type section: Chama-El Rito collecting locality, E border of Juan J. Lobato Grant near Espanola, W1/2 sec. 23, T. 23 N., R. 7 E., Medanales Quadrangle, Rio Arriba County.

Chamita Formation (Santa Fe Group) CHMT01
1. Pliocene
2. New Mexico (NC)
3. Galusha, Ted, and Blick, J. C., 1971, Am. Mus. Nat. History Bull. 144, art. 1, p. 71-76

4. Tuff, sand, gravel
5. White, gray, pink
6. 310 m
9. Unconformably overlies Ojo Caliente Sandstone Member (Tesuque Formation); unconformably underlies Puye Conglomerate
10. Type section: Area S of Black Mesa between Chama River and Rio Grande, NW1/4 sec. 10, and W1/2 sec. 3, T. 21 N., R. 8 E., Rio Arriba County. Named for village of Chamita.

Chandler Pond Formation (East Branch Group) CDPD01

1. Upper Silurian and Lower Devonian
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 31-32
4. Conglomerate with minor sandstone and mudstone
6. > 120 m
8. Informal upper and lower tongues
9. Intertongues with Carpenter Pond Formation; underlies Seboomook Formation
10. Type locality: Outcrop at hunting camp on SE shore of Chandler Pond, T. 8, R. 10, Spider Lake Quadrangle, Piscataquis County. Type section is first ridge N of intersection of East Branch Stream and Great Northern Paper Co. road from Pillsbury Pond to Snake Pond.

Changuinola Formation CNGL03

1. Upper Cretaceous
2. Panama (NW)
3. Fisher, S. P., and Pessagno, E. A., Jr., 1965, Am. Assoc. Petroleum Geologists Bull., v. 49, no. 4, p. 433-444
4. Limestone, andesitic and dacitic volcanic flows, and tuffaceous sandstone
5. White, pale-green-gray
6. 1280 m
7. Contains foraminifera
9. Underlies lower Tertiary volcanic rocks unconformably or in fault contact
10. Type section: Two river traverses each 6 km long along upper Rio Changuinola and its main tributary, Rio Pena Blanca, 31 km S of Chiriqui Land Company railroad bridge over Rio Changuinola, Province of Boca del Toro.

Chapin Peak Formation U CPPK02

1. Upper Triassic
2. Alaska (SE)
3. Berg, H. C., 1973, U.S. Geol. Survey Bull. 1373, p. 23-26
4. Basaltic volcanic rocks with intertonguing sedimentary and basic intrusive rocks
5. Gray, green, brown
6. 457 m, range 152-457 m
7. Pillow lavas, breccia
9. Conformably or possibly disconformably overlies Nehenta Formation; unconformably underlies Upper Jurassic slates
10. Type locality: Chapin Peak-Downdraft Lake area, SW of Bostwick-Vallenar Valley, secs. 12 and 13, T. 77 S., R. 90 E., SW Gravina Island.

Charging Eagle Formation CGGE01

1. Pliocene
2. North Dakota (WC)

3. Ulmer, J. H., and Sackreiter, D. K., 1973, North Dakota Geol. Survey Rept. Inv. 51, 1 p.
4. Sand, silt
5. Gray-white
6. 14 m
9. Overlies Sentinel Butte Formation; underlies Medicine Hill Formation
10. Type section: N-facing bluff of Lake Sakakawea, SW1/4SE1/4 NE1/4 sec. 20, T. 147 N., R. 85 W., Mercer County. Named for Charging Eagle Bay of Lake Sakakawea.

Charlos Drift CRLS17
1. Pleistocene
2. Montana (WC)
3. Weber, W. M., 1972, Montana Bur. Mines and Geology Mem. 42, p. 14
4. Till, outwash gravel
9. Overlies Judd Drift; underlies Lost Horse Drift
10. Type area: Mouth of canyon of Lost Horse Creek, sec. 9, 10, 15, 16, T. 4 N., R. 21 W., Ravalli County. Named for town N of type area.

Charlotte Granite CRLT05
1. Lower Devonian
2. Maine (EC)
3. Spooner, C. M., and Fairbairn, H. W., 1970, Geol. Soc. America Bull., v. 81, no. 12, p. 3664
7. Small pluton
10. Type area: Near town of Charlotte, Calais area, Washington County.

Chase Brook Formation CBRK02
1. Cambrian(?)
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 11-13
4. Slate with interbedded limestone and siltstone
5. Gray
6. 760 m
9. Unconformably underlies Chase Lake Formation
10. Type section: Exposed in Chase Brook from point 270 m to point 1.6 km from its mouth in Chase Lake, T. 9, R. 10, Spider Lake Quadrangle, Piscataquis County.

Chase Lake Formation CSLK01
1. Middle Ordovician
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 15-19
4. Graywacke, conglomerate, slate
6. > 610 m
8. Two informal members
9. Unconformably overlies Chase Brook Formation; conformably underlies Bluffer Pond Formation
10. Type locality: Shores of Chase Lake, T. 9, R. 10, Spider Lake Quadrangle, Piscataquis County.

Chase Ranch Quartzite Member (Cressmans Gulch Formation) CSRC02
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines

Quart., v. 63, no. 1, p. 146
6. Range 3-6 m
7. Fine-grained, massive to thin-bedded
10. Type area: Ridge N of Chase Ranch, NE1/4 sec. 20, T. 2 S., R. 70 W., Jefferson County.

Chatanika Ash Bed (Goldstream Formation) U CTNK01
1. Pleistocene (Wisconsinan)
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 15, 17
5. White
6. > 0.1 cm
10. Type section: Cutbank of Chatanika River 2 km downstream from Elliot Highway bridge, 40 km N of Fairbanks, NW1/4 sec. 15, T. 3 N., R. 1 W., Livengood A-2 Quadrangle.

Chelmsford Granite CMFD01
1. Devonian (?)
2. Massachusetts (NC)
3. Lyons, J. B., and Faul, Henry, 1968, in Zen, E-an, and others, eds., New York, Interscience Publishers, p. 305-318
9. Overlies Paleozoic diorite-monzonite and Merrimack Formation
10. Type locality: Near Chelmsford, Middlesex County.

Chena Alluvium U CHEN01
1. Pleistocene and Holocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 21-22
4. Silt, sand, gravel with some outwash deposits
6. 120 m, range 3-120 m
9. Unconformably overlies Cripple Gravel or Tanana Formation
10. Type section: U.S. Smelting, Refining, and Mining Co. well B at 510 Illinois Street, Fairbanks, SE1/4 sec. 3, T. 1 S., R. 1 W., Fairbanks D-2 Quadrangle.

Cherry Brook Formation U CRBK01
1. Precambrian Z and Paleozoic, lower
2. Massachusetts (C)
3. Nelson, A. E., 1974, U.S. Geol. Survey Bull. 1395-E, p. E8-E10
4. Amphibolite with felsic volcanic rocks
6. Range 900- > 1200 m
9. Conformably overlies Kendal Green Formation; unconformably underlies Claypit Hill Formation
10. Type locality: In Concord Quadrangle, 1.6 km N of Natick Quadrangle, where several exposures are located SE of Merriam Street crossing of Cherry Brook, Middlesex County.

Cherry Run Member (Licking Creek Limestone) CRRN03
1. Lower Devonian
2. Maryland (NW), Pennsylvania, Virginia, West Virginia
3. Head, J. W., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 2, p. 247-259
4. Shale and limestone interbedded with siltstone and sandstone
5. Gray to black
6. 26 m
9. Overlies Corriganville Limestone; underlies Little Cove Member (Licking Creek Limestone)
10. Type section: Lat 39°38′24" N., long 78°02′09" W., Washington County, Md.

Chewack River Gneiss CKRV02
1. Triassic and Lower Jurassic
2. Washington (NC)
3. Hawkins, J. W., Jr., 1968, Geol. Soc. America Bull., v. 79, no. 12, p. 1802-1811
4. Gneiss, amphibolite, and schist
10. Type locality: Exposures along Chewack River, Okanogan County.

Chino Valley Formation U CNVL23
1. Cambrian (?)
2. Arizona (NW)
3. Hereford, Richard, 1975, Geol. Soc. America Bull., v. 86, no. 5, p. 677-682
4. Lithic sandstone, with conglomerate and dolomite
5. Grayish-orange
6. 27 m
7. Rounded
9. Conformably overlies Tapeats Sandstone or Bright Angel Shale; conformably underlies Martin Formation
10. Type section: Abandoned quarry 2 km NW of Jerome, NE1/4NW1/4 sec. 21, T. 16 N., R. 2 E., Clarkdale Quadrangle, Yavapai County.

Chirikof Formation U CRKF01
1. Tertiary, middle
2. Alaska (SW)
3. Gates, Olcott, Powers, H. A., and Wilcox, R. E., 1971, U.S. Geol. Survey Bull. 1028-U, p. 738-739
4. Conglomerate, sandstone, shale, lava
6. 60 m
10. Type locality: Along S shore of Chirikof Point, EC Attu Island, Near Islands.

Chisana Formation U CHSN01
1. Lower Cretaceous
2. Alaska (EC)
3. Richter, D. H., and Jones, D. L., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-749
4. Volcanic and volcaniclastic rocks
5. Dark-green
6. > 3000 m
9. Gradationally overlies Jurassic and Cretaceous mudstones; unconformably underlies Cretaceous(?) sedimentary rocks; intruded by middle Cretaceous granodiorite
10. Type section: Lower part in valley of Bonanza Creek, secs. 25, 35, and 36, T. 4 N., R. 19 E.; upper part in valley of Toby Creek, secs. 28, 33, and 34, T. 4 N., R. 20 E., Nabesna A-2 Quadrangle. Named for nearby settlement of Chisana in Nabesna A-3 Quadrangle.

Chititu Formation U CHTT01
1. Lower and Upper Cretaceous
2. Alaska (EC)
3. Jones, D. L., and MacKevett, E. M., 1969, U.S. Geol. Survey Bull. 1274-K, p. K15-K17
4. Mudstone, shale
5. Gray to black
6. 1680 m
7. Concretions locally abundant. Cut by granodiorite and felsic

rocks
9. Overlies Kennicott, Schulze, or Moonshine Creek Formation; conformably underlies MacColl Ridge Formation
10. Type area: NW McCarthy A-4 Quadrangle and S McCarthy B-4 Quadrangle, S Wrangell Mountains.

Chopawamsic Formation U CPMC02
1. Paleozoic, lower
2. Virginia (EC)
3. Southwick, D. L., Reed, J. C., Jr., and Mixon, R. B., 1971, U.S. Geol. Survey Bull. 1324-D, p. D1-D11
4. Felsic, intermediate, and mafic metavolcanic and metasedimentary rocks derived from flows and volcaniclastic accumulations
6. Range 1800-3000 m
9. Conformably overlies and interfingers with Wissahickon Formation; conformably underlies Quantico Slate
10. Type section: Along Chopawamsic Creek on Quantico Marine Base, from point 1.8 km S. 45° W. of crossroads of Joplin to point 4 km S. 6° E. of Joplin, Joplin Quadrangle, Prince William County.

Chuitna Member (Tyonek Formation) CHTN01
1. Miocene
2. Alaska (C)
3. Laughbaum, G. H., Jr., 1970, Alaska Geol Soc., p. 3, 5
4. Sandstone
9. Overlies informal Middle Ground Shoal member (Tyonek Formation); underlies Beluga Formation
10. Type section: Pan American Tyonek State 17587 no. 2 well, Albert Kaloa gas field, sec. 25, T. 11 N., R. 12 W., 13 km SW of Tyonek, Cook Inlet.

Chulafinnee Schist (Talladega Group) CLFN07
1. Paleozoic
2. Alabama (NE)
3. Bearce, D. N., 1973, Alabama Geol. Soc. Guidebook 11, p. 10-21
4. Schist and phyllite derived from siltstone and sandstone
5. Green, brown, red
6. 150 m
7. Fine-textured; weathers to crumbly residuum
9. Overlies Abel Gap Formation
10. Type locality: Exposures near Chulafinnee on Alabama Highway 431, Cleburne County.

Chuniksak Formation U CKSK01
1. Miocene (?)
2. Alaska (SW)
3. Gates, Olcott, Powers, H. A., and Wilcox, R. E., 1971, U.S. Geol. Survey Bull. 1028-U, p. 731-738
4. Marine sedimentary rocks
6. > 600 m
7. Fossiliferous, fine-grained, laminated
9. Conformably and gradationally overlies Nevidiskov Formation
10. Type locality: Chuniksak Point, between Nevidiskov Creek and Abraham Bay, SC Attu Island, Near Islands.

Church Mountain Latite (Sierra Blanca Volcanics) CRCM01
1. Oligocene

2. New Mexico (C)
3. Thompson, T. B., 1972, Geol. Soc. America Bull., v. 83, no. 8, p. 2348
4. Latite porphyry and welded ash-flows
6. 230 m
9. Overlies Walker Andesite Breccia (Sierra Blanca Volcanics)
10. Type locality: N Sierra Blanca, lat 33°30′ N., long 105°41′ W., Lincoln County.

Chute Creek Member (Totatlanika Schist) U CCRK18
1. Mississippian (?)
2. Alaska (EC)
3. Wahrhaftig, Clyde, 1968, U.S. Geol. Survey Bull. 1254-E, p. E16-E17
4. Schist derived from basic volcanic rock
5. Dark-green
6. Range 390-450 m
9. Overlies California Creek Member; underlies and interfingers with Mystic Creek Member
10. Type section: Along Rogers Creek from 2600 to 3260 m S of its junction with Sheep Creek, Healy D-2 Quadrangle.

Cibola Gneiss CBOL06
1. Precambrian X
2. New Mexico (NC)
3. Kelley, V. C., and Northrop, S. A., 1975, New Mexico Bur. Mines and Mineral Resources Mem. 29, p. 21
4. Foliated gneiss with quartzite layers
5. Pink
10. Type locality: Forms an outcrop 1.2 km wide and 8 km long in Tijeras Canyon, center of sec. 20, T. 10 N., R. 5 E., Sandia Mountains, Bernalillo County.

Cid Formation (Albemarle Group) U CID 02
1. Cambrian
2. North Carolina (NC)
3. Stromquist, A. A., and Sundelius, H. W., 1969, U.S. Geol. Survey Bull. 1274-B, p. 10
4. Lower member contains mudstone, tuff, and laminated shale; upper member contains breccia and tuff
6. 4300 m
8. Lower mudstone member, upper Flat Swamp Member
9. Conformably overlies Tillery Formation (Albemarle Group); underlies Floyd Church Member (Millingport Formation), (Albemarle Group)
10. Type locality: Along Cid Road from 0.8 km E of town of Jackson Creek W to W flank of Wildcat Mountain, Denton Quadrangle, Davidson County.

Cimarron Ridge Formation U CMRG01
1. Upper Cretaceous
2. Colorado (SW)
3. Dickinson, R. G., Leopold, E. B., and Marvin, R. F., 1968, Colorado School Mines Quart., v. 63, no. 3, p. 128-130
4. Tuff breccia and volcanic-derived conglomerate, sandstone, and mudstone
5. Green to gray
6. Range 0-180 m
9. Unconformably overlies Mancos Shale, Fruitland Formation, and

Kirtland Shale
10. Type area: Cimarron Ridge, 24 km NNE of Ouray, Ouray County.

Circle Creek Rhyolite U CCCK05
1. Pliocene, lower
2. Nevada (NE)
3. Coates, R. R., 1968, Geol. Soc. America Mem. 116, p. 69-106
4. Porphyritic rhyolite with vitric to felsic groundmass
7. Flow layering and microbrecciation
9. Intrudes Idavada Volcanics; unconformably underlies Banbury Formation
10. Type locality: Exposures along Circle Creek, N of Hat Peak, N Elko County.

Claryville Clay CLVL63
1. Pleistocene, lower
2. Kentucky (NE)
3. Durrell, R. H., 1961, Geol. Soc. America Guidebook, Trip 2, p. 55, 70-73
4. Limonite-rich clay shale
5. Yellowish-gray to yellowish-brown
6. 6.7 m
7. Fine-grained, laminated, lacustrine
9. Overlies alluvium
10. Type locality: 0.6 km S of Claryville, Campbell County.

Clay Mesa Tongue (Mancos Shale) U CLMS03
1. Upper Cretaceous
2. New Mexico (WC)
3. Landis, E. R., Dane, C. H., and Cobban, W. A., 1973, U.S. Geol. Survey Bull. 1372-J, p. J16-J17
4. Clay shale with some bentonite, limy concretions, and thin limestone beds
6. 21 m
9. Intertongues with Dakota Sandstone, overlying its Cubero Tongue and conformably underlying its Paguate Tongue
10. Type section: Units 25-31 of Laguna measured section, NE1/4SE1/4 sec. 20, and SW1/4NW1/4 sec. 21, T. 10 N., R. 5 W., Laguna Quadrangle, Valencia County. Named for exposures on E and S sides of Clay Mesa, 4.8 km NW of Laguna.

Claypit Hill Formation U CLPH01
1. Precambrian Z to Paleozoic, lower(?)
2. Massachusetts (NC)
3. Nelson, A. E., 1974, U.S. Geol. Survey Bull. 1395-E, p. E12-E14
4. Gneiss and amphibolite
5. Greenish-gray
6. Range 460-610 m
9. Unconformably overlies Cherry Brook Formation; upper part truncated by fault and underlies glacial deposits
10. Type locality: Exposures along railroad between 0.16 and 0.64 km E of Claypit Hill Road, Middlesex County.

Clayton Mine Quartzite U CLNM04
1. Lower and Middle Ordovician
2. Idaho (C)
3. Hobbs, S. W., Hays, W. H., and Ross, R. J., Jr., 1968, U.S. Geol. Survey Bull. 1254-J, p. J15-J17
4. Feldspathic quartzite

6. 603 m
9. Conformably underlies Ella Dolomite
10. Type section: Above talus slope on N wall of Salmon River canyon 1.6 km W of Clayton, SE1/4 sec. 23, T. 11 N., R. 17 E., Custer County. Named for Clayton silver mine.

Clear Creek Canyon Formation CCKC04
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 135
4. Migmatitic biotite gneiss and granite with pegmatite
6. 1500 m
9. Overlies Cedar Gulch Formation; underlies Mount Vernon Canyon Formation
10. Type area: Mouth of Clear Creek Canyon in SE1/4 sec. 29 and N1/2 sec. 32, T. 3 S., R. 70 W., Jefferson County.

Clearfield Creek Formation (Allegheny Group) CFCK01
1. Middle Pennsylvanian
2. Pennsylvania (WC)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 17, 28-32
4. Sandstone, shale, coal beds, underclays
6. Range 28-30 m
7. Represents one cycle of deposition; shale contains siderite, plant and marine fossils
8. Includes informal Clarion coal at base, lower Kittanning underclay at top
9. Overlies Curwensville Formation (Pottsville Group); underlies Millstone Run Formation (Allegheny Group)
10. Type section: Exposure in strip mine E of Clearfield Creek, S of mouth of Long Run, 1707 m S of lat 41°00′ N., 1402 m E of long 78°25′ N., Boggs Township, Clearfield County.

Clear Fork Dacite CLFK01
1. Quaternary
2. Washington (SC)
3. Ellingson, J. A., 1972, Northwest Sci., v. 46, no. 1, p. 9-24
10. Type locality: Valley of Clear Fork of Cowlitz River, from Coyote Creek to near mouth of Clear Fork, Lewis County.

Clearville Sandstone Member (Mahantango Formation)/Siltstone/ Member (Mahantango Formation) CLVL48
1. Middle Devonian
2. Pennsylvania (SC), Maryland, West Virginia
3. Cate, A. S., 1963, Pennsylvania Geol. Survey Bull. G39, p. 229-240
4. Siltstone, sandstone
9. Underlies Pokejoy Member
10. Type locality: Subsurface in Morris No. 1 well, Clearville Quadrangle, Bedford County, Pa.

Clipper Ridge Member (Bingham Mine Formation) U CPRG02
1. Upper Pennsylvanian
2. Utah (NW)
3. Tooker, E. W., and Roberts, R. J., 1970, U.S. Geol. Survey Prof. Paper 629-A, p. A33-A35
4. Quartzite with sandstone and limestone units

6. 900 m
9. Overlies Butterfield Peaks Formation; conformably underlies Markham Peak Member (Bingham Mine Formation)
10. Type section: Clipper Ridge, Middle Canyon, N1/2 sec. 6, T. 4 S., R. 3 W. and S1/2 sec. 31, T. 3 S., R. 3 W., Bingham Canyon Quadrangle, Tooele County.

Clover Fork Sandstone Member (Wise Formation) U CVFK02
1. Middle Pennsylvanian
2. Virginia (SW), Kentucky
3. Miller, R. L., 1969, U.S. Geol. Survey Bull. 1280, p. 28
4. Sandstone
5. Brownish-gray
6. Range < 15-24 m
9. Lies near middle of Wise Formation, 12 m above Wilson coal bed, 37 m above Keokee Sandstone Member, 6 m below Taggart Marker coal bed, and 18 m below Marcum Hollow Sandstone Member
10. Type section: Along State Highway 624, between Keokee and Morris Gap at crest of Little Black Mountain on Kentucky-Virginia State Line, Lee County, Va. Named for Clover Fork of Cumberland River in Harlan County, Ky.

Coad Mountain Augen Gneiss CDMN02
1. Precambrian W
2. Wyoming (SE)
3. Houston, R. S., and others, 1968, Wyoming Geol. Survey Mem. 1, p. 39
10. Type area: Outcrops on S end of Coad Mountain, sec. 2, T. 18 N., R. 82 W., Carbon County.

Cobble Mountain Formation U CBLM01
1. Middle Ordovician
2. Massachusetts (WC)
3. Hatch, N. L., Jr., and Stanley, R. S., 1973, U.S. Geol. Survey Bull. 1380, p. 9-17
4. Schist with granulite and gneiss
5. Rusty, gray-brown, silvery-gray
6. 2000 m, range 600-2000 m
8. Lower thin-bedded and upper thick-bedded members
9. Overlies Moretown Formation; underlies Goshen or Russell Mountain Formation
10. Type area: Along and near SE shores of Cobble Mountain Reservoir with outcrops along Cobble Mountain Road and point of land that extends N into reservoir 2.3 km W of SE corner of Blandford Quadrangle, Hampden County.

Cochetopa Park Member (Nelson Mountain Tuff) U CPPK03
1. Oligocene, upper
2. Colorado (SW)
3. Steven, T. A., Lipman, P. W., and Olson, J. C., 1974, U.S. Geol. Survey Bull. 1394-A, p. A81-A82
4. Ash-flow tuff, welded tuff
9. Overlies unnamed outflow; underlies unnamed rhyolite lava flow
10. Composite section: Mesa cap 600 m W of McDonough Ranch headquarters on W side of Cochetopa Park, in streambanks, road-cuts, and quarry walls along Archuleta Creek from its confluence with Cochetopa Creek extending upstream for 5-6 km, and in road-cuts along county road between McDonough Ranch and Cochetopa Creek, Saguache County.

Cochiti Formation U CCHT01
1. Pliocene
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P8-P9
4. Gravel, sand
9. Interfingers with rocks of Keres Group
10. Type locality: Exposures in badlands W and SW of Cochiti Pueblo, Sandoval County.

Cockalorum Wash Formation U CKMW01
1. Middle Devonian
2. Nevada (EC)
3. Merriam, C. W., 1973, U.S. Geol. Survey Prof. Paper 799, p. 41-43
4. Limestone, shale, siltstone, sandstone
6. 366 m
9. Overlies correlative of Nevada Formation(?); underlies Devils Gate Formation
10. Type locality: S of Nyeka Hill and W of Conglomerate Ridge, Fish Creek Range, Cockalorum Wash Quadrangle, Nye County.

Coils Creek Member (McColley Canyon Formation) CLCK54
1. Lower Devonian
2. Nevada (NE)
3. Murphy, M. A., and Gronberg, E. C., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 131
4. Limestone
5. Gray
6. Range 46-70 m
9. Conformably overlies Bartine Member (McColley Canyon Formation); underlies Denay Limestone or Union Mountain Formation
10. Type locality: Main ridge extending SW from peak of Lone Mountain, Eureka County. Named for Coils Creek, 6.5 km W of Lone Mountain.

Cokeville Formation U CKVL01
1. Lower Cretaceous
2. Wyoming (SW)
3. Rubey, W. W., 1973, U.S. Geol. Survey Bull. 1372-I, p. I10-I11
4. Sandstone with siltstone, claystone, mudstone
5. Gray to tan
6. 500 m, range 500-760 m
7. Fossiliferous
9. Intertongues with and grades into underlying Thomas Fork or Smiths Formation and overlying Quealy or Sage Junction Formation
10. Type section: E of Cokeville Butte, 3.2 km NE of Cokeville, SE1/4SE1/4SW1/4 to NW1/4SW1/4SW1/4 sec. 36, T. 25 N., R. 119 W., Lincoln County.

Coleharbor Formation/Group CLRB01
1. Pleistocene and Holocene
2. North Dakota (WC), Minnesota, Montana, South Dakota, Canada
3. Bluemle, J. P., 1971, North Dakota Geol. Survey Bull. 60, pt. 1, p. 16-24
4. Boulder-clay, sand, gravel
6. 20 m, range 0-180 m

7. Surface glacial drift
9. Underlies Walsh Formation
10. Type section: 270 m S of mouth of Dead Man Coulee, along Lake Sakakawea, 9.6 km W of town of Coleharbor, NW1/4NW1/4NE1/4 sec. 22, T. 147 N., R. 84 W., McLean County, N. Dak.

Colvin Mountain Sandstone CLVM01

1. Middle Ordovician
2. Alabama (NE)
3. Drahovzal, J. A., and Neathery, T. L., 1971, Alabama Geol. Soc. Guidebook 9, p. 48-50
4. Orthoquartzite sandstone with bentonite beds
5. Gray
6. 23 m
7. Thick- to thin-bedded, massive
9. Overlies Greensport Formation; underlies Sequatchie Formation
10. Type area: Exposures at Alexander Gap through Colvin Mountain, Calhoun County.

Compeau Creek Gneiss U CPCK22

1. Precambrian W
2. Michigan (NC)
3. Gair, J. E., and Thaden, R. E., 1968, U.S. Geol. Survey Prof. Paper 397, p. 18-27
4. Tonalite, granodiorite, and amphibolite gneiss
5. Pink, gray
7. Foliated, well-layered
9. Unconformably underlies Enchantment Lake Formation; intrudes Bell Creek Gneiss and Lighthouse Point Member (Mona Schist)
10. Type section: Exposures along Compeau Creek, sec. 5, T. 48 N., R. 25 W., Marquette County.

Concepción Formation U CCPC01

1. Upper Cretaceous (Campanian - Maestrichtian)
2. Puerto Rico (NW)
3. McIntyre, D. H., 1974, U.S. Geol. Survey Bull. 1394-D, p. D3-D5
4. Porphyritic lavas, tuff-breccias, and tuffs
5. Gray, greenish-gray
6. Range 800-1100 m
9. In fault contact with Rio Blanco, Palma Escrita, and Mal Paso Formations
10. Type locality: Along Rio Anasco near Route 119 bridge on road that follows boundary between Barrios Purisima Concepción and Buena Vista, Municipio de las Marias, and in Quebrada Velez, San Sebastian Quadrangle.

Conoy Member (Choptank Formation) CONY02

1. Miocene, middle
2. Maryland (SE), Virginia
3. Gernant, R. E., 1970, Maryland Geol. Survey Rept. Inv. 12, p. 22-23
4. Muddy sand and silt
5. Grayish-green to blue
6. Range 3-5 m
7. Thin-bedded
9. Overlies Boston Cliffs Member (Choptank Formation); unconformably underlies St. Marys Formation
10. Type section: Cliff adjacent to Camp Conoy, 6.4 km SE of Calvert Beach, Calvert County, Md.

Constitution Formation CNSN01
1. Jurassic or Lower Cretaceous
2. Washington (NW)
3. Vance, J. A., 1975, in Russell, R. H., ed., Washington Dept. Ecology Water Supply Bull. 46, p. 12-13
4. Siltstone and graywacke
5. Brown, gray, green
6. > 3000 m
7. Turbidites, fine grained, highly deformed, sheared, with prehnite veinlets
9. Unconformably overlies Orcas Formation; underlies Lummi Formation
10. Type area: Exposures on Mt. Constitution, Orcas Island, San Juan County.

Continental Granodiorite U CNNL06
1. Precambrian Y
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C3-C6
4. Granodiorite to quartz monzonite with small bodies of leucocratic quartz monzonite and aplite
7. Coarsely porphyritic
9. Unconformably underlies Bisbee Formation or Paleozoic rocks
10. Type area: Box Canyon, about 20 km E of town of Continental, Pima County.

Conway Formation CNWY01
1. Pleistocene, upper
2. South Carolina (EC)
3. Du Bar, J. R., 1969, South Carolina Div. Geology Geol. Notes, v. 13, no. 3, p. 67-71
4. Sand and clay
6. Range 1.5-6 m
7. Backbarrier deposits
9. Overlies Waccamaw or Bear Bluff Formation
10. Type area: Between Conway Barrier and Cape Horry, inland from Waccamaw River, Horry County.

Cooksburg Sandstone Member (Moscow Formation) CKBG17
1. Middle Devonian
2. New York (EC)
3. McCave, I. N., 1969, Am. Jour. Sci., v. 267, no. 5, p. 571-590
4. Sandstone containing quartz-pebble beds
5. Gray
6. 16 m
7. Crossbedded
9. Overlies silty mudstone; underlies Cooperstown Member
10. Type section: In bed and banks of tributary of Catskill Creek, 3.7 km WSW of Cooksburg crossroads and 2.4 km SW of Potter Hollow, Durham Quadrangle, Greene County.

Cooks Pond Schist (Hartland Group) CKPD01
1. Middle and Upper Ordovician
2. Connecticut (SW)
3. Crowley, W. P., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 41
7. Rusty-weathering with distinctive sheen due to fine-grained graphite interleaved with mica
9. Overlies Derby Hill Member (Orange Formation); underlies

Southington Mountain Formation
10. Type locality: Immediately W and S of Cooks Pond, Stratford, Fairfield County.

Cooper Arroyo Sandstone Member (Mancos Shale) U CPRA01
1. Upper Cretaceous
2. New Mexico (NC)
3. Landis, E. R., and Dane, C. H., 1967, New Mexico Bur. Mines and Mineral Resources Geol. Map 19, p. 7-8
4. Glauconitic sandstone
6. Range 0-1 m
9. Overlies Juana Lopez Member; transitionally underlies El Vado Sandstone Member
10. Type section: S of Cooper Arroyo in Tierra Amarilla Land Grant, 914 m S. 10° W. of road intersection at BM 6966, which lies 1097 m S. of New Mexico Highway 112, Boulder Lake Quadrangle, Rio Arriba County.

Cornhouse Schist (Wedowee Group) CRNS02
1. Paleozoic, middle
2. Alabama (EC)
3. Neathery, T. L., and Reynolds, J. W., 1975, Alabama Geol. Survey Bull. 109, p. 30-31
4. Intermediate to high-grade metamorphic rocks
7. Strong secondary foliation
10. Type locality: Exposures along Cornhouse Creek near Swan Hill, secs. 6, 7, 8, and 9, T. 21 S., R. 11 E., Randolph County.

Coronaca Granite CRNC01
1. Permian
2. South Carolina (NW)
3. McSween, H. Y., Jr., 1970, South Carolina Div. Geology Geol. Notes, v. 14, no. 3, p. 69-74
4. Granite with microcline phenocrysts
5. Pink to gray
7. Hypidiomorphic-granular
10. Type area: Exposed within 32 square km area centered on town of Coronaca, Greenwood County.

Coronados Volcanics U CRDS01
1. Middle Devonian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 33-36
4. Pillow basalts interbedded with massive limestone
5. Gray
6. 150 m
7. Basalts are porphyritic and amygdaloidal; limestone is fossiliferous
9. Conformably underlies Wadleigh Limestone
10. Type locality: E part of Coronados Islands at entrance to Port St. Nicholas, W coast of Prince of Wales Island.

Corriganville Limestone (Helderberg Group) CGVL02
1. Lower Devonian
2. Maryland (NW), New York, Pennsylvania, Virginia, West Virginia
3. Head, J. W., III, 1972, Pennsylvania Geologists Field Conf. Guidebook 37, p. 100-101
4. Limestone with chert

5. Gray
6. 8 m
8. Replaces New Scotland Limestone
9. Overlies New Creek Limestone; underlies Licking Creek Limestone or Mandata Shale
10. Type section: Railroad cut 0.5 km SE of Corriganville, Allegany County, Md.

Cosner Gap Member (Mifflintown Formation) CRGP03
1. Middle Silurian
2. West Virginia (EC), Maryland, Pennsylvania, Virginia
3. Helfrich, C. T., 1975, Geol. Soc. America Spec. Paper 161, p. 10-11
4. Shale with interbedded limestone and dolomite
5. Gray
6. 8.6 m
7. Fossiliferous, calcareous
9. Overlies lower hematitic member; underlies McKenzie Member
10. Type section: Along West Virginia Highway 42 at E edge of Cosner Gap, 1.6 km NW of Maysville, Grant County, W. Va.

Cottonwood Wash Formation CDWS05
1. Upper Cretaceous(?) or Eocene(?)
2. Arizona (NW)
3. Moore, R. T., 1972, Arizona Bur. Mines Bull. 186, p. 19-21
4. Conglomerate, tuff, limestone
5. Gray
6. 430 m
9. Overlies Jacobs Ranch Formation; underlies Muddy Creek Formation
10. Type locality: Cottonwood Wash, sec. 18, T. 37 N., R. 15 W., Mohave County.

Cottonwood Wash Tuff Member (Needles Range Formation) U CDWS04
1. Oligocene
2. Utah (SW), Nevada
3. Best, M. G., Shuey, R. T., Caskey, C. F., and Grant, S. K., 1973, Geol. Soc. America Bull., v. 84, no. 10, p. 327
4. Tuff containing large biotite books and plagioclase phenocrysts
5. Red-brown
6. 88 m
7. Moderately welded, poorly foliated
9. Overlies andesite flows and breccia; underlies Wah Wah Springs Tuff Member or Tunnel Spring Tuff
10. Type locality: Cottonwood Wash, sample site 173, E1/2 sec. 4, T. 26 S., R. 18 W., Needles Range, Millard County, Utah.

Coughs Creek Tongue (Green River Formation) U CGCK06
1. Eocene
2. Colorado (NW)
3. O'Sullivan, R. B., 1975, U.S. Geol. Survey Bull. 1395-G, p. G1-G7
4. Marlstone
5. Gray
6. 33.7 m, range 15-40 m
7. Contains richest and thickest oil-shale beds in Green River Formation
9. Underlies and intertongues with Uinta Formation

10. Type section: W side of Cow Creek, tributary to Piceance Creek, 48 m above creek level, SW1/4SE1/4 sec. 12, T. 4 S., R. 95 W., Rio Blanco County. Named for Coughs Creek, tributary to Cow Creek.

Coyote Canyon Fanglomerate Member (Uvas Basalt) CCNN06
1. Oligocene, upper
2. New Mexico (SC)
3. Seager, W. R., and Clemons, R. E., 1975, New Mexico Bur. Mines and Mineral Resources Circ. 133, p. 16-17
4. Conglomerate-sandstone-mudstone fanglomerate derived from flow-banded rhyolite
5. Brown, pink
6. 171 m
8. Lower, middle, and upper tongues
9. Overlies Bell Top Formation; underlies Santa Fe Group
10. Measured section: In Coyote Canyon, NE1/4NE1/4 sec. 23, T. 21 S., R. 2 W., Dona Ana County.

Coyote Hills Formation U CHLS01
1. Pleistocene, upper
2. California (SC)
3. Yerkes, R. F., 1972, U.S. Geol. Survey Prof. Paper 420-C, p. C24-C25
4. Nonmarine mudstone and sandstone
5. Gray
6. Range 87-370 m
7. Fossiliferous, pebbly
9. Unconformably overlies San Pedro Formation; unconformably underlies La Habra Formation
10. Type locality: S flank of East Coyote oil field structure, SW1/4 sec. 23, T. 3 S., R. 10 W., La Habra Quadrangle, Orange County.

Cragford Phyllite (Wedowee Group)/Schist (Wedowee Group) CGFD01
1. Paleozoic, middle
2. Alabama (EC), Georgia
3. Neathery, T. L., and Reynolds, J. W., 1975, Alabama Geol. Survey Bull. 109, p. 25-28
4. Graphite-chlorite-sericite phyllite and schist
7. Rhythmically bedded
9. Overlies Hillabee Chlorite Schist; underlies Cutnose Formation (Wedowee Group) or Hackneyville Schist (Wedowee Group)
10. Type locality: Exposed near town of Cragford, Clay County, Ala.

Craigs Ranch Basalt CGRC01
1. Cenozoic, upper
2. Arizona (NW)
3. Best, M. G., and Brimhall, W. H., 1970, Utah Geol. Soc. Guidebook 23, p. 57-74
10. Type area: C part of Uinkaret volcanic field near Craig's Ranch, W Grand Canyon region, Mohave County.

Cranberry Marsh Member (Detroit River Formation) CRBM05
1. Middle Devonian
2. Indiana (NW)
3. Doheny, E. J., Droste, J. B., and Shaver, R. H., 1975, Indiana Geol. Survey Bull. 53, p. 32-33

4. Limestone, dolomite, gypsum, anhydrite
5. Gray to brown
6. 13 m
7. Evaporites
9. Overlies Milan Center Dolomite Member (Detroit River Formation); underlies Traverse Formation
10. Type section: Northern Indiana Public Service Co. August Taelman No. 1 well, NE1/4 sec. 16, T. 36 N., R. 1 W., La Porte County. Named for Cranberry Marsh, secs. 5 and 8, T. 36 N., R. 1 W., 2.4 km N of Fish Lake.

Crawford Gulch Formation CFGC01
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 135-138
4. Schist containing quartzite and pegmatite lenses
5. Gray
6. Range 0-1500 m
7. Fine textured, thinly laminated
9. Overlies Belcher Hill Formation; unconformably underlies Cressmans Gulch Formation
10. Type area: Along mountain front between Cressmans Gulch and Van Bibber Creek, NW of Golden, NW1/4 sec. 17, and SW1/4 sec. 8, T. 3 S., R. 70 W., Jefferson County.

Crazy Basin Quartz Monzonite U CRZB01
1. Precambrian
2. Arizona (C)
3. Anderson, C. A., 1972, U.S. Geol. Survey Bull. 1345, p. 24-26
7. Forms part of large pluton. Coarse-grained with conspicuous pink microcline crystals
9. Intrudes Spud Mountain Volcanics
10. Type locality: Crazy Basin Creek, Cordes area, Bradshaw Mountains, Mount Union and Mayer Quadrangles, Yavapai County.

Cressmans Gulch Formation CMGC01
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 138-146
4. Gneiss containing quartz pods and pegmatite lenses
6. Range 15-240 m
8. Chase Ranch Quartzite Member
9. Unconformably overlies Crawford Gulch Formation; unconformably underlies Junction Formation
10. Type area: NW of Golden, NW1/4SE1/4 sec. 17, T. 3 S., R. 70 W., Jefferson County.

Crevice Mountain Granite CVCM01
1. Precambrian W
2. Montana (SC), Wyoming
3. Brookins, D. G., 1968, Earth Sci. Bull., v. 1, no. 2, p. 5-9
7. Medium-grained with gneissic appearance
10. Type locality: Exposed on S slope of Crevice Mountain, Gardiner Quadrangle, Park County, Mont.

Cripple Gravel U CRPL03
1. Pliocene and (or) Pleistocene

2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 2-8
4. Auriferous gravel and solifluction deposits
5. Brown
6. 25 m, range 1-25 m
9. Overlies bedrock or clay; unconformably underlies Chena Alluvium, Fox Gravel, Tanana Formation, Dawson Cut Formation, Fairbanks Formation, Gold Hill Loess, or Goldstream Formation
10. Type locality: Mining cut in valley of Cripple Creek adjacent to "Ester Island," hillock of loess lying between Ester and Cripple Creeks, SW1/4 sec. 8, T. 1 S., R. 2 W., Fairbanks D-3 Quadrangle.

Croftville Basalt (North Shore Group) CFVL02
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. M., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. 6 basalt flows
6. 180 m
9. Overlies Devil Track Felsite; underlies Grand Marais Rhyolite
10. Type area: S of Devil Track River and E of Grand Marais, Cook County.

Cromwell Formation CRML01
1. Pleistocene
2. Minnesota (NE)
3. Wright, H. E., Jr., Mattson, L. A., and Thomas, J. A., 1970, Minnesota Geol. Survey Geol. Map Ser. GM-3, p. 19-24
4. Till with associated sand and gravel
5. Reddish-brown
10. Type area: Exposures along U.S. Highway 210 near village of Cromwell, Carlton County.

Cromwell Sand Member (Union Valley Formation) CRML14
1. Lower Pennsylvanian (Morrowan)
2. Oklahoma (SE)
3. Withrow, J. R., 1969, Am. Assoc. Petroleum Geologists Bull., v. 53, no. 11, p. 2299-2313
4. Glauconitic calcareous sandstone laminated with shale
6. Range 30-60 m
7. Petroleum-producing in subsurface
9. Overlies Springer Formation
10. Type section: Sarkeys No. 1 Ayakatubby "A" well, SW1/4NE1/4 sec. 36, T. 2 N., R. 7 E., S of Stonewall, Pontotoc County. Named for "wildcatter" Joe Cromwell.

Crooks Canyon Granodiorite U CRKC03
1. Precambrian
2. Arizona (C)
3. Anderson, C. A., and Blacet, P. M., 1972, U.S. Geol. Survey Bull. 1336, p. 39-42
4. Granodiorite to quartz monzonite
5. Tan, gray
9. Intrudes older gabbro and Green Gulch and Spud Mountain Volcanics
10. Type locality: Crooks Canyon, 3.2 km SSW of village of Mount Union, NC Mount Union Quadrangle, Yavapai County.

Crooks Gap Conglomerate U CKGP01
1. Eocene
2. Wyoming (C)
3. Love, J. D., 1970, U.S. Geol. Survey Prof. Paper 495-C, p. C39-C41
4. Fan of granite boulders and decayed mafic igneous and metamorphic rocks in arkosic sandstone and siltstone
6. Range 0-460 m
10. Type locality: Crooks Mountain, on both sides of Crooks Gap, Fremont County.

Crookston Bridge Member (Valentine Formation) CKBG03
1. Miocene
2. Nebraska (NC), South Dakota
3. Skinner, M. F., Skinner, S. M., and Gooris, R. J., 1968, Am. Mus. Nat. History Bull., v. 138, art. 7, p. 404
4. Sand with lenses of sandy clay
6. Range 46-53 m
7. Massive unconsolidated channel sand
9. Overlies Rosebud Formation; underlies Devils Gulch Member (Valentine Formation)
10. Type section: Crookston Bridge Quarry, 0.2 km below confluence of Snake and Niobrara Rivers, SW1/4NW1/4 sec. 1, T. 32 N., R. 30 W., Cherry County, Nebr.

Crotched Mountain Member (Littleton Formation) CCDM01
1. Lower Devonian
2. New Hampshire (SC)
3. Greene, R. C., 1970, New Hampshire Dept. Resources and Econ. Devel. Bull. 4, p. 23-25
4. Mica schist and sillimanite schist
5. Gray
6. 1600 m
9. Overlies Francestown Member
10. Type locality: Summit of Crotched Mountain, W part of Francestown Township, NC Peterborough Quadrangle, Hillsborough County.

Crowghost Member (Hell Creek Formation) CRGS01
1. Upper Cretaceous
2. North Dakota (SC)
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 33-34
4. Lignitic, bentonitic shale, basal lignitic sandstone, siderite nodules
6. Range 2-9.5 m
9. Unconformably overlies Colgate and Bull Head Members (Fox Hills Formation); underlies Breien Member (Hell Creek Formation)
10. Type section: Crowghost Cemetery, Standing Rock Indian Reservation, center sec. 33, T. 134 N., R. 82 W., Sioux County.

Crystal Creek Member (Carmel Formation) CLCK18
1. Middle Jurassic
2. Utah (SW)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 7-8
4. Sandstone with sheets and lenses of gypsum and shale
5. Red
6. 68 m
7. Friable, banded

9. Unconformably overlies Kolob Limestone Member; unconformably underlies Paria River Member
10. Type section: Along divide between Deep Creek and Crystal Creek, near Cedar City, T. 39 S., R. 10 W., Iron County.

Crystal Lake Tuff U CLLK05
1. Oligocene, upper
2. Colorado (SW)
3. Lipman, P. W., Steven, T. A., Luedke, R. G., and Burbank, W. S., 1973, U.S. Geol. Survey Jour. Research, v. 1, no. 6, p. 635-636
5. Red-brown
6. 50 m, range 50-200 m
9. Overlies Fish Canyon Tuff; underlies Carpenter Ridge Tuff
10. Type area: Crystal Peak, W of Crystal Lake, 5 km NW of Lake City, Hinsdale County.

Crystal River Siltstone Member (Gothic Formation) CLRV02
1. Middle Pennsylvanian
2. Colorado (WC)
3. Bartleson, Bruce, 1972, Colorado School Mines Quart., v. 67, no. 4, p. 208
5. Yellow
6. 42 m
9. Overlies Brush Creek Limestone Member; underlies Hot Springs Conglomerate Member
10. Type locality: PC measured section, 9.6 km N of Redstone, few hundred m W of Colorado Highway 133, on SE slopes of ridge S of Perham Creek and opposite Avalanche Creek Road, sec. 20, T. 9 S., R. 88 W., Pitkin County.

Cub Shale Member (Ute Limestone)/Tongue (Lead Bell Shale) U CUB 01
1. Middle Cambrian
2. Idaho (SE), Utah
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 33-36
4. Shale and claystone
8. Cub Tongue grades into Cub Shale Member to E
9. Overlies High Creek Limestone; underlies Bancroft Limestone in E
10. Type locality: Sec. 4, T. 16 S., R. 41 E., Preston Quadrangle, Franklin County, Idaho. Named for Cub Basin along Maple Creek, 4 km E.

Cubero Tongue (Dakota Sandstone) U CUBR01
1. Upper Cretaceous
2. New Mexico (WC)
3. Landis, E. R., Dane, C. H., and Cobban, W. A., 1973, U.S. Geol. Survey Bull. 1372-J, p. J17-J18
4. Sandstone, partly silty and carbonaceous
5. Gray
6. 15 m
7. Fine-grained
9. Overlies Oak Canyon Member (Dakota Sandstone); underlies Clay Mesa Tongue (Mancos Shale)
10. Type section: Units 32-36 of Laguna measured section, NE1/4SE1/4 sec. 20 and SW1/4NW1/4 sec. 21, T. 10 N., R. 5 W., Laguna Quadrangle, Valencia County. Named for exposures on E side of Cubero Mountain, 13 km W of Laguna.

Cuervo Sandstone Member (Chinle Formation) CURV01
1. Upper Triassic
2. New Mexico (NE)
3. Kelley, V. C., 1972, New Mexico Bur. Mines and Mineral Resources Bull. 98, p. 24
5. Buff, gray
6. Range 45-68 m
9. Overlies and underlies unnamed shale members
10. Type section: Roadcut along New Mexico Highway 104, sec. 4, T. 12 N., R. 25 E., San Miguel County. Named for exposures along Cuervo Creek and for town of Cuervo, Guadalupe County, several km N of Fort Sumner.

Curwensville Formation (Pottsville Group) CRVL08
1. Middle Pennsylvanian
2. Pennsylvania (WC)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 31-34
4. Clay, sandstone, and siltstone, with very thin coal bed
6. Range 8.5-13 m
7. Fossiliferous
9. Overlies Elliott Park Formation; underlies Clarion coal of Clearfield Creek Formation (Allegheny Group)
10. Type section: Exposures in quarry and roadcuts W of Curwensville Reservoir, S of mouth of Passmore Run, Pike Township, Clearfield County. Named for Curwensville Borough.

Cushenbury Springs Formation CBSP01
1. Pliocene(?) or Pleistocene(?)
2. California (SE)
3. Shreve, R. L., 1968, Geol. Soc. America Spec. Paper 108, p. 14-18
4. Limestone and marble landslide breccias and cobble fanglomerates
5. Gray, brown
6. > 330 m
8. Seven informal members
9. Conformably overlies Old Woman Sandstone; underlies Holocene gravels
10. Type locality: Arrastre Canyon 19 km W to Dry Canyon, N slope of San Bernardino Mountains, Lucerne Valley Quadrangle, San Bernardino County. Named for springs at mouth of Cushenbury Canyon.

Cutnose Formation (Wedowee Group) CTNS01
1. Paleozoic, middle
2. Alabama (EC)
3. Neathery, T. L., and Reynolds, J. W., 1975, Alabama Geol. Survey Bull. 109, p. 28
4. Gneiss, schist, and phyllite
7. Cyclically interbedded
9. Overlies Cragford Phyllite (Wedowee Group)
10. Type locality: Exposures along Cutnose Creek, NE Randolph County.

Cuyler Bed (Tully Limestone) CYLR01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 20

4. Calcareous siltstone
6. 3 m
7. Thin-bedded; weathers to thin blocky slabs
9. Overlies DeRuyter Bed; underlies Fabius Bed
10. Type locality: NE of Cuyler, Cortland County.

Cymric Shale Member (Temblor Formation) U CMRC02
1. Oligocene
2. California (SC)
3. Dibblee, T. W., Jr., 1973, U.S. Geol. Survey Prof. Paper 764, p. 20
4. Clayey to silty shale
5. Gray
6. 23 m, range 23-90 m
9. Disconformably overlies Point of Rocks Sandstone; conformably underlies Wygal Sandstone Member (Temblor Formation)
10. Type section: Zemorra Creek, sec. 9, T. 29 S., R. 20 E., Kern County. Named for nearby Cymric oil field.

Dadeville Complex DDVL01
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 26-31
8. Waresville Formation, Agricola Schist-Gneiss, Rock Mills Granite, Camp Hill Granite, Ropes Creek Amphibolite, Smith Mountain Peridotite, Boyds Creek Amphibolite
10. Type locality: Not stated. Named for town of Dadeville, Tallapoosa County, Ala.

Dahlen Formation DHLN01
1. Pleistocene
2. North Dakota (NE)
3. Arndt, B. M., 1975, North Dakota Geol. Survey Bull. 62, pt. 1, p. 40-49
4. Pebble-loam
6. Range 1-12 m
7. Soft, fissile
9. Overlies Gardar Formation; underlies Falconer Formation
10. Type section: Forest River Cut 1 (no. 518), on S side of Forest River, NE1/4SE1/4NE1/4 sec. 10, T. 154 N., R. 55 W., Nelson County. Named for town of Dahlen.

Dale Canyon Formation U DLCN01
1. Mississippian
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 4
4. Grit interbedded with sandstone, conglomerate, and black shale
6. 533 m
9. Unconformably overlies Joana Limestone; unconformably underlies Chainman Shale
10. Type section: Packer Basin, sec. 23, T. 18 N., R. 54 E., Pinto Summit Quadrangle, White Pine County. Named for exposures in Lower Dale Canyon, SW of Pinto Peak, Eureka County.

Dale City Quartz Monzonite U DLCT01
1. Lower Cambrian
2. Virginia (NE)

3. Seiders, V. M., Mixon, R. B., Stern, T. W., Newell, M. F., and Thomas, C. B., Jr., 1975, Am. Jour. Sci., v. 275, no. 5, p. 481
7. Foliated to massive
9. Intrudes Quantico Slate; underlies Cretaceous and younger Coastal Plain sediments
10. Type area: Exposure in Dale City on Neabsco Creek, Prince William County.

Daly Creek Member (Sepulcher Formation) U DLCK03
1. Eocene, middle
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 17
4. Hornblende and pyroxene andesite volcaniclastic rocks
6. 120 m
9. Unconformably overlies Lost Creek Tuff Member; underlies Fortress Mountain Member
10. Type area: Headwaters of Daly Creek, NW Yellowstone National Park, Park County, Wyo.

Daly Swamp Member (Brimfield Schist) U DSMP03
1. Middle (?) Ordovician or older
2. Connecticut (EC)
3. Snyder, G. L., 1970, U.S. Geol. Survey Geol. Quad. Map GQ-791, p. 3
4. Schist
6. Range 0-210 m
10. Type locality: Ledges S and SW of Daly Swamp, Marlborough Quadrangle, Holland County.

Davis Creek Schist (North Snowy Group) DVCK07
1. Precambrian W
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 16-20
4. Mica schist with quartzite layers
5. Weathers brown
9. Intruded by Mount Delano Gneiss; in fault contact with Mount Cowen Gneiss
10. Type section: W and SW of small unnamed lake 1,450 m SE of Lake McKnight. Principal reference section is in NE wall of Pine Creek Canyon, E of Luccock Park, Beartooth Mountains, Park County. Named for Davis Creek.

Dawes Clay Member (Box Butte Formation) DWES02
1. Miocene
2. Nebraska (NW)
3. Galusha, Ted, 1975, Am. Mus. Nat. History Bull., v. 156, art. 1, p. 39-50
4. Clayey siltstone with nodular calcareous concretions
5. Mottled red and green
6. 9.4 m
9. Overlies Red Valley Member (Box Butte Formation); underlies Sheep Creek Formation
10. Type section: On C. W. Moody's Pebble Creek Ranch, on E side of Pebble Creek, NW1/4NW1/4 sec. 14, T. 30 N., R. 49 W., Dawes County.

Dawson Cut Formation U DSNC01
1. Pleistocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 6-8
4. Silt with peat lenses, logs, and forest beds
5. Dark-gray to black (frozen); light-gray to tan (dried)
6. 1 m
9. Unconformably overlies Cripple Gravel or Fox Gravel; unconformably underlies Gold Hill Loess or Goldstream Formation
10. Type section: NE wall of Dawson Cut placer mine on Engineer Creek near its junction with Goldstream Creek, 10 km N of Fairbanks, SW1/4 sec. 6, T. 1 N., R. 1 E., Fairbanks D-2 Quadrangle.

Dayley Creek Quartzite (Dove Creek Group) DLCK06
1. Paleozoic
2. Idaho (SC)
3. Armstrong, R. L., 1968, Geol. Soc. America Bull., v. 79, no. 10, p. 1302
4. Quartzite with lenses of schist and limestone
5. Gray to tan
6. 2100 m
9. Overlies Land Creek Formation; underlies Cassia Dolomite
10. Type section: Along ridge extending from NE1/4 sec. 32 to SW1/4 sec. 3, T. 12 S., R. 24 E., Cassia County. Named for Dayley Creek.

Dead Man Drift/Till DDMN02
1. Pleistocene
2. North Dakota (C)
3. Bluemle, J. P., 1971, North Dakota Geol. Survey Bull., v. 60 pt. 1, p. 43-48
4. Gravel and silty to clayey till
6. Range 8-12 m
9. Underlies Mercer Drift/Till
10. Type locality: Lake Sakakawea shore, secs. 14, 15, 22, 23, 24, 27, T. 147 N., R. 84 W., McLean County.

Deadmans Gulch Formation DMGC01
1. Upper Cambrian
2. Colorado (C)
3. Bush, J. H., and Bush, C. G., 1974, Mountain Geologist, v. 11, no. 2, p. 59-69
4. Quartz arenite and dolomite
5. Orange to red
6. 26 m
8. Lower, middle, and upper informal members
9. Overlies Peerless Formation; underlies Manitou Formation
10. Measured section: N slope of Deadmans Gulch, 1 km W of its junction with Spring Creek Road, sec. 14, T. 14 S., R. 84 W., Gunnison County.

Deadman Spring Dolomite DSPG02
1. Middle Ordovician
2. Utah (WC)
3. Oliveira, M. E., 1975, Brigham Young Univ. Geology Studies, v. 22, pt. 1, p. 69
5. Yellow-brown
6. 51 m

9. Conformably overlies Juab Limestone; intertongues with Kanosh Shale; conformably underlies Eureka Quartzite
10. Type section: NW1/4NE1/4 sec. 9, T. 11 S., R. 14 W., Juab County. Named for nearby Deadman Spring, NE Fish Springs Range.

Dead River Formation DDRV01
1. Cambrian(?) or Ordovician(?)
2. Maine (WC)
3. Boone, G. M., 1973, Maine Geol. Survey Bull. 24, p. 13-24
4. Metapelite, metagraywacke, metaquartzwacke, and phyllite
5. Silvery-green, maroon
6. 860 m, range 760-860 m
7. Relict graded and wavy bedding; pinstripe laminations; veins, dikes, and sills of metagraywacke
9. Base not exposed; unconformably underlies Silurian(?) or Devonian(?) calcareous phyllite and calc-silicate rock
10. Type area: Long Falls of Dead River, Little Bigelow Mountain area, Somerset County.

Deal Member (Manasquan Formation) DEAL01
1. Eocene
2. New Jersey (EC)
3. Enright, Richard, 1969, in Subitzky, Seymour, ed., Rutgers Univ. Press, p. 17-18
4. Sand and silt
5. Green, yellow
6. Range 12-43 m
9. Gradationally overlies Farmingdale Member (Manasquan Formation); underlies Squankum Member (Shark River Formation)
10. Type section: N bank of Hog Swamp Brook in Hollywood Golf Club, 30 m downstream from Roseld Avenue bridge, Borough of Deal, Monmouth County.

Deboullie Formation/Igneous Complex DBLL01
1. Lower Devonian
2. Maine (NC)
3. Boone, G. M., 1962, Geol. Soc. America Bull., v. 73, no. 12, p. 1451
4. Monzonite, syenite, granodiorite
7. Stock
9. Intrudes Seboomook Slate
10. Type area: Deboullie Lakes region, Fish River Lake Quadrangle, Aroostook County.

Deer Canyon Member (Valles Rhyolite) U DRCN01
1. Pleistocene
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969 U.S. Geol. Survey Bull. 1274-P, p. P15
4. Rhyolite flows and tuffs
6. 30 m
9. Overlies Tshirege Member (Bandelier Tuff); underlies Redondo Creek Member (Valles Rhyolite)
10. Type locality: Deer Canyon, SW side Redondo Border, center of Valles Caldera, Jemez Springs Quadrangle, Sandoval County.

Deering Formation DRNG01
1. Pleistocene

2. Alaska (NC)
3. Guthrie, R. D., and Matthews, J. V., Jr., 1971, Quaternary Research, v. 1, no. 4, p. 474-510
4. Loess, peat
5. Olive to black
6. 10 m
9. Unconformably overlies Cape Deceit Formation
10. Type area: 250 m shoreline between Cape Deceit and Deering, Kotzebue Sound, Seward Peninsula.

Deer Mountain Member (Albee Formation) U DRMN02

1. Lower and (or) Middle Ordovician
2. Maine (WC)
3. Harwood, D. S., 1973, U.S. Geol. Survey Bull. 1346, p. 19-21
4. Slate and phyllite
5. Green
6. 760 m
9. Conformably overlies Portage Brook Member (Albee Formation); conformably underlies Dixville Formation
10. Type area: N slope and NE-trending ridge of Deer Mountain, Cupsuptic Quadrangle, Oxford County.

Deer Peak Volcanics U DRPK06

1. Oligocene
2. Colorado (SC)
3. Scott, G. R., and Taylor, R. B., 1975, U.S. Geol. Survey Prof. Paper 868, p. 5-9
5. Gray
6. > 457 m
7. Stocks, flows, lahars
9. Overlies unnamed Precambrian rocks; interfingers with Devils Hole Formation; underlies Santa Fe(?) Formation
10. Type locality: Near head of Froze Creek, secs. 22 and 27, T. 23 S., R. 70 W., Custer County.

Deer Point Formation DRPN01

1. Upper Jurassic or Lower Cretaceous(?)
2. Washington (NW)
3. McKee, Bates, 1972, Cascdia: McGraw-Hill, p. 133-134
4. Graywacke sandstone and siltstone with volcanic rock fragments
6. 910 m
7. Nonfossiliferous but presumed marine
9. Overlies Constitution Formation
10. Type area: Orcas and Lopez Islands, SE San Juan Islands, San Juan County.

Delaho Formation DLHO01

1. Miocene
2. Texas (SW)
3. Stevens, M. S., Stevens, J. B., and Dawson, M. R., 1969, Texas Memorial Mus., Pearce-Sellards Ser., no. 15, p. 8-15
4. Siltstone with lenses of sand and conglomerate
6. 142 m, range 142- > 300 m
8. Smoky Creek Member
9. Unconformably overlies Chisos and South Rim Formations
10. Measured section: Roman de la Ho Ranch, 3.2 km SE of Castolon, Webster County. Named for the ranch.

Delavan Till Member (Wedron Formation) DLVN01
1. Pleistocene
2. Illinois (C)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 68
6. 3 m, range 3-60 m
9. Overlies Morton Loess; underlies Tiskilwa Till Member (Wedron Formation)
10. Type section: Roadcuts along Illinois Highway 121, 6.4 km E of Delavan, SW1/4 sec. 16, T. 22 N., R. 3 W., Tazewell County.

Denley Limestone (Trenton Group) DNLY04
1. Middle Ordovician
2. New York (NC)
3. Kay, Marshall, 1968, Naturaliste Canadien, v. 95, no. 6, p. 1377
4. Shaly calcarenite, marl
6. > 60 m
8. Camp, Glendale, Poland, Russia, Rust Members
9. Overlies Sugar River Limestone; underlies Steuben Limestone
10. Type section: Palisades on Sugar River 0.4 km above New York Central Railroad bridge, Leyden Township, Lewis County. Named for Denley railroad station.

Dent Branch Lentil (Bonneterre Dolomite) DBRC01
1. Upper Cambrian
2. Missouri (SE)
3. Wagner, R. E., and Kisvarsanyi, E. B., 1969, Missouri Geol. Survey and Water Resources Rept. Inv. 43, p. 6-8
4. Tuffs and tuffaceous sandstones and siltstones
6. 24 m
10. Type area: Outcrops along Dent Branch, Washington County.

Depoe Bay Basalt U DPBY01
1. Miocene, middle
2. Oregon (NW), Washington
3. Snavely, P. D., Jr., MacLeod, N. S., and Wagner, H. C., 1973, Geol. Soc. America Bull., v. 84, no. 2, p. 394-405
5. Gray
6. 30 m, range 30-200 m
7. Aphanitic to fine-grained
9. Unconformably overlies Astoria Formation; unconformably underlies sandstone or Cape Foulweather Basalt
10. Type locality: Outcrop belt extending from 1 1/2 km N to 2 1/2 km S of bridge over entrance to inner harbor of Depoe Bay, and from E shoreline of outer bay to inner bay, secs. 5, 8, 17, T. 9 S., R. 11 W., Lincoln County, Oreg. Named for town of Depoe Bay on Oregon Coast.

Deronda Bay Andesite (North Shore Group) DRDB01
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. M., eds., Minnesota Geol. Survey Centennial Volume, p. 316
6. 79 m
9. Overlies Grand Portage Basalt; underlies Red Rock Rhyolite (North Shore Group)
10. Type area: Deronda Bay, Cook County.

De Ruyter Bed (Tully Limestone) DRTR01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 19
4. Limestone
6. Range 0.2-0.4 m
9. Overlies Hamilton Formation; underlies Cuyler Bed (Tully Limestone)
10. Type area: S of De Ruyter, Madison County.

Descon Formation U DSCN01
1. Lower Ordovician to Lower Silurian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 5-15
4. Graywacke, mudstone, and basaltic volcanic rocks
7. Interbedded
9. Conformably underlies Heceta Limestone or unconformably underlies Karheen Formation
10. Type locality: Triangulation station Descon, near Point Desconocida, S end of Heceta Island.

Devils Peak Member (Santa Cruz Island Volcanics) DVPK02
1. Miocene
2. California (SC)
3. Nolf, Bruce, and Nolf, Penny, 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 91-94
4. Andesite flows and breccias; reworked pyroclastics
5. Gray to black
6. 730 m
9. Discordantly overlies Stanton Ranch Member; discordantly underlies Prisoners Harbor Member
10. Type locality: S and E slopes of Devils Peak, Santa Cruz Island.

Devil Track Felsite (North Shore Group) DVTK01
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K, and Morey, G. M., eds., Minnesota Geol. Survey Centennial Volume, p. 316
4. Aphyric and porphyritic rhyolite flows
6. 310 m
9. Overlies Red Cliff Basalt; underlies Croftville Basalt
10. Type area: Canyon of Devil Track River, Cook County.

Deweesville Sandstone Member (Whitsett Formation) U DSVL01
1. Eocene
2. Texas (SC)
3. Eargle, D. H., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 3, p. 563-565
6. 3 m
9. Overlies Conquista Clay Member; underlies Dubose Member
10. Type section: Uranium pits which were used as tailing ponds at Falls City uranium mill of Susquehanna-Western, Inc., 13.6 km SW of Falls City on Farm Road 1344, 800 m NW of Farm Road 791, Karnes County. Natural exposures in NW-facing scarp of Scared Dog Creek near abandoned community of Deweesville.

Diamond Hill Member (Rowland Formation) DMDH04
1. Pleistocene
2. Oregon (WC)
3. Balster, C. A., and Parsons, R. B., 1969, Northwest Sci., v. 43, no. 3, p. 122
4. Clayey sand grading upward into clay
6. Range 0.9-2 m
9. Conformably overlies Linn Member (Rowland Formation); unconformably underlies Malpass, Wyatt, or Irish Bend Member (Willamette Silt)
10. Type locality: Not stated. Named for Diamond Hill road which crosses Little Muddy Creek at type section of Rowland Formation, NW1/4SW1/4 sec. 9, T. 15 S., R. 3 W., Linn County.

Diligencia Formation DLGC01
1. Oligocene and Miocene
2. California (SE)
3. Crowell, J. C., 1975, California Div. Mines and Geology Spec. Rept. 118, p. 99-110
4. Nonmarine conglomerate, sandstone, and mudstone with interbedded volcanic flows and sills
5. Red, maroon, yellow
6. 1500 m
9. Unconformably overlies Maniobra Formation on N, and augen gneiss and migmatite on S
10. Type section: Beds along N-S cross section from contact with augen gneiss, beginning at point 850 m S 75° E from Canyon Spring, sec. 29, T. 7 S., R. 13 E., Hayfield Quadrangle, Riverside County. Named for Spanish word for stagecoach.

Dillon Mesa Tuff U DLMS01
1. Oligocene, upper
2. Colorado (SW)
3. Olson, J. C., Hedlund, D. C., and Hansen, W. R., 1968, U.S. Geol. Survey Bull. 1251-C, p. C8-C14
4. Quartz latite ash-flow tuff with basal gravel
5. Brown
6. Range < 24-55 m
7. Moderately welded
9. Overlies Blue Mesa Tuff; underlies Sapinero Mesa Tuff
10. Type locality: Exposures on Dillon Mesa, Sapinero and Cebolla Quadrangles, Gunnison County.

Dix Limestone Member (Mattoon Formation) DIX 01
1. Upper Pennsylvanian (Missourian)
2. Illinois (SC)
3. Bradbury, J. C., 1965, Illinois Geol. Survey Indus. Mineral Notes 23, p. 4-6
4. Limestone, shale
5. Brownish-gray
6. 1.8 m
7. Fine-grained, massive, fossiliferous
9. Overlies unnamed beds of Mattoon Formation and Millersville Limestone Member (Bond Formation)
10. Type section: Sample site JM-10, in bed of SW-flowing tributary to Casey Fork, NW1/4SE1/4NW1/4 sec. 25, T. 1 S., R. 2 E., 2.4 km S of Dix, Jefferson County.

Dogie Spring Member (Superstition Tuff) U DGSP02
1. Miocene
2. Arizona (C)
3. Stuckless, J. S., and Sheridan, M. F., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3236-3240
4. Quartz latite ash-flow tuff
5. Red
6. 180 m
7. Densely welded
9. Intertongues with Geronimo Head Formation
10. Type locality: At Dogie Spring, 13 km ESE of village of Tortilla Flat, Superstition Mountains, Weavers Needle Quadrangle, Maricopa County.

Dollar Bay Formation (Big Cypress Group)/Member (Big Cypress Formation) DLRB01
1. Lower Cretaceous (Comanchean)
2. Florida (SE)
3. Winston, G. O., 1971, Florida Bur. Geology Spec. Pub. 15, p. 17
4. Limestone, dolomite, anhydrite
6. 154 m
10. Type section: Humble Oil and Refining Co. No. 1 Collier Corp. well, sec. 27, T. 50 S., R. 26 E., Collier County. Named for Dollar Bay, sec. 27, T. 50 S., R. 25 E., S of Naples.

Dolly Ridge Formation (Trenton Group) DRDG01
1. Middle Ordovician
2. West Virginia (C)
3. Perry, W. J., Jr., 1972, West Virginia Geol. Survey Circ. 13, p. 8, 11-12
4. Limestone with interbedded claystone, shale, and bentonite
5. Brown, gray
6. 120 m
9. Overlies Nealmont Limestone; underlies Reedsville Shale
10. Type locality: SE side of Dolly Ridge, on R. L. Phares Farm, 1.3 km SE of Riverton, Pendleton County.

Dolton Member (Equality Formation) DLTN01
1. Pleistocene
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 74-75
4. Sand with beds of silt and gravel
6. 2.4 m
7. Lacustrine deposits
10. Type section: Clay pit, S1/2NE1/4 sec. 3, T. 36 N., R. 14 E., Cook County. Named for town of Dolton, Cook County.

Dome Ash Bed (Gold Hill Loess) U DOME05
1. Pleistocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 12
5. White
6. < 0.1 m
10. Type locality: Dome Creek mining cut, NW1/4 sec. 5, T. 2 N., R. 1 E., Livengood A-2 Quadrangle.

Double Springs Andesite DBSP01
1. Oligocene

2. New Mexico (SW)
3. Elston, W. E., Coney, P. J., and Rhodes, R. C., 1970, New Mexico Geol. Soc. Guidebook 21, p. 82-83
4. Andesite lava flow
9. Overlies Jerky Mountains Rhyolite or Bloodgood Canyon Rhyolite; underlies Deadwood Gulch Rhyolite or Bearwallow Mountain Formation
10. Type area: Exposed at Canyon Creek, W of Black Mountain, Catron County.

Douglas Mountain Tonalite Porphyry (Toats Coulee Group) DGLM02
1. Upper Triassic
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3030
4. Schistose to gneissose porphyry with relict quartz and plagioclase phenocrysts
7. Small conformable lenses in metasedimentary-metavolcanic rocks
10. Type area: Douglas Mountain, secs. 8, 9, 16, 17, T. 37 N., R. 25 E., Okanogan County.

Drip Tank Member (Straight Cliffs Formation) U DPTK01
1. Upper Cretaceous
2. Utah (SC)
3. Peterson, Fred, 1969, U.S. Geol. Survey Bull. 1274-J, p. J18-J21
4. Sandstone with pebbles of chert, quartz, and mudstone, petrified logs, bone fragments, and bentonitic mudstone lenses
5. Yellowish-brown to grayish-orange
6. Range 44-160 m
7. Crossbedded
9. Overlies and interfingers with John Henry Member (Straight Cliffs Formation); underlies and interfingers with Wahweap Formation
10. Type section: E side of small tributary canyon on N side of Drip Tank Canyon, tributary to Last Chance Creek, NE1/4NE1/4 sec. 24, T. 40 S., R. 3 E., Kane County.

Drumcliff Member (Choptank Formation) DMCF01
1. Miocene
2. Maryland (SE), Virginia
3. Gernant, R. E., 1970, Maryland Geol. Survey Rept. Inv. 12, p. 13-17
4. Sand characterized by beds of densely packed large shells alternating with beds of small shells
5. Yellow-brown to orange
6. 9.2 m
9. Gradationally overlies Calvert Beach Member; conformably underlies St. Leonard Member
10. Type section: Drumcliff on SW shore of Patuxent River between Cole Creek and St. Thomas Creek, St. Marys County, Md.

Drummond Member (Kankakee Formation) DRMD01
1. Lower Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 17
4. Dolomite with glauconite and quartz grains
5. Gray
6. 2.4 m

7. Massive, vuggy
9. Overlies Elwood Formation; underlies Offerman Member (Kankakee Formation)
10. Type section: Railroad cut on SE side of Des Plaines River, Will County. Named for village of Drummond.

Drummond Mine Limestone (Copper Basin Group) DMDM01
1. Upper Mississippian
2. Idaho (SC)
3. Paull, R. A., Wolbrink, M. A., Volkmann, R. G., and Grover, R. L., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1387-1389
4. Limestone with thin beds of argillite, siltstone, sandstone, chert, and conglomerate
5. Gray
6. 800 m
9. Overlies Milligen Formation (Copper Basin Group); gradationally underlies Scorpion Mountain Formation
10. Type section: W ridge of Star Hope Canyon, from NW1/4NE1/4SE1/4 sec. 10 along ridge to SE1/4SE1/4 sec. 14, T. 4 N., R. 21 E., Custer and Blaine Counties. Named for Drummond Mine.

Dry Fork Tongue (Green River Formation) U DRFK02
1. Eocene
2. Colorado (NW)
3. Duncan, D. C., Hail, W. J., Jr., O'Sullivan, R. B., and Pipiringos, G. N., 1974, U.S. Geol. Survey Bull. 1394-F, p. F5-F6
4. Marlstone with calcareous siltstone
5. Greenish-gray
6. 21 m, range 9-21 m
9. Intertongues with Uinta Formation; merges laterally to S with Parachute Creek Member (Green River Formation)
10. Type section: NE1/4SE1/4NW1/4SE1/4 sec. 35, T. 1 N., R. 97 W., White River City Quadrangle, Piceance Creek Basin, Rio Blanco County.

Dry Gulch Creek Member (Duchesne River Formation) DGCK01
1. Oligocene
2. Utah (NE)
3. Anderson, D. W., 1972, Utah Geol. and Mineralog. Survey Bull. 97, p. 13
4. Claystone, sandstone
5. Reddish-brown
6. 201 m
9. Conformably overlies Brennan Basin Member; underlies Lapoint Member
10. Type section: From sec. 7, T. 2 S., R. 2 W., 900 m E of Dry Gulch Creek, N to NW corner sec. 32, T. 1 S., R. 2 W., Duchesne County.

Dry Tank Member (Boquillas Formation) DRTK02
1. Upper Cretaceous (Gulfian)
2. Texas (SW)
3. Frush, M. P., and Eicher, D. L., 1975, Geol. Assoc. Canada Spec. Paper 13, p. 277-301
4. Marl
6. 47 m

7. Contains foraminifera
9. Overlies informal flaggy member
10. Type locality: S of Dry Tank on KC Ranch, NW1/4NW1/4 sec. 29, Blk. 57, T. 9, T. and P. R. R. Co. Survey, Davis Mountains, Jeff Davis County.

Duffer Peak Granodiorite U DFPK01
1. Upper Cretaceous
2. Nevada (NW)
3. Smith, J. G., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-606
9. Intrudes Triassic (?) quartzite, marble, and amphibolite and Permian Happy Creek Volcanics; intruded by Cretaceous alaskite and aplite; unconformably underlies Tertiary volcanic rocks
10. Type locality: Duffer Peak, Pine Forest Range, Duffer Peak Quadrangle, Humboldt County.

Duffey Dome Formation U DFDM02
1. Mississippian
2. California (NW)
3. Hietanen, Anna, 1973, U.S. Geol. Survey Prof. Paper 731, p. 17-19
4. Metabasalt and metarhyolite
5. Greenish-gray to black and bluish-gray
6. > 400 m
9. Overlies Calaveras Formation; presumably underlies Horseshoe Bend Formation
10. Type section: Near Duffey Dome, sec. 16, T. 23 N., R. 6 E., Pulga Quadrangle, Plumas County.

Duffy Formation DFFY01
1. Pleistocene
2. Nebraska (NC)
3. Skinner, M. F., and Hibbard, C. W., 1972, Am. Mus. Nat. History Bull., v. 148, art. 1, p. 28-29
4. Sand, silt, clay
5. Brown
6. 19 m
9. Unconformably overlies Long Pine Formation; unconformably underlies Pettijohn or Sand Hills Formation
10. Type section: E side of Long Pine Creek, 4.8 km S of town of Long Pine, SW1/4NE1/4 sec. 17, T. 29 N., R. 20 W., Brown County. Named for Duffy Ranch.

Duke Island Complex/Ultramafic Complex DKID01
1. Jurassic and Cretaceous
2. Alaska (SE)
3. Irvine, T. N., 1974, Geol. Soc. America Mem. 138, p. 12
4. Clinopyroxenite, peridotite, dunite, hornblendite
6. > 1500 m
7. Outcrops occur in 2 areas; thought to represent single continuous complex at depth
8. Hall Cove Peridotite and Judd Harbor Dunite-Peridotite
9. Intrusive into metamorphosed sedimentary and volcanic rocks
10. Type locality: Duke Island, lat 55° N.

Duncan Mills Member (Glasford Formation) DCML01
1. Pleistocene (Illinoian)
2. Illinois (WC)

3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 56
4. Sand and gravel
6. 9 m
9. Overlies Kellerville Till Member; underlies Hulick Till Member
10. Type section: Exposures in creek bank 6.4 km S of Duncan Mills, NW1/4SW1/4SE1/4 sec. 32, T. 4 N., R. 3 E., Fulton County.

Dunham Salt Bed (Poe Member of Piper Formation)/(Piper Formation) DNHM01
1. Middle Jurassic
2. North Dakota (SW)
3. Zieglar, D. L., 1956, North Dakota Geol. Soc. and Saskatchewan Geol. Soc., p. 170-178
4. Salt with shale and anhydrite interbeds
5. Red
6. 46 m
9. Overlies Sande Formation
10. Type area: Subsurface in Williston Basin.

Duppa Member (Galeros Formation) DUPP01
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1250
4. Argillaceous shale with limestone and siltstone beds
6. 174 m
9. Overlies Carbon Canyon Member (Galeros Formation); underlies Carbon Butte Member (Kwagunt Formation)
10. Type section: Below Duppa Butte, Kwagunt Canyon, E Grand Canyon, lat 36°15′ N., long 111°50′ W., Vishnu Temple Quadrangle, Coconino County.

Dutchmans Creek Gabbro DMCK02
1. Precambrian and Cambrian
2. South Carolina (NC)
3. McSween, H. Y., Jr., 1972, South Carolina Div. Geology Geol. Notes, v. 16, no. 2, p. 19-42
4. Gabbro, weathering to saprolite
5. Brownish-gray
9. Intrudes metasedimentary and metavolcanic rocks
10. Type area: Along Dutchmans Creek, SE Fairfield County.

Dykersburg Shale Member (Carbondale Formation) DKBG03
1. Middle Pennsylvanian (Des Moinesian)
2. Illinois (SC)
3. Hopkins, M. E., 1968, Illinois Geol. Survey Circ. 431, p. 3-4
4. Silty shale
5. Gray
6. 4.6 m, range 4.6-30 m
10. Type locality: Outcrop on highwall of abandoned Delta Collieries Corp. strip mine, SE1/4SE1/4NE1/4 sec. 24, T. 9 S., R. 4 E., near Dykersburg, Williamson County.

Eagle Creek Formation (Mankomen Group) U EGCK06
1. Lower Permian
2. Alaska (EC)
3. Richter, D. H., and Dutro, J. T., Jr., 1975, U. S. Geol. Survey Bull. 1395-B, p. B10-B21

4. Argillite and limestone
5. Gray
6. 895 m
9. Conformably overlies Slana Spur Formation (Mankomen Group); conformably underlies Nikolai Greenstone or unnamed chert and limestone
10. Type locality: W side of Eagle Creek valley, secs. 22, 23, 27, and 34, T. 15 N., R. 5 E., Mt. Hayes A-1 Quadrangle, Eagle Creek area, Alaska Range.

East Gulch Tuff U EGLC03

1. Oligocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C15-C17
5. Gray, brown
6. 21 m
9. Overlies Antero Formation; underlies Thorn Ranch Tuff
10. Type locality: East Gulch, secs. 2, 3, and 11, T. 49 N., R. 12 E., SC Black Mountain Quadrangle, Fremont County.

Echo Park Alluvium U ECPK03

1. Eocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C4-C7
4. Alluvium
5. Weathers reddish-brown
6. 274 m
9. Overlies unnamed Precambrian rocks; underlies Wall Mountain Tuff
10. Type locality: Along part of Echo Canyon which is 2.8 to 5.6 km N from Arkansas River, Cotopaxi Quadrangle, Fremont County. Named for Echo Park on N side Arkansas River, C T. 15 S., R. 73 W.

Eddyville Member (Esopus Formation) EDVL02

1. Lower Devonian
2. New York (SE), New Jersey
3. Boucot, A. J., Gauri, K. L., and Southard, John, 1970, Palaeontographica, Abt. A, Bd. 135, Lief. 1-2, p. 29-34
4. Siltstone, mudstone
5. Black
6. Range 6-24 m
9. Gradationally overlies Highland Mills Member (Esopus Formation); underlies Woodbury Creek Member (Pine Hill Formation)
10. Type area: Near Highland Mills W and S of Catskill, Orange County, N. Y.

Edna Member (Pismo Formation) U EDNA02

1. Miocene and Pliocene
2. California (SC)
3. Hall, C. A., Jr., 1973, California Div. Mines and Geology Map Sheet 24, p. 4-6
4. Bituminous and nonbituminous sandstone with dolomite and conglomerate
6. 442 m
9. Disconformably overlies Monterey Formation; interfingers with

or underlies Miguelito Member (Pismo Formation); unconformably underlies Squire Member (Pismo Formation)
10. Type section: Near Edna oil field and along NW side of Pismo Creek from 0.8 to 3.2 km S of town of Edna, T. 31 and 32 S., R. 13 E., San Luis Obispo County.

Edwards Creek Tuff U EDCK02
1. Oligocene or Miocene
2. Nevada (C)
3. McKee, E. H., and Stewart, J. H., 1971, U.S. Geol. Survey Bull. 1311-B, p. B11-B14
4. Ash-flow tuff, nonwelded to welded
5. White, gray, pink, red
6. Range 90-150 m
8. 5 informal units
9. Overlies unnamed lithic eutaxite; unconformably (?) underlies unnamed tuff
10. Type section: NE side of Edwards Creek Valley, NW edge of New Pass Range, sec. 5, T. 21 N., R. 40 E., Lander County.

Edwards Island Flow (Portage Lake Volcanics) U EDDI01
1. Precambrian Y
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C15
4. Trap
5. Black
6. 15 m
7. Fine-grained, massive, columnar
9. Erupted after Middle Point Flow and before Scoville Point Flow
10. Type locality: N side Edwards Island, Isle Royale, Keweenaw County.

Edwards Slough Diorite (Horseshoe Basin Group) EDSG01
1. Lower Cretaceous
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3013-3048
10. Type area: Secs. 33 and 34, T. 40 N., R. 25 E., Okanogan County.

Elba Quartzite (Dove Creek Group) U ELBA03
1. Precambrian
2. Idaho (SC), Utah
3. Armstrong, R. L., 1968, Geol. Soc. America Bull., v. 79, no. 10, p. 1301
5. White, gray
6. Range 150-300 m
7. Massive, medium-bedded
9. Unconformably overlies Green Creek Complex; interfingers with and underlies Conner Creek Formation (Dove Creek Group)
10. Type section: Exposures N and W of town of Elba, S1/2 sec. 1, T. 14 S., R. 24 E., Cassia County, Idaho.

Electra Lake Gabbro U ECLK03
1. Precambrian Y
2. Colorado (SW)
3. Barker, Fred, 1969, U.S. Geol. Survey Prof. Paper 644-A, p. A27
4. Gabbro to granodiorite cut by dikes of alaskite, granophyre, and pegmatite

5. Brown, pink
9. Intrudes Twilight Gneiss and Irving Formation
10. Type locality: E shore of N half of Electra Lake, 29 km SSW of Silverton, La Plata County.

Elephant Head Quartz Monzonite U EPHD01
1. Upper Cretaceous
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C13-C14
7. Two stocks, characterized by rugged knobs, serrate ridges, deep canyons
9. Probably cuts Josephine Canyon Diorite; intruded by rhyolite dikes
10. Type area: Flanks of Elephant Head, Santa Cruz County.

Elkahatchee Quartz Diorite (Pinckneyville Complex) ELKC03
1. Paleozoic, lower
2. Alabama (C), Georgia
3. Wampler, J. M., Neathery, T. L., and Bentley, R. D., 1970, Alabama Geol. Soc. Guidebook 8, p. 88
10. Type locality: Not stated.

Elk Hills Member (Monterey Shale) U ELKH01
1. Miocene
2. California (SC)
3. Adkison, W. L., 1973, U.S. Geol. Survey Bull. 1375, p. 34-39
4. Siliceous shale, diatomaceous (?) siltstone, petroliferous sandstone
5. Gray
6. Range 915-945 m
9. Overlies informal McDonald Shale Member (Monterey Shale); underlies Reef Ridge Shale
10. Type section: Well 526-30R, depth-interval 1830-2890 m, Elk Hills oil field, 500 m N and 300 m E of SW corner sec. 29, T. 30 S., R. 23 E., Kern County.

Ella Dolomite U ELLA01
1. Middle Ordovician
2. Idaho (C)
3. Hobbs, S. W., Hays, W. H., and Ross, R. J., Jr., 1968, U.S. Geol. Survey Bull. 1254-J, p. J12-J15
4. Dolomite with laminae of silt and sand
5. Gray, weathers brown
6. 210 m
9. Conformably overlies Clayton Mine Quartzite; underlies Kinnikinic Quartzite
10. Type section: High on N wall of Salmon River canyon, 1.6 km W of Clayton, SE part of sec. 23, T. 11 N., R. 17 E., Custer County. Named for Ella Mine.

Ellemeham Formation U ELMM01
1. Jurassic or Cretaceous
2. Washington (NC)
3. Rinehart, C. D., and Fox, K. F., Jr., 1972, Washington Div. Mines and Geology Bull. 64, p. 22-25
4. Greenstone, siltstone, breccia, conglomerate
5. Olive to gray
6. 900 m

9. Unconformably overlies Kobau Formation; underlies unnamed Tertiary clastic rocks
10. Type locality: 3.2 km S of Ellemeham Draw at bluffs NE of Wannacut Lake, sec. 1, T. 39 N., R. 26 E., Loomis Quadrangle, Okanogan County.

Ellenton Formation U ELNN01

1. Upper Cretaceous (?)
2. South Carolina (C), Georgia
3. Siple, G. E., 1967, U.S. Geol. Survey Water-Supply Paper 1841, p. 28-31
4. Lignitic micaceous clay interbedded with quartz sand and gravel
5. Gray to black
6. 18 m, range 0-30 m
9. Overlies Tuscaloosa Formation; underlies Congaree (?) or McBean Formation
10. Type section: U.S. Atomic Energy Commission well 52-C, depth-interval 94-112 m, Savannah River Plant site, 6.4 km NE of town of Ellenton and 12.4 km SE of Jackson, Aiken County, S.C.

Elliott Park Formation (Pottsville Group) ELPK01

1. Lower and Middle Pennsylvanian
2. Pennsylvania (WC)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 17-18
4. Micaceous sandstone containing iron zones, siltstone beds, and carbonized plant fragments
6. Range 13-23 m
9. Unconformably overlies Burgoon Sandstone Member (Pocono Formation); underlies Curwensville Formation (Pottsville Group)
10. Type section: Exposure in roadcut along U.S. Highway I-80, 1.5 km S of lat 41°05′ N., 1.2 km E of long 78°30′ W., Lawrence Township, Clearfield County. Named for S. B. Elliott State Park in Pine Township.

El Ocho Formation U ELOC01

1. Lower to Upper Cretaceous
2. Puerto Rico (NC)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 12-13
4. Tuff, volcanic breccia, andesitic lava flows, with lenticular bodies of tuffaceous wacke and siltstone
5. Greenish-gray, reddish-gray
6. 825 m
7. Fine- to coarse-grained, lapilli, massive to thick-bedded
8. Pina Siltstone Member
9. Conformably overlies Cerro Gordo Lava; conformably underlies Cancel Breccia
10. Type section: Quarry N of El Ocho, 56,870 N., 177,210 E., Barrio Buena Vista, Naranjito Quadrangle.

El Picacho Formation EPCC02

1. Upper Cretaceous (Gulfian)
2. Texas (WC), Mexico
3. Wolleben, J. A., 1968, Gulf Coast Assoc. Geol Socs. Trans., v. 18, p. 169
4. Sandstone, clay, coal seams
5. Yellow, red, green
7. Crossbedded
9. Gradationally overlies San Carlos Formation; unconformably

underlies Tertiary rocks
10. Type area: Not given. Described in Rim Rock area, Presidio County, Texas, and Chihuahua, Mexico.

El Pico Clay (Claiborne Group) U ELPC01
1. Eocene, middle
2. Texas (SC)
3. Eargle, D. H., 1968, U.S. Geol. Survey Bull. 1251-D, p. D11-D19
4. Clay and shale, with interbedded sandstone and cannel coal
5. Gray, weathering to various colors
6. 355 m, range 213-355 m
7. Fresh- and brackish-water facies
9. Conformably overlies Bigford Formation; underlies Laredo Formation
10. Type section: Along Rio Grande from mouth of Sombrerito Creek to point 40 km upstream, Webb County. Named for El Pico mesa-butte, 12.8 km NW of Laredo.

El Rechuelos Rhyolite (Polvadera Group) U ELRC01
1. Pleistocene, lower
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P11
7. Small domes, pumice cone
9. Overlies Tschicoma Formation; underlies Bandelier Tuff
10. Type area: Rhyolite domes and pumice cone in N Jemez Mountains. Named for El Rechuelos, a small steep draw which drains the W side of Polvadera Peak, Abiquiu Quadrangle, Rio Arriba County.

Elstow Member (Duperow Formation) ELST01
1. Upper Devonian
2. Canada (Saskatchewan), Montana
3. Kent, D. M., 1968, Saskatchewan Dept. Mineral Resources Rept. 99, p. 26-27
4. Limestone with interbedded marlstone, shale, and mudstone
5. Yellowish-brown to gray
7. 14 m
9. Overlies Saskatoon Member; underlies Wymark Member
10. Type section: United States Borax and Chemical Company Elstow 5-22A well (Lsd. 5-22-34-1W3), depth-interval 765-779 m. Named for village of Elstow, 16 km N of type well, Saskatchewan, Canada.

El Vado Sandstone Member (Mancos Shale) ELVD01
1. Upper Cretaceous
2. New Mexico (NC)
3. Landis, E. R., and Dane, C. H., 1967, New Mexico Bur. Mines and Mineral Resources Geol. Map 19, p. 8-9
4. Sandstone and siltstone containing shell fragments
5. Brown to yellowish-gray
6. Range 27-30 m
7. Fine-grained, crossbedded
9. Transitionally overlies Cooper Arroyo Sandstone Member; underlies upper shale unit
10. Type section: Escarpment below 2250 m altitude at point 3.9 km E and 1.6 km N of SW corner of Tierra Amarilla Land Grant and 3.2 km SW of emergency outflow outlet for El Vado Reservoir, Boulder Lake Quadrangle, Rio Arriba County.

Elwood Formation ELWD01
1. Lower Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 14, 50
4. Argillaceous dolomite with chert layers
5. Gray, white
6. 8.2 m
9. Overlies Wilhelmi Formation; underlies Kankakee Dolomite
10. Type section: Ravine on SE side of Des Plaines River, Schweizer North Section, Will County. Named for town of Elwood, 8 km S of type section.

Emuckfaw Formation EMKF01
1. Paleozoic, lower
2. Alabama (EC)
3. Neathery, T. L., and Reynolds, J. W., 1975, Alabama Geol. Survey Bull. 109, p. 8
4. Metasedimentary interlayered schist and gneiss weathering to sandy muscovite-rich soil
10. Type locality: Exposures along Emuckfaw Creek, 2.4 km N of Horseshoe Bend, Tallapoosa County.

Enchantment Lake Formation (Chocolay Group) U EMLK02
1. Precambrian X
2. Michigan (NC)
3. Gair, J. E., and Thaden, R. E., 1968, U.S. Geol. Survey Prof. Paper 397, p. 27-34
4. Graywacke, slate, conglomerate
6. 153 m
9. Unconformably overlies Mona Schist or Compeau Creek Gneiss; conformably underlies Mesnard Quartzite (Chocolay Group)
10. Type locality: Exposures N of Enchantment Lake, S1/2 sec. 29, T. 48 N., R. 25 W., Marquette County.

Energy Shale Member (Carbondale Formation) ENRG01
1. Pennsylvanian (Des Moinesian)
2. Illinois (SC)
3. Allgaier, G. J., and Hopkins, M. E., 1975, Illinois Geol. Survey Circ. 489, p. 7-14
4. Silty shale
5. Gray
6. 4.5 m, range 4.5-30 m
9. Overlies Herrin Coal Member; underlies Anna Shale and Brereton Limestone Members
10. Type locality: 4.8 km E of village of Energy on W side of abandoned strip pit of Forsyth-Energy, Inc., Energy Mine, SW1/4NE1/4NE1/4 sec. 3, T. 9 S., R. 2 E., Williamson County.

Engineer Loess U ENGR01
1. Holocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 17-21
4. Loess
6. Range 1-12 m
8. Wilber, Jarvis, White River Ash Beds
9. Disconformably overlies Goldstream Formation; downslope grades into Ready Bullion Formation; upslope grades into Fairbanks Loess

10. Type locality: Dawson Cut gold placer mine on Engineer Creek near its confluence with Goldstream Creek, SW1/4 sec. 6, T. 1 N., R. 1 E., Fairbanks D-2 Quadrangle.

Enion Formation ENON01
1. Pleistocene
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 48
4. Glacial till, outwash, silt
6. 0.9 m
9. Overlies bedrock or Grover Gravel; underlies Banner Formation
10. Type section: Exposure in ravine 0.8 km W of Enion, NW1/4SW1/4SE1/4 sec. 32, T. 4 N., R. 3 E., Fulton County.

Eppenauer Ranch Basalt/Formation EPRC02
1. Tertiary
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Geol. Quad. Map 36, p. 8
4. Basalt
5. Brown to black
6. > 30 m
7. Massive to vesicular, aphanitic
9. Overlies Mount Locke Formation; underlies Wild Cherry Formation
10. Type locality: Exposed in roadcut on Spur 78, 0.8 km N of summit of Mount Locke. Named for Eppenauer Ranch, Jeff Davis County.

Equality Formation EQLT01
1. Pleistocene
2. Illinois (SE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 72-75
4. Clay, silt, sand, gravel lake deposits
6. 9.2 m
8. Carmi and Dolton Members
10. Type locality: Excavation at bridge crossing Saline River 6.4 km SW of Equality, SE corner SW1/4 sec. 27, T. 9 S., R. 7 E., Gallatin County.

Erda Formation (Oquirrh Group) U ERDA01
1. Middle Pennsylvanian
2. Utah (NW)
3. Tooker, E. W., and Roberts, R. J., 1970, U.S. Geol. Survey Prof. Paper 629-A, p. A14-A18
4. Limestone and shale
6. 1100 m
7. Cyclically repeated layers, fossiliferous
9. Conformably overlies Lake Point Limestone; conformably underlies Kessler Canyon Formation
10. Type section: W side Kessler Peak from hill 6231, N across Rogers Canyon and up ridge, sec. 31, T. 1 S., R. 3 W. Named for Erda siding, Union Pacific Railroad, W of mouth of Bates Canyon, Tooele County.

Escalante Member (Entrada Sandstone) ESCL01
1. Middle Jurassic
2. Utah (SC)

3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 19-24
4. Sandstone
5. Gray, green, red, white
6. 85 m, range 29-85 m
7. Massive, crossbedded
9. Unconformably overlies Cannonville Member (Entrada Sandstone); unconformably underlies Henrieville Sandstone or Salt Wash Member (Morrison Formation)
10. Type locality: Near Escalante, T. 35 S., R. 3 E., Garfield County.

Esmond Till Member (Wedron Formation) ESMD02
1. Pleistocene
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 67-68
4. Calcareous clayey till with illite-rich upper and lower silty phases
5. Brownish-gray
6. Range 6-9 m
9. Overlies Morton Loess, Robein Silt, or Winnebago Formation; underlies Tiskilwa Till Member (Wedron Formation); stratigraphically equivalent to Lee Center and Delavan Till Members.
10. Type section: Roadcuts 16 km N of Esmond, NW1/4SW1/4NW1/4 sec. 27, T. 43 N., R. 2 E., Winnebago County.

Espanola Formation ESPL01
1. Pleistocene
2. New Mexico (NC)
3. Galusha, Ted, and Blick, J. C., 1971, Am. Museum Nat. History Bull., v. 144, art. 1, p. 80
4. Sand, silt, loess
5. Brown
6. 11 m
9. Unconformably overlies Pojoaque Member (Tesuque Formation)
10. Type locality: Espanola Valley, sec. 31, T. 21 N., R. 9 E., Rio Arriba County. Named for town of Espanola.

Eva Formation U EVA 01
1. Pleistocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 14-15
4. Silt with peat lenses and forest beds
6. 1 m
9. Unconformably overlies Gold Hill Loess; conformably underlies and grades into Goldstream Formation
10. Type section: N wall of Eva Creek mining cut, NW1/4 sec. 5, T. 1 S., R. 2 W., 16 km W of Fairbanks, Fairbanks D-3 Quadrangle.

Everson Glaciomarine Drift/Drift EVRS01
1. Pleistocene
2. Washington (NW)
3. Easterbrook, D. J., 1968, Washington Dept. Water Resources Water Supply Bull. 25, pt. 1, p. 31
4. Pebbly silt to till

6. Range 2.5-12 m
7. Poorly sorted
9. Overlies Partridge Gravel or Vashon drift
10. Type area: Whidbey and Camano Islands, Island County.

Everts Formation U EVRS04
1. Upper Cretaceous
2. Wyoming (NW), Montana
3. Fraser, G. D., Waldrop, H. A., and Hyden, H. J., 1969, U.S. Geol. Survey Bull. 1277, p. 32-33
4. Sandstone and mudstone
6. 380 m
9. Gradationally overlies Eagle Sandstone; unconformably underlies Landslide Creek Formation
10. Type area: W half of N projection of Mount Everts, Yellowstone National Park, Park County, Wyo. Extends N 4 km from Wyoming-Montana State line nearly to Yellowstone River.

Eye of Needle Limestone ENDL01
1. Middle Cambrian
2. Utah (SW)
3. Hintze, L. F., and Robison, R. A., 1975, Geol. Soc. America Bull., v. 86, no. 7, p. 881-891
5. Gray
6. 62 m
7. Massive, banded
9. Overlies Swasey Limestone; underlies Pierson Cove Formation
10. Type section: 1.3 km N of Eye of Needle, NW1/4 sec. 25, T. 26 S., R. 16 W., Wah Wah Summit Quadrangle, Beaver County.

Fabius Bed (Tully Limestone) FBUS11
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 21
4. Quartz sandstone and calcilutite
6. 2.4 m
9. Overlies Cuyler Bed; underlies Meeker Hill Bed
10. Type area: S of Fabius, Onondaga County.

Fairbanks Coal Member (Bond Formation) FRBK03
1. Upper Pennsylvanian
2. Indiana (WC)
3. Shaver, R. H., and others, 1970, Indiana Geol. Survey Bull. 43, p. 54
4. Coal with shale partings
6. Range 0.3-1.2 m
9. Overlies Shoal Creek Limestone Member
10. Type locality: 2.4 km NW of Fairbanks, SW1/4SE1/4 sec. 8, T. 9 N., R. 10 W., Sullivan County.

Fairfield Formation FFLD01
1. Middle and Upper Ordovician
2. Connecticut (SW)
3. Dieterich, J. H., 1968, New England Intercollegiate Geol. Conf. Guidebook 60, Trip D-2, p. 1-5
4. Schist, gneiss, quartzite
6. > 91 m
9. Overlies Prospect Formation; underlies Straits Schist
10. Type area: Exposed in roadcuts along Merritt Parkway between

Morehouse Highway overpass and interchange 45, Westport Quadrangle, Fairfield County.

Falconer Formation/Member (Coleharbor Formation) FLCR02
1. Pleistocene
2. North Dakota (NE), Minnesota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 17-20
4. Silty pebble-loam with sand and gravel beds
6. Range 3-30.6 m
9. Gradationally overlies Wylie Formation; overlies Dahlen Formation; gradationally underlies Brenna or Poplar River Formation
10. Type section: University of North Dakota, Witmer Hall, Boring No. 3, SE1/4SE1/4SE1/4 sec. 5, T. 151 N., R. 50 W., Grand Forks, Grand Forks County, N. Dak. Named for Falconer Township.

Faleasao Formation FLS001
1. Holocene
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 434, 438
4. Basaltic lapilli tuff, breccia
6. > 335 m
7. Tuff cones
10. Type locality: Not stated. Named for Faleasao village, NW Ta'u Island.

Falls Creek Gneiss (North Snowy Group) FLCK11
1. Precambrian X
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 31-35
4. Trondhjemitic and granodioritic gneiss, with pegmatite intrusions
5. Gray to pink
7. Strongly foliated
9. Contains sheet-form inclusions of Mount Delano and Mount Cowen Gneisses
10. Type section: E of West Boulder fault, in canyon walls along Falls Creek, Beartooth Mountains, Park County.

Falls River Basalt U FLRV02
1. Pleistocene
2. Wyoming (NW), Idaho
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B15-B16
7. Dense thin flows with vesicular tops
9. Overlies Lava Creek Tuff; underlies Central Plateau Member (Plateau Rhyolite) or Pleistocene glacial deposits
10. Type locality: W rim of Falls River valley just below Cave Falls, Yellowstone National Park, Park County, Wyo.

Faneto Formation U FNTO01
1. Tertiary, upper, or Pleistocene, lower
2. Alaska (SW)
3. Gates, Olcott, Powers, H. A., and Wilcox, R. E., 1971, U.S. Geol. Survey Bull. 1028-U, p. 742-743

4. Clastic rocks including conglomerate, sandstone, graywacke
5. Red
6. > 450 m
10. Type locality: Faneto Hill, 6.4 km W of West Arm of Holtz Bay, NE Attu Island, Near Islands.

Fan Lake Granodiorite U FNLK01
1. Cretaceous
2. Washington (NE)
3. Miller, F. K., 1974, Washington Div. Geology and Earth Resources Geol. Map GM-9, p. 3-4
4. Hornblende-biotite granodiorite
6. Range 609-914 m
7. Medium- to coarse-grained, granular and porphyritic where large hornblende crystals are abundant.
9. Intrudes Precambrian rocks; intruded by Cretaceous or Tertiary granodiorite dikes
10. Type locality: Exposures around Fan Lake, Newport No. 3 Quadrangle, Pend Oreille County.

Farmingdale Member (Manasquan Formation) FMGD01
1. Eocene
2. New Jersey (EC)
3. Enright, Richard, 1969, in Subitzky, Seymour, ed., Rutgers Univ. Press, p. 14-17
4. Glauconite sand
6. 13 m, range 0-13 m
9. Unconformably overlies Vincentown Formation; gradationally underlies Deal Member (Manasquan Formation)
10. Type section: S bank Manasquan River, 760 m upstream from Southard Avenue in Farmingdale, Monmouth County.

Ferrelview Formation FRLV02
1. Pleistocene
2. Missouri (NW), Kansas
3. Howe, W. B., and Heim, G. E., Jr., 1968, Missouri Geol. Survey and Water Resurces Rept. Inv. 42, p. 7-21
4. Clayey silt
5. Gray to brown
6. Range 3-18 m
9. Overlies Kansan till; underlies Yarmouth soil and Loveland Loess
10. Type section: Missouri Geological Survey Test-hole No. 984, SE1/4SE1/4NE1/4 sec. 5, T. 52 N., R. 34 W., 5.2 km NW of town of Ferrelview, Platte County, Mo.

Fillmore Glen Bed (Tully Limestone) FLMG08
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 43
4. Limestone, shale
6. 3 m
9. Overlies Moravia Bed (Tully Limestone); conformably underlies Geneseo Shale
10. Type locality: Fillmore Glen, Cayuga County.

Fincastle Conglomerate/Member (Liberty Hall Formation) FCSL01
1. Middle Ordovician
2. Virginia (SC)

3. Kellberg, J. M. and Grant, L. F., 1956, Geol. Soc. America Bull., vol. 67, no. 6, p. 697-716
4. Polymict conglomerate containing clasts of limestone, quartzite, quartz, sandstone, chert
6. 17 m
10. Type locality: Roadcuts along U.S. Highway 220, 2.4 km N of Fincastle, Botetourt County.

Fire Creek Siltstone Member (Ivishak Formation) U FRCK18

1. Lower Triassic
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 11-14
4. Siltstone
5. Gray to black
6. 33 m, range 0-135 m
7. Thin-bedded to massive; worm trails and concretions
9. Conformably overlies Ledge Sandstone Member (Ivishak Formation); conformably(?) and disconformably(?) underlies Shublik Formation
10. Type section: On Fire Creek along W side of canyon at lat 69°31′45" N., long 145°13′30" W.

Fish Canyon Tuff U FSCN01

1. Oligocene, upper
2. Colorado (SW)
3. Olson, J. C., Hedlund, D. C., and Hansen, W. R., 1968, U.S. Geol. Survey Bull. 1251-C, p. C8-C14
4. Quartz latite ash-flow tuff
5. Gray, buff, white
6. 390 m, range 0-390 m
9. Overlies Masonic Park Tuff or Sapinero Mesa Tuff; underlies Carpenter Ridge Tuff or Crystal Lake Tuff
10. Type locality: Exposures in Fish Canyon, near S edge of Rudolph Hill Quadrangle, Gunnison County.

Fish Creek Mountains Tuff U FCKM01

1. Miocene, lower
2. Nevada (C)
3. McKee, E. H., 1970, U.S. Geol Survey Prof. Paper 681, p. 6-13
4. Rhyolite tuff
5. Gray to pink
6. Range 30-910 m
9. Overlies Caetano Tuff; underlies Bates Mountain Tuff(?)
10. Type locality: Cliff W of and below U.S. Government radio facility, SW1/4 sec. 19, T. 27 N., R. 41 E., Fish Creek Mountains, Lander County.

Fish River Lake Formation FRVL05

1. Upper Silurian to Lower Devonian
2. Maine (NC)
3. Boone, G. M., 1970, Maine Geol. Survey Bull. 23, p. 27-41
4. Sandstone and siltstone, with interbedded flows of mafic and felsic volcanics
5. Buff to dark gray-green
6. 910 m
8. Contains marine fauna and plant stems
9. Overlies Winterville volcanic sequence; underlies Seboomook Slate

10. Type locality: Not stated. Named for outcrops around shores of Fish River Lake, Aroostook County.

Fish Springs Member (Trippe Limestone) FSPG07
1. Middle Cambrian
2. Utah (WC)
3. Hintze, L. F., and Robison, R. A., 1975, Geol. Soc. America Bull., v. 86, no. 7, p. 881-891
4. Shale and limestone
5. Olive-green
6. 43 m
7. Forms soil- or talus-covered slope
9. Overlies lower unnamed member of Trippe Limestone; underlies Lamb Dolomite or Wah Wah Summit Formation
10. Type section: Units 1 to 5 of Nolan's type section for Trippe Limestone in Deep Creek Range. Reference section: NE1/4SW1/4 sec. 33, T. 12 S., R. 14 W., Juab County. Named for Fish Springs Range.

Fitiiuta Formation FTUT01
1. Holocene
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 434, 438
4. Olivine basalt lava, cinder
7. Pahoehoe flows, cinder cone
10. Type locality: Not stated. Named for Fitiiuta village, NE Ta'u Island.

Flat Swamp Member (Cid Formation) U FSMP01
1. Cambrian
2. North Carolina (C)
3. Stromquist, A. A., and Sundelius, H. W., 1969, U.S. Geol. Survey Bull. 1274-B, p. B1-B4
4. Breccias and tuffs, welded and subaerially reworked
6. 1200 m
9. Conformably overlies informal mudstone member of Cid Formation; underlies Floyd Church Member (Millingport Formation)
10. Type area: On Flat Swamp and Wildcat Mountains and in roadcuts across these ridges, SE Davidson and Rowan Counties.

Florida Mountains Formation (El Paso Group) FLDM01
1. Lower Ordovician
2. New Mexico (SW), Texas
3. Le Mone, D. V., 1969, New Mexico Bur. Mines and Mineral Resources Circ. 104, p. 22
4. Calcarenite limestone
6. 11 m
10. Type locality: EC Florida Mountains, sec. 6, T. 26 S., R. 7 W., Luna County, N. Mex.

Flour Island Formation (Wilcox Group) U FLID01
1. Eocene
2. Tennessee (WC)
3. Moore, G. K., and Brown, D. L., 1969, Tennessee Div. Geology Rept. Inv. 26, p. 1
4. Lignitic silt with interbeds of clay and sand
6. 60 m
9. Overlies Fort Pillow Sand (Wilcox Group); underlies Memphis

Sand (Claiborne Group)
10. Type section: Fort Pillow test well, depth-interval 396-456 m, old Fort Pillow on Mississippi River, lat 35°38′39" N., long 89°49′35" W., Lauderdale County. Named for Flour Island No. 33, land-tied island N of fort.

Flournoy Formation FLRN09
1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 18-19
4. Sandstone, siltstone
6. 920 m
8. White Tail Ridge Member, Camas Valley Member
9. Unconformably overlies Lookingglass Formation; underlies Tyee Formation
10. Type section: Along upper Lookingglass Creek in Flournoy Valley and between N edge of Lookingglass Valley and Tyee escarpment, Camas Valley Quadrangle, Douglas County.

Flowery Trail Granodiorite U FLTL01
1. Upper Triassic or Lower Jurassic
2. Washington (NE)
3. Clark, L. D., and Miller, F. K., 1968, Washington Div. Mines and Geology Geol. Map GM-5, p. 3
4. Hornblende-biotite granodiorite
7. Pluton
9. Intrudes Precambrian to upper Paleozoic rocks
10. Type locality: Excellent exposures in roadcuts along Flowery Trail Road, near base of Chewelah Mountain ski lift, 3.2 km NE of Chewelah, from sec. 7, T. 32 N., R. 41 E., to sec. 32, T. 33 N., R. 42 E., Stevens County.

Floyd Church Member (Millingport Formation) U FDCC01
1. Cambrian
2. North Carolina (C)
3. Stromquist, A. A., and Sundelius, H. W., 1969, U.S. Geol. Survey Bull. 1274-B, p. B1-B4
4. Argillite and siltstone
5. Gray
6. Range 900-1800 m
9. Overlies Flat Swamp Member (Cid Formation); conformably underlies Yadkin Member (Millingport Formation)
10. Type area: Along North Carolina Highway 8 W of Flat Swamp Mountain and NE of High Rock Lake, Davidson County. Named for town of Floyd Church.

Ford Lake Shale U FDLK01
1. Upper Devonian to Upper Mississippian
2. Alaska (NE), Canada
3. Brabb, E. E., 1969, U.S. Geol. Survey Bull. 1274-I, p. I2-I7
4. Shale and chert
5. Grayish-black
6. 600 m
9. Conformably overlies Nation River Formation; conformably underlies Calico Bluff Formation
10. Type section: E and W banks of Yukon River near Calico Bluff, from 3.2 km E to 3.2 km NE of Ford Lake, Eagle D-1 Quadrangle, Alaska.

Foreknobs Formation (Greenland Gap Group)/(Chemung Group) U FRKB06
1. Upper Devonian
2. West Virginia (EC), Maryland, Pennsylvania, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-54
4. Alternating sandstone and siltstone with redbeds
5. Gray
6. 403 m, range 403-585 m
7. Massive, fossiliferous
8. Mallow, Briery Gap Sandstone, Blizzard, Pound Sandstone Members
9. Disconformably overlies Scherr Formation (Greenland Gap Group); conformably underlies Hampshire Formation
10. Type section: Along West Virginia Highway 42, Measured Section 1, 0.48 km NW of Scherr, Grant County, W. Va.

Fork Mountain Formation FRKM01
1. Precambrian
2. Virginia (SC)
3. Conley, J. F., and Henika, W. S., 1973, Virginia Div. Mineral Resources Rept. Inv. 33, p. 12-21
4. Mica schist with thin lenses of quartzite and micaceous gneiss
5. Gray
10. Type area: Along SE and NW forks of Fork Mountain, in NW part of Snow Creek Quadrangle, Franklin County.

Fort Hill Waterlime (Bertie Group) FRHL07
1. Upper Silurian
2. New York (WC)
3. Ciurca, S. J., Jr., 1973, New York Geol. Assoc. Guidebook 45, Trip D, p. 1-14
4. Dolostone with calcite vugs and salt crystal impressions
6. 0.6 m
7. Fine-grained, fossiliferous, straticulate
9. Overlies Camillus Shale (Salina Group); underlies Oatka Shale (Bertie Group)
10. Type section: Exposure on New York Highway 19 N of LeRoy, Genesee County.

Fort Kipp Lignite Bed (Fort Union Formation) FRKP01
1. Paleocene
2. Montana (NE)
3. Montana Geol. Soc., 1975, 22d Ann. Pub., p. 189
6. 3 m
10. Type locality: 11 km W of Culbertson on Fort Peck Indian Reservation, center sec. 17, T. 28 N., R. 54 E., Roosevelt County.

Fort Lancaster Formation (Washita Group) FRLC03
1. Lower Cretaceous (Comanchean)
2. Texas (C)
3. Brown, J. B., and Sharp, E. R., 1974, West Texas Geol. Soc.-Soc. Econ. Paleontologists and Mineralogists, Permian Basin Sec., Guidebook 74-64, 12 p.
4. Shell fragment lime mudstone
6. 110 m
8. Includes Dr. Burt beds at base
9. Overlies Fort Terrett Formation; underlies Buda Formation
10. Type section: Fort Lancaster section, Lancaster Hill, E of old Fort Lancaster, Crockett County.

Fort Lowell Formation U FRLL08
1. Pleistocene, lower and middle
2. Arizona (SE)
3. Davidson, E. S., 1973, U.S. Geol. Survey Water-Supply Paper 1939-E, p. E25-E30
4. Gravel to clayey silt
5. Reddish-brown
6. 90 m
9. Unconformably overlies older rock units; unconformably underlies upper Pleistocene surficial deposits
10. Type section: NE1/4NW1/4SE1/4 sec. 31, T. 13 S., R. 14 E., lat 32°15′22" N., long 110°56′52" W., Pima County.

Fort Peck Lignite Bed (Fort Union Formation) FPCK01
1. Paleocene
2. Montana (NE)
3. Montana Geol. Soc., 1975, 22d Ann. Pub., p. 189
6. 3 m
10. Type locality: 11 km W of Culbertson, on Fort Peck Indian Reservation, T. 28 N., R. 54 E., Roosevelt County.

Fort Pillow Sand (Wilcox Group) U FRPL01
1. Paleocene and Eocene, lower
2. Tennessee (WC)
3. Moore, G. K., and Brown, D. L., 1969, Tennessee Div. Geology Rept. Inv. 26, p. 1
5. Gray to orange
6. 50 m
7. Coarse-grained aquifer
9. Overlies Old Breastworks Formation; underlies Flour Island Formation
10. Type section: Fort Pillow test well, depth-interval 472-508 m, at site of old Fort Pillow on Mississippi River, lat 35°38′39" N., long 89°49′35" W., Lauderdale County.

Fortress Mountain Member (Sepulcher Formation) U FRRM02
1. Eocene
2. Montana (SC), Wyoming
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 18
4. Alluvial facies andesite volcaniclastic rocks
5. Gray
6. Range 240-420 m
9. Overlies Daly Creek Member
10. Type area: Bighorn Peak, Yellowstone National Park, Gallatin County, Mont.

Fort Rice Member (Hell Creek Formation) FRRC02
1. Upper Cretaceous
2. North Dakota (SC)
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 36-37
4. Lignitic and bentonitic shales, sandstones, zones of siderite nodules
6. Range 12-18 m
9. Overlies Breien Member; underlies Huff Member
10. Type section: 1.6 km N of town of Huff, N1/2 sec. 1, T. 136 N., R. 80 W., Norton County. Named for town of Fort Rice.

Fort Terrett Formation (Edwards Group) FRTR03
1. Lower Cretaceous (Comanchean)
2. Texas (C)
3. Rose, P. R., 1972, Texas Bur. Econ. Geology Rept. Inv. 74, p. 30-32
4. Dolomite, evaporite
6. 49 m
8. Kirschberg Evaporite Bed Member
9. Overlies Hensell Formation; underlies Segovia Formation (Edwards Group) or Fort Lancaster Formation (Washita Group)
10. Type locality: Roadcuts of U.S. Highway 290 where highway rises out of valley of North Llano River, onto Edwards Plateau, 0.8 km S of Roosevelt, Kimble County. Named for Fort Terrett, 19th century army post, 13 km W.

Forty Bridge Formation (Canadaway Group) FBDG01
1. Upper Devonian
2. New York (WC)
3. Rickard, L. V.; 1975, New York Map and Chart Series no. 24, 16 p.
4. Shale, sandstone
8. Equivalent of Wellsville and Whitesville Formations
9. Overlies Caneadea Shale (Canadaway Group); underlies Chadakoin Formation
10. Type locality: Along S branch of Cattaraugus Creeek, Cattaraugus County.

Fossil Butte Member (Green River Formation) U FSLB01
1. Eocene
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 30-32
4. Mudstone, limestone, shale
6. Range 61-82 m
7. Fossiliferous, oil-shales
9. Conformably overlies Wasatch Formation; conformably underlies Angelo Member (Green River Formation)
10. Type section: E end of S-facing scarp of Fossil Butte, near center of Fossil Basin, SW1/4NW1/4 sec. 5, T. 21 N., R. 117 W., Lincoln County.

Fourmile Gneiss FRML05
1. Ordovician
2. Massachusetts (NW)
3. Ashenden, D. D., 1973, Massachusetts Univ. Geology Dept. Contr. 16, p. 53
4. Quartz-feldspar-biotite gneiss with feldspar phenocrysts
6. 23 m
7. Fine- to medium-grained, slabby to massive
9. Unconformably overlies Poplar Mountain Gneiss; infolded with and underlies Partridge Formation
10. Type locality: Cascade on Fourmile Brook immediately W of State Highway 63 at Northfield Farms, Northfield Quadrangle, Franklin County.

Fourmile Draw Member (San Andres Formation) FMLD01
1. Lower Permian (Leonardian)
2. New Mexico (SE)
3. Kelley, V. C., 1971, New Mexico Bur. Mines and Mineral

Resources Mem. 24, p. 13-14
4. Gypsum, dolomite
6. Range 0-210 m
9. Overlies Bonney Canyon Member (San Andres Formation); underlies Grayburg Formation
10. Type section: Fourmile Draw, T. 18 S., Rs. 19-21 E., Pecos County.

Fox Gravel U FOX 03
1. Pleistocene, lower or middle
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 6-9
4. Auriferous gravel with silt and sand lenses
5. Tan
6. 15 m, range 1-30 m
9. Unconformably overlies Precambrian bedrock or Cripple Gravel; unconformably underlies Dawson Cut Formation, Fairbanks Loess, Gold Hill Loess, or Goldstream Formation; grades laterally into Tanana Formation in valley bottoms
10. Type locality: Mining cut in Goldstream valley, near village of Fox, SE1/4 sec. 31, T. 2 N., R. 1 E., Fairbanks D-2 Quadrangle.

Francestown Member (Littleton Formation) FRCS02
1. Lower Devonian
2. New Hampshire (SC)
3. Greene, R. C., 1970, New Hampshire Div. Econ. Devel. Bull. 4, p. 80-81
4. Pyrite-quartz-plagioclase granulite, weathering into impure limonite
5. White and gray to rusty
6. Range 0-150 m
9. Overlies Peterborough Member; underlies Crotched Mountain Member
10. Type locality: Along quarry road 2.4 km NE of village of Francestown, NE Peterborough Quadrangle, Hillsborough County.

Franklin Bluffs Member (Sagavanirktok Formation) U FKBF01
1. Oligocene(?) and Miocene(?)
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 37-39
4. Silt, clay sand, gravel, volcanic ash beds in cyclic-bedded subaerial deposit
6. Range 900-1500 m
7. Desiccation cracks, limonite staining, irregular crossbedding, laminated beds
9. Conformably(?) overlies Sagwon Member; conformably underlies Nuwok Member or unconformably underlies Quaternary gravel.
10. Type section: Along stream 1.8 km S. 10° W. of VABM Greta, lat 69°48′ N., long 148°39′ to 148°41′ W.

Franklin Canyon Formation U FKLC02
1. Devonian
2. California (NC)
3. Hietanen, Anna, 1973, U.S. Geol. Survey Prof. Paper 731, p. 12-17
4. Metavolcanic rocks including meta-andesite, metadacite, metasoda-rhyolite, metatuff

5. Gray
9. Overlies Calaveras Formation; probably underlies Horseshoe Bend Formation
10. Type section: Franklin Canyon on Middle Fork of Feather River, secs. 3, 4, 5, T. 22 N., R. 8 E., Bucks Lake Quadrangle, Plumas County.

Frederika Formation U FRDK01
1. Miocene
2. Alaska (EC)
3. MacKevett, E. M., Jr., 1970, U.S. Geol. Survey Geol. Quad. Map GQ-844, p. 3-4
4. Continental sedimentary rocks including conglomerate, sandstone, siltstone, shale, and coal
5. Brown to red
6. Range 10-450 m
9. Unconformably overlies Hasen Creek Formation (Skolai Group), Moonshine Creek Formation, or older rocks; gradationally underlies basal flows of Wrangell Lava
10. Type area: Valley walls of W-flowing tributary of Frederika Creek, SE of terminus of Frederika Glacier, S Wrangell Mountains, McCarthy C-4 Quadrangle.

Fresno Springs Canyon Shale FSPC01
1. Lower Cretaceous
2. California (C)
3. Anderson, J. Q., 1972, Soc. Econ. Paleontologists and Mineralogists, Pacific Sec., Guidebook Fall Field Trip, Oct. 20-21, p. 11-18
4. Shale, sandy graywacke
5. Grayish-brown
6. 900 m
7. Massive
9. Unconformably underlies Center Peak Conglomerate
10. Type area: Vicinity of Fresno Springs Canyon, Fresno County.

Friars Formation (La Jolla Group) U FRRS01
1. Eocene, middle and upper
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 717, 719
4. Sandstone, with sandy claystone beds
5. Yellowish-gray
6. 35 m
7. Nonmarine, friable, vertebrate fossils
10. Type section: On W wall of Mission Valley, lat 32°46.0′ N., long 117°10.8′ W., San Diego County.

Gable Creek Formation GBCK08
1. Cretaceous
2. Oregon (C)
3. Wilkinson, W. D., and Oles, K. F., 1970, Am. Assoc. Petroleum Geologists Bull., v. 52, no. 1, p. 133
4. Conglomerate, sandstone
7. Deltaic and fluvial tongues
9. Overlies and intertongues with Hudspeth Formation
10. Type locality: Mitchell Quadrangle, Wheeler County.

Galena Point Granodiorite U GLNP01
1. Cretaceous
2. Washington (NE), Idaho
3. Miller, F. K., 1974, Washington Div. Geology and Earth Resources Geol. Map GM-7, p. 4
4. Biotite granodiorite
6. 914 m
7. Medium- to coarse-grained, porphyritic, pluton
9. Intrudes Belt Supergroup rocks
10. Type locality: Galena Point, NE1/4 sec. 4, T. 34 N., R. 45 E., Pend Oreille County, Wash.

Galeros Formation (Chuar Group) GLRS04
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1245-1250
4. Argillaceous shale with minor limestone, dolomite, siltstone, and sandstone
6. 1302 m
8. Tanner, Jupiter, Carbon Canyon, Duppa Members
9. Unconformably overlies Nankoweap Group; underlies Kwagunt Formation (Chuar Group)
10. Type section: Galeros Promontory in Chuar and Carbon Canyons, Grand Canyon, lat 36°12′ N., long 111°50′ W., Coconino County.

Game Hut Obsidian GMHT01
1. Holocene
2. Oregon (C)
3. Peterson, N. V., and Groh, E. A., 1969, Ore Bin, v. 31, no. 4, p. 81, 83
4. Rhyolite obsidian flow
10. Type locality: Newberry Crater, N of road and S of Pumice Cone, 40 km S of Bend, Deschutes County.

Gardar Formation GRDR12
1. Pleistocene
2. North Dakota (NE)
3. Arndt, B. M., 1975, North Dakota Geol. Survey Bull. 62, pt. 1, p. 40-47
4. Pebble-loam
5. Olive-gray to yellowish-brown
6. Range 2-24 m
7. Unbedded, compact, blocky
9. Overlies pebble-loam; underlies Dahlen Formation and Wylie Formation
10. Type section: Gardar Section (no. 30), SE1/4NE1/4SE1/4 sec. 16, T. 159 N., R. 56 W., river cut on S side of North Branch of Park River, Pembina County. Named for village of Gardar.

Gardner Canyon Formation U GRDC01
1. Upper Triassic
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4
4. Red beds, conglomerate, limestone, volcanic rocks
5. Red
6. > 300 m
9. Unconformably overlies Permian rocks or Mount Wrightson Formation; underlies Canelo Hills Volcanics

10. Type area: Gardner Canyon and adjacent parts of Cave Creek, Santa Cruz County.

Garrison Formation GRSN23
1. Silurian to Lower Devonian
2. Washington (NW)
3. Vance, J. A., 1975, in Russell, R. H., ed., Washington Dept. Ecology Water Supply Bull. 46, p. 5
4. Greenschist, amphibolite, phyllitic quartzite
5. Green
6. 120 m
7. Fine-grained, lustrous, foliated
9. Tectonically emplaced along contact between Permian cherts and Mesozoic clastic sedimentary rocks
10. Type area: Exposures on E side Garrison Bay from Bell Point to English Camp, San Juan Island, San Juan County.

Gas-Line Flows/Basalt GSLN01
1. Holocene
2. Oregon (C)
3. Peterson, N. V., and Groh, E. A., 1969, Ore Bin, v. 31, no. 4, p. 76
4. Basaltic aa lava flows
10. Type locality: E side of U.S. Highway 97, SE of Lava Butte, 16 km SSW of Bend, Deschutes County.

Gastineau Channel Formation U GSCL01
1. Pleistocene, upper, and Holocene, lower
2. Alaska (EC)
3. Miller, R. D., 1973, U.S. Geol. Survey Bull. 1394-C, 20 p.
4. Pebbles and large clasts in silt and sand matrix
5. Gray
6. Range 15-26 m
7. Glaciomarine deposit
9. Overlies bedrock; underlies beach gravels
10. Type area: Low-lying land on Juneau mainland and Douglas Island, in bluffs along Gastineau Channel and lower Montana Creek valley.

Geertsen Canyon Quartzite (Brigham Group) U GRSC04
1. Lower Cambrian
2. Utah (NC)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 592-593
4. Conglomeratic quartzite and arkose
6. 1340 m
9. Conformably overlies Browns Hole Formation (Brigham Group); conformably underlies Langston Dolomite
10. Type section: Ridge W of Geertsen Canyon, 8 km N of Huntsville, secs. 18 and 19, T. 7 N., R. 2 E., Weber County.

George Lake Marble (North Snowy Group) GGLK01
1. Precambrian W
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 14-15
4. Dolomitic and calcitic marble
5. Weathers brown and gray

6. Range 0-6 m
7. Coarsely crystalline
9. Adjacent to Barney Creek Amphibolite and Jewel Quartzite
10. Type section: NW wall of Cascade Creek, 1,000 m N of Lake George. Reference section: W of small fault on N wall of North Fork of Pine Creek, Beartooth Mountains, Park County.

Geronimo Head Formation U GMHD01

1. Miocene
2. Arizona (C)
3. Stuckless, J. S., and Sheridan, M. F., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3236-3240
4. Rhyolite ash flows and epiclastic breccias
5. White to pale-yellow
6. 430 m
9. Unconformably overlies Siphon Draw Member (Superstition Tuff); intertongues with Dogie Spring Member (Superstition Tuff); underlies Canyon Lake Member (Superstition Tuff) and glassy quartz latite lava
10. Type section: Geronimo Head, lat 33°29′ N., long 111°22′ W., 4 km SE of village of Tortilla Flat, Goldfield Mountains, Morman Flat Dam Quadrangle, Maricopa County.

Gervais Formation/(Coleharbor Group)/Member (Coleharbor Formation) GRVS01

1. Pleistocene
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 6-9
4. Silty, pebbly clay-loam
5. Gray
6. 12 m
9. Underlies Marcoux or Red Lake Falls Formation
10. Type section: Three Creeks Section, NE1/4NE1/4NW1/4 sec. 21, T. 151 N., R. 44 W., Red Falls area, Red Lake County, Minn. Named for Gervais Township.

Ghost Rocks Formation U GRCK03

1. Paleocene and Eocene
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A31-A32
4. Zeolite-bearing tuffaceous sandstone with basalt, tuff, claystone
6. 5000 m
9. Underlies Sitkalidak Formation in fault contact
10. Type section: Exposures along N coast of Sitkalidak Island, SW of Kodiak Island, opposite Ghost Rocks and extending from Amee Bay to McDonald Lagoon.

Gibson Jack Formation U GBJK01

1. Lower Cambrian
2. Idaho (SE)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 586-587
4. Argillaceous siltstone and shaly argillite
5. Tan to brown
6. > 300 m
9. Conformably and transitionally overlies Camelback Mountain

Quartzite
10. Type locality: Head of Gibson Jack Creek, 12.8 km SSW of Pocatello, sec. 33, T. 7 S., R. 34 E., near Bannock-Power County line.

Gillis Formation GLLS02
1. Middle Triassic
2. Nevada, (WC)
3. Rogers, J. J. W., and others, 1974, Geol. Soc. America Bull., v. 85, no. 12, p. 1913-1924
4. Volcanic flow and pyroclastic rocks interbedded with limestone
6. > 1000 m
7. Porphyritic
9. Overlies Luning Formation
10. Type area: Gillis Range near Hawthorne, Mineral County.

Gilpins Falls Member (James Run Formation) U GLPF01
1. Paleozoic, lower
2. Maryland (NE)
3. Higgins, M. W., 1971, Am. Jour. Sci., v. 271, no. 4, p. 321-332
4. Metamorphosed basaltic rocks including metagraywacke, diamictite, pelitic schist
7. Pillow basalt
8. 4 informal units
10. Type section: Along Northeast Creek for 305 m N of Gilpins Falls and for 1829 m S of falls, just S of Maryland Highway 272, NE of Bayview, Cecil County.

Gingrass Draw Slate U GGRD01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Pelitic slate with thin quartzite layers
5. Brown to gray
9. Conformably overlies Buck Mountain Quartzite; conformably underlies Hay Creek Greenstone (Windy Flats Group)
10. Type locality: Vicinity of Gingrass Draw, secs. 5 and 8, T. 2 N., R. 5 E., Black Hills area, Lawrence County.

Glades Group (Marquesas Supergroup)/Formation (Marquesas Supergroup) GLDS01
1. Lower Cretaceous
2. Florida (EC)
3. Winston, G. O., 1971, Gulf Coast Assoc. Geol. Socs. Trans. 21, p. 25
4. Interbedded limestone, dolomite, and anhydrite
5. Brown
6. 570 m
8. Punta Gorda anhydrite
9. Overlies Fort Pierce Formation; underlies Ocean Reef Group (Marquesas Supergroup)
10. Type section: Coastal No. 1 Tiedtke well, sec. 25, T. 42 S., R. 33 E., Glades County.

Gladesville Norite GLDV08
1. Precambrian
2. Georgia (C)
3. Carpenter, R. H., and Hughes, T. C., 1970, Georgia Geol. Survey

Inf. Circ. 37, 7 p.
6. 7000 m
7. Rhythmic layering. Thermal alteration zone along margin
9. Intrudes gneissic country rocks; cut by later intrusive mafic dikes, pegmatites, diabase
10. Type locality: Not stated. Named for town of Gladesville, Jasper County.

Glasford Formation GLFD01
1. Pleistocene (Illinoian)
2. Illinois (NC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 52-59
4. Glacial tills and intercalated outwash deposits
8. In N: Sterling Till, Winslow Till, Ogle Till Members; in C and W: Berry Clay, Radnor Till, Toulon, Hulick Till, Duncan Mills, Kellerville Till Members; in SC: Roby, Hagarstown, Vandalia Till, Mulberry Grove Silt, Smithboro Till Members
9. Overlies Lierle Clay Member (Banner Formation), Petersburg Silt, or Yarmouth soil; underlies Wedron Formation
10. Type section: Tindall School Section, SW1/4SW1/4NE1/4 sec. 31, T. 7 N., R. 6 E., Peoria County, Ill. Named for town of Glasford.

Glen Aubrey Formation (Sonyea Group) GLAB01
1. Upper Devonian
2. New York (C)
3. Sutton, R. G., Bowen, Z. P., and McAlester, A. L., 1970, Geol. Soc. America Bull., v. 81, no. 10, p. 2978
4. Siltstone, shale, mudstone
5. Gray
6. 46 m
7. Fossiliferous
9. Overlies Sawmill Creek Shale; underlies Moreland Shale
10. Type section: Strata exposed in bed of W-flowing stream 0.8 km E of village of Glen Aubrey, Broome County.

Glenburn Till Member (Wedron Formation) GLBR02
1. Pleistocene (Wisconsinan)
2. Illinois (EC), Indiana
3. Johnson, W. H., Gross, D. L., and Moran, S. R., 1971, Ohio State Univ. Press, p. 184-216
4. Till with wood and sand stringers
5. Brownish-gray
6. 6 m
9. Overlies Oakland Till Member (Wedron Formation) or Tilton Till Member (Banner Formation); underlies Batestown Till Member (Wedron Formation)
10. Type section: Emerald Pond Section, NE1/4SW1/4SW1/4 sec. 33, T. 20 N., R. 12 W., Vermilion County, Ill. Named for town of Glenburn.

Glen Creek Gabbro-Ultramafic Complex/Complex U GLCK10
1. Jurassic
2. California (NW)
3. Irwin, W. P., Wolfe, E. W., Blake, M. C., Jr., and Cunningham, C. G., Jr., 1974, U.S. Geol. Survey Geol. Quad. Map GQ-1111
4. Gabbro and hornblendite with serpentinized peridotite
9. Intrudes Galice(?) Formation

10. Type locality: Exposures on Glen Creek, sec. 24, T. 1 S., R. 7 E., near Forest Glen, Pickett Peak Quadrangle, Trinity County.

Glenloch Formation (Heard Group) GLLC02
1. Precambrian and Paleozoic, lower
2. Georgia, (WC), Alabama
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 15-16
4. Interlayered muscovite-garnet-quartz-feldspathic schist and muscovite-graphite-garnet-quartz schist
5. Weathers to light-orange soils
7. Produces gravel of pea-sized garnets
9. Middle unit of Heard Group; adjoins Roopville Formation to N; gradationally adjoins Centralhatchee Formation to S
10. Type area: Community of Glenloch, Heard County, Ga.

Glenn Shale U GLNN01
1. Middle Triassic to Lower Cretaceous
2. Alaska (NE)
3. Brabb, E. E., 1969, U.S. Geol. Survey Bull. 1274-I, p. I9-I13
4. Fissile carbonaceous shale, argillite, siltstone, limestone
5. Grayish-black
6. 1500 m, Range 100-1500 m
9. Unconformably overlies Tahkandit Limestone or Step Conglomerate; conformably underlies Keenan Quartzite; locally, unconformably underlies Cretaceous and Tertiary sedimentary rocks
10. Type section: Along banks and bed of Washington Creek, N-flowing tributary of Yukon River, from 3.2 to 6.4 km NW of bench mark 2452 (Glenn), NW1/4 sec. 24 to NW1/4 sec. 12, T. 5 N., R. 26 E., Charley River A-3 Quadrangle. Named for Glenn Creek.

Glen Richey Formation (Allegheny Group) GLRC01
1. Middle Pennsylvanian
2. Pennsylvania (WC)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 18-22
4. Sandstone with interbedded siltstone, shale, coal, underclay
6. 12.5 m
7. Represents one cycle of deposition, plus coal of next higher cycle
8. Informal lower Freeport coal at base, upper Freeport coal at top
9. Overlies Laurel Run Formation (Allegheny Group); underlies Conemaugh Group
10. Type section: Measured section taken from double strip mine 1.6 km NW of village of Glen Richey, 600 m E of long 78°30′ W., 150 m S of lat 40°37′30″ N., Pike Township, Clearfield County.

Goat Gabbro (Horseshoe Basin Group) GOAT01
1. Lower Cretaceous
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3032-3034
5. Black
7. Small pluton with magmatic nongneissose texture

10. Type locality: Chopaka Mountain, sec. 23, T. 40 N., R. 24 E., Okanogan County.

Goat Canyon Formation GCNN01
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 10
4. Trachyte with feldspar phenocrysts
5. Gray, weathers yellowish-brown
6. Range 34-157 m
7. Forms caps on ridges
9. Overlies Wild Cherry or Medley Formation
10. Type locality: Exposed along crests of ridges, W side of High Peak, Jeff Davis County.

Goat Creek Formation GCRK01
1. Lower Cretaceous
2. Washington (NC)
3. Barksdale, J. D., 1975, Washington Div. Geology and Earth Resources Bull. 68, p. 27-29
4. Arkose and argillite
5. Black
6. 1560 m
7. Coarse- to fine-grained
9. Unconformably overlies Buck Mountain Formation; conformably underlies Panther Creek Formation
10. Type section: Named for Goat Creek, whose headwaters drain the type section exposed in E end of drainage divide between Isabella Ridge and Sunrise Peak, sec. 4, T. 37 N., R. 20 E., and sec. 33, T. 38 N., R. 20 E., Okanogan County.

Goat Hill Diorite GTHL03
1. Devonian
2. Massachusetts (C)
3. Field, M. T., 1975, Massachusetts Univ. Dept. Geology Contr. 22, p. 94-98
4. Diorite
9. Lies at contact between Partridge and Littleton Formations, and in one place it is in contact with Hardwick Quartz Diorite
10. Type locality: On and near Goat Hill, Ware area, Ware Quadrangle, Worcester County.

Goat Hill Member (Logtown Ridge Formation) U GTHL02
1. Middle and Upper Jurassic (Callovian)
2. California (C)
3. Duffield, W. A., and Sharp, R. V., 1975, U.S. Geol. Survey Prof. Paper 827, p. 10-12
4. Greenstone interbedded with volcanic breccia and tuff with minor slate
7. Cut-and-fill structures, soft-sediment deformation, fossiliferous
9. Conformably overlies Rabbit Flat Member; conformably underlies Pokerville Member
10. Type section: Exposures on N bank of Mokelumne River, secs. 16 and 17, T. 5 N., R. 11 E., about 1 km S of Goat Hill, Amador County.

Godfrey Hills Trachyte (Sierra Blanca Volcanics) GDFH01
1. Oligocene
2. New Mexico (C)
3. Thompson, T. B., 1972, Geol. Soc. America Bull., v. 83, no. 8, p. 2341, 2348-9
4. Latite porphyry flow, tuff, breccia, welded ash-flow
6. 550 m
9. Overlies Walker Andesite Breccia
10. Type locality: Within 3.2 km to E and W of long 106°00′ W., between lat 33°30′ and 33°20′ N., W edge of Sierra Blanca, Lincoln-Otero County border.

Golden Gate Canyon Formation GDGC03
1. Precambrian
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 135
4. Gneiss with quartzite lenses
6. 1370 m
9. Unconformably overlies Junction Formation; gradationally underlies Cedar Gulch Formation
10. Type area: Along Rocky Mountain front from mouth of Golden Gate Canyon N 1370 m, sec. 20, T. 3 S., R. 70 W., Jefferson County.

Golden Hill Schist Member (Prospect Formation) GLDH07
1. Middle and Upper Ordovician
2. Connecticut (SW)
3. Crowley, W. P., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 37-38
4. Schist interlayered with gneiss and quartzite
9. Overlies Pumpkin Ground Member; interfingers with Beardsley Gneiss Member; underlies calcareous member of Prospect Formation
10. Type locality: Golden Hill section of Bridgeport, 90 m E of N termination of Harral Avenue, Fairfield County.

Golden Horn Limestone Lentil (Hasen Creek Formation) U GLDH06
1. Lower Permian
2. Alaska (EC)
3. Smith, J. G., and MacKevett, E. M., Jr., 1970, U.S. Geol. Survey Bull. 1274-Q, p. Q20-Q26
4. Bioclastic limestone, calcite-cemented arkose
5. Rust-red and yellow
6. 244 m
7. Fossiliferous
9. Conformably overlies Station Creek Formation; unconformably underlies Nikolai Greenstone, Wrangell Lava, or Frederika Formation
10. Type area: N side of Skolai Creek extending W from peak of Golden Horn to Tinplate Hill, sec. 23, T. 2 S., R. 17 E., Wrangell Mountains, McCarthy C-4 Quadrangle.

Gold Hill Loess U GLDH12
1. Pleistocene (Illinoian)
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 6-10
4. Loess
5. Green or brown (frozen); tan (thawed)

6. 55 m, range 0-55 m
8. Ester Ash Bed, Dome Ash Bed
9. Unconformably overlies pre-Quaternary bedrock, Cripple Gravel, Fox Gravel, Tanana Formation, and Dawson Cut Formation; unconformably underlies Eva and Goldstream Formations; lateral equivalent of lower part of Fairbanks Loess
10. Type section: N wall of Gold Hill mining cut on Gold Hill in SW1/4 sec. 3, T. 1 S., R. 2 W., 10 km W of Fairbanks, Fairbanks D-2 Quadrangle.

Gold Island Granite GDID08
1. Precambrian W
2. Minnesota (NE)
3. Goldich, S. S., and others 1972, Geol. Soc. America Mem. 135, p. 165-6
4. Granite and pegmatite
5. Red
9. Possibly intrusive into Saganaga Tonalite
10. Type locality: Gold Island in SW corner of Saganaga Lake at mouth of Red Rock Bay, Cook County.

Gold Range Formation GDRG01
1. Upper Triassic
2. Nevada (WC)
3. Archbold, N. L., and Paul, R. R., 1970, Nevada Bur. Mines Bull. 74, p. 5-6
4. Shale, siltstone, agglomerate, tuff, ignimbrite, andesite
6. 300 m
9. Interfingers with Luning Formation; unconformably overlies Excelsior Formation where Luning is missing
10. Type locality: Exposed in Pilot Mountains, Excelsior Mountains, and Garfield Hills, Mineral County.

Goldstream Formation U GLDM06
1. Pleistocene (Wisconsinan)
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 6-12
4. Loess
5. Gray to black to greenish-black when frozen
6. 15 m, range 10-35 m
8. Chatanika Ash Bed
9. Conformably overlies and grades into Eva Formation and unconformably overlies Cripple Gravel, Dawson Cut Formation, Fox Gravel, Tanana Formation, and Gold Hill Loess; unconformably underlies Ready Bullion Formation and Engineer Loess
10. Type section: Left limit of Goldstream Creek mining cut, SW1/4 sec. 32, T. 2 N., R. 1 E., about 0.8 km E of village of Fox, Fairbanks D-2 Quadrangle.

Golmeyer Creek Volcanics (Washburn Group) U GMCK01
1. Eocene
2. Montana (SW)
3. Chadwick, R. A., 1969, Wyoming Univ. Contr. Geology, v. 8, no. 2, pt. 2, p. 153-155
4. Andesite lava grading upward into flow breccia
6. > 610 m, range 0- > 610 m
7. 4 massive lava flows
9. Unconformably underlies Hyalite Peak Volcanics

10. Type section: Along ridge between Dry and Golmeyer Creeks, from NW1/4 sec. 4 through secs. 10 and 11 to SE1/4 sec. 2, T. 6 S., R. 7 E., Park County.

Good Harbor Bay Andesite (North Shore Group) GHBB01
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. Porphyritic andesite, trachyandesite
5. Brown
6. 94 m
7. 2 flows
9. Overlies Breakwater Trachybasalt; underlies Terrace Point Basalt
10. Type area: Cook County.

Gooseberry Member (Fowkes Formation) U GSBR01
1. Eocene(?) or Pliocene(?)
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 35-37
4. Conglomerate interbedded with calcareous rhyolitic ash and limestone
5. Gray to white
6. > 60 m
9. Overlies Bulldog Hollow Member
10. Type section: 3.2 km NE of Sage, near Gooseberry Spring, N1/2 sec. 33, T. 22 N., R. 119 W., Lincoln County.

Gooseberry River Basalt (North Shore Group) GBRV02
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Basalts, felsite
6. 980 m
9. Overlies Two Harbors Basalt; underlies Baptism River Lava
10. Type locality: Shoreline exposures in vicinity of Crow Creek, forming Lafayette Bluff and Encampment Island, Lake County,

Goose Lake Member (Siamo Slate) U GSLK01
1. Precambrian X
2. Michigan (NC)
3. Tyler, S. A., and Twenhofel, W. H., 1952, Am. Jour. Sci., v. 250, no. 2, p. 120-124
4. Cherty iron-formation with interbedded quartzite and conglomerate
9. Overlies Ajibik Formation; underlies quartzite of Siamo Slate
10. Type area: Belt from Goose Lake to old Palmer Mine, S of Negaunee, Marquette County.

Gothenburg Member (Loveland Formation) GBRG02
1. Pleistocene
2. Nebraska (SC), Iowa
3. Schultz, C. B., and Martin, L. D., 1970, Kansas Univ. Spec. Pub. 3, p. 341-353
4. Loess-silt
5. Light-brown

6. 2.4 m
7. Massive, columnar jointing
9. Overlies Beaver Creek Member (Loveland Formation); underlies Gilman Canyon Formation
10. Type section: Buzzard's Roost, 9.6 km S and 12.8 km W of Gothenburg, W1/2SE1/4 sec. 7, T. 10 N., R. 26 S., Lincoln County, Neb. Named for town of Gothenburg.

Grace Island Flow (Portage Lake Volcanics) U GCID01
1. Precambrian Y
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C13-C15
4. Porphyrite
6. 15 m
9. Erupted after Minong Flow and before Greenstone Flow
10. Type locality: On point S of campground on Grace Island, W Isle Royale, Keweenaw County.

Gragg Member (Pismo Formation) U GRGG01
1. Pliocene, upper
2. California (SC)
3. Hall, C. A., Jr., 1973, California Div. Mines and Geology Map 24
4. Sandstone with diatomaceous siltstone and conglomerate beds.
5. White, weathers buff
6. 146 m
7. Massive, fossiliferous
9. Unconformably overlies Miguelito Member; concordantly underlies Belleview Member
10. Type section: Gragg Canyon, W San Luis Obispo County.

Grand Marais Rhyolite (North Shore Group) GRDM02
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. Porphyritic rhyolite
5. Pink, red, gray
6. 150 m
9. Overlies Croftville Basalt; underlies Breakwater Trachybasalt
10. Type area: Underlies town of Grand Marais, Cook County.

Grand Wash Basalt GRDW01
1. Quaternary
2. Arizona (NW), Utah
3. Best, M. G., and Brimhall, W. H., 1970, Utah Geol. Soc. Guidebook 23, p. 59-61
4. Basalt with olivine and labradorite phenocrysts in intergranular to ophitic matrix
9. Grades into Hurricane Diabase; interlayered with Uinkaret Basalt
10. Type locality: Grand Wash, W Grand Canyon, W of Shivwits Plateau, Mohave County, Ariz.

Granger Island Member (Tymochtee Formation) GGID01
1. Upper Silurian
2. Ohio (NW)
3. Kahle, C. F., and Floyd, J. C., 1971, Geol. Soc. America Bull.,

v. 82, no. 8, p. 2071
4. Dolomite
5. Gray
6. 1.5 m
7. Calcite pseudomorphs, fossiliferous
9. Overlies Greenfield Formation; underlies Ovitt Road Member (Tymochtee Formation)
10. Type section: SE corner of Waterville Bridge at W end of lot 49, T. 1, Bowling Green North Quadrangle, Wood County. Named for island in Maumee River SE of Waterville.

Granite Canyon Formation/Till GRNC01
1. Pleistocene, upper
2. Alaska (EC)
3. McKenzie, G. D., 1970, Ohio State Univ. Inst. Polar Studies Rept. 25, p. 17-37
4. Till composed of loam or clay loam with abundant pebbles and cobbles
5. Gray
6. 2 m
7. Compact
9. Unconformably overlies striated and grooved Paleozoic limestone; gradationally underlies Forest Creek Formation
10. Type locality: Exposed for 30 m along NW side of Granite Canyon 1.1 km NE of mouth of Granite River, lat 58°55′ N., long 135°50′ W., on N shore of Adams Inlet.

Granite Falls Till GRFL01
1. Pleistocene
2. Minnesota (SW), South Dakota
3. Matsch, C. L., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 548-560
4. Till composed of carbonate and granitic rock fragments
5. Yellow and brown
6. 6 m
7. Sandy loam to clay loam
9. Overlies Hawk Creek Till; underlies New Ulm Till
10. Type section: Roadcut, center sec. 28, T. 116 N., R. 39 W., near Granite Falls, Granite Falls Quadrangle, Yellow Medicine County, Minn.

Grassy Branch Formation (Great Smoky Group) GRBC01
1. Precambrian Z
2. North Carolina (WC)
3. Mohr, D. W., 1973, Am. Jour. Sci., v. 273-A, p. 41-71
4. Metasandstone, pebble metaconglomerate, and laminated mica schist with porphyroblasts of garnet, biotite, chlorite, and staurolite
6. 300 m
7. Thin-bedded to laminated
8. 2 local subunits
9. Conformably overlies Anakeesta Formation (Great Smoky Group); conformably underlies Ammons Formation (Great Smoky Group)
10. Type locality: Exposed at times of low water level in N bank of Alarka Creek in Grassy Branch area; N bank of Little Tennessee River, 2 km downstream from U.S. Highway 19; and along W bank of Panther Creek, N of mouth of Wolf Creek, Swain County. Named for Grassy Branch, which flows into Alarka Creek.

Gravina Island Formation U GVID02
1. Middle or Upper Jurassic
2. Alaska (SE)
3. Berg, H. C., 1973, U.S. Geol. Survey Bull. 1373, p. 28-33
4. Recrystallized sedimentary and volcanic rocks including phyllitic detrital rocks, andesitic to basaltic metavolcanic rocks, and phyllitic conglomerate, grit, and sandstone
5. Gray
6. 1100 m
10. Type area: Blank Inlet area NE of Bostwick-Vallenar Valley, E Gravina Island.

Grays Canyon Limestone Member (Nevada Formation) U GRSC06
1. Lower and Middle Devonian
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 3
4. Limestone
5. Weathers tan or light brown
6. 91 m
7. Thin-bedded
9. Overlies Beacon Peak Dolomite Member; equivalent to Oxyoke Canyon Sandstone Member
10. Type section: Grays Canyon in low hills W and SW of South Hill, Eureka County.

Grayslake Peat GRLK01
1. Quaternary
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 77
4. Peat and muck with interbedded silt and clay
6. 9 m
7. In swampy depressions, associated with late stage of lake filling
9. Locally overlies Cahokia Alluvium
10. Type locality: Exposures in pit of Grayslake Peat Company, 1.6 km SE of Grayslake, NE1/4SE1/4NE1/4 sec. 2, T. 44 N., R. 10 E., Lake County.

Grayson Sandstone Member (Breathitt Formation)/Bed (Lee Formation) GRSN10
1. Lower Pennsylvanian
2. Kentucky (NE)
3. Whittington, C. L., and Ferm, J. C., 1967, U.S. Geol. Survey Geol. Quad. Map GQ-640
4. Micaceous and quartzose sandstone
5. Gray
6. Range 0-1.5 m
7. Fine-grained; contains stigmarian roots
9. Underlies Wolf Creek coal bed
10. Type locality: Not stated. Named for town of Grayson, Carter County.

Great Moose Member (Goshen Formation) GRMS05
1. Silurian
2. Massachusetts (WC)
3. Jackson, R. A., 1975, Massachusetts Univ. Geology Dept. Contr. 21, p. 25-27

4. Interbedded garnet-quartz-biotite-muscovite schist, calcareous granulite, and micaceous quartzite
5. Gray, brown
6. > 30 m
7. Thick-bedded
9. Overlies informal quartzite member (Goshen Formation); underlies Waits River Formation
10. Type locality: Great Moose Hill, NW of town of Huntington, Blandford Quadrangle, Hampshire County.

Greenback Member (Willamette Silt) GBCK06

1. Pleistocene, upper
2. Oregon (WC)
3. Balster, C. A., and Parsons, R. B., 1969, Northwest Sci., v. 43, no. 3, p. 127-128
4. Silt with iron-manganese concretions
5. Gray
9. Overlies Malpass, Irish Bend, or Wyatt Member
10. Type locality: From Greenback School, NE1/4SE1/4 sec. 4, T. 13 S., R. 4 W., S 13 km to Irish Bend on Willamette River, Linn County.

Green Lake Limestone Member (Muldoon Canyon Formation) GRLK02

1. Lower Pennsylvanian
2. Idaho (SC)
3. Paull, R. A., Wolbrink, M. A., Volkmann, R. G., and Grover, R. L., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1395
4. Silty, micritic limestone
5. Gray-black; weathers gray-orange
6. 102 m
9. Lies 30 m below top of Muldoon Canyon Formation
10. Type section: SE1/4NE1/4NW1/4 sec. 5, T. 4 N., R. 22 E., Custer County. Named for Green Lake.

Green Lake Formation GRLK06

1. Precambrian Y
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 8
4. Alternating bands of quartzite and feldspathic quartzite
5. White
6. 600 m
8. Royal Mountain Member
9. Overlies Canada Lake Formation; underlies Peck Lake Formation
10. Type locality: Outcrops E of Canada Lake, Fulton County. Named for exposures along E shore of Green Lake.

Greenland Gap Group GDGP04

1. Upper Devonian
2. West Virginia (EC), Maryland, Pennsylvania, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-55
4. Siltstone, shale, sandstone
5. Olive-gray
6. 708 m, range 708-1180 m
7. Turbidites and shallow-water basin fill
8. Scherr and Foreknobs Formations
9. Overlies Brallier Formation; underlies Hampshire Formation

10. Type section: Along West Virginia Highway 42, 0.5 km NW of Scherr, Grant County, W. Va. Named for town of Greenland Gap.

Green Ranch Quartzite Member (Junction Formation) GRRC04
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 146
6. Range 2.5-3 m
7. Fine- to medium-grained; thin-bedded
9. Unconformably underlies Golden Gate Canyon Formation
10. Type area: Ridge S of Green Ranch, NE1/4 sec. 29, T. 3 S., R. 70 W., Jefferson County.

Green Ravine Formation U GRRV04
1. Upper Mississippian
2. Utah (NW)
3. Tooker, E. W., and Roberts, R. J., 1970, U.S. Geol. Survey Prof. Paper 629-A, p. A10-A11
4. Limestone with shale layers
6. 430 m
9. Conformably underlies Lake Point Limestone (Oquirrh Group)
10. Type section: S of mouth of Green Ravine, SE1/4 sec. 1, T. 2 S., R. 4 W., and NW1/4 sec. 6, T. 2 S., R. 3 W., W side of Kessler Peak, N Oquirrh Mountains, Garfield Quadrangle, Tooele County.

Greensport Formation GRPR01
1. Middle Ordovician
2. Alabama (NE)
3. Drahovzal, J. A., and Neathery, T. L., 1971, Alabama Geol. Soc. Guidebook 9, p. 45
4. Siltstone, calcilutite, shale clastics
5. Red, yellow, tan
7. Thin-bedded
9. Overlies Little Oak and Lenoir Limestones; underlies Colvin Mountain Sandstone
10. Type locality: Greensport Gap on Coosa River and on Alabama Highway 77, Etowah County.

Greenvale Cove Formation U GVCV02
1. Upper Ordovician(?)
2. Maine (WC)
3. Moench, R. H., 1969, U.S. Geol. Survey Bull. 1274-L, p. L12-L16
4. Metamorphosed shale, siltstone, sandstone
6. 183 m, range 90-183 m
7. Strikingly banded
9. Conformably overlies Quimby Formation; conformably underlies Rangeley Formation
10. Type locality: Exposures along NE shore of Greenvale Cove at E end of Rangeley Lake, Rangeley Quadrangle, Franklin County.

Grenloch Sand Member (Kirkwood Formation) U GRLC01
1. Miocene, middle
2. New Jersey (WC)
3. Isphording, W. C., 1970, Jour. Sed. Petrology, v. 40, no. 3, p. 986-997
4. Silty sands, lignitic at base
5. Yellow, pink

6. 15 m
9. Overlies, intertongues with, and grades laterally into Alloway Clay and Asbury Park Members (Kirkwood Formation); underlies Cohansey Sand
10. Type area: Exposures in vicinity of Grenloch and Blackwood, Gloucester and Camden Counties.

Gribbles Park Tuff U GBPK02
1. Oligocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C16-C21
5. Red, orange, brown
6. 91 m
9. Overlies Thorn Ranch Tuff; underlies unnamed andesite from Waugh Mountain
10. Type locality: Along N side of Gribbles Park, W1/2 sec. 16 and E1/2 sec. 17, T. 51 N., R. 11 E., Cameron Mountain Quadrangle, Fremont County.

Griffith Canyon Member (Santa Cruz Island Volcanics) GRFC01
1. Miocene, lower
2. California (SC)
3. Nolf, Bruce, and Nolf, Penny,1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 91-94
4. Basalt and andesite flows and breccias
5. Greenish-gray to brown
6. 370 m, range 370-760 m
9. Conformably overlies San Onofre Breccia; underlies Stanton Ranch Member (Santa Cruz Island Volcanics)
10. Type area: Extends 21 km on strike on N side of Santa Cruz Island Fault. Named for small canyon at head of Canada Del Portezuelo.

Gringo Gulch Volcanics U GGGC01
1. Paleocene
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4
4. Dacitic lava and sandstone, tuff, and andesite
6. Range 460-600 m
9. Unconformably overlies Josephine Canyon Diorite
10. Type area: Gringo Gulch, 4 km NNW of town of Patagonia, E1/2W1/2 sec. 25, T. 21 S., R. 15 E., Santa Cruz County.

Grossman Formation U GRSM07
1. Devonian or Mississippian
2. Nevada (NC)
3. Coats, R. R., 1969, U.S. Geol. Survey Bull. 1274-A, p. A22-A24
4. Conglomerate grading to siltstone and phyllite
6. 610 m
9. Unconformably overlies Valmy Formation; underlies Banner Formation
10. Type locality: Hill in SE1/4 sec. 4, T. 45 N., R. 53 E., 0.8 km W of Grossman house, Grossman Ranch, Owyhee Quadrangle, Elko County.

Grosvenor Hills Volcanics U GVHL01
1. Oligocene, upper(?)
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C14-C15
4. Gravel, silt, rhyolite, rhyodacite
6. 600 m
9. Unconformably overlies Cretaceous and older rocks; unconformably underlies Tertiary gravels or Nogales Formation
10. Type area: Uppermost parts of Coal Mine and Cinigita Canyons, Grosvenor Hills, Santa Cruz County.

Grover Ditch Member (Detroit River Formation) GVDC01
1. Middle Devonian
2. Indiana (NE)
3. Doheny, E. J., Droste, J. B., and Shaver, R. H., 1975, Indiana Geol. Survey Bull. 53, p. 24
4. Dolomite and anhydrite and gypsum evaporites
6. 2.4 m
9. Overlies Salina Formation; underlies Milan Center Dolomite Member (Detroit River Formation)
10. Type section: Well in Woodburn Quarry of May Stone and Sand, Inc., NE1/4 sec. 23, T. 31 N., R. 14 E., Allen County. Named for drainage line that flows N in secs. 23 and 26 into Maumee River along Woodburn Quarry.

Grubstake Formation U GRBK01
1. Miocene, upper
2. Alaska (EC)
3. Wahrhaftig, Clyde, Wolfe, J. A., Leopold, E. B., and Lanphere, M. A., 1969, U.S. Geol. Survey Bull. 1274-D, p. D22-D27
4. Interbedded claystone, sandstone, and conglomerate, with coal and vitric ash beds
6. 0-460 m
9. Conformably overlies Lignite Creek Formation; underlies Nenana Gravel
10. Type locality: E bank of Tatlanika Creek from mouth of Grubstake Creek S for 1.6 km, secs. 19 and 30, T. 10 S., R. 3 W., Fairbanks A-3 Quadrangle.

Guacio Member (Río Culebrinas Formation) U GUC002
1. Eocene, middle
2. Puerto Rico (NW)
3. McIntyre, D. H., Aaron, J. M., and Tobisch, O. T., 1970, U.S. Geol. Survey Bull. 1294-D, p. D12-D14
4. Siliceous and calcareous mudstone and limestone
6. 100 m
7. Thin-bedded, deeply weathered
9. At base of Río Culebrinas Formation; conformably overlies Mal Paso Formation
10. Type locality: Along Route 433, just E of junction with Route 119, 93,200 E., 50,600 N., Barrio Guacio, Municipio de San Sebastián.

Guaracanal Andesite U GRCL01
1. Paleocene
2. Puerto Rico (NE)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 40-43
4. Andesite flow breccia, vent agglomerate, and tuff

5. Purplish gray
6. 600 m
7. Massive, coarse-grained
9. Conformably overlies Monacillo Formation; conformably underlies Río Piedras Siltstone
10. Type section: Exposures along Route 1 and adjacent hills between Cerro Magueyes and valley N of La Muda, 56,320 N., 188,140 E., to 55,360 N., 187,760 E. Named for Quebrada Guaracanal which flows along S border of San Juan Quadrangle into Aguas Buenas Quadrangle.

Gulfport Formation GLFP01

1. Pleistocene, upper
2. Mississippi (SE)
3. Otvos, E. G., Jr., 1973, New Orleans Geol. Soc. Guidebook, p. 1-67
4. Sand
5. White, yellow-orange near surface
6. Range 5.0-9.5 m
7. Barrier ridge, medium- to fine-grained
9. Overlies Biloxi Formation
10. Type locality: Along Mississippi coast at Bay St. Louis, Harrison County shore, and Bellefontaine Point, Gulfport, Harrison County.

Gunlock Basalt GLCK01

1. Quaternary
2. Utah (SW)
3. Embree, G. F., 1970, Brigham Young Univ. Studies, v. 17, pt. 1, p. 67-73
4. Olivine basalt flow
6. Range 1-9 m
7. Massive, crude columnar joints
9. Unconformably overlies Mesozoic sediments; underlies Middleton and Veyo Basalts
10. Type area: Exposed for 12 km S of town of Gunlock, NW of St. George, Washington County.

Gunsight Formation (Lemhi Group) U GNSG04

1. Precambrian Y
2. Idaho (EC)
3. Ruppel, E. T., 1975, U.S. Geol. Survey Prof. Paper 889-A, p. 5-6, 11-14
4. Feldspathic quartzite
5. Brownish-gray to grayish-red-purple
6. > 1830 m
7. Fine-grained
9. Overlies Apple Creek Formation (Lemhi Group); gradationally underlies Swauger Formation or unconformably underlies Kinnikinic Quartzite or Wilbert Formation
10. Type locality: S and W sides of Gunsight Peak, in C Lemhi Range, Patterson Quadrangle, Lemhi County.

Gunsight Butte Member (Entrada Sandstone) GSGB01

1. Middle Jurassic
2. Utah (SC)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 13-16
4. Sandstone with silty and sandy facies

5. Red, gray
6. 145 m, range < 100-145 m
7. Crossbedded, forms imposing arches and overhangs, badlands and ribbed cliffs
9. Overlies Wiggler Wash Member (Carmel Formation); underlies Cannonville Member (Entrada Sandstone)
10. Type section: Gunsight Butte on W side of Gunsight Canyon, sec. 15, 16, 21, 22, T. 43 S., R. 5 E., Kane County.

Gunsight Pass Member (Pierre Shale) U GSGP01
1. Upper Cretaceous
2. Colorado (NC)
3. Izett, G. A., Cobban, W. A., and Gill, J. R., 1971, U.S. Geol. Survey Prof. Paper 684-A, p. A15-A18
4. Sandstone and silty shale
6. Range 46-54 m
9. Overlies and underlies unnamed shale units of Pierre Shale
10. Type locality: NW part of T. 3 N., R. 80 W., Kremmling Quadrangle, Grand County. Named for Gunsight Pass.

Hackberry Member (Frio Formation)/Formation HCKB05
1. Oligocene
2. Louisiana (SW)
3. Paine, W. R., 1971, Gulf Coast Assoc. Geol. Socs. Trans., v. 21, p. 37-55
4. Shale, sandstone
6. Range 30-1300 m
7. Turbidites with channel and blanket depositional patterns
9. Overlies Vicksburg Formation
10. Type section: T. 8 S., R. 10-13 W.; T. 7 S., R. 5 W.; T. 10 S., R. 7 W., Hackberry (Dome) Field, Cameron Parish.

Hackneyville Schist (Wedowee Group) HCKV02
1. Paleozoic, middle
2. Alabama (EC)
3. Neathery, T. L. and Reynolds, J. W.; 1975, Alabama Geol. Survey Bull. 109, p. 29-30
4. Highly metamorphosed
7. Medium- to coarse-grained, intensely foliated
9. Overlies Cragford Phyllite
10. Type locality: Not stated. Named for town of Hackneyville, Tallapoosa County.

Haeger Till Member (Wedron Formation) HEGR01
1. Pleistocene (Wisconsinan)
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 69-70
4. Silty and sandy till interbedded with sand and gravel outwash
6. 4 m, range 6-15 m
9. Overlies Yorkville or Tiskilwa Till Member; underlies Wadsworth Till Member (Wedron Formation) or Richland Loess
10. Type section: Roadcuts along Algonquin-Cary Road, 0.8 km NW of Haegers Bend, NW1/4NE1/4 sec. 23, T. 43 N., R. 8 E., McHenry County.

Hagarstown Member (Glasford Formation) HGRS02
1. Pleistocene (Illinoian)
2. Illinois (C)

3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 58-59
4. Gravelly till, gravel, sand
6. 30 m
9. Overlies Vandalia Till Member
10. Type section: Hickory Ridge Section, SW1/4NW1/4 sec. 30, T. 6 N., R. 1 E., Fayette County. Named for town of Hagarstown.

Hager City Member (Oneota Dolomite) HGRC01
1. Lower Ordovician
2. Wisconsin (WC), Iowa, Minnesota
3. Davis, R. A., Jr., 1970, Wisconsin Geol. and Nat. History Survey Inf. Circ. 11, p. 35-44
4. Dolomite
6. 55 m
7. Thick- or poorly bedded, medium crystalline
9. Overlies Stockton Hill Member (Oneota Dolomite); underlies New Richmond Member (Shakopee Formation)
10. Type locality: Roadcuts along Wisconsin Highway in 63 N of Hager City, Pierce County, Wis.

Halfway Draw Tuff Member (Wind River Formation) U HLFD01
1. Eocene
2. Wyoming (C)
3. Love, J. D., 1970, U.S. Geol. Survey Prof. Paper 495-C, p. C46-C48
4. Felsic tuff
5. White
6. Range 3-6 m
7. Thin-bedded
9. Overlies sandstone and underlies claystone of Wind River Formation
10. Type section: Sec. 2, T. 33 N., R. 96 W., Fremont County. Named for intermittent stream on both sides of which it is exposed.

Hall Shale HALL03
1. Pliocene
2. California (WC)
3. Hoffman, R. D., 1964, San Joaquin Geol. Soc. Selected Papers, v. 2, p. 30-45
9. Overlies Garzas Sandstone
10. Type section: Seaboard "Hall 1" well, sec. 6, T. 2 S., R. 5 E., San Joaquin County.

Hall Cove Peridotite (Duke Island Complex) HLCV01
1. Jurassic and Cretaceous
2. Alaska (SE)
3. Irvine, T. N., 1974, Geol. Soc. America Mem. 138, p. 12-13
4. Peridotite-dunite, clinopyroxenite
6. > 1500 m
7. Cumulates showing rhythmic layering
9. Emplaced in gabbro which intrudes metamorphosed sedimentary and volcanic rocks
10. Type area: Hall Cove, Duke Island.

Hall Quarry Granite HLQR01
1. Middle Silurian

2. Maine (SE)
3. Metzger, W. J., and Bickford, M. E., 1972, Geol. Soc. America Bull., v. 83, no. 2, p. 499-502
4. Biotite granite
9. Overlies Cadillac Granite; underlies Cranberry Island Volcanics
10. Type locality: Mount Desert Island, Hancock County.

Hames Member (Monterey Formation) U HMES01

1. Miocene
2. California (WC)
3. Durham, D. L., 1974, U.S. Geol. Survey Prof. Paper 819, p. 28
4. Siliceous mudstone, porcelanite, chert, and dolomite
6. 2134 m
9. Conformably overlies Sandholdt Member (Monterey Formation); underlies and intertongues with Buttle Member (Monterey Formation), Santa Margarita, or Pancho Rico Formation
10. Type locality: Exposures SW of Hames Valley and along highway that crosses hills to W, from NW1/4 sec. 5, T. 24 S., R. 10 E., NW through secs. 30 and 31, T. 23 S., R. 10 E., to secs. 25 and 26, T. 23 S., R. 9 E., Hames Valley Quadrangle, Monterey County.

Hamilton Reservoir Formation (Brimfield Group) U HMRV01

1. Ordovician(?) to Lower Devonian(?)
2. Massachusetts (C), Connecticut
3. Peper, J. D., Pease, M. H., Jr., and Seiders, V. M., 1975, U.S. Geol. Survey Bull. 1389, p. 7-9
4. Schist with gneiss
5. Weathers rusty
6. 9200 m
7. Structurally separated into two parts by Rock Meadow fault
8. Five informal members
9. Overlies Bigelow Brook Formation (Brimfield Group); underlies Mount Pisgah Formation (Brimfield Group)
10. Type area: Lower parts: low hills N of town of Union and around Mashapaug Pond in Wales Quadrangle; middle parts: low hills in vicinity of Hamilton Reservoir in Wales Quadrangle; upper parts: WC part of Wales Quadrangle, Mass.

Hams Fork Conglomerate Member (Evanston Formation) U HMFK01

1. Upper Cretaceous
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 6-9
4. Boulder conglomerate, sandstone, mudstone
5. Brown
6. 139 m, range 139-300 m
9. Conformably overlies lower mudstone member (Evanston Formation) to W; unconformably overlies Adaville, Hilliard, Frontier, Wells, or Twin Creek Formation to N; underlies Wasatch Formation to N
10. Type section: 3.2 km NNW of Elkol, E1/2 sec. 36, T. 21 N., R. 117 W., Lincoln County. Named for Hams Fork stream.

Hanover Schist (Hatchet Creek Group) HNVR12

1. Paleozoic, lower to middle
2. Alabama (EC)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 27
4. Quartz muscovite schist and staurolite biotite feldspathic

gneiss
9. Structurally underlies Wedowee Group in NE Coosa County
10. Type locality: Exposed along U.S. Highway 231 S of Hanover, along Mount Olive to Goodwater Road, at Hatchet Creek, Coosa County.

Harkness Silt Member (Banner Formation) HRKS04
1. Pleistocene (Kansan)
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 51-52
4. Calcareous and sandy silt
5. Gray to tan
6. 1.8 m
9. Overlies Afton soil
10. Type section: Zion Church section, roadcuts 3.2 km SE of Marblehead, SE1/4SE1/4SW1/4 sec. 9, T. 3 S., R. 8 W., Adams County. Named for nearby Harkness Creek.

Harmattan Till Member (Banner Formation) HRMN01
1. Pleistocene (Kansan)
2. Illinois (EC)
3. Johnson, W. H., Gross, D. L., and Moran, S. R., 1971, in Goldthwait, R. P., ed., Ohio State Univ. Press, p. 194
4. Calcareous till with gravelly sand
5. Gray
6. 5 m
9. Underlies Hillery Till Member; overlies Belgium Member
10. Type section: Harmattan Strip Mine, NE1/4 sec. 4, T. 19 N., R. 12 W., Danville, Vermilion County.

Harrison Summit Quartzite (Dove Creek Group) HRSM05
1. Paleozoic, Mississippian(?)
2. Idaho (SC)
3. Armstrong, R. L., 1968, Geol. Soc. America Bull., v. 79, no. 10, p. 1298
5. Weathers rusty and gray
6. 550 m
9. Overlies Conner Creek Formation; underlies Land Creek Formation (Dove Creek Group)
10. Type locality: Mount Harrison, Cassia County.

Harts Pass Formation HRSP02
1. Cretaceous
2. Washington (NC)
3. Barksdale, J. D., 1975, Washington Div. Geology and Earth Resources Bull. 68, p. 32-35
4. Marine arkose with fossiliferous black shale
6. 2400 m
8. 3 informal members
9. Conformably overlies Panther Creek Formation; unconformably underlies Virginian Ridge Formation
10. Type area: Terrane within 4.8 km NW and SE of Harts Pass, sec. 7, T. 37 N., R. 18 E., Okanogan and Whatcom Counties.

Hartt Cabin Bed (Laney Member of Green River Formation) U HRCB01
1. Eocene, middle
2. Wyoming (SW)
3. Roehler, H. W., 1973, U.S. Geol. Survey Bull. 1372-E, p. E8-E9

4. Mudstone, sandstone, limestone, shale, siltstone, tuff, dolomite
6. 210 m
7. Heterogeneous alternating sedimentary sequence
9. In E: conformably overlies or intertongues with LaClede Bed (Laney Member); unconformably underlies Adobe Town Member (Washakie Formation). In W: laterally equivalent to and underlies Kinney Rim Member (Washakie Formation); intertongues with Sand Butte Bed (Laney Member)
10. Type section: Secs. 30, 31, 32, T. 15 N., R. 93 W., and sec. 6, T. 14 N., R. 93 W., Carbon County. Named for Hartt Draw, NW part of T. 14 N., R. 93 W.

Hasen Creek Formation (Skolai Group) U HCRK03

1. Lower Permian
2. Alaska (EC)
3. Smith, J. G., and MacKevett, E. M., Jr., 1970, U.S. Geol. Survey Bull. 1274-Q, p. Q16-Q25
4. Heterogeneous mixture of chert, shale, sandstone, limestone, and conglomerate
6. 520 m
8. Golden Horn Limestone Lentil
9. Conformably overlies Station Creek Formation; unconformably underlies Nikolai Greenstone, Wrangell Lava, or Frederika Formation
10. Type area: Valley walls of Hasen Creek, secs. 11 and 12, T. 4 S., R. 17 E., S Wrangell Mountains, McCarthy C-4 Quadrangle.

Hatcher Complex HTCR02

1. Paleozoic
2. Virginia (C)
3. Brown, W. R., 1969, Virginia Div. Mineral Resources Rept. Inv. 10, p. 14-19
4. Granitic, quartz dioritic, and hornblendic gneisses and associated migmatites
9. Unconformably underlies Arvonia Formation
10. Type locality: Exposures E of Hatcher, 14.4 km ENE of Dillwyn, Cumberland County.

Hatchet Creek Group HCCK16

1. Paleozoic, lower and middle
2. Alabama (EC)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 27-28
4. Schist, gneiss
8. Hanover Schist, Pinchoulee Gneiss
10. Type area: Coosa and Elmore Counties. Named for Hatchet Creek near Goodwater.

Hauser Lake Gneiss U HRLK03

1. Precambrian
2. Idaho (NW), Washington
3. Weis, P. L., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-734, p. 2-3
4. Schist, gneiss with abundant dikes and cross-cutting intrusives
5. Gray, tan, brown
7. Medium-grained, layered, intensely crumpled
9. Gradationally underlies Newman Lake Gneiss

10. Type locality: E side of Hauser Lake, NW Kootenai County, Idaho.

Hawk Creek Till HKCK01
1. Pleistocene
2. Minnesota (SW), South Dakota
3. Matsch, C. L., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 548-60
4. Sandy till composed of felsite, sandstone, gabbro fragments
5. Light reddish-brown when wet, pink when dry
6. 1.5 m
9. Overlies Cretaceous sediments; underlies Granite Falls Till
10. Type section: Exposures along Hawk Creek, SW1/4NW1/4 sec. 16, T. 116 N., R. 38 W., Minnesota Falls Quadrangle, Renville County, Minn.

Hay Creek Greenstone (Windy Flats Group) U HCRK10
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Metabasalt, slate, ferruginous chert, iron-formation
9. Conformably overlies Gingrass Draw Slate; conformably underlies Reausaw Slate (Windy Flats Group)
10. Type locality: N of Hay Creek, sec. 1, T. 3 N., R. 4 E., Black Hills, Lawrence County.

Hayden Creek Drift U HDCK01
1. Pleistocene, upper
2. Washington (WC)
3. Crandell, D. R., 1969, U.S. Geol. Survey Bull. 1288, p. 16-18
4. Till
5. Brownish-gray, weathers yellowish-brown
6. Range 15-30 m
9. Overlies Tertiary bedrock; underlies Mount Rainier pumice
10. Type locality: Cuts along Mowitch Lake Road near mouth of Hayden Creek, sec. 27, T. 17 N., R. 7 E., Mount Rainier National Park, Pierce County.

Hayner Ranch Formation (Santa Fe Group) HRRC02
1. Miocene
2. New Mexico (SC)
3. Seager, W. R., Hawley, J. W., and Clemons, R. E., 1971, New Mexico Bur. Mines and Mineral Resources Bull. 97, p. 12-14
4. Pebble conglomerate and conglomeratic sandstone
5. Red
6. 840 m
8. Five informal units
9. Conformably overlies unnamed conglomerate; transitionally underlies Rincon Valley Formation (Santa Fe Group)
10. Type section: Exposures in badlands SE of Hayner Ranch, SE1/4SE1/4 sec. 6 to NW1/4NW1/4 sec. 8, T. 20 S., R. 1 W., Dona Ana County.

Haystack Mountains Formation (Mesaverde Group) U HCKM03
1. Upper Cretaceous
2. Wyoming (SC)
3. Gill, J. R., Merewether, E. A., and Cobban, W. A., 1970, U.S. Geol. Survey Prof. Paper 667, p. 11-20

4. Thick sandstone and shale units
5. Yellowish- to brownish-gray
6. 780 m, range 260-780 m
7. Sediments represent marine regression and transgression
8. Tapers Ranch Sandstone, O'Brien Spring Sandstone, and Hatfield Sandstone Members and lower, middle, and upper unnamed shale members
9. Conformably and gradationally overlies Steele Shale; conformably underlies Allen Ridge Formation
10. Type section: S Haystack Mountains, 9.6 km N of town of Sinclair, NE1/4NE1/4 sec. 22, NE1/4 sec. 23, and SE1/4SE1/4 sec. 14, T. 22 N., R. 86 W., Carbon County.

Haystack Valley Member (John Day Formation) HCKV01
1. Miocene
2. Oregon (C)
3. Fisher, R. V., and Rensberger, J. M., 1972, California Univ. Pubs. Geol. Sci., v. 101, p. 17
4. Lacustrine, fluvial, and airfall tuff, conglomerate, and sandstone
5. Gray-buff
6. 150 m
9. Overlies Kimberly Member (John Day Formation); underlies Picture Gorge Basalt
10. Measured section: NE1/4 sec. 33 and SE1/4 sec. 28, T. 8 S., R. 25 E., Haystack Valley, Wheeler County.

Heald Mountain Rhyolite (Moose River Group) HLDM01
1. Lower Devonian
2. Maine (WC)
3. Boucot, A. J., and Heath, E. W., 1969, Maine Geol. Survey Bull. 21, p. 25
4. Felsite, flow breccia, tuff
6. Range 300-610 m
9. Overlies Tarratine Formation (Moose River Group)
10. Type area: Heald Mountains, Pierce Pond Quadrangle, Somerset County.

Healy Creek Formation U HLCK02
1. Oligocene, upper and Miocene, lower
2. Alaska (EC)
3. Wahrhaftig, Clyde, Wolfe, J. A., Leopold, E. B., and Lanphere, M. A., 1969, U.S. Geol. Survey Bull. 1274-D, p. D7-D12
4. Sandstone, conglomerate, claystone, coal
6. Range 0-610 m
7. Interbedded, poorly consolidated
9. Unconformably overlies pre-Tertiary rocks; conformably underlies Sanctuary Formation
10. Type section: NE wall of canyon of Healy Creek at Suntrana, SW1/4 sec. 24, T. 12 S., R. 7 W., Healy D-4 Quadrangle.

Heard Group HERD02
1. Precambrian and Paleozoic, lower
2. Georgia, (WC), Alabama
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 14
4. Metapelites and metagraywackes
8. Centralhatchee Formation, Glenloch Formation, Roopville

Formation
10. Type area: Heard County, Ga.

Heart Lake Conglomerate U HRLK01
1. Pliocene or Pleistocene
2. Wyoming (WC)
3. Love, J. D., and Keefer, W. R., 1969, U.S. Geol. Survey Prof. Paper 650-D, p. D122-D130
4. Conglomerate composed of Paleozoic rock fragments
6. Range 21-100 m
9. Unconformably overlies Pinyon Conglomerate or Sundance Formation; underlies Pleistocene(?) rhyolite tuff
10. Type section: Locality B, in S-facing headwall at base of steep slope that rises to top of Mount Sheridan, Yellowstone National Park, Park County. Named for Heart Lake.

Heceta Limestone U HECT01
1. Lower to Upper Silurian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 15-22
4. Limestone with medial zone of clastic rocks
5. Gray
6. > 3000 m
7. Fossiliferous
9. Conformably overlies Descon Formation; conformably underlies Karheen Formation
10. Type locality: Exposures on Heceta Island, from NE side of Warm Chuck Inlet to N shore W of Camp Island.

Hector Formation HCTR01
1. Miocene, lower
2. California (SE)
3. Woodburne, M. O., Tedford, R. H., Stevens, M. S., and Taylor, B. E., 1974, Jour. Paleontology, v. 48, no. 1, p. 6-26
4. Tuff and tuffaceous conglomeratic sandstone
5. White, gray, reddish-brown
6. 490 m
7. Contains mammalian fossils
9. Unconformably overlies andesitic lahar and agglomerate; unconformably underlies Pleistocene alluvium
10. Type area: 6.4 km N of Hector siding of Atchison, Topeka, and Santa Fe Railroad, secs. 13, 22, and 26, T. 9 N., R. 5 E., Cady Mountains, San Bernardino County.

Heflin Phyllite (Talladega Group) HFLN01
1. Paleozoic
2. Alabama (NE)
3. Bearce, D. N., 1973, Alabama Geol. Soc. Guidebook 11, p. 10-21
4. Calcareous sandy siltstone and sandstone, with basal conglomerate
5. Green, gray, and bluish gray
6. Range 1500-1800 m
9. Underlies Abel Gap Formation
10. Type locality: Along U.S. Highway 78 from NE margin of Talladega Belt E to Skyway Road (Highway 49), and SE along U.S. Highway 431. Named for town of Heflin, Cleburne County.

Hegeler Till Member (Banner Formation) HGLR01
1. Pleistocene (Kansan)
2. Illinois (EC)
3. Johnson, W. H., 1971, Illinois Geol. Survey Circ. 457, p. 1-16
4. Outwash and gravelly to silty till
5. Greenish-gray
6. 2.4 m
9. Overlies bedrock; underlies Belgium Member (Banner Formation)
10. Type section: Harmattan Strip Mine No. 2, SE1/4SW1/4SW1/4 sec. 34, T. 20 N., R. 12 W., Danville, Vermilion County. Named for town of Hegeler.

Hells Half Acre Tuff Member (Galiuro Volcanics) U HHFA01
1. Miocene
2. Arizona (SE)
3. Krieger, M. H., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-668, p. 1
4. Rhyolite, vitric and crystal tuff
6. Range 0-150 m
7. Cliff-forming, well-bedded, massive
9. Overlies rhyolite-obsidian member; underlies and grades into Apsey Conglomerate Member
10. Type locality: Aravaipa Canyon upstream from Javalina Canyon, sec. 7, T. 6 S., R. 18 E., Pinal County. Named for exposures in Hells Half Acre.

Helvas Canyon Member (Gering Formation) HLVC01
1. Miocene
2. Nebraska (WC)
3. Vondra, C. F., Schultz, C. B., and Stout, T. M., 1969, Nebraska Geol. Survey Paper 18, p. 3-4
4. Siltstone and sandstone
5. Gray to buff
7. 62 m, range 15-62 m
8. Carter Canyon Ash Bed
9. Disconformably overlies Brule Formation; disconformably underlies Mitchell Pass Member (Gering Formation)
10. Type locality: Helvas Canyon, E of Carter Canyon and S of Mitchell Pass, 4.3 km W and 9 km S of Gering, NW1/4NE1/4NW1/4 sec. 6, T. 20 N., R. 55 W., Scotts Bluff County.

Hemlock Conglomerate (Kenai Group)/Formation (Kenai Group) HMCK03
1. Miocene
2. Alaska (C)
3. Calderwood, K. W., and Fackler, W. C., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 4, p. 739-754
4. Conglomeratic sandstones and conglomerate
5. Gray to brown
6. 170 m
9. Unconformably overlies West Foreland Formation; underlies Tyonek Formation
10. Type section: Richfield Oil Corp. Swanson River Unit No. 1 well, sec. 10, T. 8 N., R. 9 W., Cook Inlet Basin.

Henrieville Sandstone (San Rafael Group) HRVL02
1. Middle Jurassic
2. Utah (SC)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 4-5

4. Sandstone with siltstone, limestone, shale, limonite and siderite concretions
5. Gray to yellow
6. 71 m
7. Lenticular, crossbedded, of fluvial and eolian origin. Forms cliffs and pinnacles
9. Unconformably overlies Escalante Member (Entrada Sandstone); underlies Dakota Formation
10. Type section: 2.4 km N of Henrieville, E side of Utah Highway 54, sec. 14, T. 37 S., R. 2 W., Garfield County.

Henry Formation HNRY01

1. Pleistocene (Wisconsinan)
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 70-72
4. Sand and gravel
6. Range 1-30 m
7. Glacial outwash
8. Batavia, Mackinaw, and Wasco Members
9. Underlies Richland Loess, post-Wedron formations, or modern soil
10. Type section: Gravel pit along Illinois Highway 29, 3.2 km N of Henry, SE1/4SE1/4 sec. 32, T. 14 N., R. 10 E., Putnam County.

Heydlauff Sandstone HDLF01

1. Lower Permian
2. Idaho (SE)
3. Cramer, H. R., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 10, p. 1793-1794
4. Sandstone with interbedded quartzite, chert, limestone
5. Tan, gray
6. 1500 m
9. Overlies Trail Canyon Limestone; underlies Grandeur Tongue (Park City Formation)
10. Type section: Dividing ridge between Heydlauff and Saeger Canyons, on E flank of Sublett Range; secs. 1 and 2, T. 13 S., R. 30 E., Oneida County.

Higgins Ferry Formation (Wedowee Group) HGFR01

1. Paleozoic, middle
2. Alabama (C)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 17-22
4. Interbedded clastic sequence of metagraywacke, schist, gneiss, and quartzite
10. Type locality: Exposed in W Coosa and E Chilton Counties and along Higgins Ferry Road, T. 22 N., R. 16 E., Chilton County.

High Creek Limestone U HGCK16

1. Middle Cambrian
2. Utah (NC), Idaho
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 33
4. Limestone with shale partings, conglomerate, oolites
5. Gray
9. Intertongues with and grades into Lead Bell Shale or Langston Dolomite; overlies Spence Tongue (Lead Bell Shale); underlies

Cub Tongue (Lead Bell Shale)
10. Type section: Section at High Creek, sec. 11, T. 14 N., R. 2 E., 11 km NE of Richmond, Cache County, Utah.

Hildreths Formation U HLDR02
1. Devonian
2. Maine (WC)
3. Osberg, P. H., Moench, R. H., and Warner, Jeffrey, 1968, in Zen, E-an and others, eds., New York, Interscience Publishers, p. 250-251
4. Calc-silicate granulite, marble, and metasandstone
6. Range 60-240 m
10. Type locality: Hildreths Mill, 1.1 km W of high area along Wilton-Weld Road (Maine Highway 156), S Franklin County.

Hillery Till Member (Banner Formation) HLLR01
1. Pleistocene (Kansan)
2. Illinois (EC)
3. Johnson, W. H., Gross, D. L., and Moran, S. R., 1971, in Goldthwait, R. P., ed., Ohio State Univ. Press, p. 195
4. Calcareous, massive till containing silt and sand
5. Reddish-brown
6. 4.3 m
9. Overlies Harmattan Till Member or Pennsylvanian bedrock; underlies Tilton Till Member
10. Type section: Power Plant Section, NW1/4SW1/4SW1/4 sec. 21, T. 20 N., R. 12 W., Vermilion County. Named for town of Hillery.

Hill Point Flow (Portage Lake Volcanics) U HLPN01
1. Precambrian Y
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C19-C20
4. Ophite, with poikilitic augite crystals
6. 48 m
9. Erupted after Amygdaloid Island Flow; before Huginnin Flow
10. Type locality: Hill Point along N shore of E end of Isle Royale, Keweenaw County.

Hirz Mountain Limestone Member (Baird Formation) HRZM01
1. Upper Pennsylvanian and Lower Permian
2. California (NW)
3. Watkins, Rodney, 1973, Am. Assoc. Petroleum Geologists Bull., v. 57, no. 9, p. 1750-1752
4. Limestone, aphanitic, with cherty and silty stringers
5. Blue-gray
6. 21 m
7. Lenticular, with bioclasts and coral debris
10. Type section: On high SW slopes of Hirz Mountain, secs. 12, 13, 18, T. 35 N., R. 4 W., Shasta County.

Hitt Canyon Formation (El Paso Group) U HCNN01
1. Lower Ordovician
2. Texas (WC), New Mexico
3. Hayes, P. T., and Cone, G. C., 1975, U.S. Geol. Survey Prof. Paper 873, p. 33-40
4. Limestone and dolomite, commonly quartzose and locally oolitic
5. Gray

6. 162 m
7. Intraformational conglomerates; fossiliferous; some beds intricately burrowed
9. Gradationally overlies Bliss Sandstone or, locally, unconformably overlies Precambrian rocks; conformably underlies McKelligon Limestone
10. Type section: On spur on E side of Franklin Mountains, 0.8 km S of drainage course of Hitt Canyon, El Paso County, Texas.

Hogback Mountain Charnockite HBKM02
1. Precambrian
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 9
4. Hornblende with orthopyroxene and aplite
5. Green, pink
6. 910 m
7. Well developed foliation
10. Type locality: E end of Canada Lake to N of Green Lake, Fulton County.

Hogback Mountain Olivine Basalt HBKM01
1. Quaternary
2. Washington (SC)
3. Ellingson, J. A., 1972, Northwest Sci., v. 46, no. 1, p. 9-24
4. Basalt flows with olivine and augite phenocrysts
7. Thin, vesicular
10. Type locality: Crops out along ridge S of White Pass and on Hogback Mountain, Yakima County. Vent is marked by volcanic neck 0.8 km S of Hogback Mountain.

Hog Creek Member (Poison Creek Formation) HGCK01
1. Pliocene
2. Idaho (SW)
3. Smiley, C. J., Shah, S. M. I., and Jones, R. W., 1975, Idaho Bur. Mines and Geology Inf. Circ., 28, p. 3-5
4. Shale and silt with interbedded basalt and pyroclastics
5. Gray and yellowish-gray
7. Medium- to thin-bedded; contains fossil flora
9. Unconformably overlies Sucker Creek Formation; underlies Scott Creek Member (Poison Creek Formation)
10. Type section: Hog Creek, between Warm Spring Creek and Dead Indian Ridge, Weiser area, Washington County.

Holts Ledge Gneiss HLDG07
1. Ordovician
2. New Hampshire (WC)
3. Naylor, R. S., 1971, New England Intercollegiate Geol. Conf. Guidebook 63, Trip A-4, p. 28-37
4. Quartz-plagioclase-biotite-hornblende gneiss
7. Massive, mapped as stratified core-rocks of Mascoma Dome
9. Underlies Ammonoosuc Volcanics
10. Type locality: Holts Ledge at head of beginners' slope, Dartmouth Skiway, Lyme Center, Grafton County.

Holy Joe Member (Galiuro Volcanics) U HLYJ01
1. Miocene
2. Arizona (SE)
3. Krieger, M. H., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-669,

p. 2
4. Quartz-latite ash-flow tuff
5. Red to brown, gray to black
6. Range 0-90 m
9. Overlies unnamed andesite unit of Galiuro Volcanics; underlies unnamed units or Aravaipa Member (Galiuro Volcanics)
10. Type locality: Top of Holy Joe Peak, sec. 7, T. 7 S., R. 18 E., Pinal County.

Honeoye Falls Formation HFLS01
1. Upper Silurian and Lower Devonian
2. New York (WC)
3. Ciurca, S. J., Jr., 1973, New York Geol. Assoc. Guidebook 45, Trip D, p. 1-14
4. Dolostone
6. 4.5 m
7. Massive and thin-bedded, mudcracks, few fossils
9. Overlies Cobleskill Formation; underlies Onondaga Formation
10. Type locality: Honeoye Creek at Honeoye Falls, and downstream to New York Highway 65 overpass, Monroe County.

Hoot Nanny Olivine Basalt (Reynolds Basin Group) HTNN01
1. Upper Miocene and Lower Pliocene
2. Idaho (SW)
3. McIntyre, D. H., 1972, Idaho Bur. Mines and Geology Pamph. 151, p. 24-30
4. Basalt flows containing poikilitic grains of clinopyroxene
5. Gray, weathers grayish-orange
6. 940 m
10. Type locality: Draw SW of Windy Peak, secs. 20 and 21, T. 2 S., R. 3 W. Named for outcrops on Hoot Nanny Ranch, sec. 24, T. 2 S., R. 4 W., Owyhee County.

Hoppin Hill Granite HPHL08
1. Precambrian Z
2. Massachusetts (C)
3. Fairbairn, H. W., Moorbath, S., Ramos, A. O., Pinson, W. H., Jr., and Hurley, P. M., 1967, Earth and Planetary Sci. Letters, v. 2, no. 4, p. 321-328
4. Potassium-rich granite
7. Granite inlier surrounded by younger sedimentary rocks
9. Unconformably underlies Lower Cambrian quartzite; correlative with Dedham Granodiorite
10. Type locality: Hoppin Hill, near North Attleboro, Bristol County.

Horner Member (Lucas Formation) HRNR01
1. Middle Devonian
2. Michigan (EC)
3. Gardner, W. C., 1974, Michigan Basin Geol. Soc. Spec. Papers 1, p. 37-41
4. Evaporite strata, salt beds
5. Gray-brown
6. 240 m
8. At least 8 recognizable salt beds
9. Overlies Lutzi Member (Lucas Formation); underlies Dundee Formation
10. Type section: Sun-Horner No. 17 well, depth-interval 1065-1300 m, Norwich field, Missaukee County.

Horse Branch Member (Ammons Formation) HRBC03
1. Precambrian Z
2. North Carolina (WC)
3. Mohr, D. W., 1973, Am. Jour. Sci., v. 273-A, p. 41-71
4. Schist
5. Black
6. 300 m
7. Thin-bedded, laminated
10. Type section: Roadcut along Horse Branch, which flows into Panther Creek, about 1/2 km S of North Carolina Highway 28, Graham County.

Horse Cave Limestone Member (St. Louis Formation)/(Ste. Genevieve Formation) HRCV02
1. Upper Mississippian (Meramecian)
2. Kentucky (SC)
3. Pohl, E. R., 1970, Kentucky Acad. Sci. Trans., v. 31, no. 1-2, p. 8-9
4. Limestone and dolostone
5. Gray, white
6. 11.5 m
7. Fossiliferous
10. Type locality: Hart Stone Co. Quarry, 1.6 km E of town of Horse Cave, Hart County.

Horseshoe Basin Magma Series/Group HRSB01
1. Lower Cretaceous
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3013-3048
4. Gneissose and nongneissose magmatic rocks
7. Plutons
8. Cathedral Quartz Monzonite, Similkameen Granodiorite, Bowers Quartz Diorite
10. Type locality: T. 38-40 N., R. 23-25 E., Okanogan County.

Horseshoe Bend Formation U HRBD02
1. Permian(?)
2. California (NC)
3. Hietanen, Anna, 1973, U.S. Geol. Survey Prof. Paper 731, p. 4, 19-22
4. Metasedimentary and metavolcanic rocks, quartzite, mica schist, phyllite, limestone, metabasalt, meta-andesite, metadacite, metarhyolite, and metatuff, with lenses of marble
5. Gray
6. 300 m
9. Presumably overlies Duffey Dome Formation and Franklin Canyon Formation; underlies Jurassic and Cretaceous ultramafic and plutonic rocks
10. Type section: Roadcuts along Little North Fork of Middle Fork of Feather River, secs. 1, 12, 13, T. 22 N., R. 6 E., Pulga Quadrangle, Plumas County.

Horseshoe Mountain Group HRSM10
1. Upper Cambrian and Lower Ordovician
2. Colorado (C)
3. Gerhard, L. C., 1972, Colorado School Mines Quart., v. 67, no. 4, p. 5-12
4. Sandstone, carbonate, shale

6. 106 m, range 106-235 m
7. Lithologic sequence characterized by transitional contacts, no interformational unconformities
8. SE facies: Sawatch Sandstone, Peerless Formation, Manitou Limestone; NW facies: Sawatch Sandstone, Dotsero Formation, Manitou Limestone
9. Nonconformably overlies Precambrian crystalline rocks; unconformably underlies Parting Shale
10. Type locality: N wall of cirque on E side of Horseshoe Mountain, S of Fairplay, sec. 12, T. 10 S., R. 79 W., Park County.

Horseshoe Valley Formation HRVL16

1. Pleistocene
2. North Dakota (C)
3. Ulmer, J. H., and Sackreiter, D. K., 1973, North Dakota Geol. Survey Rept. Inv. 51, map
4. Pebble-loam
5. Yellow
6. 6.8 m, range 6.8-11 m
7. Compact, nonbedded
9. Overlies upper member of Medicine Hill Formation; underlies lower member of Snow School Formation
10. Type section: In bluffs of Lake Sakakawea along N shore of Dead Man Coulee Bay, 100 m E of its mouth, SE1/4NE1/4NW1/4 sec. 22, T. 147 N., R. 84 W., McLean County. Named for Horseshoe Valley Township, T. 149 N., R. 80 W.

Horse Valley Formation U HRVL25

1. Miocene
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B16
4. Volcanic rocks including lava flows, intrusive plugs, mudflow breccia
5. Pale-pink or light-gray
6. > 350 m
9. Overlies Mount Dutton or Condor Canyon Formation; underlies Mount Belknap Rhyolite
10. Type section: Secs. 20, 21, T. 31 S., R. 12 W., 10 km W of Horse Valley, about 21 km SW of Minersville, Iron County.

Horton Creek Member (Hannibal Shale) HRCK10

1. Lower Mississippian (Kinderhookian)
2. Illinois (WC), Missouri
3. Conklin, J. E., and Conklin, B. M., 1973, Univ. Louisville, Studies in Paleontology and Stratigraphy, no. 1, p. 14-16
4. Dolomite, shale, with basal siltstone
5. Tan
6. 5 m
9. Overlies Saverton Shale or Louisiana Limestone. Basal member of Hannibal Shale, replaces Glen Park Member
10. Type section: Hillside on S bank of Horton Creek, NW1/4NW1/4NW1/4 sec. 6, T. 6 S., R. 5 W., Pike County, Ill.

Hot Springs Conglomerate Member (Gothic Formation) HSPG12

1. Middle Pennsylvanian
2. Colorado (WC)
3. Bartleson, Bruce, 1972, Colorado School Mines Quart., v. 67,

no. 4, p. 208-209
4. Quartzite, feldspar, and crystalline pebbles in coarse arkosic matrix
5. Red to greenish-gray
6. 22 m
9. Overlies Brush Creek Limestone Member or Crystal River Siltstone Member; underlies Jacks Cabin Limestone Member
10. Type locality: HS measured section 3.2 km N of Redstone on E slopes of valley adjacent to gully with intermittent waterfall, sec. 4, T. 10 S., R. 88 W., Pitkin County.

Houchin Creek Coal Member (Petersburg Formation) HCCK07
1. Middle Pennsylvanian
2. Indiana (SW)
3. Burger, A. M., and Wier, C. E., 1970, in Shaver, R. H., and others, Indiana Geol. Survey Bull. 43, p. 74
4. Coal with medial shale parting
6. 1.1 m, range 0.1-1.1 m
7. Bright-banded coal
9. Overlies underclay above Survant Coal Member (Linton Formation); underlies shale and Stendal Limestone Member (Petersburg Formation)
10. Type section: Exposure in SE1/4NE1/4SW1/4 sec. 3, T. 3 S., R. 7 W., along Houchin Creek, SE Pike County.

Hound Dog Holler Sandstone Member (Wann Formation) HDGH01
1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Desjardins, L. A., 1972, Tulsa Geol. Soc. Digest, v. 37, p. 68
4. Massive continental sandstone
5. Brown, red, yellow
9. Overlies Overlook Sandstone Member
10. Type locality: S1/2 sec. 29, T. 19 N., R. 10 E., Tulsa County. Named for country estates development.

Housatonic Highlands Complex HCHG01
1. Precambrian
2. Connecticut (NW)
3. Gates, R. M., 1961, Connecticut Geol. and Nat. History Survey Quad. Rept. 11, 35 p.
4. Banded granitic, felsic, amphibolitic, and graphitic gneiss
5. Gray
8. Two informal units: Barrack Mountain granite gneiss and Grenville metasediments
9. Underlies Waramaug Formation
10. Type locality: Housatonic Highlands, Cornwall Quadrangle, Litchfield County.

House Creek Member (Lowville Formation) HCRK11
1. Middle Ordovician
2. New York (NC)
3. Walker, K. R., 1973, New York State Mus. and Sci. Service Bull. 419, p. 1-43
4. Limestone-coral colonies and bioclastic debris
6. 3.6 m
9. Overlies unit D; underlies Chaumont Formation
10. Type locality: Along House Creek, 70 m W of bridge on Searls Road, Port Leyden Quadrangle, Lewis County.

Hovland Lava (North Shore Group)/Diabase Complex (Keweenawan Supergroup) HVLD01

1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317
4. Rhyolite and porphyritic trachybasalt
6. 1500 m
9. Overlies Red Rock Rhyolite; merges with Reservation River Diabase Complex; underlies Brule River Rhyolite
10. Type locality: W of Reservation River along shore of Lake Superior, Cook County.

Howardton Limestone Member (Lingle Formation) HRDN04

1. Middle Devonian
2. Illinois (SC)
3. North, W. G., 1969, Illinois Geol. Survey Circ. 441, p. 22-25
4. Argillaceous limestone with shaly partings
5. Brownish-gray
6. 10 m, range 10-34 m
7. Fine-grained, fossiliferous
9. Conformably and gradationally overlies Grand Tower Limestone; disconformably underlies Tripp Limestone Member (Lingle Formation)
10. Type section: N face of abandoned quarry in Backbone Ridge, 106 m NW of road through ridge, N of town of Grand Tower, NE1/4NE1/4SE1/4 sec. 23, T. 10 S., R. 4 W., Jackson County. Named for town of Howardton, 3.2 km E of type section.

Hubbard Creek Member (Tyee Formation) HBCK03

1. Eocene, middle
2. Oregon, (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 20-22
4. Sandstone and siltstone
6. 120 m
7. Thin-bedded, soft
9. Overlies Tyee Mountain Member; underlies Baughman Member
10. Type locality: Band of sandstone and siltstone along Hubbard Creek where it joins Umpqua River just W of Tyee Mountain, Douglas County.

Huckleberry Ridge Tuff (Yellowstone Group) U HKBR03

1. Pleistocene
2. Wyoming (NW), Idaho, Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B3-B5
4. Rhyolitic ash-flow tuff
6. 300 m
7. Welded, phenocryst-rich
9. Overlies Cretaceous sandstones and shales or Junction Butte Basalt; underlies Lava Creek or Mesa Falls Tuff (Yellowstone Group) or Lewis Canyon Rhyolite
10. Type section: Cliff exposure at head of large landslide 1.8 km N. 10° E. of Snake River bridge at Flagg Ranch on highway 3 km S of South Entrance of Yellowstone National Park, Teton County, Wyo.

Hudspeth Formation HDSP02
1. Lower or Upper Cretaceous
2. Oregon (C)
3. Wilkinson, W. D., and Oles, K. F., 1968, Am. Assoc. Petroleum Geologists Bull., v. 52, no. 1, p. 133
4. Marine mudstone with siltstone and sandstone
6. 900 m
9. Underlies and intertongues with Gable Creek Formation
10. Type locality: Mitchell Quadrangle, Wheeler County.

Hudspeth Cutoff Sandstone HPCF01
1. Lower Permian
2. Idaho (SE)
3. Cramer, H. R., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 10, p. 1788-1791
4. Quartzose sandstone and siltstone with cherty dolomite near top
5. Gray, weathers tan
6. 1100 m
9. Overlies Indian Fork Member (Wells Formation); underlies unnamed limestone designated as "lower limestone"
10. Type section: N wall of ridge between Sager Canyon and canyon by which Hudspeth's Cutoff enters Sublette Range. Base is in NW1/4 sec. 17, and top is in center sec. 19, T. 13 S., R. 31 E., Oneida County.

Huerfanito Bentonite Bed (Lewis Shale) U HRFN04
1. Upper Cretaceous
2. New Mexico (NW), Colorado
3. Fassett, J. E., and Hinds, J. S., 1971, U.S. Geol. Survey Prof. Paper 676, p. 6-8
4. Bentonite
5. Green
6. 3.6 m
9. Marker bed in upper part of Lewis Shale, which underlies Pictured Cliffs Sandstone
10. Type section: El Paso Natural Gas Co. Huerfanito Unit 60 well, SW1/4SW1/4 sec. 4, T. 36 N., R. 9 W., San Juan County, New Mexico.

Huff Member (Hell Creek Formation) HUFF02
1. Upper Cretaceous
2. North Dakota (SC), Montana
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 26, 29
4. Channel sandstones separated by bentonites and shales
6. Range 26-30 m
7. Forms vertical cliffs, badlands
9. Overlies Bacon Creek and Fort Rice Members; underlies Pretty Butte Member
10. Type section: 1.6 km SE of town of Huff, SW1/4 sec. 8, T. 136 N., R. 79 W., Morton County, N. Dak.

Hulick Till Member (Glasford Formation) HLCK01
1. Pleistocene (Illinoian)
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 56-57
4. Till with sand and gravel outwash
6. Range 15-30 m

9. Overlies Duncan Mills or Kellerville Till Member (Glasford Formation); underlies Toulon, Radnor Till, or Berry Clay Member (Glasford Formation), Teneriffe Silt, or Pearl Formation
10. Type section: Roadcut exposures 2.4 km NE of Hulick School, SW1/4SE1/4SE1/4 sec. 21, T. 5 N., R. 3 E., Fulton County.

Hunters Cove Formation HRCV01

1. Upper Cretaceous
2. Oregon (SW)
3. Dott, R. H., Jr., 1971, Oregon Dept. Geology and Mineral Industries Bull. 69, p. 38-41
4. Alternating thin sandstone and mudstone beds
5. Gray, brown, weathers olive
6. 300 m
9. Overlies Cape Sebastian Sandstone; underlies Roseburg Formation or unconformably underlies Quaternary gravels, dune sand, colluvium
10. Type section: S side of first headland immediately N of Cape Sebastian, on line between secs. 25 and 36, T. 37 S., R. 15 W., Curry County. Named for Hunters Cove on SE side of Cape Sebastian.

Huot Formation/Member (Coleharbor Formation) HUOT01

1. Pleistocene
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, North Dakota Geol. Survey Misc. Ser. 52, p. 16-17
4. Unbedded pebbly clay with limestone pebbles and cobbles and chalky inclusions
5. Gray
6. Range 0.9-30.6 m
9. Overlies Wylie Formation; underlies Poplar River, Sherack, or Brenna Formation
10. Type section: Clearwater Section, NE1/4NW1/4 sec. 22, T. 151 N., R. 44 W. Named for town of Huot, Red Lake County, Minn.

Hurricane Diabase/Flows HRCN03

1. Quaternary
2. Utah (SW)
3. Best, M. G., and Brimhall, W. H., 1970, Utah Geol. Soc. Guidebook 23, p. 61-64
9. Grades into Grand Wash Basalt
10. Type locality: Near town of Hurricane, Washington County.

Hyalite Peak Volcanics (Washburn Group) U HLPK01

1. Eocene
2. Montana (SW)
3. Chadwick, R. A., 1969, Wyoming Univ. Contr. Geology, v. 8, no. 2, pt. 2, p. 155-159
4. Andesite lava flows grading into flow breccias
6. 850 m, range 850 - > 1200 m
7. Massive, blocky to columnar-jointed
9. Unconformably overlies Golmeyer Creek Volcanics or pre-Tertiary sedimentary rocks
10. Type section: E wall of West Fork Middle Creek Canyon, 6 km N of Hyalite Peak, sec. 2, T. 5 S., R. 6 E., Gallatin County.

Hymera Coal Member (Dugger Formation) HYMR01
1. Middle Pennsylvanian
2. Indiana (WC)
3. Shaver, R. H., and others, 1970, Indiana Geol. Survey Bull. 43, p. 74-75
4. Coal with shale and pyrite partings
6. 3 m, range 0.2-3 m
7. Bright-banded coal
10. Reference section: Near Hymera, NE1/4NW1/4NE1/4 sec. 10, T. 8 N., R. 8 W., Sullivan County.

Ice Point Conglomerate U ICPN01
1. Eocene, upper
2. Wyoming (C)
3. Love, J. D., 1970, U.S. Geol. Survey Prof. Paper 495-C, p. C59-C62
4. Precambrian and Cambrian rock fragments in arkosic sandstone matrix
5. Brown to yellow
6. 61 m
7. Poorly cemented
9. Overlies Wagon Bed Formation; unconformably underlies White River Formation
10. Type locality: Ice Point ridge, site of VABM 7466, sec. 3, T. 28 N., R. 95 W., Happy Spring Quadrangle, Fremont County.

Idaho Canyon Tuff U IDCN01
1. Miocene, upper
2. Nevada (NW), Oregon
3. Noble, D. C., McKee, E. H., Smith J. G., and Korringa, M. K., 1970, U.S. Geol. Survey Prof. Paper 700-D, p. D26-D27
4. Densely welded tuff
5. Grayish-green, tan
6. Range 0-120 m
10. Type locality: Idaho Canyon, near Big Mountain, sec. 1, T. 43 N., R. 26 E., Humboldt County, Nev.

Idledale Formation IDLD03
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 154-155
4. Banded quartz, feldspar, biotite gneiss
5. Pink to red
6. 600 m
9. Intruded by dikes of Mount Morrison Formation; overlies Turkey Creek Canyon Formation
10. Type locality: Bear Creek Canyon, sec. 33, R. 4 S., R. 70 W., Jefferson County.

Ikiakpaurak Member (Echooka Formation) U IKKK01
1. Upper Permian
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 8-11
4. Sandstone and siltstone with minor interbeds of silty shale, channel conglomerates, orthoquartzite. glauconite
6. 85 m, range 61-107 m
7. Fine- to very fine-grained mature quartz arenites

9. Conformably overlies Joe Creek Member (Echooka Formation); conformably to disconformably underlies Kavik Member (Ivishak Formation)
10. Type locality: On tributary of Cache Creek and Canning River, lat 69°27′45" N., long 145°53′30" W., in Ikiakpaurak Valley, S flank of Shublik Mountains.

Independence Till IDPC01
1. Pleistocene (Wisconsinan)
2. Minnesota (NE)
3. Wright, H. E., Jr., Mattson, L. A., and Thomas, J. A., 1970, Minnesota Geol. Survey Geol. Map Ser. GM-3, p. 18-19
4. Sandy, stony, noncalcareous till
5. Grayish-brown
10. Type locality: Exposures in roadcut in drumlin 2 km W of Independence, St. Louis County.

Indian Creek Amphibolite IDCK02
1. Tertiary
2. Washington (SC)
3. Ellingson, J. A., 1972, Northwest Sci., v. 46, no. 1, p. 9-12
9. Intruded by quartz diorite pegmatite dikes
10. Type locality: Outcrops N of outlet of Clear Lake, at Kamiakan Butte and along E side of Indian Creek at W end of Russell Ridge, Yakima County.

Indian Peak Formation IDPK01
1. Oligocene
2. Utah (SW)
3. Conrad, O. G., 1969, Utah Geol. and Mineralog. Survey Spec. Studies 29, p. 9-12
4. Vitric tuffs and intercalated volcanic sandstone
6. Range 90-180 m
8. Four unnamed members
9. Overlies Tertiary volcanics; underlies Sawtooth Peak Formation and Beers Spring Formation
10. Type section: Along NE flank of Indian Peak, SW part of T. 29 S., R. 18 W., Beaver County.

Infierno Formation U INFR01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F42-F44
4. Andesitic to basaltic lava and volcaniclastic breccia, sandstone, and mudstone
5. Gray to green
6. Range 600-900 m
7. Thin- to thick-bedded, poorly sorted
9. Overlies Hato Puerco Formation; underlies Celada Formation
10. Type locality: Along Quebrada Infierno from W border of Gurabo Quadrangle to 900 m upstream, 51,850 N., 198,200 E., to 51,520 N., 199,010 E.

Inkom Formation (Brigham Group in Utah) U INKM01
1. Precambrian Z
2. Idaho (SE), Utah
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3,

p. 586, 591
4. Phyllite, grading upward to argillite
5. Green to greenish-gray
6. 305 m, range 240-730 m
7. Very fine-grained detrital rocks
9. Overlies Caddy Canyon Quartzite; underlies Mutual Formation
10. Type section: N of Portneuf River, in head of small canyon which joins river about 2 km W of town of Inkom, NW part of T. 7 S., R. 36 E., Bannock County, Idaho.

Inmachuk Formation IMCK01
1. Pleistocene
2. Alaska (NC)
3. Guthrie, R. D., and Matthews, J. V., Jr., 1971, Quaternary Research, v. 1, no. 4, p. 474-510
4. Oxidized sands, rebedded loess, peaty silts
5. Buff-brown
6. Range 1-2 m
9. Unconformably overlies Cape Deceit Formation
10. Type area: 250 m of shoreline between Cape Deceit and Deering, Kotzebue Sound, Seward Peninsula.

Inyo Creek Formation (Lemhi Group) U ICRK01
1. Precambrian Y
2. Idaho (C)
3. Ruppel, E. T., 1975, U.S. Geol. Survey Prof. Paper 889-A, p. 5-7
4. Feldspathic quartzite
5. Medium- to light-gray
6. 215 m
7. Fine-grained to very fine-grained; thin-bedded
9. Faulted at base; gradationally underlies West Fork Formation (Lemhi Group)
10. Type area: Head of Inyo Creek in S Patterson Quadrangle, Lemhi Range, Lemhi County.

Irish Bend Member (Willamette Silt) IRBD01
1. Pleistocene
2. Oregon (WC)
3. Balster, C. A., and Parsons, R. B., 1969, Northwest Sci., v. 43, no. 3, p. 123-127
4. Silt with clay
5. Brown
6. Range 0-4.3 m
9. Overlies Wyatt Member (Willamette Silt) or Diamond Hill Member (Rowland Formation); unconformably underlies Malpass or Greenback Member (Willamette Silt)
10. Type locality: Cutbank of Willamette River at Irish Bend, center sec. 7, T. 14 S., R. 4 W., Linn County.

Irish Gulch Slate U IGLC03
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A4-A5
4. Sericitic, micaceous slate or phyllite
5. Gray to black
9. Unconformably(?) overlies Moonshine Gulch Quartzite; unconformably underlies Montana Mine Formation (Flag Rock Group)

10. Type locality: W side of Irish Gulch, sec. 14, T. 2 N., R. 3 E., N Black Hills, Pennington County.

Iron Bog Creek Formation (Copper Basin Group) IBCK01
1. Middle(?) Pennsylvanian
2. Idaho (SC)
3. Paull, R. A., Wolbrink, M. A., Volkmann, R. G., and Grover, R. L., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1398-1399
4. Silty argillite and shale with quartzite and conglomerate interbeds
5. Black
6. 460 m
9. Gradationally overlies Brockie Lake Conglomerate; underlies Challis Volcanics
10. Type section: W1/2 sec. 9, to SW1/4NE1/4SE1/4 sec. 9, T. 4 N., R. 22 E., Custer County. Named for Iron Bog Creek.

Iron Hill Complex IRHL07
1. Cambrian
2. Colorado (SW)
3. Fenton, M. D., and Faure, G., 1970, Mtn. Geologist, v. 7, no. 4, p. 269-271
4. Carbonatite central core and radiating dikes, surrounded by arcuate masses of nepheline syenite, ijolite, uncompahgrite, and pyroxenite
7. Intrusive alkalic complex; pyroxenite emplaced first, carbonatite last
9. Intrudes Powderhorn Granite; unconformably underlies Tertiary lava flows and tuffs
10. Type area: Exposed over 31 sq km at Iron Hill, 6.4 km SE of Powderhorn, Gunnison County.

Iron Lightning Member (Fox Hills Formation) ILGG01
1. Upper Cretaceous
2. South Dakota (C), North Dakota
3. Waage, K. M., 1968, Yale Univ., Peabody Mus. Nat. History Bull. 27, pt. 1, p. 132
4. Clay, silt, and sand
6. Range 18-52 m
7. Locally indurated and capping buttes; forms badlands
9. Overlies Trail City or Timber Lake Member (Fox Hills Formation); underlies Hell Creek Formation
10. Type locality: Badlands 5 km SE of Indian village of Iron Lightning on Moreau River, secs. 20, 28, 29, 32, and 33, T. 14 N., R. 19 E., Ziebach County, S. Dak.

Irving Pond Formation IVGP01
1. Precambrian
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 7
4. Quartzite
5. White
6. 610 m
7. Interlayered
9. Underlies Canada Lake Formation
10. Type locality: Exposed at E end of Canada Lake, Fulton County. Named for exposures around Irving Pond, E of Canada Lake.

Island Pond Diorite (Hillsboro Group)/Quartz Monzonite (Hillsboro Group) IDPD02
1. Devonian
2. New Hampshire (SE)
3. Sundeen, D. A., 1971, New England Intercollegiate Geol. Conf. Guidebook 63, Trip A-7, p. 53-63
4. Massive diorite surrounded by foliated porphyritic quartz monzonite
5. Green-gray, black
10. Type locality: Outcrops on Governors Island in Island Pond, Rockingham County.

Italian Mountain Intrusive Complex/Complex U ILNM01
1. Oligocene
2. Colorado (WC)
3. Cunningham, C. G., Jr., and Naser, C. W., 1975, U.S. Geol. Survey Bull. 1405-A, p. A10-A11
4. Quartz diorite to quartz monzonite plutons and dacite to rhyodacite dikes
7. Heterogeneous assemblage of cogenetic intrusive rocks
9. Intrudes Paleozoic and Mesozoic sedimentary rocks and Precambrian plutonic and metamorphic rocks
10. Type locality: N peak of Italian Mountain, 20 km NE of Crested Butte, Gunnison County.

Italian Springs Formation ISPG02
1. Oligocene
2. Nevada (C)
3. Cook, H. E., 1968, Geol. Soc. America Mem. 116, p. 116-117
4. Rhyolite and rhyodacite lapilli tuff
5. Gray, brown
6. 1460 m
7. Moderately to intensely welded, crystal-vitric; upper ignimbrite is jointed, blocky, cliff-forming
8. 4 informal members: andesite, sedimentary, lower and upper ignimbrite
9. Unconformably overlies Rawhide Formation; unconformably underlies Box Canyon Formation; intruded by ignimbrite plugs
10. Type areas: Andesite: head of Tybo Canyon, NE1/4 T. 6 N., R. 49 E.; sedimentary: 4 km N of ignimbrite plug no. 2 on both sides of unnamed valley, NW1/4 T. 7 N., R. 49 E.; lower and upper ignimbrite: 1.6 km E of Italian Springs, NE1/4 T. 6. N., R. 49 E., Nye County.

Itkilyariak Formation (Endicott Group) IKLK01
1. Upper Mississippian
2. Alaska (NE)
3. Mull, C. G., and Mangus, M. D., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1364-1369
4. Limestone, shale, sandstone, conglomerate, breccia with interbedded shale and sandstone
5. Red
6. Range 45-150 m
9. Gradationally overlies Kayak Shale or Kekiktuk Conglomerate; gradationally underlies Alapah Limestone (Lisburne Group)
10. Type section: Near tributary of Itkilyariak Creek, SW1/4 sec. 6, T. 3 N., R. 31 E., UPM, in E Sadlerochit Mountains, Mt. Michelson Quadrangle.

Iutzi Member (Lucas Formation) IUTZ01
1. Middle Devonian
2. Michigan (EC)
3. Gardner, W. C., 1974, Michigan Basin Geol. Soc. Spec. Papers 1, p. 36-37
4. Anhydrite and carbonate beds
6. 48 m
8. Lower portion of member is referred to as "massive anhydrite"
9. Overlies Richfield Member; underlies Horner Member
10. Type section: Sun Oil Co.-Arlie Iutzi et al., No. B-2 well, depth-interval 1505-1555 m, sec. 6, T. 19 N., R. 3 W., Clare County.

Ivydell Sandstone Member (Hance Formation) U IVDL02
1. Middle Pennsylvanian
2. Tennessee (NE)
3. Englund, K. J., 1968, U.S. Geol. Survey Prof. Paper 572, p. 22
5. Gray
6. 17 m, range 17-21 m
7. Massive, fine- to medium-grained
9. Overlies Rich Mountain coal bed (Hance Formation)
10. Type section: Along road on left side of Kent Hollow, from town of Ivydell to broad upland, Campbell County.

Iyanbito Member (Entrada Sandstone) U INBT01
1. Middle Jurassic (Callovian)
2. New Mexico (NW)
3. Green, M. W., 1974, U.S. Geol. Survey Bull. 1395-D, p. D1-D12
4. Sandstone
5. Reddish-orange
6. 38 m
9. Unconformably overlies Chinle Formation; conformably underlies unnamed middle siltstone member of Entrada Sandstone
10. Type locality: NW1/4 sec. 15, T. 15 N., R. 16 W., in NE1/4 of Fort Wingate Military Reservation (old boundary), 4.42 km N. 76°30′ W. of Iyanbito and 2.54 km N. 37° E. of Wingate Station, Church Rock Quadrangle, McKinley County.

Jacks Cabin Limestone Member (Gothic Formation) JKCB01
1. Middle Pennsylvanian
2. Colorado (WC)
3. Bartleson, Bruce, 1972, Colorado School Mines Quart., v. 67, no. 4, p. 209-243
5. Gray
6. 10 m
9. Overlies Hot Springs Conglomerate Member (Gothic Formation); underlies Maroon Formation
10. Type locality: HG measured section, sec. 21, T. 15 S., R. 84 W., few hundred m NW of Colorado Highway 306 up first draw E of Jack's Cabin cutoff road and prominent hogback of Entrada Sandstone, Gunnison County.

Jacksons Gap Formation/Group JKGP01
1. Paleozoic, middle
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 22-23, 108-114
4. Sericite-quartz phyllite grading into and interlayered with graphitic schist and phyllite, with minor mylonite schist,

graphite, metaquartzite, metaconglomerate, and metagraywacke
7. Fine-grained metasediments
8. Tallassee Metaquartzite
9. Unconformably overlies Heard Group
10. Type section: 3.2 km SW of Jacksons Gap, along lake front road from S1/2NE1/4 sec. 27 to Maroy Creek, SW1/4SW1/4 sec. 25, T. 22 N., R. 22 E., Tallapoosa County, Ala.

Jackson Summit Formation JKSM01
1. Precambrian Y
2. New York (EC)
3. McLelland, James, 1972, New York Geol. Assoc. Guidebook 44, Trip E, p. E27
4. Garnetiferous gneisses
6. 900 m
9. Overlies Rooster Hill Quartz Monzonite Gneiss
10. Type locality: Not stated. Named for exposures near Jackson Summit, Fulton County.

Jacobs Ranch Formation JCBR01
1. Upper Cretaceous(?)
2. Arizona (NW)
3. Moore, R. T., 1972, Arizona Bur. Mines Bull. 186, p. 18-20
4. Clastic siltstone and sandstone, with basal conglomerate
5. Gray, reddish-brown
6. 87 m
9. Overlies Navajo Sandstone; underlies Cottonwood Wash Formation
10. Type section: On E side of Tom-and-Cull Wash and along base of ridge separating Tom-and-Cull and Cottonwood Washes, secs. 5, 6, and 7, T. 37 N., R. 15 W., and sec. 32, T. 38 N., R. 15 W., Mohave County. Named for ranch in area.

Jaluco Formation JLUC02
1. Pleistocene
2. South Carolina (EC), North Carolina
3. Du Bar, J. R., 1968, South Carolina Div. Geology Geol. Notes, v. 12, no. 1, p. 11-18
4. Sand
5. Gray, brown, orange
6. 16 m
7. Fine- to medium-grained, fossiliferous
9. Overlies Peedee Formation; underlies Myrtle Beach Formation
10. Type section: Drill hole Horry No. 39 near town of Myrtle Beach, Horry County, S.C.

Janesville Gravel/Till JSVL01
1. Pleistocene (Wisconsinan)
2. Wisconsin (SC)
3. Bleuer, N. K., 1970, Wisconsin Geol. and Nat. History Survey Inf. Circ. 15, p. J20-J24
4. Sandy-silty till
5. Pink
6. 8 m
10. Reference section: West Janesville Section, NW1/4NE1/4 sec. 31, T. 3 N., R. 12 E., Rock County.

Jelloway Till JLLY02
1. Pleistocene (Wisconsinan)
2. Ohio (C)

3. Totten, S. M., 1973, Ohio Div. Geol. Survey, Rept. Inv. 88, p. 29-31
4. Silt, clay, sand
5. Yellow-brown
6. 2.4 m
9. Overlies Butler Till; underlies Knox Lake Till
10. Type locality: W side Jelloway Creek, 2.4 km N of Jelloway, Ashland County.

Jerky Mountains Rhyolite JRKM02
1. Miocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 236
4. Flow-banded rhyolite
9. Underlies Double Springs Andesite
10. Type locality: Not stated. Named for Jerky Moutains, Catron County.

Jersey Shore Member (Keyser Limestone) JRSR02
1. Lower Devonian
2. Pennsylvania (C), Virginia, West Virginia
3. Head, J. W., III, 1972, Pennsylvania Geologists Field Conf. Guidebook 37, p. 100
6. 10.6 m
7. Contains corals and stromatoporoids
9. Overlies Clifton Forge Sandstone Member (Keyser Limestone) or Byers Island Limestone Member (Keyser Limestone); grades laterally into and underlies New Creek Limestone; underlies LaVale Member (Keyser Limestone)
10. Type locality: Jersey Shore, Lycoming County, Pa.

Jewel Quartzite (North Snowy Group) JEWL01
1. Precambrian W
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 15-16
4. Micaceous quartzite
5. Green
6. Range 20-60 m
7. Medium- to thick-layered
9. Adjacent to George Lake Marble; intruded by Mount Delano Gneiss
10. Type section: Jewel Lake, 50 m downstream from Pine Creek Lake. Principal reference section: Ridge crest 360 m NE of Pine Creek Lake, Beartooth Mountains, Park County.

Jim Mountain Member (Wapiti Formation) U JMMN01
1. Eocene, middle
2. Wyoming (NW)
3. Nelson, W. H., and Pierce, W. G., 1968, U.S. Geol. Survey Bull. 1254-H, p. H4-H7
4. Trachyandesite flows
6. Range 0-300 m
9. Overlies breccia beds of lower Wapiti Formation; underlies rocks of upper Wapiti Formation
10. Type section: Near Jim Mountain, NE Absaroka Mountains, N of Wapiti Post Office, Park County.

Joe Creek Member (Echooka Formation) U JCRK12
1. Lower and Upper Permian
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 8-11
4. Siltstone, mudstone, chert, limestone
5. Yellow to yellow-brown, gray
6. 113 m
7. Poorly indurated and thin- to massive-bedded
9. Conformably overlies Wahoo Limestone (Lisburne Group); conformably underlies Ikiakpaurak Member (Echooka Formation)
10. Type section: Along S slope of mountains N of creek, 18.5 km N. 68° W. from point where Joe Creek crosses Canada-United States boundary, lat 68°59′30" N., long 141°26′ W.

Joes Point Basalt Member (Perry Formation) JSPN02
1. Upper Devonian
2. Canada (New Brunswick), Maine
3. Schluger, P. R., 1973, Geol. Soc. America Bull., v. 84, no. 8, p. 2536
5. Gray to green
6. 18 m, range 10-18 m
7. Amygdaloidal flow, columnar joints and pillows
9. Overlies Brandy Cove Member; underlies St. Andrews Member
10. Type section: Joe's Point, on NE bank at mouth of St. Croix River, 1.5 km NW of St. Andrews, Charlotte County, New Brunswick, Canada.

John Henry Member (Straight Cliffs Formation) U JNHR01
1. Upper Cretaceous
2. Utah (SC)
3. Peterson, Fred, 1969, U.S. Geol. Survey Bull. 1274-J, p. J14-J18, J21-J24
4. Sandstone, mudstone containing coal beds
5. Yellowish-brown, grayish-orange, black
6. 225 m, range 200-330 m
7. Very fine- to medium-grained, cliff- and slope-forming
9. Overlies Smoky Hollow Member with intraformational regional angular unconformity; underlies and interfingers with Drip Tank Member
10. Type section: N side of small tributary canyon on W side of Smoky Hollow, NW1/4 sec. 32 and N1/2NE1/4 sec. 31, T. 41 S., R. 4 E., Kane County. Named for John Henry Canyon tributary to Warm Creek, 5 km W of section.

John Kerr Peak Quartz Latite JKPK01
1. Miocene
2. New Mexico (SW)
3. Elston, W. E., Coney, P. J., and Rhodes, R. C., 1970, New Mexico Geol. Soc. Guidebook 21, p. 82-84
4. Quartz latite domes and flows, breccia, clastic sedimentary rocks
6. 200 m
7. Late-stage eruptive dome complex in center and near margins of 25 km-diameter Squirrel Springs volcano-tectonic depression
9. Intertongues with, is both underlain and overlain by, and is in fault contact with Bearwallow Mountain Formation
10. Type area: NW Mogollon Plateau, around John Kerr Peak, 20 km E of Reserve, T. 6 S., R. 16 W., Catron County.

Johnstone Creek Volcanics JCRK02
1. Tertiary
2. Idaho (SC)
3. Dover, J. H., 1969, Idaho Bur. Mines and Geology Pamph. 142, p. 49-50
4. Andesite and latite porphyritic flowrocks
5. Purple to gray
9. Unconformably overlies Wood River Formation and Milligen Formation
10. Type area: Exposed N of Johnstone Creek, tributary to Hyndman Creek, SE side of Pioneer Mountains, Blaine County.

Jolla Vieja Formation JLVJ01
1. Eocene
2. California (SC)
3. Doerner, D. P., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 18
4. Arkose
5. Buff
6. 26 m
9. Conformably overlies Canada Formation; underlies Cozy Dell and Vaqueros Formations
10. Type locality: Alegria Canyon, W Santa Cruz Island.

Jones Formation JONS02
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 8
4. Basalt
5. Black
6. 14 m
9. Overlies Wild Cherry-Barrel Springs Formations (undifferentiated)
10. Type section: NW side of county road, 0.8 km E of intersection of Texas Highway 166 with County road 505, Jeff Davis County.

Joplin Member (Boone Formation) U JPLN03
1. Lower Mississippian
2. Missouri (SW), Kansas, Oklahoma
3. McKnight, E. T., and Fischer, R. P., 1970, U.S. Geol. Survey Prof. Paper 588, p. 32-37
4. Limestone with chert nodules and beds
5. Gray to brown
6. Range 0-30 m
7. Fossiliferous, thick- to massively-bedded
9. Conformably overlies Grand Falls Chert Member; unconformably underlies Short Creek Oolite Member
10. Type locality: Quarry of Joplin Marble Quarry Company on left bank of Shoal Creek 0.8 km below Grand Falls, 4.8 km SW of Joplin, Newton County, Mo.

Jordan Canyon Rhyolite JRDC01
1. Cenozoic, middle
2. New Mexico (SW)
3. Elston, W. E., Damon, P. E., Coney, P. J., Rhodes, R. C., Smith, E. I., and Bikerman, Michael, 1973, Geol. Soc. America Bull., v. 84, no. 7, p. 2259-2274

4. Ash-flow and air-fall tuff
9. Intertongues with lower part of Bearwallow Mountain Formation
10. Type locality: Along New Mexico Highway 61, SE1/4NW1/4 sec. 36, T. 9 S., R. 13 W., lat 33°31′ N., long 108°08′ W., Catron County.

Jordan River Formation JDRV04
1. Upper Devonian
2. Michigan (C)
3. Kesling, R. V., Segall, R. T., and Sorensen, H. O., 1974, Michigan Univ. Mus. Paleontology Papers on Paleontology 7, p. 114-115
4. Argillaceous limestone and shale
5. Gray-green
6. 2 m
7. Soft, thin-bedded, fossiliferous
9. Overlies Whiskey Creek Formation; underlies Norwood Shale
10. Type locality: Along Lake Michigan shore, about 1.6 km N of Norwood, SE1/4 sec. 22, and NE1/4 sec. 27, T. 33 N., R. 9 W., Jordan River State Forest, SW Charlevoix County.

Josephine Peridotite U JSPN04
1. Mesozoic
2. Oregon (SW), California
3. Wells, F. G., Hotz, P. E., and Cater, F. W., Jr., 1948, Oregon Dept. Geology and Mineral Ind. Bull. 40, 23 p.
5. Weathers buff to rusty-red
6. 4600 m
7. Tabular sheet
8. Includes rocks previously designated by informal name "Vulcan Peak peridotite"
9. Overlies Dothan Formation in thrust contact
10. Type locality: Josephine Mountain, sec. 20, T. 39 S., R. 9 W., Chetco Peak Quadrangle, Josephine County, Ore.

Josephine Canyon Diorite U JSPC01
1. Upper Cretaceous
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4, C12
4. Diorite-quartz diorite-granodiorite
5. Gray
9. Intrudes Salero Formation; probably intruded by Elephant Head Quartz Monzonite; cut by Madera Canyon Granodiorite; unconformably underlies Gringo Gulch Volcanics
10. Type area: Josephine Canyon, Santa Rita Mountains, Santa Cruz County.

Juda Gravel JUDA01
1. Pleistocene (Kansan)
2. Wisconsin (SC)
3. Bleuer, N. K., 1970, Wisconsin Geol. and Nat. History Survey Inf. Circ. 15, p. J31-J32
4. Dolomite gravel
6. 5 m
9. Underlies Ogle or Argyle Till
10. Reference section: North Juda Section, SW1/4SE1/4SW1/4 sec. 36, T. 2 N., R. 8 E., 1.2 km NE of Juda, Green County.

Judd Drift JUDD02
1. Pleistocene
2. Montana (WC)
3. Weber, W. M., 1972, Montana Bur. Mines and Geology Mem. 42, p. 8-10
4. Quartz monzonite, granite, and gneiss boulders and cobbles in coarse, sandy matrix
7. Bouldery till
9. Overlies gneiss of Bitterroot frontal zone; underlies Charlos Drift
10. Type locality: N side of Judd Creek, S1/2 sec. 15, T. 5 N., R. 21 W., Ravalli County.

Judd Harbor Dunite-Peridotite (Duke Island Complex)/Peridotite (Duke Island Complex) JDHB01
1. Jurassic and Cretaceous
2. Alaska (SE)
3. Irvine, T. N., 1974, Geol. Soc. America Mem. 138, p. 85
4. Hornblende and olivine clinopyroxenite, peridotite, dunite
6. 1500 m
7. Cumulates, with rhythmic layering
9. Emplaced in gabbro which intrudes metamorphosed sedimentary and volcanic rocks
10. Type area: Judd Harbor, lat 55° N., Duke Island.

Junction Formation JNCN01
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 146-147
4. Muscovite-sillimanite gneiss and schist with quartz and granite stringers and pods
6. 270 m
8. Green Ranch Quartzite Member
9. Unconformably overlies Cressmans Gulch Formation; unconformably underlies Golden Gate Canyon Formation
10. Type area: SW1/4SE1/4 sec. 17, T. 3 S., R. 70 W., Jefferson County.

Junction Butte Basalt U JNCB01
1. Pleistocene
2. Wyoming (NW)
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B9-B10
4. Aphanitic basalt
5. Black
6. 90 m, range 3-100 m
8. Several informally named flows
9. Unconformably overlies Absaroka Supergroup and Paleozoic and Precambrian rocks; locally underlies Huckleberry Ridge Tuff (Yellowstone Group), Mount Jackson Rhyolite, or Lava Creek Tuff (Yellowstone Group)
10. Type locality: W side of Grand Canyon of Yellowstone opposite mouth of Deep Creek. Named for butte between Yellowstone and Lamar Rivers, Yellowstone National Park, Park County.

Jupiter Member (Galeros Formation) JPTR01
1. Precambrian Y
2. Arizona (NC)

3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1243-1260
4. Shale, with minor limestone
5. Red-purple to pale-green
6. 462 m
9. Overlies Tanner Member; underlies Carbon Canyon Member
10. Type section: Below Jupiter Temple in lower part of Chuar Canyon, E Grand Canyon, lat 36°10′ N., long 111°50′ W., Coconino County.

Kaena Formation U KAEN01

1. Pleistocene
2. Hawaii (NC)
3. Lum, Daniel, and Stearns, H. T., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 10-11
4. Coral reef limestone overlain by sand
5. Gray, white
6. Range 21-39 m
7. Leached and recrystallized
9. Unconformably overlies Kahuku Point Formation; unconformably underlies Bellows Field Formation
10. Type locality: Exposures on Kaena Point, SE Oahu.

Kahuku Point Formation KKPN01

1. Pleistocene
2. Hawaii (NC)
3. Lum, Daniel, and Stearns, H. T., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 7-10
4. Clay, limestone, and alternating basaltic and calcareous sands
5. Gray, white
6. Range 38-47 m
9. Unconformably overlies unnamed conglomerate; unconformably underlies Kaena Formation
10. Type locality: Not stated. Named for Kahuku Point quarry, SE Oahu.

Kainer Formation (Edwards Group) KINR02

1. Lower Cretaceous (Comanchean)
2. Texas (SE)
3. Rose, P. R., 1972, Texas Bur. Econ. Geology Rept. Inv. 74, p. 18-19
4. Dolomite and lime sand
6. 120 m, range 120-140 m
8. Informal dolomitic and grainstone members
9. Overlies Glen Rose Formation; underlies Person Formation (Edwards Group)
10. Type section: Shell No. 2 Charles Kainer well, depth-interval 3290-3410 m, Person Field, Karnes County.

Kallander Creek Formation (Powder Mill Group) U KDCK03

1. Precambrian Y
2. Michigan (NW), Wisconsin
3. Hubbard, H. A., 1975, U.S. Geol. Survey Jour. Research, v. 3, no. 5, p. 529-535
4. Basalt, andesite, rhyodacite, trachyandesite
5. Gray, purple, dark-brown, and reddish-brown
6. 4,500 m
7. Chiefly aphanitic or very fine-grained
9. Unconformably(?) overlies Siemens Creek Formation (Powder Mill

Group); unconformably underlies middle Keweenawan(?) nonmagnetic rocks, Portage Lake Volcanics, and Jacobsville Sandstone
10. Type locality: Along Powder Mill Creek valley and hills to E, secs. 5 and 8, T. 47 N., R. 46 W., and sec. 33, T. 48 N., R. 44 W., Gogebic County, Mich.

Kalona Quartzite Member (Lay Dam Formation) KLON01
1. Lower Devonian
2. Alabama (C)
3. Carrington, T. J., 1972, Geol. Soc. America Southeastern Sec. Guidebook 21, Trip 1, p. 14
4. Feldspathic to arkosic quartzite
6. 182 m
7. Fine- to coarse-grained
9. Overlies Jumbo Dolomite; underlies Miller Mill Quartzite Member (Lay Dam Formation)
10. Type locality: E of U.S. Highway I-65, Chilton County.

Karen Creek Sandstone U KRCK04
1. Upper Triassic
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 1, 5, 14-19
4. Arenite
6. 21 m, range 3-38 m
7. Very-fine grained, massively-bedded; large irregular to colloform phosphate nodules
9. Conformably overlies Shublik Formation; disconformably(?) underlies Kingak Shale
10. Type section: W bank of upper part of Karen Creek, 5.1 km S. 48° E. of outlet of Lake Schrader, lat 69°22′ N., long 144°49′ W.

Karheen Formation U KRHN01
1. Upper Silurian and Lower Devonian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1969, U.S. Geol. Survey Bull. 1284, p. 22-27
4. Sandstone, conglomerate, limestone
5. Grayish-green, gray, reddish-brown
6. 1800 m, range 1060-1800 m
7. Bedded to massive
9. Overlies Heceta Limestone (conformably) or Descon Formation (unconformably); conformably underlies Wadleigh Limestone
10. Type locality: Exposures along SW side of Karheen Passage, E Heceta Island.

Karluk Drift U KRLK03
1. Pleistocene
2. Alaska (SC)
3. Karlstrom, T. N. V., 1969, in Karlstrom, T. N. V., and Ball, E. G., eds., Toronto, Ontario, Ryerson Press, p. 20-54
4. Glacial drift
10. Type locality: On mountain slopes where Karluk River flows into Shelikof Straight at Karluk, Kodiak Island.

Kasiska Quartzite Member (Brigham Quartzite) U KSSK01
1. Precambrian Z
2. Idaho (SE)
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 6-7
4. Conglomeratic quartzite, argillite, siltstone
5. Gray, tan
6. 490 m
9. Conformably underlies Windy Pass Argillite Member
10. Type section: W of Twin Knobs, W1/2 sec. 12, T. 10 S., R. 38 E., Bancroft Quadrangle, Bannock and Caribou Counties. Named for Kasiska Ranch.

Katakturuk Dolomite U KKRK01
1. Silurian and Lower Devonian
2. Alaska (NE)
3. Dutro, J. T., Jr., 1970, in Adkison, W. L., and Brosgé, M. M., eds., Am. Assoc. Petroleum Geologists, Pacific Sec., p. M1-M3
4. Siliceous dolomite, shale
6. > 1000 m
7. Fine- to medium-crystalline, thin- to thick-bedded
9. Overlies unnamed dolomite; disconformably underlies Nanook Limestone
10. Type locality: C part of Shublik Mountains.

Kathul Graywacke (Kandik Group) U KTHL01
1. Lower Cretaceous
2. Alaska (NE)
3. Brabb, E. E., 1969, U.S. Geol. Survey Bull. 1274-I, p. I21-I25
4. Sandstone, conglomerate, grading upward to thin beds of siltstone and argillite in rhythmical sets
5. Greenish-gray
6. 450 m, range 450-1000 m
7. Medium- to coarse-grained, poorly sorted
9. Overlies Biederman Argillite (Kandik Group)
10. Type section: Middle to upper S slope of Kathul Mountain, N of Yukon River, from 1.5 to 0.8 km SE of bench mark 3122 (Kat), Charley River B-3 Quadrangle.

Kavik Member (Ivishak Formation) U KVIK01
1. Lower Triassic
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 1, 5, 8-13
4. Shale and siltstone with some argillaceous sandstone beds
6. 85 m, range 37-213 m
7. Thin-bedded, laminated
9. Disconformably to conformably overlies Ikiakpaurak Member (Echooka Formation); conformably underlies Ledge Sandstone Member (Ivishak Formation)
10. Type locality: Along Kavik River on both flanks of small anticline between lat 69°17′ N. and 69 18′ N., long 146°52′ W.

Keenan Quartzite (Kandik Group) U KENN01
1. Lower Cretaceous
2. Alaska (NE)
3. Brabb, E. E., 1969, U.S. Geol. Survey Bull. 1274-I, p. I14-I16
4. Glauconitic quartzite with shale and argillite beds

5. Gray, weathers white to orange
6. 45 m, range 45-300 m
7. Massive
9. Conformably overlies Glenn Shale; conformably underlies Biederman Argillite (Kandik Group)
10. Type section: W bank Yukon River 0.8 km downstream from mouth of Glenn Creek, Charley River B-2 Quadrangle. Named for Keenan Creek, tributary to Glenn Creek.

Keeton Porphyry KTON02

1. Precambrian Y and Z
2. Colorado (C)
3. Murray, Michael, 1975, Rocky Mtn. Assoc. Geologists, v. 12, no. 4, p. 127-132
4. Rhyodacite porphyry with phenocrysts of plagioclase, K-feldspar, quartz, and mafic minerals
5. Groundmass pale reddish-brown; with conspicuous white phenocrysts
7. Vertical dikes, irregular feeders, and sub-horizontal sheets separating granite above from metamorphic rocks below
9. Intrusive into Pikes Peak Granite and Idaho Springs Formation(?) Locally extrusive onto conglomeratic surface
10. Type section: Exposed on W side of Cheyenne Mountain fault in secs. 3 and 10, T. 16 S., R. 67 W., and in SE1/4SW1/4 sec. 25, T. 15 S., R. 67 W., El Paso County.

Keevy Peak Formation U KVPK01

1. Precambrian or Paleozoic
2. Alaska (EC)
3. Wahrhaftig, Clyde, 1968, U.S. Geol. Survey Bull. 1254-E, p. E11-E12
4. Quartz-sericite schist, slate, quartzite, conglomerate
5. Black
6. 760-910 m
7. Lenticular bodies of stretched conglomerate occur at base of formation
9. Overlies Birch Creek Schist; underlies Totatlanika Schist
10. Type locality: NW shoulder of Keevy Peak, Healy D-3 Quadrangle.

Keim Formation KEIM01

1. Pliocene or Pleistocene
2. Nebraska (NC)
3. Skinner, M. F., and Hibbard, C. W., 1972, Am. Mus. Nat. History Bull., v. 148, art. 1, p. 21-24
4. Sand, silt, clay, limestone
6. 14 m, range 14-40 m
7. Fine-grained swamp and lake deposits
9. Unconformably overlies Valentine and Ash Hollow Formations; unconformably underlies Long Pine Formation
10. Type locality: W fork of Deep Creek in E1/2 sec. 11, T. 31 N., R. 23 W., Brown County. Named for Ray Keim Ranch.

Kellerville Till Member (Glasford Formation) KLVL01

1. Pleistocene (Illinoian)
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 55-56
4. Till with intercalated sand and gravel

6. Range 15-45 m
9. Overlies Petersburg Silt or Yarmouth soil; underlies Pike soil, Teneriffe Silt, or Duncan Mills Member, Hulick Till Member, or Ogle Till Member (Glasford Formation)
10. Type section: Roadcut exposures 3.2 km SW of Kellerville, NW1/4NW1/4SW1/4 sec. 11, T. 2 S., R. 5 W., Adams County.

Kelley Canyon Formation U KLCN01
1. Precambrian Z
2. Utah (NC)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 589-590
4. Argillite with quartzite beds and limestone lenses, persistent basal dolomite bed
6. 610 m
7. Fine-grained, thin-bedded; cyclic laminations in dolomite
9. Overlies Maple Canyon Formation; gradationally underlies Caddy Canyon Quartzite (Brigham Group)
10. Type section: Head of Kelley Canyon, 5.5 km E of Huntsville, S1/2 sec. 3, T. 6 N., R. 2 E., Weber County.

Kemik Sandstone Member (Kongakut Formation) U KMIK01
1. Lower Cretaceous
2. Alaska (NE)
3. Keller, A. S., Morris, R. H., and Detterman, R. L., 1961, U.S. Geol. Survey Prof. Paper 303-D, p. 196
4. Quartzose sandstone
5. Gray
6. 66 m
7. Fine- to medium-grained, sugary texture, marine
9. Conformably overlies Kingak Shale; underlies unnamed upper member of Kongakut Formation
10. Type locality: Along S bank of Kemik Creek, tributary to Shaviavik River, lat 69°29′ N., long 147°12′ W.

Kennebago Member (Albee Formation) U KNBG01
1. Lower and (or) Middle Ordovician
2. Maine (WC)
3. Harwood, D. S., 1973, U.S. Geol. Survey Bull. 1346, p. 17-19
4. Slate with quartzite and greenstone
5. Red, maroon, gray
6. 1370 m
9. Conformably underlies and grades into Portage Brook Member
10. Type locality: Exposures along banks of Kennebago River, 0.8 km downstream from dam at outlet of Kennebago Lake, Cupsuptic Quadrangle, Franklin County.

Keokee Sandstone Member (Wise Formation) U KEOK02
1. Middle Pennsylvanian
2. Virginia (SW)
3. Miller, R. L., 1969, U.S. Geol. Survey Bull. 1280, p. 27-28
4. Sandstone
5. Gray, yellow-brown
6. 18 m
7. Medium-grained, thick-bedded
9. Overlies and underlies unnamed siltstones in Wise Formation; lies 37 m below Clover Fork Sandstone Member

10. Type section: Ledges 1.6 km E of Keokee along State Highway 68, NE Lee County.

Kerbel Formation KRBL01
1. Upper Cambrian
2. Ohio (NC)
3. Janssens, Adriaan, 1973, Ohio Div. Geol. Survey Bull. 64, p. 15-22
4. Sandstone, dolomitic in upper part
6. Range 0-52 m
7. Fine- to coarse-grained
9. Overlies Eau Claire and Conasaugo Formations; underlies Knox Dolomite
10. Type section: Maguire No. 1 Kerbel well, Woodville Township, Elmore Quadrangle, Sandusky County.

Keres Group U KERS01
1. Pliocene, lower to middle
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P2-P5
4. Basaltic, andesitic, dacitic, rhyolitic rocks
6. Range 910-1820 m
8. Basalt of Chamisa Mesa, Canovas Canyon Rhyolite, Paliza Canyon Formation, Bearhead Rhyolite
9. Conformably overlies Santa Fe Formation and interfingers with Cochiti Formation; unconformably underlies Polvadera and Tewa Groups
10. Type area: S Jemez Mountains, Sandoval County. Name taken from Keresan Range, old name for this part of Jemez Mountains.

Kessler Canyon Formation (Oquirrh Group) U KLRC02
1. Upper Pennsylvanian and Lower Permian(?)
2. Utah (NW)
3. Tooker, E. W., and Roberts, R. J., 1970, U.S. Geol. Survey Prof. Paper 629-A, p. A18-A21
4. Orthoquartzite and cherty limestone in lower part; sandstone, dolomite, and chert in upper part
6. 1300 m
9. Conformably overlies Erda Formation; conformably underlies Park City Formation
10. Type section: Lower part: sec. 30, T. 1 S, R. 3 W.; upper part: secs. 27 and 35, T. 1 S., R. 3 W., Oquirrh Mountains, Salt Lake County. Named for prominent N-flowing stream at N end of Oquirrh Mountains.

Ketchepedrakee Amphibolite KCPK01
1. Paleozoic, middle
2. Alabama (EC)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 41-42
10. Type area: Exposures along Ketchepedrakee Creek in N Clay County.

Keystone Quartz Diorite KSTN03
1. Precambrian
2. Wyoming (SE)
3. Houston, R. S., and others, 1968, Wyoming Geol. Survey Mem. 1, p. 66-68

5. Dark-gray
10. Type locality: Exposures along Douglas Creek S of old mining town of Keystone, SE1/4, T. 14 N., R. 79 W., Albany County.

Keystone Dam Member (Iola Limestone) KSDM03
1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Desjardins, L. A., 1972, Tulsa Geol. Soc. Digest, v. 37, p. 65
4. Limestone
10. Type section: Bed and bank of Brush Creek, E1/2 sec. 4, T. 19 N., R. 10 E., S of new State Highway 51 interchange cloverleaf, Tulsa County.

Keystone Park Member (Wann Formation) KPRK01
1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Desjardins, L. A., 1972, Tulsa Geol. Soc. Digest, v. 37, p. 68
4. Continental deposits, massive sandstones alternating with shales
5. Brown-red
6. 46 m
9. Overlies Tall Chief Member
10. Type locality: Not stated. Probably named for Keystone State Park, T. 19 N., R. 10 E., Tulsa County.

Khaz Formation (Kelp Bay Group) U KHAZ01
1. Triassic and (or) Jurassic
2. Alaska (SE)
3. Loney, R. A., Brew, D. A., Muffler, L. J. P., and Pomeroy, J. S., 1975, U.S. Geol. Survey Prof. Paper 792, p. 18-21
4. Greenstone, greenschist, graywacke, and phyllite
7. Folded, faulted, sheared
9. Uppermost formation of Kelp Bay Group; overlies Waterfall Greenstone; underlies Sitka Graywacke
10. Type locality: Exposed across Khaz Peninsula at latitude of head of Slocum Arm on Chichagof Island.

Kidder Limestone Member (Monteagle Limestone) U KDDR01
1. Upper Mississippian
2. Kentucky (SC), Tennessee
3. Lewis, R. Q., Sr., 1971, U.S. Geol. Survey Bull. 1324-E, p. E6-E9
4. Limestone, oolite, calcilutite, calcarenite
6. Range 34-58 m
7. Fossiliferous
8. Four informal units
9. Overlies Ste. Genevieve Limestone Member (Monteagle Limestone); underlies Hartselle Formation
10. Type section: Along State Highway 790 at town of Kidder between Doublehead Gap and bridge over Sinking Creek, Frazer Quadrangle, Wayne County, Ky.

Kimball Creek Felsite (North Shore Group) KBCK03
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. Porphyritic felsite
5. Pink to tan

6. 400 m
9. Overlies Marr Island Lava; underlies Red Cliff Basalt
10. Type area: Cook County.

Kimberly Member (John Day Formation) KMBL05
1. Miocene, lower
2. Oregon (C)
3. Fisher, R. V., and Rensberger, J. M., 1972, California Univ. Pubs. Geol. Sci., v. 101, p. 15
4. Unzeolitized massive tuff
5. Gray to yellow-gray
6. 91 m
9. Overlies Turtle Cove Member (John Day Formation); underlies Haystack Valley Member (John Day Formation) or Columbia River Basalt
10. Type locality: Not stated. Named for town of Kimberly, sec. 30, T. 9 S., R. 26 E., Grant County.

Kimbeto Member (Ojo Alamo Sandstone) KMBT01
1. Paleocene, lower
2. New Mexico (NW)
3. Powell, J. S., 1973, Four Corners Geol. Soc. Mem. 1, p. 111-122
4. Conglomeratic sandstone
6. Range 20-82 m
7. Coarse-grained, crossbedded. Dinosaur bones found in lower part
9. Overlies Naashoibito Member (Ojo Alamos Sandstone); underlies and intertongues with Nacimiento Formation
10. Type locality: Not stated. Named for exposures near Kimbeto Trading Post. Most productive fossil locality is in NW1/4 sec. 32, T. 25 N., R. 12 W., in small tributary to Hunters Wash, San Juan County.

Kings Falls Limestone (Trenton Group) KGFL01
1. Middle Ordovician
2. New York (NC)
3. Kay, Marshall, 1968, Naturaliste Canadien, v. 95, no. 6, p. 1376
6. 30 m
7. Fossiliferous, thick ledges of calcarenite and coquinite with large ripples
9. Overlies Napanee Limestone; underlies Sugar River Limestone
10. Type section: Base to top of Kings Falls on Deer River, 3 km W of Deer River village, Denmark Township, Lewis County.

Kingston Canyon Tuff Member (Mount Dutton Formation) U KGSC02
1. Oligocene, upper and (or) Miocene, lower
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B14-B15
4. Tuff, vitrophyre
5. Pale-purple, black
6. 12 m
7. Crystal-poor ash-flow tuff near base of alluvial facies of Mount Dutton
9. Intercalated with unnamed volcanic member of Mount Dutton Formation
10. Type section: NW1/4NE1/4 sec. 16, T. 30 S., R. 2-1/2 W., in Kingston Canyon E of town of Kingston, Piute County.

Kinney Rim Member (Washakie Formation) U KNRM01
1. Eocene, middle
2. Wyoming (SW)
3. Roehler, H. W., 1973, U.S. Geol. Survey Bull. 1369, p. 12-14
4. Mudstone, sandstone, tuff
5. Gray, green, red, white
6. 270 m
9. Overlies Hartt Cabin or Sand Butte Bed (Laney Member of Green River Formation); unconformably underlies Adobe Town Member
10. Type section: Lower part: S1/2 sec. 16, T. 14 N., R. 99 W.; upper part: SW1/4 sec. 15, T. 14 N., R. 99 W., Washakie Basin, Sweetwater County.

Kinter Formation U KNTR02
1. Miocene
2. Arizona (SW), California
3. Olmsted, F. H., Loeltz, O. J., and Irelan, Burdge, 1973, U.S. Geol. Survey Prof. Paper 486-H, p. H33-H37
4. Upper member: fanglomerate with some sandstone and mudstone; lower member: breccia with tongues of sandstone and mudstone
5. Upper member: gray; lower member: gray-brown
6. 2000 m
9. Overlies volcanic rocks of Tertiary age; unconformably(?) underlies Bouse Formation
10. Type section: Secs. 3, 9, 10, 11, T. 8 S., R. 21 W., Gila and Salt River base line and meridian, directly S of Wellton-Mohawk Canal, 1.7 km E to 1.3 km S of McPhaul Bridge, and about 11.2 km SE of Laguna Dam, Yuma County, Ariz.

Kisinger Sandstone KSGR01
1. Upper Pennsylvanian
2. Texas (NC)
3. Shelton, J. W., 1973, Oklahoma Geol. Survey Bull. 118, p. 18-24
4. Chert
5. White, gray
6. 46 m
7. Textural sequences of conglomerate to medium-grained sandstone each 6 to 9 m thick. River-bed deposit
9. Overlies Home Creek Limestone, Ranger Limestone, and Colony Creek Shale; underlies Salem School Limestone
10. Type locality: Outcrops along Brazos River, SE Young County.

Kissenger Limestone Member (Bryant Knob Formation) KSGR02
1. Lower Silurian
2. Missouri (NE)
3. Thompson, T. L., and Satterfield, I. R., 1975, Missouri Geol. Survey Rept. Inv. 57, p. 97-99
5. Light-gray and light-brown
7. Coarsely crystalline, bioclastic
9. Overlies unnamed unit of Bryant Knob Formation; underlies Bowling Green Dolomite (Edgewood Group)
10. Type section: Kissenger roadcut on Missouri Highway 79, 1.6 km N of Kissenger, 8 km S of Clarksville, SW1/4 sec. 35, T. 53 N., R. 1 E., Pike County.

Klawak Formation U KLWK02
1. Lower and Middle Pennsylvanian
2. Alaska (SE)

3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 54-59
4. Calcareous sandstone and siltstone, minor limestone and chert-pebble conglomerate
5. Weathers orange
6. Range 150-300 m
7. Thin-bedded, slabby, fossiliferous
9. Conformably overlies Peratrovich Formation; upper contact unknown
10. Type locality: W coast of Prince of Wales Island, and adjacent small islands, from Klawak Harbor N about 4 km to near S entrance to Big Salt Lake.

Knifley Sandstone Member (Fort Payne Formation) U KNFL01

1. Lower Mississippian
2. Kentucky (SC)
3. Hrabar, S. V., Kepferle, R. C., and others, 1972, Kentucky Geol. Survey Rept. Inv. 13, p. 4
4. Sandstone, very fine-grained, silty, argillaceous, and dolomitic
5. Gray to light-gray, weathers yellowish-brown and brownish-red
6. 60 m, range 60-76 m
9. Overlies New Providence Shale Member; underlies Cane Valley Limestone Member
10. Type section: High bluff on N side of Green River Lake opposite Fisher Bend near Knifley, Adair County.

Kobau Formation U KOBU01

1. Permian or Triassic
2. Washington, Canada (British Columbia)
3. Rinehart, C. D., and Fox, K. F., Jr., 1972, Washington Div. Mines and Geology Bull. 64, p. 6-8
4. Greenstone and quartzite, with some phyllite
5. Grayish-green
6. 3660 m
7. Hornfelsic, slaty, schistose, gneissose; massive to thin-laminated
9. Unconformably overlies Bullfrog Mountain Formation (Anarchist Group); interfingers with Palmer Mountain Greenstone; unconformably underlies Ellemeham Formation
10. Reference locality: NE flank of Ellemeham Mountain, sec. 19, T. 40 N., R. 26 E., Loomis Quadrangle, Okanogan County, Wash. Named for Mount Kobau, British Columbia, 12.8 km N of Lenton Flat.

Kobeh Member (McColley Canyon Formation) U KOBH01

1. Lower Devonian
2. Nevada (C)
3. Murphy, M. A., and Gronberg, E. C., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 130
4. Dolomite, limestone
5. Gray
6. Range 49-113 m
7. Fossiliferous
9. Conformably overlies Lone Mountain Dolomite; conformably underlies Bartine Member (McColley Canyon Formation)
10. Type locality: Main ridge, extending SW from peak of Lone Mountain, accessible from U.S. Highway 50, Eureka County. Named for Kobeh Valley, NE of Lone Mountain.

Kodiak Formation U KODK01
1. Upper Cretaceous
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A28-A30
4. Phyllitic and shaly sandstone and slate
6. 30,000 m
7. Geosynclinal sequence of graded beds that average 1 m thick
9. Intruded by middle Tertiary quartz diorite; Triassic rocks are thrust over youngest part of formation
10. Type section: Along W shore of Uyak Bay, Kodiak Island, from 4 km S of head of bay to 3 km S of Uyak village.

Kolob Limestone Member (Carmel Formation) KOLB03
1. Middle Jurassic
2. Utah (SW)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 6-7
4. Limestone, shale, siltstone, gypsum
6. Range 37-168 m
7. Fossiliferous
9. Overlies Temple Cap Member (Navajo Sandstone); unconformably underlies Crystal Creek Member (Carmel Formation)
10. Type section: Between Virgin River bridge, 3.2 km SW of Mount Carmel, and point 3.2 km W of Mount Carmel, Kane County. Named for Kolob Terrace.

Kongakut Formation U KNGK04
1. Lower Cretaceous
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 20-29
4. Shale and siltstone with minor sandstone
5. Gray, black
6. 637 m
7. Clay shale: nonresistant saddle-forming; Kemik Sandstone Member: very fine grained with resistant ledges; pebble shale: resistant highly manganiferous beds in middle, remainder forms saddles; siltstone: contains sandstone beds that form prominent ledges
8. Clay shale, Kemik Sandstone, pebble shale, and siltstone members
9. Unconformably overlies Ivishak Formation (Sadlerochit Group); conformably underlies Bathtub Graywacke
10. Type section: N flank of Bathtub Ridge, 15.8 km S. 85° W. of mouth of Cottonwood Creek, lat 69°06′30″ N., long 142°17′ W.

Kowaliga Gneiss KWLG01
1. Paleozoic, lower
2. Alabama (C)
3. Bentley, R. D. and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 20-21
4. Quartz monzonite gneiss
7. Coarse-grained, contains augen up to 10 cm in diameter
9. Intrudes Centralhatchee Formation(?) (Heard Group)
10. Type locality: Exposed along Kowaliga Creek, Elmore County.

Kremmling Sandstone Member (Pierre Shale) U KMLG01
1. Upper Cretaceous
2. Colorado (NC)

3. Izett, G. A., Cobban, W. A., and Gill, J. R., 1971, U.S. Geol. Survey Prof. Paper 684-A, p. A11-A17
4. Flaggy sandstone, shaly siltstone
6. Range 6-21 m
7. Ledge- to cliff-forming, ripple marks and worm trails occur along bedding planes
9. Overlies and underlies unnamed shale units of Pierre Shale
10. Type locality: SE1/4NW1/4 sec. 7, T. 1 N., R. 80 W., 0.8 km N of town of Kremmling, Grand County.

Krugloi Formation U KRGL01

1. Mesozoic or Tertiary
2. Alaska (SW)
3. Gates, Olcott, Powers, H. A., and Wilcox, R. E., 1971, U.S. Geol. Survey Bull. 1028-U, p. 766-768
4. Bedded argillite, siltstone, and chert with some basaltic and spilitic lava, tuff, tuff-agglomerate, and conglomerate
5. 2250 m
10. Type area: Mountain peaks from Krugloi Point W to Peak I, NE Agattu Island, Near Islands.

Kwagunt Formation (Chuar Group) KGNT01

1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1243-1260
4. Argillaceous shale, sandstone, mudstone, siltstone, limestone
6. 675 m
8. Carbon Butte Member, Awatubi Member, Flaky dolomite bed, Walcott Member
9. Overlies Galeros Formation (Chuar Group); underlies Sixty Mile Formation
10. Type locality: Not stated. Named for Kwagunt Canyon, Coconino County.

La Casa Member (Wild Cow Formation) U LACS01

1. Upper Pennsylvanian and Lower Permian
2. New Mexico (C)
3. Myers, D. A., 1973, U. S. Geol. Survey Bull. 1352-F, p. F10-F11
4. Siltstone, shale, calcarenite
5. Gray
6. 88 m
9. Conformably overlies Pine Shadow Member (Wild Cow Formation); underlies Bursum Formation
10. Type section: Exposures on W side of Priest Canyon, sec. 7, T. 3 N., R. 5 E., Torrance County. Named for La Casa Spring, SW1/4NE1/4 sec. 6, T. 3 N., R. 5 E.

LaClede Bed (Laney Member of Green River Formation) U LCLD02

1. Eocene, middle
2. Wyoming (SW)
3. Roehler, H. W., 1973, U. S. Geol. Survey Bull. 1372-E, p. E15-E18
4. Oil-shale interbedded with siltstone and sandstone
5. Tan to brown
6. Range 44-139 m
8. Lower buff marker, middle Gyraulus marker, upper green shale marker
9. Overlies and intertongues with Cathedral Bluffs Tongue (Wasatch

Formation); conformably underlies or intertongues with Sand Butte and Hartt Cabin Beds (Laney Member)
10. Type section: On Laney Rim, secs. 14, 15, and 23, T. 17 N., R. 98 W., Sweetwater County. Named for LaClede Stage Station ruins on Overland Trail, NE1/4 sec. 26, T. 17 N., R. 98 W.

Lacon Formation LCON01
1. Quaternary
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 77-78
4. Mudflow deposits of locally derived rocks
7. Landslide and rockfall masses
9. Locally overlies Cahokia Alluvium
10. Type section: Landslip area along base of bluffs of Illinois Valley, 3.2 km NW of Lacon, E 1/2 sec. 2, T. 12 N., R. 9 E., Marshall County.

La Crosse Sandstone LCRS02
1. Upper Cretaceous (Gulfian)
2. Florida (NE)
3. Babcock, Clarence, 1969, Florida Div. Geology Inf. Circ. 60, p. 1-7, 9-10
4. Quartzitic sandstone
6. 83 m
7. Fine-grained, thin-bedded
9. Overlies Atkinson Formation; underlies Austin Chalk
10. Type section: Tidewater No. 1 Parker test well, sec. 33, T. 7 S., R. 19 E., Alachua County.

Ladrones Limestone U LDRS03
1. Lower and Middle Pennsylvanian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 59-60
6. 274 m
7. Sublithographic, massive-bedded, fossiliferous; contains interbeds of calcarenite in upper part
9. Conformably overlies Peratrovich Formation; top not exposed
10. Type locality: Ladrones Islands, between Bucareli and Trocadero Bays off W coast of Prince of Wales Island.

La Jara Canyon Member (Treasure Mountain Tuff) U LJRC01
1. Oligocene, upper
2. Colorado (SC)
3. Lipman, P. W., and Steven, T. A., 1970, U.S. Geol. Survey Prof. Paper 700-C, p. C21-C23
4. Quartz latite ash-flow tuff
6. 100 m (> 800 m within caldera)
7. Porphyritic, densely welded, multiple-flow, reversed magnetic polarity
9. Conformably overlies informal lower tuff of Treasure Mountain Tuff, or unconformably overlies Conejos Formation; conformably underlies informal middle tuff or Ojito Creek Member (Treasure Mountain Tuff)
10. Type locality: La Jara Canyon, 27 km SE of Platoro, lat 37°10′ N., long 106°20′ W., Conejos County.

Lake Forest Member (Lake Michigan Formation) LKFR01

1. Holocene
2. Illinois (NE), Michigan, Wisconsin
3. Lineback, J. A., Ayer, N. J., and Gross, D. L., 1970, Illinois Geol. Survey Environmental Geology Notes 35, p. 8, 16-17
4. Silty clay, containing mottling and many thin beds of black clay
6. 0.2 m
7. More silty than underlying members; less sandy and more compact than overlying member
9. Overlies Winnetka Member; underlies Waukegan Member
10. Type section: Core 143, depth-interval 16-35.5 cm, water depth 119 m, lat 42°21.8′ N., long 81°10.8 W., Lake Michigan, 51 km E of Waukegan, Lake County, Ill. Named for town of Lake Forest, Lake County, Ill.

Lake McLain Quartz Diorite LKMC01

1. Precambrian
2. Wyoming (NC)
3. Heimlich, R. A., 1969, Wyoming Univ. Contr. Geology, v. 8, no. 1, p. 47-61
5. Mottled black and white
7. Crescent-shaped plug
10. Type area: Bighorn Mountains, about 8 km N of Powder River Pass on U.S. Highway 16, Bighorn County.

Lake Mathews Formation LKMS01

1. Pliocene, lower (Clarendonian)
2. California (SE)
3. Woodford, A. O., Shelton, J. S., Doehring, D. O., and Morton, R. K., 1971, Geol. Soc. America Bull., v. 82, no. 12, p. 3427-3428
4. Sandstone and conglomerate
5. Green
6. 89 m
7. Continental sediments filling bowls and valleys in bedrock. Fossil mammals
10. Type locality: S side of Lake Mathews in SW1/4 sec. 7, T. 4 W., R. 5 S., Riverside County.

Lake Michigan Formation LKMG01

1. Quaternary
2. Illinois (NE), Michigan, Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 78
4. Silty clay
5. Gray to brown
6. 3.3 m
7. Lacustrine deposits and beach sediments
8. South Haven Member, Sheboygan Member, and its Wilmette Bed, Winnetka Member, Lake Forest Member, Waukegan Member, Ravinia Sand Member
9. Overlies till or Paleozoic bedrock
10. Type section: Lake Michigan bottom sediments extending from point 19 km E to point 51 km E of Waukegan, Lake County, Ill.; at latter point, core 143, depth-interval 0-326 cm, water depth 119 m.

Lake Point Limestone (Oquirrh Group) U LKPN03
1. Upper Mississippian and Lower Pennsylvanian
2. Utah (NW)
3. Tooker, E. W., and Roberts, R. J., 1970, U.S. Geol. Survey Prof. Paper 629-A, p. A11-A14
4. Limestone, locally cherty and sandy, with shale and conglomerate beds
5. Gray to tan
6. 520 m
7. Massive cliff-forming to thin-bedded
9. Conformably overlies Green Ravine Formation; conformably underlies Erda Formation
10. Type section: W side of Kessler Peak, NE1/4 sec. 6, T. 2 S., R. 3 W., to SW1/4 sec. 31, T. 1 S., R. 3 W., Garfield Quadrangle, Tooele County. Named for town of Lake Point S of Great Salt Lake.

Lakeside Lava (North Shore Group) LKSD02
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Porphyrites, melaphyres, felsites, andesites
6. 1090 m
8. Informal Tischer Creek felsite
9. Overlies Endion sill and Leif Ericson Park Lava; underlies Lester River diabase sill and Lakewood Basalt
10. Type locality: From Lester River to Leif Ericson Park in E Duluth, St. Louis County.

Lake Trafford Formation (Ocean Reef Group) LKTF01
1. Lower Cretaceous
2. Florida (SE)
3. Oglesby, W. R., 1965, Florida Geol. Survey Map Ser. no. 19, p. 1-3
4. Limestone with minor anhydrite
5. Buff to brown
6. 41 m
9. Overlies Sunniland Limestone
10. Type section: Humble Oil and Refining Company No. 1 J. A. Curry well, 4 km E of Lake Trafford, sec. 8, T. 47 S., R. 29 E., Collier County.

Lake Vermilion Formation LKVM02
1. Precambrian W
2. Minnesota (NE)
3. Morey, G. B., Green, J. C., Ojakangas, R. W., and Sims, P. K., 1970, Minnesota Geol. Survey Rept. Inv. 14, p. 12-13, 20-25
4. See lithologies of members; these also contain banded iron-formation, metabasalt, and metadiabase
6. < 6000 m
7. Complexly folded and faulted, inverted anticline
8. Informal metagraywacke-slate, volcaniclastic, feldspathic quartzite, and mixed metagraywacke-felsic conglomerate members
9. Overlies Ely Greenstone or Soudan Iron-formation; underlies Newton Lake Formation; intruded by Giants Range Granite; in fault contact with biotite schist associated with Vermilion Granite
10. Type area: Shores of Lake Vermilion, S and SE to Embarrass and

Babbitt, in W part of Vermilion district, St. Louis County. Type localities designated for first 3 members: NW of bridge on County Highway 77 over Pike River, SW1/4 sec. 3, T. 61 N., R. 16 W.; Ely Island and adjacent mainland, C part of T. 62 N., Rs. 14 and 15 W.; S of Lake Vermilion, 3.2 km W of Tower, along State Highway 169-1; fourth member exposed SE of Tower and N of Embarrass and Babbitt.

Lakewood Basalt (North Shore Group) LKWD03

1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Mixed basalts, mostly non-ophitic
6. 1340 m
9. Overlies Lakeside Lava; underlies Sucker River Basalt
10. Type locality: Extends past Lakewood pumping station, Duluth, St. Louis County.

Lamar River Formation (Washburn Group) U LMRV03

1. Eocene, lower to middle
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 19-21
4. Volcanic breccias, conglomerates, and tuffs; brecciated andesite intrusives in lower part of formation
5. Brown
6. Range 150-670 m
7. Tuffs contain fossil forests
8. Elk Creek Basalt Member
9. Overlies or grades laterally into Sepulcher Formation (Washburn Group); underlies Wapiti Formation (Sunlight Group) or Langford Formation (Thorofare Creek Group)
10. Type area: Valley walls of Lamar River and tributaries, Yellowstone National Park, Park County, Wyo.

Lamb Cove Member (Perry Formation) LBCV01

1. Upper Devonian
2. Maine (EC), Canada (New Brunswick)
3. Schluger, P. R., 1973, Geol. Soc. America Bull., v. 84, no. 8, p. 2535
4. Conglomerate, with minor sandstone and mudstone
5. Red
6. 264 m
7. Massive, contains angular to rounded boulders
9. Overlies Red Beach Granite; underlies Loring Cove Basalt Member (Perry Formation)
10. Type section: Lamb Cove, on SW bank of St. Croix River, 3.5 km NW of Robbinston, Washington County, Me.

Land Creek Formation (Dove Creek Group) LDCK10

1. Paleozoic
2. Idaho (SC)
3. Armstrong, R. L., 1968, Geol. Soc. America Bull., v. 79, no. 10, p. 1298
4. Limestone and schist
5. Blue-gray
9. Overlies Harrison Summit Quartzite; underlies Dayley Creek

Quartzite
10. Type locality: W flank of Mount Harrison, Cassia County.

Land Monument Mesa Latite LMMM01
1. Eocene
2. Idaho (C)
3. Shannon, S. S., Jr., and Reynolds, S. J., 1975, Idaho Bur. Mines and Geology Inf. Circ. 29, p. 5
4. Aphanitic latite
5. Gray
6. Range 30-60 m
9. Overlies volcaniclastic breccia
10. Type area: Uppermost rock in Thunder Mountain Cauldron, T. 19 N., R. 11 E., Valley County.

Landslide Creek Formation U LDCK05
1. Upper Cretaceous
2. Montana (SC), Wyoming
3. Fraser, G. D., Waldrop, H. A., and Hyden, H. J., 1969, U.S. Geol. Survey Bull. 1277, p. 34-37
4. Sandstone interbedded with mudstone and claystone
5. Gray, olive-drab, yellow, green
6. 610 m
9. Unconformably overlies Everts Formation; unconformably underlies Quaternary surficial deposits
10. Composite type area: On and N of Mount Everts; 2.4 to 5.6 km NW of Gardiner along mountain front to Little Trail Creek; Landslide Creek area in SW corner of mapped area; and at N end of topographic nose 6.4 km NW of Gardiner and E of Reese Creek, Park County, Mont.

Langford Formation (Thorofare Creek Group) U LGFD03
1. Eocene, middle
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 28-29
4. Andesitic volcaniclastic strata and lava flows of vent and alluvial facies
5. Light-gray
6. 610 m
8. Promontory Member
9. Overlies Lamar River Formation (Washburn Group), Trout Peak Trachyandesite, or Mount Wallace Formation (Sunlight Group); unconformably underlies Two Ocean Formation (Thorofare Creek Group)
10. Type area: Mount Langford, Yellowstone National Park, Park County, Wyo.

Langtry Member (Boquillas Formation) LNGR05
1. Upper Cretaceous (Gulfian)
2. Texas (C)
3. Pessagno, E. A., Jr., 1969, Geol. Soc. America Mem. 111, p. 62-63
4. Calcareous marlstone, marl, chalky limestone
5. Buff
6. 12 m
7. Thin-bedded, lenticular, planktonic foraminifera
9. Gradationally overlies Rock Pens Member (Boquillas Formation); conformably underlies Austin Chalk

10. Type locality: Lozier Canyon, 1.2 km S of U.S. Highway 90, 4.8 km W of Val Verde County line, Terrell County. Named for Langtry, Val Verde County.

Laniloa Formation LNLO01
1. Pleistocene (upper Wisconsinan)
2. Hawaii (NC)
3. Stearns, H. T., 1970, Bishop Mus. Occasional Papers, v. 24, no. 4, p. 50-69
4. Lithified sand dunes
6. 14 m
7. Contact cemented sand
10. Type locality: Not stated. Named for Laniloa Point, Oahu, at seaward tip of large lithified dune at Laie.

Laramie Anorthosite Complex LRMI02
1. Precambrian Y
2. Wyoming (SE)
3. Hodge, D. S., Owen, L. B., and Smithson, S. B., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1453
4. Anorthosite, norite, syenite
6. 4000 m
7. Core of anorthosite surrounded by partial layers of norite and syenite
8. Red Mountain Hornblende Syenite
9. Intruded by Sherman Granite
10. Type area: Southern Laramie Mountains between lat 41°15′-41°55′ N. and long 105°10′-105°30′ W., Albany County.

Larsen Quartzite U LRSN01
1. Middle Pennsylvanian
2. Colorado (SW)
3. McKnight, E. T., 1974, U.S. Geol. Survey Prof. Paper 723, p. 8, 13-16
4. Quartzite
5. Light-gray to brown
6. 23 m
9. Unconformably overlies Leadville Limestone; conformably underlies Hermosa Formation
10. Type locality: Above portal of Larsen Tunnel on N slope of Silver Creek, Rico district, Dolores County.

Larsmont Ophitic Basalt (North Shore Group)/Basalt (North Shore Group) LRSM01
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Amygdaloidal ophitic olivine basalt
6. 490 m
9. Overlies Sucker River Basalt; underlies Two Harbors Basalt
10. Type area: Extends from Two Harbors SW to Knife River, Lake County.

La Sauses Member (Conejos Formation) LSSS01
1. Oligocene, upper
2. Colorado (SC)
3. Burroughs, R. L., 1971, New Mexico Geol. Soc. Guidebook 22, p. 280

4. Interbedded tuff-breccias, mudflows, lava flows, crystal tuffs, and local epiclastic deposits
5. Gray-pink to red-brown
6. Range 15-240 m
9. Unconformably overlies Wildhorse Member; unconformably underlies Manassa Member
10. Type locality: Cliffs along length of Wildhorse Ridge E of town of La Sauses, continuing S on both sides of La Sauses Gorge 4.8 km S of town, Conejos County.

Las Palmas Amphibolite/Hornblende Schist (Bermeja Complex) LPLM01
1. Lower Cretaceous (?)
2. Puerto Rico (SW)
3. Mattson, P. H., 1973, Geol. Soc. America Bull., v. 84, no. 1, p. 22
4. Hornblende schist and amphibolite
7. Tectonic blocks, foliated and unfoliated
9. In sheared serpentinite
10. Type area: Quebrada Cajul S of Las Palmas, 17,000 N., 78,000 E., Sierra Bermeja.

Lata Formation LATA01
1. Pliocene, Pleistocene
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 429
4. Basalt lavas and tuffs
6. 3650 m
7. Shield volcano and collapsed caldera, aa flows
8. Informal extra - and intra-caldera members
10. Type locality: Lata Mountain, Táu Island.

Laurel Run Formation (Allegheny Group) LRLR01
1. Middle Pennsylvanian
2. Pennsylvania (C)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 16, 22-24
4. Shale, siltstone, interbedded with sandstone, coal, underclay
5. Gray to black
6. 14 m
7. Represents one cycle of deposition; underclay contains zone of limestone boulders
8. Includes informal upper Kittanning coal at base, lower Freeport underclay at top
9. Overlies Mineral Springs Formation, underlies Glen Richey Formation
10. Type section: Exposure in strip mine W of village of Pleasant Hill, 305 m W of long 78°15′ W., 125 m S of lat 40°55′ N., Decatur Township, Clearfield County. Named for stream, Laurel Run.

Lava Creek Tuff (Yellowstone Group) U LVCK05
1. Pleistocene
2. Wyoming (NW), Idaho, Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B7-B9
4. Devitrified welded ash-flow tuff
6. 210 m, range 210-300 m
8. Two informal members

9. Overlies Huckleberry Ridge or Mesa Falls Tuff (Yellowstone Group), Lewis Canyon Rhyolite, Mount Jackson Rhyolite, Undine Falls Basalt, or Junction Butte Basalt; locally underlies Falls River Basalt, Plateau Rhyolite, Madison River Basalt, or Swan Lake Flat Basalt
10. Type area: Walls of upper canyon of Lava Creek and its tributary, Arrow Canyon, Yellowstone National Park, Park County, Wyo.

La Vale Member (Keyser Limestone) LVLE04
1. Lower Devonian
2. Maryland (NW), Pennsylvania, Virginia, West Virginia
3. Head, J. W., III, 1972, Pennsylvania Geologists Field Conf. Guidebook 37, p. 100
6. 10.5 m
7. Banded, laminated carbonate lithofacies, stromatoporoids
9. Overlies Jersey Shore Member (Keyser Limestone); underlies New Creek Limestone
10. Type locality: Corriganville Quarry, Allegany County, Md. Named for nearby town of La Vale.

Lava Top Butte Flow LVTB01
1. Holocene
2. Oregon (C)
3. Greeley, Ronald, 1971, Oregon Dept. Geology and Mineral Industries Bull. 71, p. 3, 12-13
4. Basalt
7. Caldera flank fissure eruption
10. Type locality: Lava Top Butte, on flank of Newberry Caldera, T. 19 S., R. 13 E., Deschutes County.

Lay Dam Formation (Talladega Group) LYDM01
1. Lower Devonian
2. Alabama (C)
3. Carrington, T. J., 1972, Geol. Soc. America Southeastern Sec. Guidebook 21, Trip 1, p. 13-15
4. Bouldery graywacke with intercalated slate and phyllite
5. Gray-green to black
6. Range 1800-3600 m
8. Miller Mill Quartzite Member, Kalona Quartzite Member
9. Underlies upper portion of Butting Ram Sandstone
10. Type locality: Both sides of U.S. Highway I-65, Chilton County.

Lead Bell Shale U LDBL01
1. Middle Cambrian
2. Idaho (SE), Utah
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 22-23, 33-36
4. Claystone, siltstone, sandstone, limestone
5. Gray to black, green
6. Range 120-150 m
8. Spence Tongue, Cub Tongue
9. Overlies Twin Knobs Formation; intertongues with and grades into High Creek Limestone; grades upward into Bancroft Limestone
10. Type section: 0.8 km E of Twin Knobs, NE1/4SW1/4 sec. 7, T. 10 S., R. 39 E., Bancroft Quadrangle, Bannock and Caribou

Counties, Idaho. Named for exposures NE of abandoned Lead Bell Mine, NE1/4SE1/4SW1/4 sec. 18, T. 10 S., R. 39 E.

Lead Camp Limestone U LCMP06
1. Middle Pennsylvanian
2. New Mexico (SC)
3. Bachman, G. O., and Myers, D. A., 1969, U.S. Geol. Survey Bull. 1271-C, p. C22-C28
4. Cherty limestone, calcareous shale, minor sandstone and conglomerate
6. 262 m
7. Limestone is clastic, fine- to very coarse-grained, thick-bedded to massive, cliff-forming
9. Unconformably overlies Mississippian rocks in type locality, but to N conformably overlies Sandia Formation; conformably underlies Panther Seep Formation
10. Type section: High cliffs on N side of San Andres Canyon near junction with Lead Camp Canyon, NW1/4 sec. 19, T. 18 S., R. 4 E., Dona Ana County.

Leavick Tarn Dolomite Member (Manitou Formation) LVKT01
1. Lower Ordovician
2. Colorado (C)
3. Gerhard, L. C., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 7, p. 1397-1406
4. Dolomitized limestone
6. 11 m
7. Massive
9. Overlies Ptarmigan Chert Member
10. Type section: Horseshoe Mountain, 0.4 km E of Park County line, along extension of line between secs. 7 and 18, T. 10 S., R. 78 W. Named for Leavick Tarn, highest lake in cirque on E side of Horseshoe Mountain, SW of Fairplay, Mosquito Range, Park County.

Ledge Sandstone Member (Ivishak Formation) U LEDG01
1. Lower Triassic
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 11-13
4. Quartz arenite
5. Light-gray to reddish brown
6. 58 m, range 12-141 m
7. Massive, crossbedded, ripple marks, ball-and-pillow structures, and flute casts
9. Conformably overlies Kavik Member; conformably underlies Fire Creek Siltstone Member
10. Type section: Along small E tributary to Marsh Creek on N side of Sadlerochit Mountains, lat 69°41′ N., long 144°50′30" W.

Lee Center Till Member (Wedron Formation) LCNR02
1. Pleistocene (Wisconsinan)
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 68
4. Calcareous, silty till
5. Gray
6. Range 6-15 m
9. Overlies Morton Loess, Peddicord Formation, or Robein Silt;

underlies Tiskilwa Till Member (Wedron Formation); stratigraphically equivalent to Delavan and Esmond Till Members
10. Type section: Roadcut 8 km NW of Lee Center, SE1/4SW1/4NW1/4 sec. 31, T. 21 N., R. 10 E., Lee County.

Lee Creek Member (Brassfield Limestone) LCRK14
1. Lower Silurian
2. Indiana (SE), Kentucky
3. Nicoll, R. S., and Rexroad, C. B., 1968, Indiana Geol. Survey Bull. 40, p. 8-13
4. Dolomite
5. Varicolored
6. 1.3 m
7. Fine-grained, thin-bedded, contains calcite-filled vugs, glauconite, diagnostic conodont fossils
9. As top member, overlies lower part of Brassfield Limestone with sharp lithologic break; unconformably underlies Osgood Member (Salamonie Dolomite)
10. Type section: Near head of tributary to Lee Creek, NE1/4SE1/4SE1/4 sec. 36, T. 3 N., R. 9 E., Jefferson County, Ind.

Leemon Formation (Edgewood Group) LMON03
1. Upper Ordovician
2. Missouri (SE), Illinois
3. Thompson, T. L., and Satterfield, I. R., 1975, Missouri Geol. Survey Rept. Inv. 57, p. 74-79
4. Calcarenite
5. Gray to brown
6. Range 0-7 m
7. Oolitic, fossiliferous, crossbedded, coarsely crystalline
9. Overlies Girardeau Limestone; underlies Sexton Creek Limestone
10. Type section: 100 m below head of drainage 100 m E of barn in SE1/4NE1/4SW1/4 sec. 21, T. 32 N., R. 13 E., Cape Girardeau County, Mo. Named for town 3.5 km NE of type section.

Leif Ericson Park Lava (North Shore Group) LEPK01
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Mixed basalts, andesites
6. 780 m
9. Overlies and truncated by Duluth Complex; underlies Lakeside Lava (North Shore Group) and Endion sill
10. Type area: Leif Ericson Park, Duluth, St. Louis County.

Lewis Canyon Rhyolite U LSCN01
1. Pleistocene
2. Wyoming (NW)
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B10-B11
4. Rhyolitic lava flows with conspicuous phenocrysts
6. 200 m
9. Overlies Huckleberry Ridge Tuff (Yellowstone Group) and Paleozoic and Mesozoic sedimentary rocks; underlies Lava Creek Tuff (Yellowstone Group)
10. Type area: N side of Glade Creek between Snake River and E end of Grassy Lake Reservoir, Yellowstone National Park, Teton

County. Named for exposures in Lewis Canyon between Lewis Lake and Snake River.

Libby Creek Group LBCK08
1. Precambrian
2. Wyoming (SE)
3. Houston, R. S., and others, 1968, Wyoming Geol. Survey Mem. 1, p. 15, 17
4. Metasedimentary schist, quartzite, greenstone, slate
8. Headquarters Schist, Heart Formation, Medicine Peak Quartzite, Lookout Schist, Sugarloaf Quartzite, Nash Fork Formation, Towner Greenstone, French Slate
9. Overlies Deep Lake Formation
10. Type area: Sec. 22, T. 16 N., R. 79 W., Albany County. Named for Libby Creek, which heads in center of outcrop area.

Lierle Clay Member (Banner Formation) LIRL01
1. Pleistocene (Kansan, Yarmouthian)
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 52
4. Clay with silt and sand
5. Gray
6. 3 m
7. Massive
9. Underlies Loveland or Petersburg Silt, Glasford Formation, or younger deposits
10. Type section: Roadcut in SE1/4SW1/4 sec. 33, T. 1 S., R. 6 W., Adams County. Named for Lierle Creek.

Lighthouse Point Member (Mona Schist) U LGSP04
1. Precambrian W
2. Michigan (NC)
3. Gair, J. E., and Thaden, R. E., 1968, U.S. Geol. Survey Prof. Paper 397, p. 8-18
4. Chloritic schist and slate in lower part, amphibole schist in upper part; interbedded with felsite and metavolcanics
5. Green
6. 1400 m
7. Partings parallel to strong schistosity separate rock into layers or tabular lenses; may be repeated by folding
9. Overlies and interfolds with metabasalt of lower member of Mona Schist; intruded and partly replaced by Compeau Creek Gneiss; unconformably underlies rocks of Chocolay and Menominee Groups
10. Type locality: Lighthouse Point, in E part of city of Marquette, sec. 24, T. 48 N., R. 25 W., Marquette County.

Lignite Creek Formation U LGCK02
1. Miocene, middle
2. Alaska (C)
3. Wahrhaftig, Clyde, Wolfe, J. A., Leopold, E. B., and Lanphere, M. A., 1969, U.S. Geol. Survey Bull. 1274-D, p. D19-D22
4. Interbedded sandstone, conglomerate, claystone, and coal
5. Buff, gray
6. 160 m
9. Conformably overlies Suntrana Formation; conformably underlies Grubstake Formation or Nenana Gravel
10. Type section: Along Suntrana Creek from top of No. 6 coal bed

N for 300 m to top of sandstone outcrop between first forks of creek, sec. 23, T. 12 S., R. 7 W., Healy D-4 Quadrangle.

Lime Kiln Member (Frederick Limestone) U LMKL01
1. Upper Cambrian (Trempealeauan)
2. Maryland (NC)
3. Reinhardt, Juergen, 1974, Maryland Geol. Survey Rept. Inv. 23, p. 6, 11, 24, 30-37
4. Limestone, with some dolomite
5. Light- to dark-gray
6. 180 m
7. Fine grained, thin-bedded. and laminated with abundant fossil debris, highly burrowed
9. Overlies Adamstown Member (Frederick Limestone); underlies Grove Limestone
10. Type section: At entrance to Frederick pit at Alpha Portland Quarry W of Lime Kiln, Frederick County.

Linden Syenite LNDN10
1. Precambrian W
2. Minnesota (NC)
3. Sims, P. K., Sinclair, David, and Mudrey, M. G., Jr., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 160-162
4. Alkali-lime syenite pluton
5. Pink to grayish-pink
7. Vertical foliation and lineation
10. Type section: Exposures in sec. 35, T. 63 N., R. 21 W.; NW1/4 sec. 1, T. 62 N., R. 21 W.; S1/2 sec. 7, T. 62 N., R. 20 W.; N1/2 sec. 23, T. 62 N., R. 21 W., St. Louis County.

Linden Hall Formation LDHL02
1. Middle Ordovician
2. Pennsylvania (C)
3. Rones, Morris, 1969, Pennsylvania Geol. Survey Bull. G-53, p. 44, 199
4. Limestone
5. Dark-gray
6. 46 m
7. Thick-bedded
8. At type section: Oak Hall Member, Stover Member. At standard section: Valentine Member, Valley View Member, Stover Member
9. Conformably overlies Snyder Limestone; underlies Centre Hall Member (Nealmont Formation)
10. Type section: Oak Hall Quarries, Centre County. Standard section: Pleasant Gap Quarries, Centre County. Named for village 2 miles E of Oak Hall.

Lionshead Dolomite Member (Minturn Formation) LNSD01
1. Middle Pennsylvanian
2. Colorado (C)
3. Walker, T. R., 1972, Colorado School Mines Quart., v. 67, no. 4, p. 249-277
4. Dolomite
6. 9 m
7. Algal bioherm
10. Type locality: Not stated. Named for Lionshead cliff above Minturn, on NE side of Eagle River valley, Eagle County.

Little Beaver Creek Member (Hell Creek Formation) LBVC01
1. Upper Cretaceous
2. North Dakota (SW)
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 21-22
4. Lignitic channel sandstones with interbedded shale and bentonite
5. Purple
6. 32 m
9. Unconformably overlies Colgate Member (Fox Hills Formation); underlies Marmarth Member (Hell Creek Formation)
10. Type section: Along Little Beaver Creek several km SW of town of Marmarth, SW1/4 sec. 7, T. 132 N., R. 106 W., Bowman County.

Little Cove Member (Licking Creek Limestone) LLCV01
1. Lower Devonian
2. Pennsylvania (SC), Maryland, Virginia, West Virginia
3. Head, J. W., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 2, p. 247-259
4. Calcarenites with minor chert
5. Gray
6. 10 m
9. Overlies Cherry Run Member (Licking Creek Limestone); underlies Oriskany Sandstone
10. Type locality: 39°43′22" N.; 78°03′43" W.; Franklin County, Pa.

Livingston Hills Formation U LVGH01
1. Cretaceous or Tertiary
2. Arizona (SW)
3. Miller, F. K., 1970, U.S. Geol. Survey Geol. Quad. Map GQ-841, p. 2-3
4. Graywacke, intertonguing siltstone, basal angular boulder conglomerate
6. 3700 m
7. Graywacke medium- to coarse-grained, medium- to thick-bedded, formation cut by pre-middle Miocene thrust faults
8. Informal conglomerate, graywacke, and siltstone members
9. Unconformably overlies Mesozoic (?) red beds and Paleozoic rocks; unconformably underlies Tertiary (?) volcanic rocks
10. Type locality: Livingston Hills, in S part of T. 2 N., R. 18 W., Yuma County.

Lizard Creek Member (Shawangunk Formation) U LZCK02
1. Middle Silurian
2. Pennsylvania (EC), New Jersey
3. Epstein, J. B., and Epstein, A. G., 1972, U.S. Geol. Survey Prof. Paper 744, p. 7-12
4. Interbedded quartzose sandstone, siltstone, and shale
5. Gray
6. Range 83-373 m
9. Gradationally overlies Minsi Member (Shawangunk Formation); transitionally underlies or intertongues with Tammany Member (Shawangunk Formation) or Bloomsburg Red Beds
10. Type section: Along abandoned Lehigh and New England Railroad in Lehigh Gap, Palmerton Quadrangle, Northampton County, Pa. Named for Lizard Creek, which joins Lehigh River 4.8 km W of Lehigh Gap.

Loachapoka Schist (Opelika Complex) LCPK01
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 31-32
4. Kyanite-sillimanite schist interlayered with metaorthoquartzite
10. Type locality: Not stated. Named for town of Loachapoka, Lee County, Ala.

Lobster Mountain Volcanics LBRM01
1. Ordovician
2. Maine (C)
3. Boucot, A. J., and Heath, E. W., 1969, Maine Geol. Survey Bull. 21, p. 56-58
4. Felsite, tuff, agglomerate, greenstone
6. Range 15-3000 m
9. Overlies unnamed sedimentary and volcanic rocks; unconformably(?) underlies Big Claw Red Bed Member (Lobster Lake Formation) or Tarratine Formation
10. Type locality: Lobster Mountains, North East Carry Quadrangle, Piscataquis County.

Lomas Formation U LOMS01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F46-F47
4. Volcanic breccia and sandstone and andesitic to basaltic lava
5. Grayish-green
6. 1500 m
7. Thick-bedded, poorly-sorted
9. Restricted to fault blocks
10. Type locality: Roadcut in SW part of Barrio Lomas, 48,750 N., 207,890 E., Gurabo Quadrangle.

Long Island Flow (Portage Lake Volcanics) U LGID01
1. Precambrian Y
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C15
4. Trap
5. Dark-gray or black
6. 15 m
7. Fine-grained massive, nonporphyritic aphanitic, columnar
9. Erupted after Tobin Harbor Flow and before Middle Point Flow
10. Type locality: Long Island, Tobin Harbor, E Isle Royale, Keweenaw County.

Long Pine Formation LNGP01
1. Pleistocene (Nebraskan)
2. Nebraska (NC)
3. Skinner, M. F., and Hibbard, C. W., 1972, Am. Mus. Nat. History Bull. 148, art. 1, p. 24-28
4. Sand and gravel
5. Red, yellow, brown
6. 8 m
7. Crossbedded, unconsolidated
9. Unconformably overlies Keim Formation or Ash Hollow Formation; unconformably underlies Duffy Formation or fine sand and silt
10. Type section: Along both sides of U.S. Highway 20 where it

crosses Long Pine Creek NW of town of Long Pine, NW1/4 sec. 30, T. 30 N., R. 20 W., Brown County.

Long Run Member (Catskill Formation) U LNGR04
1. Upper Devonian
2. Pennsylvania (EC)
3. Epstein, J. B., Sevon, W. D., and Glaeser, J. D., 1974, Pennsylvania Geol. Survey Atlas 195cd, p. 171-175
4. Siltstone, sandstone, shale, conglomerate
5. Red
6. 720 m
9. Overlies Beaverdam Run Member; underlies Packerton Member
10. Type section: Along U.S. Highway 209 and in cuts of the former railroad E of and below U.S. Highway 209 on W bank of Lehigh River, Carbon County. Named for Long Run, tributary to Lehigh River N of Weissport.

Lookingglass Formation LKGL01
1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 12-18
4. Conglomerate, sandstone, siltstone
6. 1570 m
8. Bushnell Rock Member, Tenmile Member, Olalla Creek Member
9. Unconformably overlies Roseburg Formation; unconformably underlies Flournoy Formation or Tyee Formation
10. Type section: Along Tenmile Creek from Bushnell Rock S to Tenmile Butte, Douglas County. Named for Lookingglass Valley.

Loomis Granodiorite (Toats Coulee Group) LOMS02
1. Upper Triassic
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3029-3031
4. Granodiorite with euhedral hornblende crystals and secondary biotite
5. Light-gray
7. Medium-grained
10. Type area: Occurs near town of Loomis, Okanogan County.

Loring Cove Basalt Member (Perry Formation) LGCV01
1. Upper Devonian
2. Maine (EC), Canada (New Brunswick)
3. Schluger, P. R., 1973, Geol. Soc. America Bull., v. 84, no. 8, p. 2535
4. Basalt flow
5. Gray to green
6. 9.5 m
7. Contains pillow structures and calcite-filled amygdules near top
9. Overlies Lamb Cove Member; underlies Brandy Cove Member
10. Type section: Loring Cove, on SW side of Passamaquoddy Bay, 6 km N of Little River, Washington County, Me.

Los Moyos Limestone (Madera Group) U LSMS01
1. Middle and Upper Pennsylvanian
2. New Mexico (C)
3. Myers, D. A., 1973, U.S. Geol. Survey Bull. 1372-F, p. F4-F5

4. Cherty limestone with minor interbedded shale, sandstone, conglomerate
5. Gray
6. 180 m
7. Massive, cliff-forming
9. Conformably overlies Sandia Formation; conformably underlies Wild Cow Formation
10. Type section: Exposures on walls of ravine that drains into Priest Canyon through hogback in sec. 7, T. 3 N., R. 5 E., SW Torreon Quadrangle, Valencia County.

Lost Horse Drift/Till LSHR01

1. Pleistocene
2. Montana (WC)
3. Weber, W. M., 1972, Montana Bur. Mines and Geology Mem. 42, p. 20
4. Cobbles and boulders of quartz monzonite and gneiss in loose matrix of arkosic sand
7. Relatively-fresh, poorly-sorted till and outwash gravel
9. Overlies Charlos Drift
10. Type locality: Not stated. Named for Lost Horse Creek, secs. 8, 9, 16, 17, 18, T. 4 N., R. 21 W., Ravalli County.

Lostwood Drift LSTD01

1. Pleistocene
2. North Dakota (C)
3. Bluemle, J. P., 1971, North Dakota Geol. Survey Bull. 60, pt. 1, p. 57-58
4. Silty to sandy till
6. 10 m
7. Dead-ice moraine
9. Overlies Napoleon Drift
10. Type area: N and E McLean County.

Loues Formation U LOUS01

1. Precambrian
2. South Dakota (SW)
3. Redden, J. A., 1968, U.S. Geol. Survey Prof. Paper 297-F, p. 354-356
4. Biotite-garnet and mica schist with staurolite, cordierite, and chlorite
5. Grayish-black
6. 180 m
9. Probably conformably overlies Vanderlehr Formation; underlies Bugtown Formation
10. Type section: Along N boundary of Berne Quadrangle, SE1/4 sec. 13, T. 2 S., R. 3 E., and SW1/4 sec. 18, T. 2 S., R. 4 E., Pennington County.

Louis Lake Granodiorite LSKL01

1. Precambrian X
2. Wyoming (WC)
3. Naylor, R. S., Steiger, R. H., and Wasserburg, G. J., 1970, Geochim. et Cosmochim. Acta, v. 34, no. 11, p. 1136
4. Granodiorite
7. Batholith
9. Intrudes metamorphic sequence of graywacke, schist, greenstone, and iron-formation. Unconformably underlies Middle Cambrian and younger strata

10. Type section: Louis Lake, S Wind River Mountains, lat 42°30′-45′ N., long 108°45′-109° W., Fremont County.

Lovelock Formation LVCK08
1. Lower or Middle Jurassic
2. Nevada (NW)
3. Speed, R. C., 1974, Geol. Soc. America Bull., v. 85, no. 1, p. 105-118
4. Limestone, carbonate conglomerate and breccia, gypsum
6. Range 25-200 m
7. Occurs in 2 nappes that lie between thrust faults
8. 3 informal members
9. Conformably overlies Jurassic pelite; top is erosional
10. Type locality: Gypsum Mountain area, West Humboldt Range, lat 40°10′07" N., long 118°23′10" W., 8 km NE of Lovelock, Pershing County.

Luatele Formation LUTL01
1. Pleistocene
2. American Samoa, Manu′a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 434, 437
4. Olivine basalt lava
7. Small shield volcano, with recollapsed area, thin-bedded, pahoehoe flows
10. Type locality: Not stated. Named for Luatele depression in shield, NE Ta′u Island.

Lubbe Creek Formation U LBCK02
1. Lower Jurassic
2. Alaska (EC)
3. MacKevett, E. M., Jr., 1969, U.S. Geol. Survey Bull. 1274-A, p. A35-A52
4. Spiculite and coquina
5. Gray, weathers brown
6. 90 m
9. Conformably overlies McCarthy Formation; unconformably underlies Nizina Mountain or Root Glacier Formation
10. Type locality: Along Lubbe Creek, tributary to McCarthy Creek, S flank Wrangell Mountains, McCarthy C-5 Quadrangle.

Lumbee Group LUMB01
1. Upper Cretaceous
2. South Carolina (EC), North Carolina
3. Swift, D. J. P., and Heron, S. D., Jr., 1969, Southeastern Geology, v. 10, no. 4, p. 201
4. Sand and clay
8. Middendorf, Black Creek, Peedee Formations
9. Unconformably overlies Cape Fear Formation, Triassic red beds, or Paleozoic crystalline rocks; disconformably underlies Castle Hayne Limestone or Black Mingo Formation
10. Type section: Type sections of component formations in S.C. Named for Indian tribe which once occupied outcrop area near Cape Fear.

Lummi Formation LUMM01
1. Lower Cretaceous
2. Washington (NW)
3. Vance, J. A., 1975, in Russell, R. H., ed., Washington Dept.

Ecology Water Supply Bull. 46, p. 13-14
4. Interbedded graywacke, shale, siltstone
5. Gray, brown, black
6. 1800 m, range 900-1800 m
7. Well-stratified, turbidites
9. Overlies Constitution Formation
10. Type area: Exposures on Lummi Island, E San Juan Islands, Whatcom County.

Lund Tuff Member (Needles Range Formation) U LUND02
1. Oligocene
2. Utah (SW), Nevada
3. Best, M. G., Shuey, R. T., Caskey, C. F., and Grant, S. K., 1973, Geol. Soc. America Bull., v. 84, no. 10, p. 3269-3278
4. Welded tuff with large quartz phenocrysts
5. Pink to gray
6. 325 m
9. Overlies Wah Wah Springs Tuff Member (Needles Range Formation); underlies Wallaces Peak Tuff Member (Needles Range Formation) or Isom Formation
10. Type locality: Sec. 6, T. 32 S., R. 14 W. and sec. 1, T. 32 S., R. 15 W., Iron County, Utah. Named for town of Lund.

Lusardi Formation (Rosario Group) U LSRD01
1. Upper Cretaceous
2. California (SE)
3. Nordstrom, C. E., 1970, Geol. Soc. America Bull., v. 81, no. 2, p. 601-605
4. Massive cobble and boulder conglomerate with arkosic sandstone matrix
6. 120 m
9. Unconformably overlies batholithic rocks; disconformably underlies La Jolla or Point Loma Formation
10. Type locality: Near confluence of San Dieguito River and Lusardi Creek, secs. 26 and 27, T. 13 S., R. 3 W., San Diego County.

Lutsen Basalt (North Shore Group) LTSN01
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. Olivine basalts, olivine tholeiites
6. 310 m
7. Numerous flows
9. Overlies Terrace Point Basalt
10. Type locality: From Cascade River to Lutsen village, Cook County.

Luzerne Till LZRN01
1. Pleistocene
2. New York (EC)
3. Connally, G. G., and Sirkin, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 4, p. 989-1008
5. Gray-black
6. 15 m
10. Type locality: Along Corinth Road, between Glens Falls and Corinth, on N side of Luzerne Mountain gorge of Hudson River, Warren County.

Lyons Valley Member (Popo Agie Formation) U LSVL11
1. Upper Triassic
2. Wyoming (C) Colorado
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D15-D16
4. Siltstone, analcime-rich claystone, and analcimolite
5. Purple, ocher
6. 18 m
7. Weathers to smooth slopes
9. Gradationally overlies Brynt Draw Member (Popo Agie Formation); disconformably underlies Bell Springs Member (Nugget Sandstone)
10. Type section: Dallas anticline (reference section for Popo Agie Formation), 11 km SE of Lander, SE1/4 sec. 13 and SW1/4 sec. 12, T. 32 N., R. 99 W., Fremont County, Wyo. Named for nearby Lyons Valley.

MacColl Ridge Formation U MCRG01
1. Upper Cretaceous
2. Alaska (EC)
3. Jones, D. L., and MacKevett, E. M., Jr., 1969, U.S. Geol. Survey Bull. 1274-K, p. K4-K5
4. Sandstone, grading into conglomerate or siltstone
5. Gray, black, brown
6. 760 m
9. Conformably overlies Chititu Formation; cut by Tertiary granodiorite plutons and felsic dikes and sills
10. Type section: MacColl Ridge, 4.8 km E of W boundary of McCarthy A-4 Quadrangle, S Wrangell Mountains.

Mackay Granite U MCKY03
1. Tertiary, lower
2. Idaho (C)
3. Nelson, W. H., and Ross, C. P., 1968, U.S. Geol. Survey Bull. 1252-A, p. A10-A11
4. Granite porphyry with orthoclase phenocrysts
5. Pinkish-gray
9. Intrudes Copper Basin Formation and Knob Limestone
10. Type locality: Mackay Peak, Alder Creek mining district, SW1/4 sec. 35, T. 7 N., R. 23 E., Custer County.

Mackinaw Member (Henry Formation) MCKN02
1. Pleistocene (Wisconsinan)
2. Illinois (C)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 71-72
4. Sandy gravel, pebbly sand
6. 9 m
7. Deposited as valley train glacial outwash
9. Overlies Batavia Member (Henry Formation); underlies Richland Loess
10. Type section: Gravel pit SW of town of Mackinaw, NE1/4NW1/4 sec. 19, T. 24 N., R. 2 W., Tazewell County.

Madera Canyon Granodiorite U MDRC02
1. Upper Cretaceous
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C12-C13
5. Gray

9. Cuts Josephine Canyon Diorite
10. Type area: Lower Madera Canyon, Pima County.

Mad Indian Formation/Group MDID03
1. Paleozoic, middle to upper
2. Alabama (EC)
3. Neathery, T. L., and Reynolds, J. W., 1975, Alabama Geol. Survey Bull. 109, p. 13-15
4. Garnet-muscovite-biotite schist and gneiss with irregular zones of graphite-sericite schist
7. Interbedded; infolded; intensely metamorphosed; cut by granitic dikes, veins, and plutons
10. Type locality: Exposures along Mad Indian Creek, N Lineville East Quadrangle, Clay County.

Madison River Basalt U MDRV02
1. Pleistocene
2. Wyoming (NW), Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B16-B17
4. Basalt flows
5. Gray
6. 50 m
9. Overlies Lava Creek Tuff or Roaring Mountain Member (Plateau Rhyolite)
10. Type area: Uplands W of S end of Gallatin Range, S of Upper Maple Creek, Yellowstone National Park, Park County, Wyo.

Magalloway Member (Dixville Formation) U MGLL02
1. Middle Ordovician
2. Maine (WC), Canada (Quebec)
3. Green, J. C., 1968, Geol. Soc. America Bull., v. 79, no. 11, p. 1610-1613
4. Metagraywackes interbedded with pelitic phyllites
5. Gray, tan, silver
6. 1500 m
9. Overlies and interfingers with Dixie Brook Member
10. Type locality: S slopes of Thrasher Peaks, Parmachenee Township, Oxford County, Me.

Magpie Hill Basalt U MGPH01
1. Miocene
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 8
4. Alkalic olivine basalt
9. Unconformably overlies Pancake Summit Tuff; unconformably underlies Tertiary and Quaternary deposits
10. Type section: On Magpie Hill, sec. 34, T. 18 N., R. 54 E., on E side of Rescue Canyon, White Pine County.

Maguayo Porphyry (Bermeja Complex) MGUY01
1. Lower Cretaceous (?)
2. Puerto Rico (SW)
3. Mattson, P. H., 1973, Geol. Soc. America Bull., v. 84, no. 1, p. 23-24
4. Felsite porphyry with feldspar and hornblende phenocrysts
5. Tan, gray, weathers yellow-brown
9. Underlies Mariquita Chert; dikes and sill cut Mariquita Chert

and Cajul Volcanics
10. Type locality: Outcrops in road and stream 750 m S of Maguayo, 19,200 N., 82,950 E., Sierra Bermeja.

Malden Till Member (Wedron Formation) MLDN01
1. Pleistocene (Wisconsinan)
2. Illinois (NC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 69
4. Silty and sandy till
6. 8 m
9. Overlies Tiskilwa Till Member; underlies Yorkville Till Member
10. Type section: Roadcuts 3.2 km S of Malden, SW1/4SE1/4SE1/4 sec. 5, T. 16 N., R. 10 E., Bureau County, Ill.

Mallard Lake Member (Plateau Rhyolite) U MDLK04
1. Pleistocene
2. Wyoming (NW)
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B12
4. Rhyolitic lava flow
6. > 120 m
7. Thinly flow-laminated
9. Overlies Lava Creek Tuff; underlies Upper Basin and Central Plateau Members (Plateau Rhyolite)
10. Type area: Mallard Lake, 5 km NE of Old Faithful Geyser, Yellowstone National Park, Teton County.

Mallow Member (Foreknobs Formation) MLLW03
1. Upper Devonian
2. West Virginia (EC), Maryland, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-54
4. Marine siltstone, shale, sandstone
6. Range 225-335 m
9. Overlies Scherr Formation; underlies Briery Gap Sandstone Member (Foreknobs Formation)
10. Type section: Along road beside Briery Gap Run near Judy Gap, leading from U.S. Highway 33 to Spruce Knob, Pendleton County, W. Va. Named for Mallow Knob, 1.6 km N of Riverton.

Mal Paso Formation U MLPS03
1. Eocene, middle
2. Puerto Rico (NW)
3. McIntyre, D. H., Aaron, J. M., and Tobisch, O. T., 1970, U.S. Geol. Survey Bull. 1294-D, p. D11-D12
4. Basaltic lava, crystal tuff, and limestone
5. Grayish-red-purple
6. > 1000 m
7. Amygdaloidal and pillow lavas
9. Overlies Concepción and Palma Escrita Formations; conformably underlies Rio Culebrinas Formation
10. Type area: Along Route 416 for 2.7 km from N border of Rincon Quadrangle, Barrios Mal Paso and Piedras Blancas, Municipio de Aguada, NE Rincon Quadrangle.

Malpass Member (Willamette Silt) MLPS01
1. Pleistocene
2. Oregon (WC)

3. Balster, C. A., and Parsons, R. B., 1969, Northwest Sci., v. 43, no. 3, p. 125-126
4. Clay with iron-manganese oxide concretions
5. Gray
6. 1 m
9. Unconformably overlies Irish Bend or Wyatt Member (Willamette Silt) or Diamond Hill and Linn Members (Rowland Formation); underlies Greenback Member (Willamette Silt)
10. Type section: Exposures in cutbank of Willamette River at Irish Bend, center sec. 7, T. 14 S., R. 4 W., Linn County. Named for Malpass Lane, N-S road 4.8 km E of type section.

Mamey Lava Member (Camarones Sandstone) U MMEY01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 19-21
4. Basaltic lava
5. Dark-gray
6. 50 m, range 50-350 m
7. Porphyritic
10. Type section: Upper valley of Rio Piedras, 54,000 N., 192,040 E., to 54,800 N., 192,020 E., Barrio Mamey, EC Aguas Buenas Quadrangle.

Manakacha Formation (Supai Group) U MNKC02
1. Middle Pennsylvanian (Atokan and Des Moinesian(?))
2. Arizona (NW)
3. McKee, E. D., 1975, U.S. Geol. Survey Bull. 1395-J, p. J1-J6, J9
4. Sandstone, with limestone and minor mudstone
5. Pale red-purple to moderate reddish-orange
6. 77 m
7. Mostly very fine-grained; crossbedded
9. Conformably overlies Watahomigi Formation; unconformably underlies Wescogame Formation
10. Type section: Along Apache trail which begins in Supai village and winds up on Havasu Canyon side toward Manakacha Point on E side of Havasu Canyon, Coconino County.

Manassa Member (Conejos Formation) MNSS01
1. Oligocene, upper
2. Colorado (SC)
3. Burroughs, R. L., 1971, New Mexico Geol. Soc. Guidebook 22, p. 281
4. Explosive breccias, flow breccias, lava flows
5. Brown-black
6. 460 m
9. Unconformably overlies La Sauses Member (Conejos Formation); unconformably underlies Servilletta Formation
10. Type locality: Not stated. Named for exposures in W San Luis Hills, E of Manassa, Conejos County.

Manitou Trachybasalt (North Shore Group) MNTU07
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 320
4. Trachybasalt to basalt
5. Red-brown

6. > 90 m
7. Granular
9. Overlies Bell Harbor Lava or Schroeder Basalt
10. Type locality: Near Manitou River N of Little Marais, Lake County.

Manitowoc Till Member (Wedron Formation)/Till MNTC02

1. Pleistocene
2. Wisconsin (EC), Michigan
3. Lineback, J. A., Gross, D. L., and Meyer, R. P., 1974, Illinois Geol. Survey Environmental Geology Notes, no. 69, p. 16
4. Clayey till
5. Brown to reddish-brown
6. 2 m
9. Overlies Shorewood Till Member (Wedron Formation); underlies Two Rivers Till
10. Type section: Core 904, lat 43°45′ N., long 87°22.2′ W., in Lake Michigan, 45 km SE of Manitowoc, Manitowoc County, Wis.

Maple Canyon Formation U MPLC01

1. Precambrian Z
2. Utah (NC)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 587-589
4. Arkose, underlain by argillite, overlain by conglomerate
5. Green, olive-drab
6. 460 m
7. Argillite is typically phyllitic, locally schistose; arkose is massive, very fine-grained
8. Informal argillite, arkose, and conglomerate members
9. Lower contact not exposed; underlies Kelley Canyon Formation
10. Type locality: NW side of Maple Canyon 4 km NE of Huntsville, from N1/2 sec. 9 to center sec. 4, T. 6 N., R. 2 E., Weber County.

Mapledale Till MPLD02

1. Pleistocene (Illinoian)
2. Pennsylvania (WC), Ohio
3. White, G. W., 1969, Geol. Soc. London Quart., v. 124, p. 141
4. Sandstone gravel till
6. > 7 m
7. Deeply weathered. In some places, appears to be 2 till sheets separated by sand and gravel
10. Type area: Grand River Lobe. Named for Mapledale, suburb adjacent to Franklin, Venango County, Pa.

Marcoux Formation/Member (Coleharbor Formation) MRCX01

1. Pleistocene
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 9-10
4. Unbedded, sandy pebble-loam
5. Gray and brown
6. Range 0.1-20 m
7. Glacial sediment
9. Overlies Gervais Formation; underlies St. Hilaire and Red Lake Falls Formations
10. Type section: Clearwater Section, NE1/4NE1/4 sec. 22,

T. 151 N., R. 44 W., Red Lake Falls area, Minn. Named for Marcoux Corners, Red Lake County.

Marcum Hollow Sandstone Member (Wise Formation) U MCMH02
1. Middle Pennsylvanian
2. Virginia (SW), Kentucky
3. Miller, R. L., 1969, U.S. Geol. Survey Bull. 1280, p. 28-29
4. Sandstone, moderately quartzose
6. 13 m, range 13-26 m
7. Massive, medium-grained, crossbedded
9. Lies 18 m above Clover Fork Sandstone Member; underlies Rockhouse Valley Sandstone Member
10. Type section: Along Virginia Highway 624 which follows Marcum Hollow from Keokee to Morris Gap, up Little Black Mountain, Lee County, Va.

Marcus Formation MRCS02
1. Middle Silurian
2. Illinois (NW)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 37-38, 53
4. Massive, pure dolomite
5. Buff-brown
6. 12 m
9. Overlies Sweeney Formation; underlies Racine Formation
10. Type section: Abandoned quarry in S part of Mississippi Palisades State Park, Carroll County. Named for village of Marcus, 6.5 km NW of type section.

Mariah Hill Coal Bed (Mansfield Formation) MRHL02
1. Lower Pennsylvanian
2. Indiana (SC)
3. Shaver, R. H., and others, 1970, Indiana Geol. Survey Bull. 43, p. 106
6. 1 m
9. Underlies Ferdinand Limestone Member (Mansfield Formation)
10. Type locality: Coal bed mined by Mariah Hill Super Block Coal Company in secs. 19 and 20, T. 4 S., R. 4 W., 2.4 km SE of Mariah Hill, Spencer County.

Mariquita Chert (Bermeja Complex) MRQT02
1. Lower Cretaceous (?)
2. Puerto Rico (SW)
3. Mattson, P. H., 1973, Geol. Soc. America Bull., v. 84, no. 1, p. 23
4. Chert with iron and manganese oxides
5. Greenish-gray or black, weathers red
6. Range 200 - > 250 m
7. Medium-bedded, radiolarian-bearing, brecciated, jointed, intensely deformed
9. In fault contact with and cut by dikes and sill underlying Maguayo Porphyry
10. Type locality: Quebrada Cajul N of Las Palmas, 17,380 N., 78,050 E., Sierra Bermeja. Named for Cerro Mariquita, 18,820 N., 80,590 E.

Markham Member (Roxana Silt) MRKM02
1. Pleistocene (Wisconsinan)
2. Illinois (WC)

3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 62
4. Colluvium of silt, sand, and loess
6. 0.4 m
9. Overlies Sangamon soil; underlies McDonough Loess Member and Meadow Loess Member (Roxana Silt)
10. Type section: Roadcuts along Illinois Highway 104, 2.4 km NW of Markham on W side of Mauvaise Terre Creek, SW1/4NE1/4NW1/4 sec. 8, T. 15 N., R. 11 W., Morgan County.

Markham Peak Member (Bingham Mine Formation) U MKPK01
1. Upper Pennsylvanian
2. Utah (NW)
3. Tooker, E. W., and Roberts, R. J., 1970, U.S. Geol. Survey Prof. Paper 629-A, p. A35-A38
4. Orthoquartzite and calcareous quartzite, sandstone, and siltstone
6. 1300 m
9. Conformably overlies Clipper Ridge Member
10. Type section: Ridge between Spring and Dry Canyons, secs. 30 and 31, T. 3 S., R. 3 W., and on Markham Peak, secs. 21 and 22, T. 3 S., R. 3 W., Tooele and Salt Lake Counties.

Marmarth Member (Hell Creek Formation) MRMR03
1. Upper Cretaceous
2. North Dakota (SW)
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 31-32
4. Sandstone channel bodies separated by bentonite and shale beds
6. 23 m
7. Forms cliffs and haystack-like buttes, fossiliferous
9. Overlies Little Beaver Creek Member; underlies and interfingers with Bacon Creek Member
10. Type section: Small butte S of U.S. Highway 12, W of town of Marmarth, SW1/4 sec. 26, T. 133 N., R. 106 W., Slope County.

Marquesas Supergroup MRQS01
1. Upper Jurassic and Lower Cretaceous
2. Florida (SE)
3. Meyerhoff, A. A., and Hatten, C. W., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 6, p. 1201-1239
4. Dolomite, limestone, anhydrite, gypsum
6. 2365 m
7. Shallow-water lagoonal deposits
8. Fort Pierce Formation, Glades Group, Ocean Reef Group, Big Cypress Group, Naples Bay Group
9. Overlies unnamed Jurassic rocks; underlies Pine Key Formation and Card Sound Dolomite
10. Type section: Gulf Oil Company State of Florida-1 Lease 826-Y well, depth-interval 2,355-4,720 m, Monroe County.

Marquette Range Supergroup U MQRG01
1. Precambrian X
2. Michigan (NC), Wisconsin
3. Cannon, W. F., and Gair, J. E., 1970, Geol. Soc. America Bull., v. 81, no. 9, p. 2843-2845
4. Metamorphic sedimentary rocks including quartzite, slate, greenstone
8. All stratigraphic units formerly included in Animikie Series: Chocolay, Menominee, Baraga, and Point River Groups

10. Type locality: Not stated. Named for Marquette Range, Marquette County, Mich.

Marr Island Lava (North Shore Group) MILD02
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316,318
4. Mixed tholeiitic basalt, intermediate felsic lavas
6. 550 m
9. Overlies Brule River Basalt; underlies Kimball Creek Felsite
10. Type locality: Exposed near Kadunce Creek, Cook County.

Martín González Lava/Lava Member (Guaynabo Formation) U MGZZ01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 23-25
4. Basaltic lava
5. Greenish-gray
6. 400 m
7. Coarsely porphyritic
9. Midway between base of Guaynabo Formation and Leprocomio Siltstone Member
10. Type locality: Large quarry in Barrio Martin Gonzalez, 59,400 N., 201,600 E., to 59,500 N., 201,610 E., NW Gurabo Quadrangle.

Masonic Park Tuff U MCPK03
1. Oligocene
2. Colorado (SC)
3. Lipman, P. W., 1975, U.S. Geol. Survey Prof. Paper 852, p. 1, 18
4. Phenocryst-rich quartz latite tuff
5. Red-brown and yellowish-brown
6. 550 m
7. Ash-flow sheets
9. Near Mount Hope caldera interfingers with Sheep Mountain Andesite and other lava units; away from this caldera, generally overlies upper units of Treasure Mountain Tuff; underlies Fish Canyon Tuff, Los Pinos Formation, or Hinsdale Formation
10. Type locality: Along Rio Grande valley near Masonic Park, 5 km NW of South Fork, Rio Grande County.

Massacre Bay Formation U MCRB01
1. Tertiary, upper, or Pleistocene, lower
2. Alaska (SW)
3. Gates, Olcott, Powers, H. A., and Wilcox, R. E., 1971, U.S. Geol. Survey Bull. 1028-U, p. 739-742
4. Subaerial coarse sandstone, conglomerate, tuff, and basaltic andesite lava flows
6. > 150 m
10. Type area: Near Massacre Bay, EC Attu Island, Near Islands.

Mather Sandstone Lentil (Waynesburg Formation) MTHR03
1. Upper Pennsylvanian
2. Pennsylvania (SW), West Virginia
3. Martin, W. D., and Henniger, B. R., 1969, Am. Assoc. Petroleum Geologists Bull., v. 53, no. 2, p. 281

4. Sandstone with claystone and siltstone lenses
6. 23 m
9. Overlies Waynesburg coal
10. Type section: Along South Fork of Tenmile Creek from Waynesburg, Greene County, Pa., NE to Monongahela River.

Maumee River Member (Tymochtee Formation) MMRV01
1. Upper Silurian
2. Ohio (NW)
3. Kahle, C. F., and Floyd, J. C., 1971, Geol. Soc. America Bull., v. 82, no. 8, p. 2071
4. Shaly dolomite
5. Gray to brown
6. 20 m
7. Crossbedded, with sedimentary structures including shrinkage cracks, flute casts, stylolites
9. Overlies Ovitt Road Member; underlies Roche de Boeuf Member
10. Type section: Walls of Waterville Quarry SW of Waterville, and in W1/2 secs. 38 and 39, T. 1, Bowling Green Quadrangle, Wood County.

McAllister Formation MCAL05
1. Precambrian X
2. Wisconsin (NE)
3. Jenkins, R. A., 1973, Inst. Lake Superior Geology, v. 19, no. 1, p. 15-16
4. Metamorphosed tholeiitic basalt agglomerate
6. Range 300-3000 m
9. Overlies Quinnesec Formation; underlies Beecher Gneiss
10. Type area: Occurs in Beecher and Pembine Townships, NE Marinette County.

McDonough Loess Member (Roxana Silt) MCDG02
1. Pleistocene (Wisconsinan)
2. Illinois (SC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 62
5. Gray to tan
6. 2 m
7. Leached, contains etched fossil snail shells
9. Overlies Markham Member; underlies Meadow Loess Member
10. Type section: Borrow pits and roadcuts 1.6 km SE of McDonough Lake, SW1/4NE1/4SE1/4 sec. 20, T. 3 N., R. 8 W., Madison County.

McGowan Creek Formation U MGCK14
1. Lower Mississippian (Kinderhookian and Osagean)
2. Idaho (EC)
3. Sandberg, C. A., 1974, U.S. Geol. Survey Bull. 1405-E, p. E1-E11
4. Lower member, argillite with some siltite; upper member, siltstone interbedded with limestone
5. Lower member, grayish-black; upper member, dark-gray and yellowish-brown
6. 1111 m
7. Thin-bedded; contains abundant terrestrial plant stems and debris and U-shaped worm trails
8. Informal lower and upper members
9. Unconformably overlies Three Forks Formation; gradationally

underlies Middle Canyon Formation
10. Type section: Along ridge crest S of McGowan Creek, N1/2 sec. 28 and E1/2 sec. 29, T. 12 N., R. 21 E., Doublespring Quadrangle, Custer County.

McHugh Complex U MCHG01
1. Upper Jurassic and (or) Cretaceous
2. Alaska (C)
3. Clark, S. H. B., 1973, U.S. Geol. Survey Bull. 1372-D, p. D1-D11
4. Chaotically juxtaposed sequences of weakly metamorphosed siltstone, graywacke, arkose, and conglomeratic sandstone, and metavolcanic basaltic greenstones, metachert, and argillite
9. Overlies Valdez(?) Group in thrust contact
10. Type locality: Along Seward Highway E and W of McHugh Creek, Chugach Mountains.

McNeeley Drift U MCNL01
1. Pleistocene, upper
2. Washington (WC)
3. Crandell, D. R., 1969, U.S. Geol. Survey Bull. 1288, p. 20
4. Till
7. Sharp-crested, little-eroded moraines
9. Overlies Evans Creek Drift or glacier-scoured Tertiary bedrock; underlies Garda Drift or other Holocene deposits
10. Type locality: N-facing cirque 8 km S of McNeeley Peak, Mount Rainier National Park, Pierce County.

McNutt Limestone Member (Bokchito Formation) MCNT02
1. Upper Cretaceous (Gulfian)
2. Oklahoma (SE)
3. Huffman, G. G., and others, 1975, Oklahoma Geol. Survey Bull. 120, p. 18
4. Sandy limestone to calcareous sandstone
6. 1 m
7. Platy, fossiliferous
9. Overlies Weno Clay Member; underlies Pawpaw Sandstone Member
10. Type locality: Not stated. Named for McNutt Ranch, 6.4 km SE of Soper, NE1/4SE1/4 sec. 36, T. 6 S., R. 15 E., Choctaw County.

Meadow Loess Member (Roxana Silt) MDOW02
1. Pleistocene (Wisconsinan)
2. Illinois (SC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 63
4. Massive loess
5. Pink to gray
6. 13 m
9. Overlies McDonough Loess Member or Markham Member (Roxana Silt); underlies Robein Silt, Morton Loess, or Peoria Loess
10. Type section: 1.2 km W of Meadow Heights section of Collinsville, SW1/4NE1/4SE1/4 sec. 20, T. 3 N., R. 8 W., Madison County.

Meadow Creek Granodiorite MDCK24
1. Oligocene
2. Wyoming (NW)
3. Wilson, W. H., 1975, Wyoming Geol. Assoc. Guidebook 27,

p. 235-241
5. Gray
6. 460 m
7. Pluton, copper-bearing
9. Intrusive into Wiggins Formation
10. Type locality: Exposed over an area 2.8 km long and 1.6 km wide in Meadow Creek Basin, T. 46 N., R. 104 W., Francs Peak Quadrangle, 5.6 km N of Kirwin, Park County.

Meads Creek Formation (West Falls Group) MDCK22
1. Upper Devonian
2. New York (WC)
3. Rickard, L. V., 1975, New York State Mus. and Sci. Service Map and Chart Ser. 24, 16 p.
4. Shale, sandstone
9. Overlies Roricks Glen Shale; underlies Corning Shale
10. Type section: Tributary to Meads Creek descending steep valley 1.6 km SE of Monterey, Bradford Quadrangle, Steuben County.

Mecklenburg Gabbro MKBG01
1. Paleozoic
2. North Carolina (C), South Carolina
3. Hermes, O. D., 1968, Mineralogy and Petrology Contr., v. 18, no. 3, p. 270-294
6. Range 2400-4600 m
10. Type area: S Mecklenburg County, N.C.

Meddybemps Granite MBMP01
1. Lower Devonian
2. Maine (EC)
3. Spooner, C. M., and Fairbairn, H. W., 1970, Geol. Soc. America Bull., v. 81, no. 12, p. 3663-3670
7. Small granite pluton
10. Type area: Near town of Meddybembs, near Calais, Washington County.

Medicine Hill Formation MDCH01
1. Pleistocene
2. North Dakota (C)
3. Ulmer, J. H., and Sackreiter, D. K., 1973, North Dakota Geol. Survey Rept. Inv. 51, 1 sheet
4. Till or pebble-loam, silt, sand, and gravel
5. Yellow to brownish-gray, mottled
6. > 12 m, range 1- > 15 m
7. Poorly-sorted, very compact
8. 2 unnamed members
9. Overlies Charging Eagle Formation or Sentinel Butte Formation; underlies Horseshoe Valley Formation or Snow School Formation
10. Type section: Bluffs of Lake Sakakawea 425 m S of mouth of Dead Man Coulee Bay, NW1/4SE1/4NW1/4 sec. 22, T. 147 N., R. 84 W., McLean County.

Medley Formation MDLY02
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 10
4. Latite porphyry
6. 7 m

9. Overlies Wild Cherry Formation; underlies Goat Canyon Formation
10. Type locality: Peak 0.8 km NE of Medleys White Mountain, Jeff Davis County.

Medora Member (Tongue River Formation) MDOR02
1. Paleocene
2. North Dakota (WC)
3. Jacob, A. F., 1973, Am. Assoc. Petroleum Geologists Bull., v. 57, no. 6, p. 1038-1052
4. Tabular sand body
5. Brownish-gray
6. 8 m
10. Type section: In vertical face of cliff E of Medora, NW1/4 sec. 26, T. 140 N., R. 102 W., Billings County.

Meeker Hill Bed (Tully Limestone) MKHL01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 23
5. Siltstone to silty limestone
6. < 1 m
7. Thin-bedded
9. Overlies Fabius Bed; underlies Tully Valley Bed
10. Type locality: Junes Ravine on S side of Meeker Hill, 1.8 km NE of Tully, Onondaga County.

Meldrum Member (Amherstburg Formation) MLDM01
1. Middle Devonian
2. Michigan (EC)
3. Gardner, W. C., 1974, Michigan Basin Geol. Soc. Spec. Papers 1, p. 30-31
4. Limestone
5. Dark-brown to black
6. 85 m
7. Fossiliferous
9. Overlies Sylvania Sandstone; underlies Filer Sandstone Lentil (Amherstburg Formation)
10. Type section: Sun-Meldrum No. 1 well, depth-interval 1515-1600 m, sec. 28, T. 22 N., R. 1 W., Roscommon County.

Memphis Sand (Claiborne Group) U MMPS02
1. Eocene, middle
2. Tennessee (WC)
3. Moore, G. K., and Brown, D. L., 1969, Tennessee Div. Geology Rept. Inv. 26, 1 sheet
4. Lignitic sand, minor silt and silty clay
5. Very light-gray
6. 213 m
7. Fine- to coarse-grained; major aquifer
9. Overlies Flour Island Formation (Wilcox Group); underlies Cook Mountain Formation (Claiborne Group)
10. Type section: Fort Pillow test well, depth-interval 186-399 m, at site of old Fort Pillow on Mississippi River, lat 35°38′39″ N., long 89°49′35″ W., Lauderdale County. Named for city of Memphis.

Meppen Limestone/Formation MPPN02
1. Lower Mississippian (Osagean)
2. Illinois (WC), Missouri

3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 478, p. 19
4. Argillaceous, dolomitic limestone interbedded with coarsely crystalline limestone
5. White and gray, weathers brown
6. 6 m
9. Overlies Chouteau Limestone; underlies Burlington Limestone
10. Type locality: Exposed at base of bluffs S of Pearl, along Illinois River, Pike County, Ill. Probably named for town of Meppen, Calhoun County, Ill.

Mercer Drift/Till MRCR01

1. Pleistocene
2. North Dakota (C)
3. Bluemle, J. P., 1971, North Dakota Geol. Survey Bull. 60, pt. 1, p. 48-51
4. Fluvial gravel and till
6. 11 m
9. Overlies Dead Man Drift/Till; underlies Napoleon Drift
10. Type locality: Exposed SW of Missouri River trench, Mercer County.

Merrill Formation MRRL02

1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 6
4. Latite porphyry
5. Reddish-brown, weathers yellow-brown
6. 38 m
9. Underlies Barrell Springs Formation or Wild Cherry Formation
10. Type section: NW flank of High Peak, from floor of Merrill Canyon up to contact with Barrell Springs Formation, Jeff Davis County.

Merritton Limestone (Clinton Group) MRTN21

1. Middle Silurian
2. Canada (Ontario), New York
3. Kilgour, W. J., 1963, Geol. Soc. America Bull., v. 74, no. 9, p. 1136-1137
4. Argillaceous limestone with shale partings
5. Buff, brown, or gray
6. 1 m
7. Thin-bedded
9. Disconformably overlies Neahga Shale, Thorold Sandstone, and Cabot Head Shale; underlies Rockway Dolomite Member (Irondequoit Formation)
10. Type section: Railroad cut W of Lock 5 on Welland Canal, near Merritton, Ontario, Can.

Mesa Falls Tuff (Yellowstone Group) U MSFL01

1. Pleistocene
2. Idaho (EC), Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B5-B7
4. Ash-flow tuff with phenocrysts of quartz, sanidine, and plagioclase
6. 100 m
7. Welded, devitrified
9. Overlies Huckleberry Ridge Tuff; underlies Lava Creek Tuff

10. Type section: Roadcut on U.S. Highway 20, 6.8 km N of Ashton, Fremont County, Idaho. Named for Upper Mesa Falls on Henrys Fork of Snake River, Island Park area.

Mesita Member (Servilleta Formation) MSIT01
1. Pliocene, upper
2. Colorado (SC)
3. Burroughs, R. L., 1971, New Mexico Geol. Soc. Guidebook 22, p. 281
4. Loose, highly oxidized trachyandesite scoria
5. Dark-red
7. Local eruptions forming small hills above the plateau basalts
10. Type locality: Not stated. Named for exposures in Mesita Crater near Mesita, Costilla County.

Michigamme River Granite MGRV02
1. Precambrian W
2. Michigan (NW)
3. Taylor, W. E. G., 1967, Northwestern Univ. Rept. 13, p. 2, 6, 8
4. Porphyritic biotite granite
5. Gray
9. Intruded into migmatite complex; intruded by Amik Lake Granite
10. Type area: Between Champion and Republic, Marquette County.

Middle Anchorage Alluvium MACG01
1. Pleistocene
2. California (SC)
3. Weaver, D. W., and Meyer, G. L., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 103-104
4. Sandy, pebble to cobble conglomerate
5. Reddish-brown
6. 9 m
7. Poorly to moderately indurated
9. Discordantly overlies Monterey Formation
10. Type locality: Middle Anchorage, SE Santa Cruz Island.

Middle Fork Tongue (Green River Formation) MDFK02
1. Eocene
2. Utah (NC)
3. Moussa, M. T., 1969, Geol. Soc. America Bull., v. 80, no. 9, p. 1741-1742
4. Paper shale interbedded with marlstone and limestone
5. Tan to brown
6. 85 m
7. Some beds are kerogenaceous and have petroliferous odor
9. Gradationally overlies main body of Colton Formation; underlies Tabbyune Creek Tongue (Colton Formation)
10. Type section: E wall of canyon of Middle Fork, NE1/4 sec. 19 and SE1/4 sec. 18, T. 10 S., R. 8 E., Wasatch County.

Middle Point Flow (Portage Lake Volcanics) U MDLP01
1. Precambrian Y
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C13
4. Porphyrite with fine-grained matrix, tending toward glomeroporphyrite
6. 15 m

9. Erupted after Long Island Flow and before Edwards Island Flow
10. Type locality: S shore of Grace Harbor, 0.8 km NE of Middle Point, W Isle Royale, Keweenaw County.

Middleton Basalt MDLN01
1. Quaternary
2. Utah (SW)
3. Best, M. G., Hamblin, W. K., and Brimhall, W. H., 1966, Brigham Young Univ. Geology Studies, v. 13, p. 111
4. Basalt flows
6. Range 0-30 m
7. Columnar
9. Overlies Gunlock Basalt
10. Type locality: Near town of Middleton, Washington County.

Miguelito Member (Pismo Formation) U MGLT01
1. Miocene, upper, and Pliocene, lower
2. California (SC)
3. Hall, C. A., Jr., 1973, California Div. Mines and Geology Map Sheet 24
4. Claystone and siltstone with diatomite and bituminous sandstone lenses
5. Brownish-gray
6. 686 m
9. Disconformably overlies Monterey Formation; interfingers with or overlies Edna Member (Pismo Formation); underlies Gragg or Squire Member (Pismo Formation)
10. Type section: N limb of Pismo syncline, on San Luis Obispo Creek, 1.6 km N of Squire Canyon, San Luis Obispo County. Named for San Miguelito Land Grant.

Mikado Phyllite MKD001
1. Devonian(?)
2. Alaska (NE)
3. Chipp, E. R., 1970, Alaska Div. Mines and Geology Geol. Rept. 42, p. 7-8
6. 180 m
7. Overthrust plate; highly sheared, iron-stained, gold-bearing
9. Overlies unnamed schist; underlies unnamed schist and quartzite
10. Type area: 6.5 km SW of Squaw Lake, Chandalar region.

Milan Center Dolomite Member (Detroit River Formation) MLCR01
1. Middle Devonian
2. Indiana (NE)
3. Doheny, E. J., Droste, J. B., and Shaver, R. H., 1975, Indiana Geol. Survey Bull. 53, p. 28-30
4. Dolomite
5. Tan, brown
6. 4 m
7. Fine-grained, saccharoidal, vuggy
9. Overlies Grover Ditch Member; underlies Cranberry Marsh Member
10. Type section: Woodburn Quarry of May Stone and Sand, Inc. well in NE1/4 sec. 23, T. 31 N., R. 14 E., Allen County. Named for Milan Center Township.

Mill Creek Formation MLCK04
1. Pliocene, lower
2. California (SE)
3. Gibson, R. C., 1971, Geol. Soc. America Cordilleran Sec.

Guidebook, no. 9, p. 171
4. Sandstone, conglomerate, breccia, limestone
5. Gray, brown
6. 1700 m
8. Four informal members
11. Type locality: Exposures along Mill Creek, in Mill Creek-Yucaipa Ridge area, 14.4 km NE of Redlands, San Bernardino Mountains, San Bernardino County. Named for Mill Creek Canyon.

Miller Mill Quartzite Member (Lay Dam Formation) MLML01
1. Lower Devonian
2. Alabama (C)
3. Carrington, T. J., 1972, Geol. Soc. America Southeastern Sec. Guidebook 21, Trip 1, p. 14
4. Quartzite, locally conglomeratic
6. 290 m
7. Medium- to coarse-grained
9. Overlies Kalona Quartzite Member (Lay Dam Formation); underlies Butting Ram Sandstone
10. Type locality: At site of mill operated by Miller family, State Highway 145, E of U.S. Highway I-65, Chilton County.

Millingport Formation (Albemarle Group) U MLGP01
1. Cambrian
2. North Carolina (C)
3. Stromquist, A. A., and Sundelius, H. W., 1969, U.S. Geol. Survey Bull. 1274-B, p. B1-B4
4. Sandstone, siltstone, argillite, with minor pyroclastic rocks
6. Range 1800-2700 m
8. Floyd Church and Yadkin Members
9. Conformably overlies Cid Formation (Albemarle Group); interbedded with Uwharrie Formation and Albemarle Group
10. Type area: Along North Carolina Highway 71, from 8 km W to 3.2 km E of town of Millingport, Mount Pleasant Quadrangle, Stanly County.

Millrift Formation/Formation (Genesee Group) MLRF01
1. Upper Devonian
2. Pennsylvania (NE) New York
3. Fletcher, F. W., and Woodrow, D. L., 1970, Pennsylvania Geol. Survey Atlas 223, p. 51-54
4. Sandstone, siltstone, and shale
6. > 81 m
7. Ball-and-pillow structures (flow rolls); fossiliferous
9. Gradationally overlies Sloat Brook Formation; gradationally underlies Delaware River Formation
10. Type section: W bank of Delaware River at Millrift, from beneath Erie-Lackawanna railroad bridge to 230-275 m downstream, Westfall Township, Pike County, Pa.

Millstone Run Formation (Allegheny Group) MLSR01
1. Middle Pennsylvanian
2. Pennsylvania (WC)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 16, 26-28
4. Shale, interbedded with micaceous sandstone, coal, underclay
5. Gray to black
6. 23 m
7. Represents one cycle of deposition; fossiliferous

8. Includes informal lower Kittanning coal at base, middle Kittanning underclay at top
9. Overlies Clearfield Creek Formation; underlies Mineral Springs Formation
10. Type section: Exposure in strip mine S of head of Valley Fork Run, 2012 m N of lat 41°00′ N., 1646 m W of long 78°15′ W., Bradford Township, Clearfield County. Named for stream, Millstone Run.

Mineral Springs Formation (Allegheny Group) MSPG06
1. Middle Pennsylvanian
2. Pennsylvania (WC)
3. Edmunds, W. E., 1969, Pennsylvania Geol. Survey Inf. Circ. 61, p. 16, 24-26
4. Shale, interbedded with siltstone, coal, underclay, limestone
5. Gray to black
6. 19 m
7. Represents one cycle of deposition; siltstone contains bands and lenses of siderite; underclay contains limestone bed and nodules
8. Includes informal middle Kittanning coal at base, upper Kittanning underclay at top
9. Overlies Millstone Run Formation; underlies Laurel Run Formation
10. Type section: Exposure in strip mine 3.2 km S of village of Mineral Springs, 1036 m N of lat 40°55′30" N., 640 m W of long 78°20′ W., Boggs Township, Clearfield County.

Minsi Member (Shawangunk Formation) U MINS03
1. Upper Ordovician(?) and Lower Silurian
2. New Jersey (NW), Pennsylvania
3. Epstein, J. B., and Epstein, A. G., 1972, U.S. Geol. Survey Prof. Paper 744, p. 5-7
4. Quartzose conglomeratic sandstone and minor argillite
6. 92 m, range 68-92 m
9. Overlies and interfingers with Weiders Member (Shawangunk Formation) in W; unconformably overlies Pen Argyl or Ramseyburg Member (Martinsburg Formation) in E; gradationally underlies Lizard Creek Member (Shawangunk Formation)
10. Type section: Along U.S. Highway I-80 in Delaware Water Gap, Warren County, N.J. Named for Mount Minsi overlooking Delaware Water Gap, Monroe County, Pa.

Miramar Sandstone Member (Pomerado Conglomerate) MRMR07
1. Eocene, upper
2. California (SE)
3. Peterson, G. L., and Kennedy, M. P., 1974, San Diego Soc. Nat. History Trans., v. 17, no. 18, p. 251-258
5. Gray to gray-brown, weathers red-brown
6. 20 m
10. Type locality: Along fire road extending along ridge at N margin of Miramar Reservoir, San Diego County.

Mirror Lake Breccia MRLK02
1. Middle Jurassic
2. Idaho (WC)
3. Vallier, T. L. and Fredley, David, 1972, Geol. Soc. America Bull., v. 83, no. 12, p. 3827-3832
4. Mafic and granitic clasts in hornblende metadiabase porphyry

matrix
5. Pale-gray matrix, clasts of black, green, white, with overall polka dot appearance
7. Lenticular dike cutting W wall of cirque which holds Mirror Lake
9. Cuts Upper Triassic rocks of Seven Devils Volcanics
10. Type locality: Mirror Lake, He-Devil Quadrangle, Seven Devils Mountains, Idaho County.

Miscauno Formation MSCN01
1. Precambrian W
2. Wisconsin (NE)
3. Dutton, C. E., and Bradley, R. E., 1970, U.S. Geol. Survey Misc. Geol. Inv. Map I-631
4. Graywacke with crystalline tuff, chert, conglomerate
9. Intruded by Beecher Gneiss.
10. Type area: Mountain-Amberg area, Marinette County.

Mission Spring Formation MSPG01
1. Tertiary
2. Nevada (C)
3. Vitaliano, C. J., and Vitaliano, D. B., 1972, Geol. Soc. America Bull., v. 83, no. 11, p. 2370
4. Rhyolitic to trachytic flows and tuffs
5. Red, gray
6. 450 m
9. Underlies Third Canyon Formation
10. Type section: E of lower spring in Mission Canyon, WC part of sec. 4, T. 10 N., R. 39 E., lat 38°45′29" N., long 117°30′50" E., Nye County.

Mission Valley Formation (Poway Group) U MSVL01
1. Eocene, upper
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 719, 721
4. Sandstone containing several concretionary layers and silicified wood
5. Gray, red
6. 58 m
9. Gradationally underlies Pomerado Conglomerate
10. Type section: Along S wall of Mission Valley, on W side of State Highway 163 (old U.S. 395) at its junction with U.S. Highway I-8, San Diego County.

Mitchell Creek Formation U MCCK13
1. Lower Pennsylvanian
2. Nevada (NC)
3. Coats, R. R., 1971, U.S. Geol. Survey Misc. Geol. Inv. Map I-665, p. 2
4. Metabasalt and meta-andesite flows and tuffs; minor calcarenite and quartzite
6. > 1000 m
9. Unconformably underlies Tertiary volcanic rocks
10. Type section: N side of Mitchell Creek, 1.6 km NW of Porcupine Pass, Owyhee Quadrangle, Elko County.

Mitchell Dam Amphibolite MCDM05
1. Paleozoic, middle

2. Alabama (C)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 34-40
5. Dark-green to brown
7. Layered, coarse- to fine-grained
10. Type locality: Near Mitchell Dam on Coosa River, E of Coosa River bridge, SW1/4 sec. 13, T. 21 N., R. 16 E., Chilton County.

Mitchell Pass Member (Gering Formation) MCLP01
1. Miocene
2. Nebraska (WC)
3. Vondra, C. F., Schultz, C. B., and Stout, T. M., 1969, Nebraska Geol. Survey Paper 18, p. 1, 3
4. Sandstone containing lenses, pumice pebbles
5. Gray
6. 19 m, range 6-19 m
8. Twin Sisters Pumice Conglomerate Bed, Wildcat Ridge Ash Bed
9. Disconformably overlies Helvas Canyon Member (Gering Formation); underlies Monroe Creek Formation
10. Type locality: Helvas Canyon, E of Carter Canyon and S of Mitchell Pass, SW of Gering, NW1/4NE1/4NW1/4 sec. 6, T. 20 N., R. 55 W., Scotts Bluff County.

Moccasin Bend Member (Boone Formation) U MCBD03
1. Upper Mississippian (Meramecian)
2. Oklahoma (NE), Kansas, Missouri
3. McKnight, E. T., and Fischer, R. P., 1970, U.S. Geol. Survey Prof. Paper 588, p. 50-55
4. Limestone with chert beds
5. Brown
6. 43 m, range 0-43 m
9. Conformably overlies Baxter Springs Member (Boone Formation); underlies Quapaw Limestone, Hindsville Limestone, or Krebs Group
10. Type locality: Moccasin Bend on Spring River, 9.6 km E of Miami, Ottawa County, Okla.

Moffat Trail Limestone Member (Amsden Formation) U MFTL01
1. Upper Mississippian (Chesterian)
2. Wyoming (WC)
3. Sando, W. J., Gordon, MacKenzie, Jr., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 848-A, p. A27-A31
4. Limestone containing chert nodules
5. Light-gray
6. 20 m, range 20-34 m
7. Medium- to coarse-grained; fossiliferous
9. Conformably overlies or is equivalent to Horseshoe Shale Member; conformably underlies Ranchester Limestone Member
10. Type section; On ridge N of Moffat Trail, NE1/4 sec. 3, T. 33 N., R. 117 W., Lincoln County.

Moffits Mill Complex MFML01
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 38-39
4. Interlayered metasubgraywacke and schist

6. 910 m
10. Type area: Exposed along Uchee and Whites Creeks, Lee County.

Molina Member (Wasatch Formation) U MOLN01
1. Eocene
2. Colorado (NW)
3. Donnell, J. R., 1969, U.S. Geol. Survey Bull. 1274-M, p. M8-M11
4. Sandstone with claystone
5. Brown, gray, red, green
6. Range 0-150 m
7. Massive beds
9. Overlies Atwell Gulch Member; underlies Shire Member
10. Type locality: Prominent hill N of Plateau Creek 1.6 km W of Molina, Mesa County.

Monotony Tuff U MNTN05
1. Oligocene
2. Nevada (SC)
3. Ekren, E. B., Anderson, R. E., Rogers, C. L., and Noble, D. C., 1971, U.S. Geol. Survey Prof. Paper 651, p. 25-27
4. Rhyodacitic ash-flow tuff with phenocrysts of plagioclase, quartz, and biotite
5. Weathers rusty or green-brown
6. 700 m, range 300-700 m
9. Overlies Paleozoic rocks; underlies Shingle Pass Tuff
10. Type locality: NE flank of Monotony Valley, 4 km SSE of Oswald Mine, secs. 2 and 3, T. 3 S., R. 53 E., Nye County.

Montana Mine Formation (Flag Rock Group) U MNNM01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A5-A6
4. Ferruginous chert containing cummingtonite rosettes
9. Unconformably overlies Irish Gulch Slate; conformably underlies Nahant Schist or Rapid Creek Greenstone (Flag Rock Group)
10. Type locality: Montana Mine, sec. 3, T. 2 N., R. 3 E., N Black Hills, Lawrence County.

Moody Canyon Member (Moenkopi Formation) MDCN04
1. Middle Triassic
2. Utah (SE)
3. Blakey, R. C., 1974, Utah Geol. and Mineralog. Survey Bull. 104, p. 46-51
4. Siltstone, mudstone
5. Red
6. 83 m
7. Intercalated beds of great continuity and regularity, slope- and cliff-forming
9. Overlies Torrey Member (Moenkopi Formation); underlies Chinle Formation
10. Type locality: SW Circle Cliffs along Moody Creek, 3.2 km N of head of Moody Canyon, T. 34 S., R. 7 E., Garfield County.

Moonshine Creek Formation U MCRK02
1. Lower and Upper Cretaceous
2. Alaska (EC)
3. Jones, D. L., and MacKevett, E. M., Jr., 1969, U.S. Geol. Survey Bull. 1274-K, p. K4-K5
4. Siltstone and sandstone

5. Gray to green
6. Range 30-3000 m
7. Marine sediments
9. Unconformably overlies Nikolai Greenstone or Kennicott Formation; unconformably underlies Tertiary sedimentary rocks, Frederika Formation, Wrangell Lava, or Chititu Formation
10. Type area: Along Moonshine Creek, S Wrangell Mountains, McCarthy C-4 Quadrangle.

Moonshine Gulch Quartzite U MGLC01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A3-A4
4. Vitreous quartzite with interbedded slate, cut by mafic dikes
5. Black
9. Unconformably(?) underlies Irish Gulch Slate or Rapid Creek Greenstone
10. Type locality: Moonshine Gulch, sec. 13, T. 2 N., R. 3 E., N Black Hills, Pennington County.

Moose Creek Member (Totatlanika Schist) U MCRK11
1. Mississippian(?)
2. Alaska (EC)
3. Wahrhaftig, Clyde, 1968, U.S. Geol. Survey Bull. 1254-E, p. E13-E14
4. Schist, chloritic schist, and quartz-orthoclase schist and gneiss
5. Black, green, yellow
6. 1600 m
7. Lenticular bodies
9. Overlies Keevy Peak Formation; underlies California Creek Member (Totatlanika Schist)
10. Type locality: Small canyon tributary to Moose Creek from N, lat 148°16′ W., long 63°59′ N., Healy D-3 Quadrangle.

Moravia Bed (Tully Limestone) MORV01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 41
4. Limestone
5. Blue, buff
6. 2 m
7. Wavy-bedded
9. Overlies Bellona Bed (Tully Limestone) in W and West Brook Shale Bed (Tully Limestone) in E; interfingers with Unadilla Formation; underlies Fillmore Glen Bed (Tully Limestone)
10. Type area: W of Moravia, Cayuga County.

Morganville Waterlime Member (Fiddlers Green Formation) MGVL01
1. Upper Silurian
2. New York (WC)
3. Ciurca, S. J., Jr., 1973, New York Geol. Assoc. Guidebook 45, Trip D, p. 1-14
4. Dolostone
6. 2 m
7. Fine-grained, fossiliferous, conchoidal fracture
9. Overlies Oatka Formation; underlies Victor Member (Fiddlers Green Formation)
10. Type locality: Black Creek at Morganville, Genesee County.

Mormon Creek Formation MMCK13
1. Upper Ordovician
2. Michigan (C)
3. Kesling, R. V., 1975, Michigan Univ. Mus. Paleontology, Papers on Paleontology 9, p. 5-8
4. Thin-bedded dolomites alternating with bands of shale and evaporites
5. Gray
6. 5 m
7. Contains ostracod fauna and "fucoids"
9. Overlies Big Hill Formation; underlies Manitoulin Dolomite
10. Type locality: Quarry on N side of Mormon Creek Truck Trail (U.S. Forest Service Highway 2231), SE1/4 sec. 15, T. 41 N., R. 19 W., between Sturgeon River and Southwest Branch of Fishdam Creek, Delta County.

Motts Gneiss MTTS03
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 38
4. Leucocratic quartz diorite pencil gneiss with amphibolite masses
7. Weathered rock produces saprolite with spindly fragments
10. Type locality: Lee County.

Mouat Quartz Monzonite MOUT01
1. Precambrian
2. Montana (SC)
3. Butler, J. R., 1966, Geol. Soc. America Bull., v. 77, no. 1, p. 45-64
7. Pluton
10. Type locality: S of Mouat Chromite Mine, and W of Nye Post Office, long 109°55′ W., Beartooth Mountains, Stillwater County.

Mounds Gravel MNDS01
1. Pliocene and Pleistocene
2. Illinois (SC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 47-48
4. Chert pebble gravel
5. Brown
9. Overlies Paleozoic, Mesozoic, and Tertiary formations; underlies Loveland Silt
10. Type section: Gravel pit, SW1/4SW1/4SW1/4 sec. 7, T. 16 S., R. 1 W., 4.8 km W of Mounds, Pulaski County.

Mountain Pass Rhyolite MNPS02
1. Jurassic (?)
2. California (SE)
3. Evans, J. R., 1971, California Div. Mines and Geology Map Sheet 17
5. Red, locally green and purple
6. > 360 m
7. Porphyritic; massive flows; weathers to talus flows on steep slopes
9. Overlies Aztec Sandstone; upper contact not exposed; truncated on W by Mescal thrust fault of probable Early Cretaceous age

10. Type area: Occupies about 3 sq km in parts of secs. 24 and 25, T. 16 N., R. 13 E., and sec. 30, T. 16 N., R. 14 E., San Bernardino County. Named for village of Mountain Pass.

Mountain Springs Formation MSPG08
1. Upper Ordovician, Silurian, and Lower Devonian
2. Nevada (SE), California
3. Gans, W. T., 1974, Geol. Soc. America Bull., v. 85, no. 2, p. 189-200
4. Dolomite
5. Gray
6. 116 m
7. Thin-bedded
8. 9 informal units
9. Disconformably overlies Nopah Formation; underlies Ironside Member (Sultan Limestone)
10. Type section: E flank of hill 6646, N1/2 sec. 31, T. 22 S., R. 58 E., Shenandoah Peak Quadrangle. Named for village of Mountain Springs, sec. 19, T. 22 S., R. 58 E., Clark County, Nev.

Mountainville Member (Esopus Formation) MNVL04
1. Lower Devonian
2. New York (SE), New Jersey
3. Boucot, A. J., Gauri, K. L., and Southard, John, 1970, Palaeontographica, Abt. A, Bd. 135, Lief. 1-2, p. 30-34
4. Siltstone
5. Gray
6. 64 m, range 15-64 m
9. Overlies Connelly Conglomerate or Oriskany Sandstone; gradationally underlies Quarry Hill Member (Esopus Formation)
10. Type section: Cut along W side of New York Thruway, E of Highland Mills, Orange County, N.Y. Named for town of Mountainville.

Mount Carmel Complex MCML06
1. Devonian
2. South Carolina (WC)
3. Griffin, V. S., Jr., 1972, South Carolina Div. Geology, Geol. Notes, v. 16, no. 3, p. 59-78
4. Gabbro with lesser diorite and syenite
9. Intrudes Carolina Slate Belt
10. Type area: Near town of Mt. Carmel, McCormick County.

Mount Cowen Gneiss (North Snowy Group) MNCN03
1. Precambrian W
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 26-30
4. Granodioritic augen gneiss containing schist remnants and pegmatites
5. Gray and pink
7. Coarse-grained, coarsely foliated
9. Fault contact with Davis Creek Schist; intrusive into Falls Creek Gneiss
10. Type section: S part of Mount Cowen structural block, E and W of Mount Cowen, Beartooth Mountains, Park County.

Mount Delano Gneiss (North Snowy Group) MNDL02

1. Precambrian W
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 20-25
4. Tonalitic gneiss
5. Gray to brown
7. Medium- to coarse-grained, banded. Massive to foliated
9. Intrusive into Davis Creek Schist, Falls Creek Gneiss, and Jewel Quartzite
10. Type section: Near Mount Delano on ridge between North and South Forks of Deep Creek. Principal reference section is along divide between Pine Creek and Davis Creek, SE of Pine Creek Lake, Beartooth Mountains, Park County.

Mount Dutton Formation U MNDN04

1. Oligocene, upper, and Miocene, lower
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B1, B13-B15
4. Volcanic rocks from Marysvale volcanic pile
6. 950 m, range 950-1500 m
7. Vent facies and alluvial facies
8. In N Black Mountains, unnamed volcanic breccia member; in S Tushar Mountains, Beaver Member and unnamed flow-volcanic breccia and sandstone members; in Markagunt Plateau, unnamed volcanic breccia member; and in Awapa, Fish Lake, and Sevier Plateaus, Kingston Canyon and Antimony Tuff Members intercalated with unnamed volcanic breccia member
9. Overlies Isom or Needles Range Formation; underlies Horse Valley or Dry Hollow Formation; underlies or intercalated with Buckskin Breccia, Condor Canyon Formation, or Osiris Tuff
10. Type section: NE1/4NE1/4 sec. 9 to center sec. 15, T. 32 S., R. 4 W., at Mount Dutton in S Sevier Plateau, Garfield County.

Mount Edgecumbe Ash Bed (Forest Creek Formation) MEGB01

1. Pleistocene
2. Alaska (SE)
3. Reed, J. C., and Coats, R. R., 1941, U.S. Geol. Survey Bull. 929, p. 47-48
5. Buff, red, yellow
6. 0.1 m
7. Soft, fluffy
10. Type locality: Extends from crater of Mount Edgecumbe, on Kruzof Island, near Sitka, over much of coastal plain.

Mount Jackson Rhyolite U MJCK02

1. Pleistocene
2. Wyoming (NW), Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B11-B12
4. Rhyolitic lava flows with phenocrysts of quartz, sanidine, and plagioclase
6. 450 m
9. Locally overlies Junction Butte Basalt; conformably underlies Lava Creek Tuff (Yellowstone Group); underlies Undine Falls Basalt
10. Type area: Madison Canyon near Mount Jackson, summit on cliffs

forming N wall of Madison Canyon, 5.5 km W of Madison Junction, Yellowstone National Park, Teton County, Wyo.

Mount Locke Formation MLCK06
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 7-8
4. Latite porphyry with plagioclase phenocrysts
5. Gray
6. 176 m, range 42-176 m
9. Overlies Barrell Springs Formation; underlies Eppenauer Ranch Basalt or Wild Cherry Formation
10. Type section: Middle and upper slopes on S side of Mount Locke, Jeff Davis County.

Mount Owen Quartz Monzonite U MNON01
1. Precambrian W or X
2. Wyoming (NW)
3. Reed, J. C., Jr., and Zartman, R. E., 1973, Geol. Soc. America Bull., v. 84, no. 2, p. 568-577
4. Quartz monzonite with pegmatite dikes and bodies
7. Pluton
10. Type locality: Exposures along trail in South Fork of Cascade Canyon, 3.1 km W of summit of Mount Owen, Grand Teton Quadrangle, Teton County.

Mount Pisgah Formation (Brimfield Group) U MPSG01
1. Ordovician(?) to Lower Devonian(?)
2. Massachusetts (C), Connecticut
3. Peper, J. D., Pease, M. H., Jr., and Seiders, V. M., 1975, U.S. Geol. Survey Bull. 1389, p. 1, 3, 8-9
4. Schist and gneiss
5. Gray or grayish-orange
6. 810 m
7. Garnetiferous granular; thin-to very thick-layered, fine- to very coarse-grained
9. Overlies Hamilton Reservoir Formation (Brimfield Group)
10. Type locality: Mount Pisgah, in axial part and E limb of overturned Mount Pisgah syncline, Wales Quadrangle, Hampden County, Mass.

Mount Soledad Formation (La Jolla Group) U MSDD01
1. Eocene, lower(?) and middle
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 714-715
4. Marine cobble conglomerate interbedded with medium-grained sandstone in upper part
6. 70 m
10. Type section: At head of natural amphitheater 400 m W of intersection between Ardath Road and U.S. Highway I-5, San Diego County.

Mount Vernon Canyon Formation MVRC01
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 153-154

4. Hornblende plagioclase gneiss, tactite, and quartz plagioclase biotite gneiss with pegmatite intrusions
5. Gray, red
6. 600 m
7. Foliated
9. Overlies Clear Creek Canyon Formation
10. Type locality: Exposed in roadcuts along U.S. Highway 40, Mount Vernon Canyon, Jefferson County.

Mount Wallace Formation (Sunlight Group) U MWLC02

1. Eocene, middle
2. Montana (SW), Wyoming
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Andesite, trachybasalt, and latite lava flows and flow breccias, rhyodacite welded ash-flow tuff, and interlayered volcanic sediments
6. 910 m
8. Slough Creek Tuff Member
9. Overlies Washburn Group; underlies Langford Formation and Wapiti Formation
10. Type area: Mount Wallace and region to S, N of Yellowstone National Park, Park County, Mont.

Mount Wrightson Formation U MWRG02

1. Triassic
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C6-C7
4. Dacitic, andesitic, rhyolitic, and latitic volcanic rocks
6. 2600 m
8. 3 informal members
9. Unconformably underlies Gardner Canyon Formation; intruded by Piper Gulch Monzonite
10. Type area: Trail between Madera and Gardner Canyons and N slope of Cave Creek Canyon beneath crest of Mount Wrightson, Santa Rita Mountains, Santa Cruz County.

Mount Zion Formation MNZN04

1. Lower Devonian
2. Alabama (C)
3. Carrington, T. J., 1972, Geol. Soc. America Southeastern Sec. Guidebook 21, Trip 1, p. 12
4. Phyllite
5. Black and cream (unweathered), silvery-gray (weathered)
6. Range 90-150 m
7. Locally laminated
9. Neither upper nor lower contacts are exposed, but apparently underlies Jumbo Dolomite
10. Type locality: Exposures near Mt. Zion Church, SW1/4 sec. 17, T. 23 N., R. 15 E., Chilton County.

Moyer Ridge Member (Bloomsburg Formation) MRDG05

1. Upper Silurian
2. Pennsylvania (C)
3. Hoskins, D. M., 1961, Pennsylvania Geol. Survey Bull. G36, p. 3, 6
4. Fine-grained sandstone and siltstone with thin claystone interbeds
5. Grayish-red

6. 10 m
9. Overlies and underlies claystone units of Bloomsburg Formation
10. Type locality: Mifflintown, on S flank of Moyer Ridge anticline, along U.S. Highway 22, about 140 m N of town line, Juniata County.

Muddy Buttes Sandstone Member (Pierre Shale) U MDBS01
1. Upper Cretaceous
2. Colorado (NC)
3. Izett, G. A., Cobban, W. A., and Gill, J. R., 1971, U.S. Geol. Survey Prof. Paper 684-A, p. A12, A18
4. Sandstone, siltstone
5. Yellowish-brown
6. Range 1.5-9 m
7. Thin-bedded, ledge-forming
9. Overlies and underlies shale units of Pierre Shale
10. Type locality: Muddy Buttes, 1.6 km N of Kremmling, NW1/4 sec. 8 and NE1/4 sec. 7, T. 1 N., R. 80 W., Grand County.

Mulberry Grove Silt Member (Glasford Formation) MBGV01
1. Pleistocene (Illinoian)
2. Illinois (SC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 58
4. Calcareous silt with sand and gravel
6. 0.4 m
7. Thin, lenticular
9. Overlies Smithboro Till Member; underlies Vandalia Till Member
10. Type locality: Borrow pits E of Mulberry Grove along U.S. Highway I-70, SW1/4SW1/4 sec. 31, T. 6 N., R. 1 W., Fayette County.

Muldoon Canyon Formation (Copper Basin Group) MLDC01
1. Upper Mississippian and Lower Pennsylvanian
2. Idaho (SC)
3. Paull, R. A., Wolbrink, M. A., Volkmann, R. G., and Grover, R. L., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1392-1395
4. Argillite, with interbedded quartzite, conglomerate, limestone
5. Gray to reddish-brown
6. 1260 m
8. Green Lake Limestone Member
9. Gradationally overlies Scorpion Mountain Formation; conformably underlies Brockie Lake Conglomerate
10. Type section: Both sides of Muldoon Canyon, W1/2 sec. 19, T. 4 N., R. 22 E., (lower part), E1/2NE1/4 sec. 7 to NE1/4SW1/4NE1/4 sec. 8, T. 4 N., R. 22 E., (upper part), Custer County.

Mule Mountain Rhyolite MLMN03
1. Miocene
2. New Mexico (SW)
3. Rhodes, R. C., and Smith, E. I., 1973, Bull. Volcanologique, v. 36, no. 3, p. 401-411
4. Banded lava flows and domes, basal perlite with vitrophyre nodules
7. Glassy, brecciated
9. Overlies Dripping Spring Formation

10. Type locality: Mule Mountains, SE1/4 sec. 6, T. 14 S., R. 21 W., Grant County.

Munsungun Lake Formation MGLK01
1. Middle Ordovician
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 23-27
4. Fine-grained pyroclastic tuff, volcanic breccia, crystal and mixed tuffs, cherts, slates, dolorite
6. 1500 m
8. Reed Pond Member
9. Conformably overlies Bluffer Pond Formation; unconformably underlies Spider Lake Formation, Carpenter Pond Formation (East Branch Group) and Upper Silurian and Lower Devonian rocks; conformably underlies Blind Brook Formation
10. Type locality: Munsungun Lake, Spider Lake Quadrangle, Piscataquis County.

Murdock Station Member (Tamiami Formation) MCKS01
1. Pliocene
2. Florida (EC)
3. Hunter, M. E., 1968, Gulf Coast Assoc. Geol. Socs. Trans. 18, p. 439-50
4. Barnacle "hash", phosphatic sand, pectin biostrome
5. Gray
6. 1 m
9. Overlies Bayshore Clay Member; underlies Pinecrest Sand Member
10. Type section: Canal bank, sec. 4, T. 40 S., R. 21 E., on Jupiter Waterway, 1.6 km S of U.S. Highway 41, Port Charlotte, Charlotte County.

Murphy Spring Tuff Breccia MPSP01
1. Miocene
2. California (C)
3. Chesterman, C. W., 1968, Geol. Soc. America Mem. 116, p. 51-53
4. Dacite tuff breccia, with minor breccia flows and welded tuff layers; dacite lava flows at top
6. 300 m
7. Crudely layered to massive, poorly sorted, partly of lahar origin
9. Lower contact not known; underlies Potato Peak Formation; intruded by Mount Biedeman Formation; in fault contact with Willow Springs Formation
10. Type locality: Murphy Spring, in Bodie Hills, 4 km SW of ghost town of Bodie, NW1/4SE1/4 sec. 24, T. 4 N., R. 26 E., Mono County.

Muscatatuck Group MCCK33
1. Lower and Middle Devonian
2. Indiana (SE)
3. Shaver, R. H., 1974, Indiana Geol. Survey Occasional Paper 3, 7 p.
4. Dolomites, limestones
6. 20 m
8. North Vernon Limestone, Jeffersonville Limestone, Geneva Dolomite, Detroit River Formation, Traverse Formation
9. Overlies Salina and Wabash Formations in N; Clear Creek Chert and Lower Devonian rocks in S; underlies New Albany Shale in S and W, and Antrim Shale in N

10. Type section: Exposure on N bluff of Big Camp Creek and in lower part of ravine that heads immediately W of Lick Branch Cemetery, Graham Township, NE1/4NE1/4SW/14 sec. 13, T. 4 N., R. 8 E., Jefferson County. Named for exposures along Muscatatuck River in Jefferson and Jennings Counties.

Muttlebury Formation MLBR14
1. Lower and Middle Jurassic
2. Nevada (NW)
3. Speed, R. C., 1975, Geol. Soc. America Bull., v. 86, no. 4, p. 473-486
4. Rauhwacke, sheetlike carbonate complex
6. 70 m
7. Nappe
10. Type area: West Humboldt Range, Pershing County. Named for Muttlebury Canyon in T. 26 N., R. 32 E.

Mystic Creek Member (Totatlanika Schist) U MCCK17
1. Mississippian(?)
2. Alaska (EC)
3. Wahrhaftig, Clyde, 1968, U.S. Geol. Survey Bull. 1254-E, p. E17
4. Schist
5. Purple, green, yellow
6. 600 m, range 600-900 m
9. Overlies and interfingers with Chute Creek Member; underlies Sheep Creek Member
10. Type section: Along Rogers Creek from 1500 to 2600 m upstream from its junction with Sheep Creek, Healy D-2 Quadrangle.

Nahant Schist (Flag Rock Group) U NHNT02
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A7
4. Slaty to schistose graphitic rock
5. Black
9. Conformably overlies Montana Mine Formation; overlies or is interbedded with Rapid Creek Greenstone; conformably underlies Rochford Formation
10. Type locality: Nahant, sec. 34, T. 3 N., R. 3 E., N Black Hills, Lawrence County.

Nambe Member (Tesuque Formation) NMBE01
1. Miocene, middle
2. New Mexico (NC)
3. Galusha, Ted, and Blick, J. C., 1971, Am. Mus. Nat. History Bull., v. 144, art. 1, p. 45-53
4. Conglomeratic sandstone, sand, silt, ash
5. Reddish-brown
6. 140 m
7. Alluvial fan deposits, fossiliferous
9. Nonconformably overlies crystalline rocks or Picuris Tuff; underlies Skull Ridge Member (Tesuque Formation)
10. Type locality: Secs. 11, 13, 14, T. 20 N., R. 9 E., sec. 18, T. 20 N., R. 10 E., Santa Fe County. Named for Nambe Pueblo, 9.6 km S.

Nanook Limestone U NNOK01
1. Middle(?) Devonian
2. Alaska (NE)

3. Dutro, J. T., Jr., 1970, in Adkison, W. L., and Brosgé, M. M., eds., 1970, Am. Assoc. Petroleum Geologists, Pacific Sec., p. M1-M2
4. Alternating limestone and dolomite
5. Orange
6. 900 m
8. 8 informal members
9. Overlies, probably disconformably, Katakturuk Dolomite; unconformably underlies Kekiktuk Conglomerate
10. Type section: Exposures along S-flowing tributary to Nanook Creek on S flank of Shublik Mountains, secs. 14 and 23, T. 2 N., R. 25 E., and secs. 7 and 17, T. 2 N., R. 26 E.

Napanoch Member (Marcellus Shale) NPNC01
1. Middle Devonian
2. New York (EC)
3. Wolff, M. P., 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 20, p. 1-40
4. Marine conglomerate of quartz, siltstone, and chert pebbles in matrix of coarse sand and shell fragments
6. 0.2 m
9. Overlies Solsville Member; underlies Pecksport Member
10. Type area: Extends from NE of Westerlo in SE corner of Berne Quadrangle, Albany County, to Ellenville, 120 km SW.

Naples Bay Group (Marquesas Supergroup)/Formation (Marquesas Supergroup) NPLB01
1. Lower Cretaceous (Comanchean)
2. Florida (SE)
3. Winston, G. O., 1971, Gulf Coast Assoc. Geol. Socs. Trans. 21, p. 28
4. Interbedded limestone, dolomite, anhydrite
6. 378 m
9. Overlies Big Cypress Group; underlies Upper Cretaceous rocks
10. Type section: Humble No. 1 Collier Corp. well, sec. 27, T. 50 S., R. 26 E., Collier County. Named for Naples Bay, 9.6 km NW of type well.

Naranjito Formation U NRNJ03
1. Paleocene
2. Puerto Rico (NE)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 43-44
4. Tuff, tuffaceous mudstone, volcanic conglomerate, and tuff breccia
5. Reddish-gray to reddish-brown, speckled
6. 300 m
7. Thick-bedded, poorly-sorted
9. Faulted at base; conformably underlies Palmarejo Formation
10. Type section: Exposures in roadcuts on Route 825 and in adjacent streambanks N of town of Naranjito, 52,350 N., 172,160 E., to 52,070 N., 172,050 E., W Naranjito Quadrangle.

Narrow Cape Formation U NRCP01
1. Miocene
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A33-A34
4. Sandstone and siltstone with conglomerate beds
6. 700 m
9. Overlies Sitkalidak Formation (unconformably) or Sitkinak

Formation (conformably)
10. Type section: Along SW coast of Narrow Cape, from its E end NW for 1 km, Kodiak Island.

Nash Fork Formation (Libby Creek Group) NFRK02
1. Precambrian
2. Wyoming (SE)
3. Houston, R. S., and others, 1968, Wyoming Geol. Survey Mem. 1, p. 33
4. Marble, phyllite
8. Nash Marble, Anderson Phyllite, and Ranger Marble of Blackwelder
9. Overlies Sugarloaf Quartzite; underlies Towner Greenstone
10. Type locality: Not stated. Named for Nash Fork Creek that heads in Brooklyn Lake, sec. 10, T. 16 N., R. 79 W., Albany County.

Nathrop Volcanics U NTRP01
1. Oligocene, upper
2. Colorado (C)
3. Van Alstine, R. E., 1969, U.S. Geol. Survey Prof. Paper 626, p. 15-18
4. Pumiceous tuff and breccia, perlite, and rhyolite flow
5. White, black, gray
6. 150 m, range 61-150 m
7. Exposed as erosion remnants
9. Overlies Precambrian quartz monzonite
10. Type locality: Ruby Mountain, E of Arkansas River and 0.8 km E of town of Nathrop, secs. 11-13, T. 15 S., R. 78 W., Chaffee County.

Neal Sandstone Member (Hinton Formation) U NEAL01
1. Upper Mississippian
2. Virginia (SW), West Virginia
3. Englund, K. J., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-745
4. Sandstone with interbedded shale
5. Gray
6. 16 m
7. Fine-grained, thin- and partly ripple-bedded
9. Overlies Little Stone Gap Member; underlies middle shale member of Hinton Formation
10. Type section: E side of Virginia Highway 102 near mouth of Neal Hollow, N of Bluefield, Tazewell County, Va.

Nealy Creek Member (Mona Schist) U NLCK01
1. Precambrian W
2. Michigan (NC)
3. Puffett, W. P., 1974, U.S. Geol. Survey Prof. Paper 788, p. 13-15
4. Quartz-feldspar-sericite-chlorite schist
5. Greenish-gray
6. 910 m
9. Overlies unnamed lower member; underlies unnamed sheared rhyolite tuff member
10. Type locality: From center sec. 13, T. 48 N., R. 27 W., E to NE1/4 sec. 21, T. 48 N., R. 26 W., Marquette County.

Nehenta Formation U NHNT03
1. Upper Triassic

2. Alaska (SE)
3. Berg, H. C., 1973, U.S. Geol. Survey Bull. 1373, p. 19-23
4. Calcareous, conglomeratic, and basaltic volcanic rocks
5. Gray, orange, dark-green
6. 490 m
8. 3 unnamed members
9. Unconformably overlies unnamed Paleozoic rocks or Puppets Formation; conformably or possibly disconformably underlies Chapin Peak Formation
10. Type locality: Nehenta Bay-Thompson Cove area, secs. 23, 25, 26, and 36, T. 77 S., R. 90 E., SW of Bostwick-Vallenar Valley, SW Gravina Island.

Nevidiskov Formation U NVKV01
1. Oligocene, upper (?) or Miocene, lower (?)
2. Alaska (SW)
3. Gates, Olcott, Powers, H. A., and Wilcox, R. E., 1971, U.S. Geol. Survey Bull. 1028-U, p. 729-731, 737-738
4. Coarse graywacke and conglomerate, composed of fragments of basement rocks
6. 300 m
9. Conformably and gradationally underlies Chuniksak Formation
10. Type locality: W side of Nevidiskov Creek valley, SC Attu Island, Near Islands.

Newblock Park Sand NBKP01
1. Quaternary
2. Oklahoma (NE)
3. Stone, J. E., Bennison, A. P., and Kent, D. C., 1972, Tulsa Geol. Soc. Digest, v. 37, p. 82-84
4. Flood-plain terrace alluvium, clayey silt to sand
10. Type locality: Newblock Park, W of downtown Tulsa, Tulsa County.

New Braintree Gabbro NBRR24
1. Ordovician
2. Massachusetts (C)
3. Field, M. T., 1975, Massachusetts Univ. Dept. Geology Contr. 22, p. 71-73
4. Hornblende-plagioclase gabbro
8. Irregularly shaped intrusive body; unfoliated, coarse-grained
9. Surrounded by Partridge Formation
10. Type area: Low hills NW of town of New Braintree, Worcester County.

New Chicago Member (Logtown Ridge Formation) U NCCG01
1. Middle and Upper Jurassic (Callovian)
2. California (C)
3. Duffield, W. A., and Sharp, R. V., 1975, U.S. Geol. Survey Prof. Paper 827, p. 12, 13
4. Volcanic-breccia greenstone, with chiefly fine-grained clasts
6. 150 m
7. Vesicular greenstone and clasts; forms thin, discontinuous, elongate bodies
9. Uppermost member of Logtown Ridge Formation; conformably overlies Pokerville Member
10. Type locality: In and near roadcut of California Highway 49, sec. 36, T. 7 N., R. 10 E., Amador County.

Newman Lake Gneiss U NMLK05
1. Precambrian
2. Washington (EC)
3. Weis, P. L., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-734, p. 1-3
5. Gray
9. Gradationally overlies Hauser Lake Gneiss
10. Type locality: N and W sides of Newman Lake, Mount Spokane Quadrangle, Spokane County.

New Pass Tuff U NPSS01
1. Miocene
2. Nevada (C)
3. McKee, E. H., and Stewart, J. H., 1971, U.S. Geol. Survey Bull. 1311-B, p. B20-B21
4. Welded tuff
5. Red to lavender
6. 150 m, range 15-150 m
9. Overlies and underlies unnamed Tertiary tuffs
10. Type locality: Exposures on both sides of New Pass, sec. 30, T. 20 N., R. 40 E., Lander County.

Newton Lake Formation NNLK04
1. Precambrian W
2. Minnesota (NE)
3. Morey, G. B., Green, J. C., Ojakangas, R. W., and Sims, P. K., 1970, Minnesota Geol. Survey Rept. Inv. 14, p. 25-27
4. Mafic metabasalt and meta-andesite flows and felsic tuff, breccia, and agglomerate
6. 1372 m
8. 2 informal members
9. Overlies Knife Lake Group and Lake Vermilion Formation; intruded by Vermilion Granite
10. Type locality: Near Newton Lake, T. 63 and 64 N., R. 11 W., Lake County.

Newtown Gneiss NWTN07
1. Middle and Upper Ordovician
2. Connecticut (SW)
3. Crowley, W. P., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 9-12
4. Biotite-quartz-feldspar gneiss
9. Underlies Collinsville Formation
10. Type locality: Hills N of Halfway River in Newtown, NW corner of Long Hill Quadrangle, Fairfield County.

New Ulm Till NULM01
1. Pleistocene
2. Minnesota (SC), Iowa
3. Matsch, C. L., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 548-560
4. Calcareous till with abundant shale fragments, carbonates, and granitic rocks
5. Yellow to olive-brown or dark-gray
9. Overlies Granite Falls Till
10. Type section: Roadcut along Minnesota Highway 68 extending from point 2.8 km SE of New Ulm, for 600 m to S bluff of Cottonwood River, SE1/4NE1/4 sec. 4, T. 109 N., R. 30 W., New Ulm Quadrangle, Brown County, Minn.

New York Peak Quartz Monzonite U NYKP01
1. Upper Cretaceous
2. Nevada (NW)
3. Smith, J. G., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-606
4. Quartz monzonite
7. Massive
9. Intrudes Happy Creek Volcanic Series in Duffer Peak Quadrangle; intrudes unnamed syenodiorite pluton and is intruded by unnamed fine-grained quartz monzonite in Idaho Canyon Quadrangle
10. Type locality: New York Peak, Pine Forest Range, on E edge of Idaho Canyon Quadrangle, Humboldt County. Reference locality: Along Corral Creek, secs. 4 and 5, T. 42 N., R. 28 E., Idaho Canyon Quadrangle, Humboldt County.

Nis Hollow Siltstone Member (Mahantango Formation) NSHL01
1. Middle Devonian
2. Pennsylvania (EC)
3. Epstein, J. B., Sevon, W. D., and Glaeser, J. D., 1974, Pennsylvania Geol. Survey Atlas 195cd, p. 140-141
4. Siltstone and sandstone
5. Gray
6. 17 m
9. Overlies Centerfield fossil zone and underlies Tully fossil zone, Mahantango Formation
10. Type locality: Nis Hollow, which enters Lehigh River opposite best exposure of siltstone, on side of approach ramp to Pennsylvania Highway 248 N of Bowmanstown, Carbon County.

Nizina Mountain Formation U NZNM02
1. Middle Jurassic
2. Alaska (EC)
3. MacKevett, E. M., Jr., 1969, U.S. Geol. Survey Bull. 1274-A, p. A35-A37
4. Graywacke, shale, limy concretions
5. Greenish-gray, weathers reddish-brown
6. 410 m, range 30-410 m
9. Unconformably overlies Lubbe Creek Formation or McCarthy Formation; unconformably underlies Root Glacier Formation
10. Type locality: Ridge extending S from Nizina Mountain, McCarthy C-5 Quadrangle.

Noble Ranch Group NBRC01
1. Upper Mississippian and Lower Pennsylvanian (Morrowan)
2. Oklahoma (SC)
3. Straka, J. J. II, 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 6, p. 1087-1099
4. Sandstone, shale
5. Gray
8. Springer Formation, Goddard Formation
10. Type section: Secs. 1-6, T. 3 S., R. 2 E., N and E of Springer, Carter County.

Nogales Formation U NGLS01
1. Miocene, upper
2. Arizona (SE)
3. Simons, F. S., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-762, p. 1, 5, 8
4. Volcanic conglomerate containing abundant beds of sandstone and

grit
5. Gray
6. 2286 m
9. Rests on and partly derived from Grosvenor Hills Volcanics; underlies poorly consolidated alluvium of late Tertiary and Quaternary age
10. Type area: Exposures in town of Nogales, Santa Cruz County.

Nogal Peak Trachyte (Sierra Blanca Volcanics) NGPK01
1. Oligocene
2. New Mexico (C)
3. Thompson, T. B., 1972, Geol. Soc. America Bull., v. 83, no. 8, p. 2341, 2347-2348
4. Trachyte flows with abundant andesite blocks
6. 300 m
9. Overlies Walker Andesite Breccia
10. Type area: Lat 33°20′ N., long 105°45′ W., just N of Lincoln-Otero County line.

North Fork Camp Gneiss NFKC01
1. Lower Cretaceous
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3015
4. Migmatitic complexes of monzonite and leucocratic gneiss
5. Dark-gray
10. Type area: Okanogan County. Named for North Fork Camp.

North Snowy Group NRSN02
1. Precambrian W and X
2. Montana (SC)
3. Reid, R. R., McMannis, W. J., and Palmquist, J. C., 1975, Geol. Soc. America Spec. Paper 157, p. 9
4. Metamorphosed sedimentary and igneous rocks
8. Barney Creek Amphibolite, George Lake Marble, Jewel Quartzite, Davis Creek Schist, Mount Delano Gneiss, Mount Cowen Gneiss, Falls Creek Gneiss
10. Type area: North Snowy block of NW Beartooth Mountains, Emigrant and Mount Cowen Quadrangles, Park County.

Northumberland Tuff U NMBD01
1. Oligocene
2. Nevada (C)
3. McKee, E. H., 1974, Nevada Bur. Mines and Geology Rept. 19, p. 35-41
4. Tuff
5. Gray to white
6. 305 m
7. Ash-flow sheet
9. Overlies Paleozoic basement rocks; underlies tuff of Hoodoo Canyon
10. Type section: NC part of sec. 8, T. 13 N., R. 45 E., about 1.6 km S of Northumberland Canyon, Wildcat Peak Quadrangle, Nye County.

Nortonville Clay U NRVL03
1. Pleistocene (Kansan)
2. Kansas (NE)
3. Frye, J. C., and Leonard, A. B., 1952, Kansas Geol. Survey

Bull. 99, p. 83
5. Light-gray
6. 14 m
9. Overlies Cedar Bluffs Till; underlies Peoria Loess
10. Type locality: Roadcut in NE1/4 sec. 12, T. 7 S., R. 18 E., Atchison County.

Notch Quartzite NTCH01
1. Precambrian
2. New York (EC)
3. McClelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 7
6. 61 m
10. Type locality: Along New York Highway 10 between Pine and Piseco Lakes near road to Shaker Place, Hamilton County.

Nu'u Formation NUU 01
1. Quaternary
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 448, 452-454
4. Lapilli tuff and basalt lapilli
5. Reddish-yellow
7. Erosional remnants of tuff cone forming two small islets
10. Type area: Nu'utele and Nu'usilaelae Islets off W coast of Ofu Island.

Oak Canyon Member (Dakota Sandstone) U OKCN01
1. Lower and Upper Cretaceous
2. New Mexico (WC)
3. Landis, E. R., Dane, C. H., and Cobban, W. A., 1973, U.S. Geol. Survey Bull. 1372-J, p. J6-J8
4. Upper part mostly clay shale and silty clay shale, with some clayey siltstone; lower part sandstone, in places conglomeratic or silty, with some carbonaceous shales
5. Gray
6. 22 m
9. Overlies Morrison Formation; underlies Cubero Tongue (Dakota Sandstone)
10. Type section: Units 37-56 of Laguna measured section, NE1/4SE1/4 sec. 20 and SW1/4NW1/4 sec. 21, T. 10 N., R. 5 W., Laguna Quadrangle, Valencia County. Named for exposures on mesas of Oak Canyon, 6.5 km NE of Laguna.

Oakland Till Member (Wedron Formation) OKLD03
1. Pleistocene (Woodfordian)
2. Illinois (EC)
3. Johnson, W. H., Follmer, Leon, Gross, D. L., and Jacobs, A. M., 1972, Midwest Friends of Pleistocene Guidebook 21, p. 15, 51
5. Brown to brownish-gray
6. 10.4 m
9. Overlies Robein Silt; underlies Glenburn Till Member (Wedron Formation)
10. Type locality: N highwall of Harmattan Strip Mine, NE1/4NE1/4NW1/4 sec. 4, T. 19 N., R. 12 W., Vermilion County. Named for Oakland, Coles County.

O'Brien Spring Sandstone Member (Haystack Mountains Formation) U OBSP04
1. Upper Cretaceous
2. Wyoming (SC)
3. Gill, J. R., Merewether, E. A., and Cobban, W. A., 1970, U.S. Geol. Survey Prof. Paper 667, p. 12-18
4. Sandstone with concretions and fossil burrows
5. Yellowish-gray, weathers brown
6. 67 m
7. Thin-bedded, fine-grained, cliff-forming
9. Gradationally overlies lower unnamed shale member; conformably underlies middle unnamed shale member
10. Type section: S Haystack Mountains, 9.6 km N of town of Sinclair, NE1/4NE1/4 sec. 22, NE1/4 sec. 23, and SE1/4SE1/4 sec. 14, T. 22 N., R. 86 W., Carbon County. Named for exposures at O'Brien Spring, SW1/4 sec. 9, T. 24 N., R. 86 W.

Obsidian Creek Member (Plateau Rhyolite) U OBCK01
1. Pleistocene
2. Wyoming (NW)
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B13
4. Rhyolite domes and mixed rhyolite and basalt lava flows
9. Overlies Lava Creek Tuff; lies between flows of Swan Lake Flat Basalt; underlies younger members of Plateau Rhyolite
10. Type area: Gardner River and Grizzly Lake areas, in N-trending belt between Norris Geyser Basin area and Gardner River, parallel to Obsidian Creek, Yellowstone National Park, Park County.

Ocean Reef Group (Marquesas Supergroup) OCRF02
1. Lower Cretaceous
2. Florida (SE)
3. Winston, G. O., 1971, Gulf Coast Assoc. Geol. Socs. Trans. 21, p. 25-28
4. Interbedded limestone, dolomite, anhydrite
5. 280 m
8. Sunniland Limestone, Lake Trafford Formation
9. Overlies Glades Group; underlies Big Cypress Group
10. Type section: Sinclair No. 1 Williams well, sec. 24, T. 59 S., R. 40 E., Monroe County. Named for nearby Ocean Reef Club.

Ochopee Limestone Member (Tamiami Formation) OCHP01
1. Pliocene
2. Florida (SE)
3. Hunter, M. E., 1968, Gulf Coast Assoc. Geol. Socs. Trans. 18, p. 439-450
4. Fossiliferous limestone
5. White
6. 9 m
9. Overlies Buckingham Limestone Member
10. Type section: Water well, sec. 33, T. 52 S., R. 30 E., Sabal Bay, near Ochopee, Monroe County.

Offerman Member (Kankakee Formation) OFRM01
1. Lower Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 17-18, 49

4. Dolomite, slightly argillaceous
5. Pinkish- to greenish-gray
6. 16 m
9. Overlies Drummond Member; underlies Troutman Member
10. Type section: Plaines Station, railroad switching point on S side of Des Plaines River, 2.4 km SW of Brandon Bridge, Will County. Named for Offerman School, 1.2 km SE.

Ogle Till/Member (Glasford Formation) OGLE02

1. Pleistocene (Illinoian)
2. Illinois (NC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 54-55
4. Sandy, silty till
5. Tan to gray-brown
6. 6 m
9. Overlies Juda Gravel, Kellerville Till Member (Glasford Formation), or bedrock; underlies Sangamon soil, Roxana Silt, or Sterling Till Member (Glasford Formation)
10. Type section: Haldane W section, NE1/4NE1/4NE1/4 sec. 25, T. 24 N., R. 7 E., Ogle County, Ill.

Ojito Creek Member (Treasure Mountain Tuff) U OJCK01

1. Oligocene, upper
2. Colorado (SC)
3. Lipman, P. W., and Steven, T. A., 1970, U.S. Geol. Survey Prof. Paper 700-C, p. C21-C23
4. Quartz latite ash-flow tuff
5. Brown
6. 20 m, range 10-20 m
7. Densely welded
9. Conformably overlies La Jara Canyon Member; conformably underlies Ra Jadero Member
10. Type locality: Head of Ojito Creek, lat 37°20′ N., long 106°17′ W., 22 km E of Platoro, San Juan Mountains, Conejos County.

Ojo Caliente Sandstone Member (Tesuque Formation) OJCL01

1. Pliocene, lower
2. New Mexico (NC)
3. Galusha, Ted, and Blick, J. C., 1971, Am. Mus. Nat. History Bull. 144, art. 1, p. 67-70
4. Quartz sand
5. Pink to white
6. 137 m
7. Poorly consolidated, crossbedded
9. Overlies and interfingers with Pojoaque and Chama-El Rito Members (Tesuque Formation); unconformably underlies Chamita Formation
10. Type section: Triangular area bounded on E by Ojo Caliente River, on SW by Chama River, on W by El Rito Creek, Rio Arriba County.

Olalla Creek Member (Lookingglass Formation) OLCK07

1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Min. Industries Bull. 83, p. 1-40
4. Conglomerate, sandstone

6. 300 m
9. Overlies Tenmile Member (Lookingglass Formation); underlies Flournoy Formation
10. Type area: Tenmile Butte, and along Olalla Creek, Douglas County.

Old Breastworks Formation (Wilcox Group) U ODBK01
1. Paleocene
2. Tennessee (WC)
3. Moore, G. K., and Brown, D. L., 1969, Tennessee Div. Geology Rept. Inv. 26, 1 p.
4. Clayey micaceous silt
5. Gray
6. 85 m
7. Lignitic
9. Overlies Porters Creek Clay (Midway Group); underlies Fort Pillow Sand (Wilcox Group)
10. Type section: Fort Pillow test well, depth-interval 509-595 m, at site of old Fort Pillow on Mississippi River, lat 35°38′39" N., long 89°49′35" W., Lauderdale County.

Onion Creek Sandstone Lentil (Rock Lake Member, Stanton Formation) OCRK04
1. Upper Pennsylvanian (Missourian)
2. Kansas (SE)
3. Heckel, P. H., 1975, Kansas Geol. Survey Bull. 210, p. 27-28
4. Quartz sandstone with shale
5. Buff to reddish-brown
6. 30 m
7. Massive to bedded, friable
10. Type locality: Exposed along Onion Creek, secs. 14, 15, 22, 23, T. 33 S., R. 14 E., Montgomery County.

Opelika Complex OPLK01
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 31-32
4. Metagraywacke and metapelite
8. Loachapoka Schist, Auburn Gneiss
10. Type locality: Not stated. Named for town of Opelika, Lee County, Ala.

Oreville Formation U ORVL02
1. Precambrian X
2. South Dakota (WC)
3. Ratte, J. C., and Wayland, R. G., 1969, U.S. Geol. Survey Bull. 1271-B, p. B2-B6
4. Quartz-biotite-garnet schist and metagraywacke
6. Range 600-3000 m
7. Ridge-forming, complexly folded
8. Zimmer Ridge Member
9. Intruded by Harney Peak Granite; underlies Bugtown Formation
10. Type locality: Along N bank of Spring Creek, W of Oreville rail siding on U.S. Highway 16, Black Hills, Pennington County.

Orr Ranch Bed (Segovia Formation) ORRC02
1. Lower Cretaceous (Comanchean)
2. Texas (C)

3. Rose, P. R., 1972, Texas Bur. Econ. Geology Rept. Inv. 74, p. 42, 167, 188
4. Limestone and marl
5. Grayish-brown
6. 2 m
9. Overlies and underlies unnamed units of Segovia Formation
10. Type locality: Orr Ranch measured section, W. E. Orr Ranch, N Real County.

Osha Canyon Formation OSCN02
1. Lower Pennsylvanian (Morrowan)
2. New Mexico (NC)
3. DuChene, H. R., 1974, New Mexico Geol. Soc. Guidebook 25, p. 159-165
4. Limestone and shale
5. Gray to white
6. 22 m
7. Fossiliferous
9. Unconformably overlies Log Springs Formation; unconformably underlies Sandia Formation
10. Type section: E side of Guadalupe Box near Osha Canyon, 1.9 km N of Gilman, Nacimiento Mountains, Sandoval County.

Osiris Tuff U OSRS01
1. Miocene
2. Utah (SW)
3. Rowley, P. D., Anderson, J. J., and Williams, P. L., 1975, U.S. Geol. Survey Bull. 1405-B, p. B1, B15-B16
4. Ash-flow tuff
5. Reddish-brown or light-gray
6. 40 m, range 40-60 m
7. Densely welded, displays conspicuous features of secondary plastic flow, strongly zoned
9. Overlies or intercalated with Dutton Formation; underlies Dry Hollow Formation or older unnamed basalt flows
10. Type section: E of Utah Highway 22, SW1/4NW1/4 sec. 2, T. 32 S., R. 2 W., near abandoned town of Osiris in SE High Plateaus, Garfield County.

Osprey Basalt U OSPR01
1. Pleistocene
2. Wyoming (NW)
3. Pierce, K. L., Christiansen, R. L., and Richmond, G. M., 1970, U.S. Geol. Survey Bull. 1324-A, p. A30-A34
4. Interlayered basalt flows and gravels
5. Black
7. Columnar jointed
9. Fills canyons cut in Lava Creek Tuff (Yellowstone Group) and Swan Lake Flat Basalt
10. Type section: Cliff exposures on W side of Sheepeater Canyon, 970 m N of Osprey Falls and E of closest approach of Bunsen Peak Road to canyon rim, Yellowstone National Park, Park County.

Otay Formation OTAY01
1. Miocene
2. California (SE)
3. Artim, E. R., and Pinckney, C. J., 1973, Geol. Soc. America Bull., v. 84, no. 3, p. 1075

4. Tuffaceous fine sandstone with thin bentonitic interbeds, and basal breccia conglomerate unit
5. White
6. 50 m
9. Overlies Sweetwater Formation; underlies San Diego Formation
10. Type area: E of San Diego Bay along E side of La Nacion Fault, San Diego County.

Ottawanah Rhyolite U OTTN02

1. Eocene or Oligocene
2. Nevada (NE)
3. Coats, R. R., 1971, U.S. Geol. Survey Misc. Geol. Inv. Map I-665, p. 1
4. Welded tuffs with abundant phenocrysts. Locally opalized, bleached, non-stained
6. 120 m
9. Unconformably overlies andesite of Summit Creek; unconformably underlies volcanic and sedimentary rocks of Jones Creek
10. Type locality: Exposures at Ottawanah, sec. 6, T. 46 N., R. 53 E., Owyhee Quadrangle, Elko County.

Overlook Sandstone Member (Wann Formation) OVLK01

1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Desjardins, L. A., 1972, Tulsa Geol. Soc. Digest, v. 37, p. 68
5. Brown, red, yellow
7. Massive, continental deposit
9. Overlies Clem Creek Sandstone Member; underlies Hound Dog Holler Sandstone Member
10. Type locality: Rimrock at Keystone Dam Overlook, NW1/4 sec. 9, T. 19 N., R. 10 E., Tulsa County.

Ovitt Road Member (Tymochtee Formation) OVRD01

1. Upper Silurian
2. Ohio (NW)
3. Kahle, C. F., and Floyd, J. C., 1971, Geol. Soc. America Bull., v. 82, no. 8, p. 2071
4. Dolomite and shaly dolomite
6. 8 m
9. Overlies Granger Island Member; underlies Maumee River Member
10. Type section: Maumee River bank, along W edge of lots 46, 47, and 48 N of S boundary of Twelvemile Reserve, Bowling Green North Quadrangle, Wood County. Named for road which intersects Maumee River 0.6 km S of Waterville.

Owl Conglomerate Member (Barstow Formation) OWL 01

1. Miocene, middle and upper(?)
2. California (SE)
3. Dibblee, T. W., Jr., 1968, California Div. Mines and Geology Bull. 188, p. 28-30
4. Cobble and boulder conglomerate in arkosic sandstone matrix
5. Gray
6. 75 m, range 58-300 m
9. Unconformably overlies Pickhandle Formation; conformably underlies unnamed shale and fanglomerate of Barstow Formation
10. Type section: Exposure on N flank of Barstow syncline in Mud Hills between Owl and Solomon Canyons, N1/2 secs. 19 and 20, T. 11 N., R. 1 W., San Bernardino County.

Owl Kill Member (Poultney Formation) OLKL04
1. Lower Ordovician
2. New York (EC), Vermont
3. Potter, D. B., 1972, New York State Mus. and Sci. Service Map and Chart Ser. 19, p. 20
4. Argillite and slate
6. 250 m
9. Overlies White Creek Member (Poultney Formation); underlies Normanskill Formation
10. Named for exposures on W side of Owl Kill, from 300 to 1200 m upstream from confluence of Owl Kill with Hoosic River, Rensselaer County, N. Y.

Pacific Creek Tuff Member (Trout Peak Trachyandesite) U PFCK03
1. Eocene, middle
2. Wyoming (NW)
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 27
4. Rhyodacite welded ash-flow tuff
5. Pale-brown, yellow
6. 24 m
10. Type area: Pacific Creek, near Two Ocean Pass, Yellowstone National Park, Teton County.

Packerton Member (Catskill Formation) PCKR02
1. Upper Devonian
2. Pennsylvania (EC)
3. Epstein, J. B., Sevon, W. D., and Glaeser, J. D., 1974, Pennsylvania Geol. Survey Atlas 195cd, p. 24-26
4. Sandstone
6. 127 m
7. Crossbedded
9. Overlies Long Run Member; underlies Poplar Gap or Sawmill Run Member
10. Type section: Along railroad cuts on W bank of Lehigh River ENE of town of Packerton, Carbon County.

Padre Formation (El Paso Group) U PDRE01
1. Lower Ordovician
2. Texas (WC), New Mexico
3. Hayes, P. T., and Cone, G. C., 1975, U.S. Geol. Survey Prof. Paper 873, p. 42-45
4. Limestone and dolomite carbonate rocks
5. Yellowish-gray to yellowish-brown
6. 116 m, range 0-122 m
7. Cross-laminations in basal part with thin laminations above
9. Conformably overlies McKelligon Limestone (El Paso Group); disconformably underlies Montoya Group
10. Type section: Pasotex section, lat°30 41′20" N., long 105°54′20" W., on ridge crest above small unnamed canyon 4.5 km due E of Padre Canyon, El Paso County, Texas.

Paguate Tongue (Dakota Sandstone) U PGUT01
1. Upper Cretaceous
2. New Mexico (WC)
3. Landis, E. R., Dane, C. H., and Cobban, W. A., 1973, U.S. Geol. Survey Bull. 1372-J, p. J5-J6, J11-J16
4. Sandstone with interbedded siltstone
5. Gray

6. 20 m
9. Intertongues with Mancos Shale, conformably overlying its Clay Mesa Tongue and disconformably(?) underlying its Whitewater Arroyo Shale Tongue
10. Type section: NE1/4SE1/4 sec. 20 and SW1/4NW1/4 sec. 21, T. 10 N., R. 5 W., Laguna Quadrangle, Valencia County. Named for town of Paguate, 11 km N of Laguna.

Pah Rah Formation PHRH01
1. Eocene and Oligocene
2. Nevada (NW)
3. Bonham, H. F., 1969, Nevada Bur. Mines Bull. 70, p. 22-23
4. Andesitic mudflow breccia
5. Grayish-brown to reddish-brown
6. 60 m
9. Unconformably underlies Hartford Hill Rhyolite
10. Type locality: Canyon of Coal Creek on E flank of Pah Rah Mountain, Pah Rah Range, Washoe County.

Paiute Monument Quartz Monzonite U PMNM01
1. Middle Jurassic
2. California (C)
3. Ross, D. C., 1969, U.S. Geol. Survey Prof. Paper 601, p. 26-33
4. Quartz monzonite with abundant pink feldspar crystals
5. Gray
7. Massive, coarse-grained, weathers to boulders and monoliths
10. Type locality: Paiute Monument, monolith on crest of Inyo Mountains, 16 km ENE of Independence, Inyo County.

Pajaros Tuff U PJRS01
1. Lower to Upper Cretaceous
2. Puerto Rico (NC)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 10-11
4. Tuff, lapilli tuff, and tuffaceous siltstone and wacke
5. Greenish-gray
6. 580 m
7. Thin-bedded to massive, fine- to coarse-grained
9. Conformably underlies Cerro Gordo Lava
10. Type section: Exposures in Quebrada Escarcha, 59,390 N., 177,620 E., to 58,940 N., 177,630 E., 600 m S of N border of Naranjito Quadrangle and extending S for 500 m. Named for exposures in Barrio Pajaros.

Palisade Rhyolite (North Shore Group) PLSD09
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 320
4. Porphyritic rhyolite
5. Gray to pink
6. 91 m
9. Overlies Baptism River Lava; underlies Bell Harbor Lava
10. Type locality: Forms Shovel Point and Palisade Head, 2.4 km SW, Lake County.

Paliza Canyon Formation (Keres Group) U PLZC01
1. Pliocene, lower to middle
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol.

Survey Bull. 1274-P, p. P6-P8
4. Basaltic, andesitic, and dacitic flows, tuffs, and breccias
6. 910 m, range 460-910 m
9. Overlies Abo Formation or Canovas Canyon Rhyolite (Keres Group); unconformably underlies Bearhead Rhyolite (Keres Group)
10. Type section: Not stated. Named for exposures in Paliza Canyon, Jemez Mountains, Sandoval County.

Palma Escrita Formation U PMEC01
1. Eocene (?)
2. Puerto Rico (WC)
3. McIntyre, D. H., 1974, U.S. Geol. Survey Bull. 1394-D, p. D5-D9
4. Pumice-rich dacitic to rhyodacitic tuffs and basaltic lavas
5. Greenish-gray
6. Range 800-2200 m
9. Faulted at base; concordantly and probably conformably underlies Mal Paso Formation
10. Type area: E flank of ridge extending N from Escuela Palma Escrita, 42,060 N., 95,000 E., to 43,020 N., 95,840 E., Barrio Palma Escrita, Municipio de Las Marias, Maricao Quadrangle.

Palmer Mountain Greenstone U PLMM01
1. Permian or Triassic
2. Washington (NC)
3. Rinehart, C. D., and Fox, K. F., Jr., 1972, Washington Div. Mines and Geology Bull. 64, p. 11-19
4. Greenstone, amphibolite, metadiabase, or mafic igneous rocks
5. Greenish-gray
6. 2,000 m
9. Unconformably(?) overlies Bullfrog Mountain Formation (Anarchist Group); interfingers with Kobau Formation
10. Type locality: Palmer Mountain bluffs near common corner of secs. 16, 17, 20, 21, T. 39 N., R. 26 E., C Loomis Quadrangle, NC Okanogan County.

Pancake Summit Tuff U PKSM01
1. Oligocene
2. Nevada (EC)
3. Armstrong, R. L., 1970, Geochim. et Cosmochim. Acta, v. 34, p. 212-213
4. Crystal-rich ash-flow tuff
5. Light-gray to reddish-brown
6. 60 m, range 30-60 m
9. Unconformably underlies Magpie Hill Basalt
10. Type section: 0.8 km N of U.S. Highway 50 on boundary between sec. 25, T. 18 N., R. 55 E., and sec. 30, T. 18 N., R. 56 E., White Pine County.

Panther Creek Formation PRCK20
1. Lower Cretaceous
2. Washington (NC)
3. Barksdale, J. D., 1975, Washington Div. Geology and Earth Resources Bull. 68, p. 95
4. Shale with beds of conglomerate and arkose
5. Black
6. 1580 m
9. Conformably overlies Goat Creek Formation; conformably underlies Harts Pass Formation
10. Type section: W1/2 sec. 9, and E1/2 sec. 8, T. 37 N.,

R. 20 E., Okanogan County. Named for creek that drains S slope of E-W ridge of type section.

Papoose Creek Formation U PPCK06

1. Precambrian Z
2. Idaho (SE)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 585
4. Siltite and quartzite
5. Gray and brown
6. 180 m
7. Thin-bedded, wavy
9. Overlies Blackrock Canyon Limestone; conformably underlies Caddy Canyon Quartzite
10. Type section: Headwaters and E of canyon of Papoose Creek, S of Portneuf River, sec. 35, T. 7 S., R. 35 E., and secs. 2 and 3, T. 8 S., R. 35 E., Bannock County.

Paria River Member (Carmel Formation) PRRV02

1. Middle Jurassic
2. Utah (SW)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 8-9
4. Sandstone, siltstone, shale, limestone, and gypsum
6. 61 m
9. Unconformably overlies Crystal Creek Member (Carmel Formation) in W and Thousand Pockets Tongue (Navajo Sandstone) in E; underlies Winsor Member (Carmel Formation)
10. Type section: E bank of Paria River 8.0 km below Cannonville, from 1.6 km S of Cottonwood Wash road to first outcrop of Thousand Pockets Tongue, Kane County.

Parkland Sand PKLD01

1. Quaternary
2. Illinois (C)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 78-79
4. Sand
6. 6 m
7. Medium-grained, well-sorted. Forms dunes and sheet-like deposits
9. Locally overlies Cahokia Alluvium
10. Type locality: Roadcut in edge of Manito Terrace 8 km W of Parkland, SW1/4SE1/4SW1/4 sec. 2, T. 23 N., R. 7 W., Tazewell County.

Partridge Gravel/Formation PRDG01

1. Pleistocene
2. Washington (NW)
3. Easterbrook, D. J., 1968, Washington Dept. Water Resources Water Supply Bull. 25, pt. 1, p. 28-30
4. Pebble to cobble gravel and sand
6. 46 m
9. Lower contact below sea level; underlies Everson Glaciomarine Drift
10. Type locality: Sea cliff between Partridge Point and West Beach on W side of Whidbey Island, Puget Sound, Island County.

Passagassawakeag Gneiss U PGKG01
1. Precambrian
2. Maine (SC)
3. Wones, D. R., 1974, U.S. Geol. Survey Prof. Paper 900, p. 23-24
4. Gneiss
5. Purplish-gray to gray
6. 2,300 m
7. Granulose to weakly-to-strongly schistose layers; some garnet; graphite commonly present in trace amounts
9. Intruded by numerous small bodies of granitic rock; unconformably underlies Hogback Schist or Bucksport Formation
10. Type area: Outcrops at headwaters of Passagassawakeag River, NC Belfast Quadrangle, Waldo County.

Patterson Sandstone PRSN19
1. Lower Silurian
2. Mississippi (NE)
3. Mellen, F. F., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 1, p. 143-148
4. Contains quartz pebbles and grit in lower part. Gas-bearing
5. Medium-gray to brownish
6. 15 m
9. Overlies Ottawa Group rocks; underlies Wayne Formation
10. Type section: L. E. Salmon 1 Rex Patterson well, sec. 21, T. 11 S., R. 1 E., Pontotoc County.

Pearl Formation PERL01
1. Pleistocene (Illinoian)
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 60
4. Pebbly sand
6. 12 m
7. Terrace and outwash deposits
9. Overlies Hulick Till Member (Glasford Formation)
10. Type section: Box canyon, 1.6 km SW of Pearl, SE1/4SW1/4NE1/4 sec. 16, T. 7 S., R. 2 W., Pike County.

Peck Lake Formation PKLK01
1. Precambrian Y
2. New York (EC)
3. McLelland, James, 1972, New York Geol. Assoc. Guidebook 44, Trip E, p. 6-7
4. Garnetiferous biotite-quartz-oligoclase gneisses
6. 1500 m
9. Overlies Green Lake Formation; underlies Rooster Hill Formation
10. Type locality: Exposures along New York Highway 29A-10 where highway crosses W end of Peck Lake, Fulton County.

Peddicord Formation PDCD01
1. Pleistocene (Wisconsinan)
2. Illinois (NE)
3. Willman, H. B., Leonard, A. B., and Frye, J. C., 1971, Illinois Geol. Survey Circ. 467, p. 1-12
4. Silt
5. Pink, gray
6. 8 m
7. Lacustrine deposits

9. Overlies Sangamon soil, Illinoian drift, or St. Peter Sandstone; underlies Lee Center Till Member (Wedron Formation) or Robein Silt
10. Type section: Wedron section: Fox River valley at silica sand pit of Wedron Silica Company, T. 34 N., R. 4 E., La Salle County. Named for Peddicord School, 1 mi. E.

Pelona Mountain Formation PLNM01
1. Miocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Guidebook III, p. 239
4. Augite-hornblende-biotite latite
7. Flow-banded, porphyritic. Intrusions forming domes in craters or basaltic andesite cones
9. Intrudes Bearwallow Mountain Formation
10. Type locality: Not stated. Named for Pelona Mountain, Catron County.

Pemene Formation PEMN01
1. Precambrian X
2. Wisconsin (NE)
3. Jenkins, R. A., 1973, Inst. Lake Superior Geology, v. 19, no. 1, p. 15-16
4. Soda-rich rhyolite and rhyodacite flows interlayered with sedimentary units
6. 2100 m
7. Microspherulitic
9. Unconformably overlies Beecher Gneiss
10. Type area: Beecher and Pembine Townships, NE Marinette County.

Peratrovich Formation U PRVC03
1. Lower and Upper Mississippian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 49-54
4. Chert and limestone
5. Gray, black
6. 240 m
8. 3 informal members
9. Overlies Wadleigh Limestone or Port Refugio Formation; conformably underlies Klawak Formation or Ladrones Limestone
10. Type locality: S end of Peratrovich Island, 1.6 km N of Klawak village, Prince of Wales Island.

Perry Creek Quartz Diorite PRCK08
1. Eocene
2. Washington (NC)
3. Grant, A. R., 1969, Washington Div. Mines and Geology Bull. 58, p. 68, 69
4. Quartz diorite, granodiorite
9. Intrudes Skagit Volcanics
10. Type area: Silver Creek, 3.2 km S of Canadian border on W side of Ross Lake, sec. 5, T. 40 N., R. 13 E., Whatcom County.

Persimmon Fork Formation U PMFK01
1. Precambrian Z or Cambrian
2. South Carolina (C)
3. Secor, D. T., and Wagener, H. D., 1968, South Carolina Div. Geology Geol. Notes, v. 12, no. 4, p. 67-84

4. Tuffaceous quartz-mica phyllite
5. Tan, brown, brick-red
6. 300 m
7. Layered, many pea-sized fragments of volcanic rock
9. Unconformably(?) overlies Wildhorse Branch Formation; underlies and grades into Richtex Formation
10. Type area: Cedar Creek-Blythewood area, Carolina Slate Belt N of Columbia, Richland and Fairfield Counties.

Person Formation (Edwards Group) PRSN18
1. Lower Cretaceous (Comanchean)
2. Texas (SE)
3. Rose, P. R., 1972, Texas Bur. Econ. Geology Rept. Inv. 74, p. 19
4. Micrite and biomicrite limestone
5. Grayish-brown
6. 69 m
8. 5 informal members
9. Overlies Kainer Formation (Edwards Group); underlies Georgetown Formation
10. Type section: Standard of Texas No. 1 Wiatrek well, index no. 10, depth-interval 3281-3350 m, Person Field, Karnes County.

Peterborough Member (Littleton Formation) PRBG08
1. Lower Devonian
2. New Hampshire (SC)
3. Green, R. C., 1970, New Hampshire Div. Econ. Devel. Bull. 4, p. 1, 7
4. Foliated mica schist with lentils of granulite and schist.
6. 3700 m
7. Cut by sills and dikes of quartz monzonite and pegmatite
9. Overlies Souhegan Member; underlies Francestown Member; intruded by Spaulding Quartz Diorite and Kinsman Quartz Monzonite
10. Type locality: Area of 1.6 square km NW of Pack Monadnock and SE of Old Mountain Road, SE Peterborough Township, Hillsboro County.

Pettet Formation/Limestone Member (Sligo Formation) PTTT05
1. Lower Cretaceous (Coahuilan)
2. Louisiana (NW), Arkansas, Texas
3. Herrmann, L. A., 1971, Gulf Coast Assoc. Geol. Socs. Trans. 21, p. 187-198
4. Porous oolitic limestone
10. Type section: Producers Oil and Gas Company No. 1 Pettet well, sec. 17, T. 17 N., R. 11 W., Sligo Field, Bossier Parish, La.

Pettijohn Formation PTJN01
1. Pleistocene
2. Nebraska (NC)
3. Skinner, M. F. and Hibbard, C. W., 1972, Am. Mus. Nat. History Bull. 148, art. 1, p. 29-30
4. Chert and quartz gravel
6. 2 m
7. Fine, well-sorted, pea-sized glacio-fluvial gravel sheet
9. Unconformably overlies Duffy Formation; underlies Sand Hills Formation or surface soil
10. Type locality: 3.2 km S of town of Long Pine, NW1/4 sec. 8,

T. 29 N., R. 20 W., Brown County. Named for Carleton Pettijohn holdings along Long Pine Creek.

Peyton Colluvium PYTN01
1. Quaternary
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 79
4. Pebbly silt
7. Creep and slopewash deposits
9. Locally overlies Cahokia Alluvium
10. Type locality: Where Peyton Creek crosses formation at base of Illinois Valley bluffs 2.4 km SW of Glasford, NW1/4NE1/4 sec. 32, T. 7 N., R. 6 E., Peoria County.

Phelps Waterlime Member (Fiddlers Green Formation) PLPS02
1. Upper Silurian
2. New York (C)
3. Ciurca, S. J., Jr., 1973, New York Geol. Assoc. Guidebook 45, Trip D, p. 1-14
4. Dolostone
6. 1.5 m
7. Fine-grained, conchoidal fracture, fossiliferous
9. Overlies Victor Member (Fiddlers Green Formation); underlies Scajaquada Formation
10. Type area: New York State Thruway N of Phelps, Ontario County.

Phenix City Gneiss (Uchee Complex) PNXC01
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 39-40
4. Gneiss and amphibolite
7. Coarsely crystalline, contorted
10. Type locality: Exposures along Chattahoochee River at Phenix City, Russell County, Ala.

Phillips Lake Granodiorite U PPLK02
1. Cretaceous
2. Washington (NE)
3. Miller, F. K., and Clark, L. D., 1975, U.S. Geol. Survey Prof. Paper 806, p. 36, 38, 40-44
4. Granodiorite
9. Unconformably overlies Wallace Formation, Ravalli Group, and Prichard Formation; unconformably underlies Quaternary glacial, alluvial, and talus deposits
10. Type locality: Phillips Lake, sec. 34, T. 34 N., R. 41 E., Chewelah-Loon Lake area, Stevens County.

Picabo Formation U PCBO01
1. Upper Devonian
2. Idaho (C)
3. Skipp, B. L., and Sandberg, C. A., 1975, U.S. Geol. Survey Jour. Research, v. 3, no. 6, p. 691-695
4. Dolomitic conglomerate with dolomitic sandstone
5. Gray to yellowish-brown
6. 58 m
7. Aphanitic to coarsely crystalline
9. Underlies Copper Basin Formation; overlies Jefferson Formation

10. Type section: Measured section 4, NE1/4 sec. 10, T. 1 N., R. 22 E., Blaine County. Named for town of Picabo.

Pierson Cove Formation PRCV01
1. Middle Cambrian
2. Utah (SW)
3. Hintze, L. F., and Robison, R. A., 1975, Geol. Soc. America Bull., v. 36, no. 7, p. 881-891
4. Mudstone, limestone, dolomite
5. Gray
6. 440 m
7. Light and dark banded
9. Overlies Eye of Needle Limestone; underlies Trippe Limestone
10. Type section: NW1/4 sec. 23, T. 26 S., R. 16 W., 2 km S of Pierson Cove, Wah Wah Summit Quadrangle, Beaver County.

Piña Siltstone Member (El Ocho Formation) U PINA01
1. Lower to Upper Cretaceous
2. Puerto Rico (NC)
3. Pease, M. H., Jr., 1968, U.S. Geol. Survey Bull. 1253, p. 12
4. Calcareous siltstone interbedded with volcanic wacke
6. 180 m
7. Thin-bedded
9. At base of El Ocho Formation
10. Type section: Roadcuts on Route 827, 57,990 N., 174,430 E., to 57,743 N., 174,314 E., valley of Quebrada Piña, Naranjito Quadrangle.

Pinchoulee Gneiss (Hatchet Creek Group) PNCL12
1. Paleozoic, lower and middle
2. Alabama (EC)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 27
4. Feldspathic and migmatitic biotite gneiss
9. Forms narrow lithologic belt between Wedowee Group and Elkahatchee Quartz Diorite
10. Type locality: Exposed along shores of Lake Jordan between Chestnut Creek and Welona Fault, Chilton County.

Pine Butte Member (Sundance Formation) U PNBT02
1. Middle Jurassic
2. Wyoming (SE), Colorado, South Dakota
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D23
4. Lime-cemented sandstone with intercalated siltstone and clay shale. Glauconitic
5. Greenish-white
6. 16 m
9. Overlies and intertongues with Lak Member; disconformably underlies Redwater Shale Member or Windy Hill Sandstone Member
10. Type section: W Flat Top anticline, 2.4 km SE of Pine Butte, S1/2 sec. 13 and NW1/4 sec. 14, T. 23 N., R. 79 W., Carbon County, Wyo.

Pine Hall Formation (Dan River Group) PNHL12
1. Upper Triassic
2. North Carolina (NC)
3. Thayer, P. A., 1970, Southeastern Geology, v. 12, no. 1, p. 9-12
4. Interbedded sandstone, conglomerate, and siltstone

6. Range 76-2100 m
9. Unconformably overlies and is in fault contact with pre-Triassic metamorphic rocks; unconformably underlies Cow Branch and Stoneville Formations
10. Type area: Along Norfolk and Western Railroad, from 0.16 to 1.9 km NE of Pine Hall Station, Stokes County.

Pine Hill Formation (Stone Ridge Group)/(Tristates Group) PNHL16

1. Lower Devonian
2. New York (SE), New Jersey
3. Boucot, A. J., Gauri, K. L., and Southard, John, 1970, Palaeontographica, Abt. A, Bd. 135, Lief. 1-2, p. 30-35
4. Calcareous siltstone-sandstone-conglomerate sequence
5. Gray, weathers tan and brown
6. 46 m
8. Woodbury Creek and Kanouse Members
9. Overlies Esopus Formation; underlies Cornwall Shale
10. Type section: Along W flank of Pine Hill, E side of New York Thruway cut at Highland Mills, Orange County, N.Y.

Pine Hollow Formation U PNHL01

1. Paleocene(?)
2. Utah (SC)
3. Bowers, W. E., 1972, U.S. Geol. Survey Bull. 1331-B, p. B20-B25, B34-B36
4. Clastic mudstone and limestone with sandstone lenses; bentonitic
5. Gray, red
6. 63 m, range 30-120 m
9. Conformably overlies Canaan Peak Formation; conformably underlies pink limestone member of Wasatch Formation
10. Type section: Head of N fork of Pine Hollow, tributary of Upper Valley Creek, on SE side of Table Cliff Plateau, NE1/4SE1/4 sec. 3, T. 36 S., R. 1 W., Garfield County.

Pinehurst Shale U PNRS03

1. Paleocene
2. California (WC)
3. Case, J. E., 1968, U.S. Geol. Survey Bull. 1251-J, p. J6, J24
4. Siliceous shale and interbedded sandstone
5. White to tan
6. 150 m
7. Fossiliferous
9. Conformably overlies unnamed Upper Cretaceous shale
10. Type locality: Exposures along Pinehurst Road, sec. 36, T. 1 S., R. 3 W., Alameda County.

Pine Key Formation PNKY01

1. Upper Cretaceous
2. Florida (SE)
3. Meyerhoff, A. A., and Hatten, C. W., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 6, p. 1201-1239
4. Chalky limestone
5. White
6. 827 m
7. Deep-water channel separating shallow terrestrial deposits to N from shallow marine banks on S and E
8. Grades laterally into Lawson, Atkinson, and LaCrosse Formations to N and into Card Sound Formation to S

9. Overlies Marquesas Supergroup; underlies Cedar Keys Formation
10. Type section: Gulf Oil Corp. State of Florida-1, Lease 373, "Big Pine Key Well", depth-interval 1479-2306 m, Big Pine Key, sec. 2, T. 67 S., R. 29 E., Monroe County.

Pine Shadow Member (Wild Cow Formation) U PNSD01
1. Upper Pennsylvanian
2. New Mexico (C)
3. Meyers, D. A., 1973, U.S. Geol. Survey Bull. 1372-F, p. F9-F10
4. Basal arkosic conglomerate or siltstone with upper limestone unit
5. Brown and gray
6. 30-49 m
7. Ledge- and cliff-forming
9. Conformably overlies Sol se Mete Member; conformably underlies La Casa Member
10. Type section: Exposures on W side of Priest Canyon in E-draining ravine, sec. 7, T. 3 N., R. 5 E., Torreon Southwest Quadrangle, Valencia County. Named for Pine Shadow Spring near head of Priest Canyon, SW1/4 sec. 16, T. 4 N., R. 5 E.

Pinewood Adamellite PNWD01
1. Permian(?)
2. Connecticut (SW)
3. Crowley, W. P., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 51-52
4. Adamellite with muscovite books
5. Weathers gray
7. Pluton
9. Surrounded by Straits Schist
10. Type locality: Beach Memorial Park, Long Hill and Bridgeport Quadrangles, Fairfield County. Named for Pinewood Lake which flanks E border of pluton.

Pinto Basin Tuff Member (Pinto Peak Rhyolite) U PNBS01
1. Oligocene
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 6-7
4. Air-fall vitric crystal tuff and breccia, tuffaceous sandstone
5. White
9. Underlies Sierra Springs Tuff Member
10. Type section: Pinto Basin, sec. 19 and 20, T. 18 N., R. 54 E., Eureka County.

Pinto Peak Rhyolite U PNPK01
1. Oligocene
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 6-7
4. Lithic breccias, flows, tuffs, vitrophyres, welded ash-flow tuff, intrusive domes and dikes
8. Sierra Springs Tuff Member; Pinto Basin Tuff Member
9. Unconformably overlies Ratto Spring Rhyodacite
10. Type section: In and around Pinto Peak, NW1/4 sec. 19, T. 18 N., R. 54 E., Eureka County.

Piper Gulch Monzonite U PPGC01
1. Triassic

2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4, C7-C8
4. Monzonite
5. Gray
7. String of bodies along crest of Santa Rita Mountains. Coarse-grained
9. Intrudes Mount Wrightson Formation; intruded by Squaw Gulch Granite and younger plutonic rocks
10. Type locality: Exposures in Piper Gulch, tributary to Mansfield Canyon, Santa Cruz County.

Pirtle Coal Member (Shelburn Formation) PRTL02
1. Middle Pennsylvanian
2. Indiana (SW)
3. Wier, C. E., 1970, in Shaver, R. H., and others, Indiana Geol. Survey Bull. 43, p. 134
4. Coal, shaly in places
6. 0.5 m
7. Bright-banded
9. Lies 18 m above Danville Coal Member (Dugger Formation)
10. Type section: SE1/4SE1/4SW1/4 sec. 15, T. 7 N., R. 8 W., Sullivan County. Named for Pirtle Cemetery.

Pitts Meadow Granodiorite U PSMD01
1. Precambrian X
2. Colorado (WC)
3. Hansen, W. R., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-747
4. Gneissic trondhjemitic granodiorite and quartz diorite
7. Large pluton. Contains abundant xenoliths
9. Intrudes Black Canyon Schist; underlies Entrada Sandstone with regional angular unconformity
10. Type area: Pitts Meadow, mesa E of Gunnison River, SE part of T. 51 N., R. 9 W., Montrose County.

Plaines Member (Kankakee Formation) PLNS01
1. Lower Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 18-19, 49
4. Pure massive dolomite
5. White
6. 0.6 m
9. Overlies Troutman Member (Kankakee Formation); underlies Brandon Bridge Member (Joliet Formation)
10. Type section: Plaines East section, abandoned quarry between 2 railroads at E end of connecting switch. Named for Plaines Station, railroad switching point on S side of Des Plaines River, 2.4 km SW of Brandon Bridge, Will County.

Plano Silt Member (Winnebago Formation) PLNO02
1. Pleistocene (Wisconsinan)
2. Illinois (NE)
3. Kempton, J. P., and Hackett, J. E., 1968, Illinois Univ. Spec. Pub. 14, p. 31-33
4. Organic silt and sand with intercalated peat
6. 2 m
9. Overlies Argyle Till Member; underlies Capron Till Member
10. Type section: E bank of Big Rock Creek 5.6 km NE of town of

Plano and 0.8 km S of Kane County line, SE1/4SW1/4NE1/4 sec. 1, T. 37 N., R. 6 E., Kendall County.

Poe Bridge Mountain Formation (Wedowee Group) PBGM01
1. Paleozoic, middle
2. Alabama (NE)
3. Neathery, T. L., 1975, Alabama Geol. Soc. Guidebook 13, p. 22-24
4. Schist interbedded with quartzite, gneiss, amphibolite
10. Type area: W Clay and S Cleburne Counties.

Pogy Member (Traveler Rhyolite) U POGY01
1. Lower Devonian
2. Maine (NC)
3. Rankin, D. W., 1968, in Zen, E-an and others, eds., New York, Interscience Publishers, p. 359, 360
4. Welded rhyolite ash-flow tuff, with quartz and plagioclase phenocrysts
6. 910 m
9. Overlies Matagamon Sandstone; underlies Black Cat Member (Traveler Rhyolite)
10. Type locality: North Pogy Mountain, Piscataquis County.

Point Augusta Formation U PAGS01
1. Upper(?) Silurian
2. Alaska (SE)
3. Loney, R. A., Brew, D. A., Muffler, L. J. P., and Pomeroy, J. S., 1975, U.S. Geol. Survey Prof. Paper 792, p. 1, 5-8
4. Interbedded graywacke and argillite with conglomerate, siltstone, and limestone
5. Dark-gray
6. 1524 m
7. Thin-bedded, medium- to fine-grained, laminated
9. Underlies Kennel Creek Limestone
10. Type locality: Exposed in nearly continuous cliffs that extend W from Point Augusta along Icy Strait to Whitestone Harbor and S from point along Chatham Straight to False Bay, Chicagof Island.

Point Loma Formation (Rosario Group) U PNLM01
1. Upper Cretaceous
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 711-712
4. Interbedded shale and sandstone, grading into siltstone
5. Gray, yellow
6. 400 m
10. Type section: Along cliff at S end of Point Loma Peninsula, San Diego County.

Pojoaque Member (Tesuque Formation) PJQU02
1. Miocene, upper, and Pliocene, lower
2. New Mexico (NC)
3. Galusha, Ted, and Blick, J. C., 1971, Am. Mus. Nat. History Bull. 144, art. 1, p. 59-64
4. Soft sandstones of granitic origin
5. Pink to buff and tan to gray
6. 167 m
9. Disconformably overlies Skull Ridge Member (Tesuque Formation);

underlies Chama-El Rito or Ojo Caliente Sandstone Member (Tesuque Formation); unconformably underlies Espanola Formation
10. Type section: SW1/4SE1/4 sec. 36, T. 20 N., R. 8 E., Pojoaque Bluffs on Pojoaque Pueblo Grant, Santa Fe County.

Pokejoy Member (Mahantango Formation) PKJY03
1. Middle Devonian
2. West Virginia (EC), Maryland, Pennsylvania
3. Hasson, K. O., and Dennison, J. M., 1974, West Virginia Acad. Sci. Proc., v. 46, no. 1, p. 78-86
4. Fossiliferous, calcitic, silty shale
6. 3 m
9. Overlies Clearville Siltstone Member; underlies Tully Limestone Member
10. Type locality: Bed of Pokejoy Run, 0.5 km upstream from confluence of Pokejoy Run with New Creek in SE1/4, Elk Garden Quadrangle, Mineral County, W. Va.

Pokerville Member (Logtown Ridge Formation) U PKVL02
1. Middle and Upper Jurassic (Callovian)
2. California (C)
3. Duffield, W. A., and Sharp, R. V., 1975, U.S. Geol. Survey Prof. Paper 827, p. 10-13, 15, 18
4. Volcanic breccia, with basalt flows, pillow lavas, and pyroclastic greenstone
6. 1370 m
7. Coarsely porphyritic augite basalt clasts in breccia, coarse-bedded
9. Conformably overlies Goat Hill Member; uppermost of three members of Logtown Ridge Formation except E and SE of Drytown where it underlies fourth member, New Chicago Member
10. Type locality: S bank of Cosumnes River, secs. 14 and 15, T. 8 N., R. 10 E., Amador County. Named for early name of present town of Plymouth.

Pollock Formation PLCK13
1. Pleistocene (Wisconsinan)
2. South Dakota (NC)
3. Hedges, L. S., 1972, South Dakota Geol. Survey Bull. 20, p. 1-39
4. Clay, silty clay
5. Gray, weathers yellow
6. 45 m
7. Uniformly bedded. Occupies ancient channel cut and fill deposits
9. Overlies pre-late Wisconsinan glacial drift; underlies late Wisconsinan till and outwash
10. Type section: South Dakota Geological Survey, test hole, NE1/4NE1/4NE1/4NE1/4 sec. 13, T. 128 N., R. 78 W., 4.8 km NE of Pollock, Campbell County. Named for town of Pollock.

Polvadera Group U PLVD02
1. Pliocene, middle, to Pleistocene, lower
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P10
4. Andesitic, dacitic, and rhyolitic basalts
6. 1500 m
8. Lobato Basalt, Tschicoma Formation, El Rechuelos Rhyolite

9. Unconformably overlies Abiquiu Tuff and Santa Fe Formation in N and Keres Group in C Jemez Mountains; unconformably underlies Tewa Group
10. Type area: C and N Jemez Mountains. Named for Polvadera Peak, Abiquiu Quadrangle, Rio Arriba County.

Pomerado Conglomerate (Poway Group) PMRD01
1. Eocene, upper
2. California (SE)
3. Peterson, G. L., and Kennedy, M. P., 1974, San Diego Soc. Nat. History Trans., v. 17, no. 18, p. 251-258
4. Conglomerate with sandstone lenses
6. 56 m
7. Conglomerate lithostrome
8. Miramar Sandstone Member
9. Gradationally overlies Mission Valley Formation; Pomerado Conglomerate is at surface at type section; unconformably underlies San Diego Formation in S
10. Type section: Roadcuts of Pomerado Road and Sycamore Canyon access road between San Diego and Poway, San Diego County.

Pond Spring Formation (Stones River Group) PSPG13
1. Middle Ordovician
2. Georgia (NW), Alabama, Tennessee
3. Milici, R. C., and Smith, J. W., 1969, Georgia Geol. Survey Bull. 80, p. 4
4. Conglomerate at base overlain by argillaceous limestones
6. 90 m
8. 3 unnamed members
9. Unconformably overlies Knox Group; underlies Murfreesboro Limestone
10. Type section: Chickamauga Valley, Kensington Quadrangle, Walker County, Ga. Named for town of Pond Spring.

Poplar Gap Member (Catskill Formation) PPGP01
1. Upper Devonian
2. Pennsylvania (EC)
3. Berg, T. M., 1975, Pennsylvania Geol. Survey Atlas 205a, p. 26-28
4. Sandstone and conglomeratic sandstone
5. Gray
6. 260 m
9. Overlies Packerton Member; underlies Duncannon Member
10. Type section: Along Pennsylvania Highway 115 in Poplar Gap, Pocono Pines Quadrangle, Monroe County.

Poplar River Formation/Member (Coleharbor Formation) PPRV01
1. Pleistocene to Holocene
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 23-25
4. Sand with minor gravel near base of formation
6. 30 m
9. Overlies Brenna, Falconer, Huot, and Wylie Formations; underlies Sherack Formation
10. Type section: Snake Curve section, SW1/4NW1/4SW1/4 sec. 18, T. 151 N., R. 44 W., Red Lake Falls, Red Lake County, Minn. Named for Poplar River.

Portage Brook Member (Albee Formation) U PGBK01
1. Lower and (or) Middle Ordovician
2. Maine (WC)
3. Harwood, D. S., 1973, U.S. Geol. Survey Bull. 1346, p. 12-16
4. Phyllite and slate with quartzite
5. Green
6. 1800 m
9. Conformably overlies and grades into Kennebago Member (Albee Formation); gradational into Aziscohos Formation; conformably underlies Deer Mountain Member (Albee Formation) or Dixville Formation
10. Type area: Exposures along Portage Brook and on ridge between Portage Brook and Lincoln Pond, SW corner Cupsuptic Quadrangle, Oxford County.

Port Refugio Formation U PRFG01
1. Upper Devonian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 43-49
4. Graywacke and conglomerate with interbedded siltstone and shale
6. 3000 m
9. Conformably overlies or is intercalated with Wadleigh Limestone; underlies Peratrovich Formation in Shelikof Islands area
10. Type locality: Exposures from Port Refugio N 3.2 km to Adrian Cove, on W side of Ullow Channel, NE coast of Suemez Island.

Potato Harbor Formation PHRB01
1. Pliocene or Pleistocene
2. California (SC)
3. Weaver, D. W., and Meyer, G. L., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 99-103
4. Sandy biomicrite and biomicrosparite limestone
6. 26 m, range 6-26 m
7. Microcrystalline
9. Unconformably overlies Monterey Formation or Santa Cruz Island Volcanics
10. Type locality: Potato Harbor, NE Santa Cruz Island.

Potrillo Basalt/Volcanics PTRL01
1. Pleistocene
2. New Mexico (SC)
3. Hoffer, J. M., and Hoffer, R. L., 1973, Geol. Soc. America Bull., v. 84, no. 6, p. 2139-2142
4. Alkali olivine basalt
8. West Potrillo Basalt, Aden Basalt, Afton Basalt, Black Mountain basalt, Santo Tomas Basalt, San Miguel basalt
10. Type locality: West Potrillo Mountains, Dona Ana County.

Pound Sandstone Member (Foreknobs Formation) PUND03
1. Upper Devonian
2. West Virginia (EC), Maryland, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-54
4. Sandstone with conglomerate layers
5. Gray

6. 59 m, range 7-59 m
7. Fine- to medium-grained, crossbedded, fossiliferous
9. Overlies Blizzard Member; underlies unnamed unit of Foreknobs Formation
10. Type section: Along road from U.S. Highway 33 to Spruce Knob, beside Briery Gap Run, near Judy Gap, Pendleton County, W. Va. Named for stream 3.2 km from type section.

Poverty Gulch Slate U PVGC01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A8
4. Slate and phyllite with abundant garnet crystals, interlayed with graphitic slate
5. Brown to black
7. Laminated
9. Conformably overlies Rochford Formation (Flag Rock Group); conformably underlies Swede Gulch Formation
10. Type locality: Poverty Gulch along E side of Silver Creek, sec. 23, T. 2 N., R. 3 E., N. Black Hills, Pennington County.

Powder Mill Group U PDML02
1. Precambrian Y
2. Michigan (NW), Wisconsin
3. Hubbard, H. A., 1975, U.S. Geol. Survey Jour. Research, v. 3, no. 5, p. 529-531, 539-540
4. Basalt with some andesite, rhyodacite, trachyandesite
5. Gray
6. 6100 m
8. Siemens Creek Formation, Kallander Creek Formation
9. Conformably overlies Bessemer Quartzite; unconformably underlies middle Keweenawan(?) nonmagnetic rocks, Portage Lake Volcanics, and Jacobsville Sandstone
10. Type locality: Along Powder Mill Creek valley and hills to E, secs. 5 and 8, T. 47 N., R. 46 W., and sec. 33, T. 48 N., R. 44 W., Gogebic County, Mich.

Pozo Formation POZO02
1. Paleocene
2. California (SC)
3. Doerner, D. P., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 17, 27
4. Arkosic sandstone and siltstone, calcareous-cemented, with intercalated shale beds
5. Buff
6. 69 m, range 69-120 m
7. Fine-grained
9. Unconformably underlies Canada Formation
10. Type locality: Wells Canyon, tributary to Canada Posa, W Santa Cruz Island.

Pratter Shale Member (Hinton Formation) U PRTR03
1. Upper Mississippian
2. Virginia (SW), West Virginia
3. Englund, K. J., 1968, U.S. Geol. Survey Geol. Quad. Map GQ-745
4. Shale with interbedded siltstone, limestone, and sandstone
5. Grayish-red
6. 20 m

9. Overlies Tallery Sandstone Member; underlies Falls Mills Sandstone Member
10. Type locality: Along Bluestone River, NW of Falls Mills, Tazewell County, Va. Named for Pratter Hollow, 0.8 km NE of Falls Mills.

Pretty Butte Member (Hell Creek Formation) PRTB02
1. Upper Cretaceous
2. North Dakota (SW), Montana
3. Frye, C. I., 1969, North Dakota Geol. Survey Bull. 54, p. 29, 38-39
4. Bentonite, bentonitic and lignitic shale, sandstone channels
6. 9 m, range 9-12 m
9. Overlies and interfingers with Huff Member (Hell Creek Formation); underlies Tullock, Ludlow, or Cannonball Formation
10. Type section: SE slope on NE end of Pretty Butte on W side of West Marmarth Road, SW1/4NE1/4 sec. 26, T. 134 N., R. 106 W., 19 km N of Marmarth, Slope County, N.D.

Prisoners Harbor Member (Santa Cruz Island Volcanics) PRHB01
1. Miocene, lower
2. California (SC)
3. Nolf, Bruce, and Nolf, Penny, 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 91-94
4. Andesite and dacite flows and flow breccias and tuffaceous volcaniclastic beds
5. Gray; weathers yellow
6. 180 m
7. Fine-grained to glassy
9. Discordantly overlies Devils Peak Member (Santa Cruz Island Volcanics); unconformably underlies Monterey Formation
10. Type locality: Quarry and sea cliffs at Prisoners Harbor, N Santa Cruz Island.

Promontory Member (Langford Formation) U PRMR03
1. Eocene, lower and middle
2. Wyoming (NW)
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Volcanic conglomerate and breccia tongues
6. 180 m
10. Type area: The Promontory, peninsula separating SE and S arms of Yellowstone Lake, Yellowstone National Park, Teton County.

Ptarmigan Chert Member (Manitou Formation) PRMG01
1. Lower Ordovician
2. Colorado (C)
3. Gerhard, L. C., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 7, p. 1397-1406
5. Mottled gray to pink
6. 29 m
7. Bedded
9. Unconformably overlies Helena Canyon Member; underlies Leavick Tarn Dolomite Member
10. Type section: N wall of cirque at Horseshoe Mountain, 1/4 mi. E of W Park County line, along W extension of line between secs. 7 and 18, T. 10 S., R. 78 W. Named for Ptarmigan Peak, S

of Horseshoe Mountain, SW of Fairplay, Mosquito Range, Park County.

Pumpkin Ground Member (Prospect Gneiss) PPKG01
1. Middle and Upper Ordovician
2. Connecticut (SW)
3. Crowley, W. P., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 10, 34-35
4. Gneiss
5. Gray
7. Medium-grained, moderately well foliated
9. Overlies Southington Mountain Formation and, locally, Trap Falls Formation; underlies Beardsley Gneiss and Golden Hill Members (Prospect Gneiss)
10. Type locality: Outcrops NE of Pumpkin Ground Brook, N Stratford, NE corner Bridgeport Quadrangle, Fairfield County.

Puppets Formation U PPTS02
1. Paleozoic, middle
2. Alaska (SE)
3. Berg, H. C., 1973, U.S. Geol. Survey Bull. 1373, p. 10-14
4. Felsic metavolcanic rocks, metarhyolite and metatuff
5. Weathers gray or light brown
6. 170 m
9. Unconformably overlies unnamed Silurian or older Paleozoic rocks; conformably underlies unnamed dolomitic limestone (Devonian?) or unconformably underlies Nehenta Formation
10. Type locality: Puppets-Punch Hill area, secs. 17, 19, and 20, T. 77 S., R. 91 E., and sec. 24, T. 77 S., R. 90 E., SW of Bostwick-Vallenar Valley, SW Gravina Island.

Purcell Limestone/Member (Marcellus Formation)/Limestone Member (Millboro Shale) PRCL12
1. Middle Devonian
2. Pennsylvania (SW), Maryland, Virginia, West Virginia
3. Cate, A. S., 1963, Pennsylvania Geol. Survey Gen. Geology Rept. G-39, p. 229-240
4. Limestone
6. 30 m
7. Contains nodules resembling golf balls. Well-known marker zone
10. Type section: Morris No. 1 well, Purcell gas field, Bedford County, Pa. Named for Purcell gas field.

Putah Tuff Member (Tehama Formation) U PUTH01
1. Pliocene, upper
2. California (WC)
3. Sims, J. D., and Sarna-Wojcicki, A. M., 1975, U.S. Geol. Survey Bull. 1395-A, p. A34-A35, A50-A55
4. Volcanic tuff
6. 15 m
10. Type locality: Roadcut on N side of Putah Creek along California Highway 128, sec. 36, T. 8 N., R. 2 W., Yolo County.

Putney Volcanics PTNY01
1. Lower Devonian
2. Vermont (SC)
3. Hepburn, J. C., 1972, New England Intercollegiate Geol. Conf. Guidebook 64, p. 231-244
4. Phyllites and granulites with interbedded slates. Conglomerate

member consists of quartzite and slate pebbles in slate matrix
7. Finely laminated and crossbedded
8. Informal conglomerate member
10. Type locality: Abandoned chicken yard W of U.S. Highway 5, 3.6 km N of Brattleboro, Windham County.

Quad Creek Metanorite QDCK01
1. Precambrian W
2. Montana (SC)
3. Eckelmann, F. D., and Poldervaart, Arie, 1957, Geol. Soc. America Bull., v. 68, no. 10, p. 1225-1262
4. Plagioclase, bronzite, hornblende, metanorite
7. Stock
10. Type area: Long 109°25′ W., Beartooth Mountains, Carbon County.

Quail Canyon Sandstone Member (Vaqueros Formation) U QLCN01
1. Oligocene, upper
2. California (SC)
3. Dibblee, T. W., Jr., 1973, U.S. Geol. Survey Prof. Paper 764, p. 17
5. Gray-white, weathers buff
6. 90 m
7. Massive, crossbedded, medium- to fine-grained
9. Conformably overlies Simmler Formation; conformably underlies Soda Lake Shale Member (Vaqueros Formation)
10. Type locality: Quail Canyon, NW1/4SW1/4 sec. 4, T. 10 N., R. 25 W., SE Caliente Range, San Luis Obispo County.

Quarry Hill Member (Esopus Formation) QRHL02
1. Lower Devonian
2. New York (SE), New Jersey
3. Boucot, A. J., Gauri, L. L., and Southard, John, 1970, Palaeontographica, Abt. A, Bd. 135, Lief. 1-2, p. 30-34
4. Mudstone with abundant concretions
5. Gray to black
6. Range 18-50 m
9. Gradationally overlies Mountainville Member; interbedded with and underlies Highland Mills Member
10. Type area: W of Catskill, Ulster County, N. Y. Reference section: E side of New York Thruway cut at Highland Mills.

Quealy Formation U QULY01
1. Lower Cretaceous
2. Wyoming (SW)
3. Rubey, W. W., 1973, U.S. Geol. Survey Bull. 1372-I, p. I15, I17-I18
4. Red beds, mudstone, and sandstone
5. Gray and red
6. 300 m, range 300-366 m
9. Overlies and intertongues with Cokeville Formation; underlies Sage Junction Formation
10. Type section: 2 km S of Quealy Reservoir, SE1/4 sec. 35 and SW1/4 sec. 36, T. 25 N., R. 119 W., Lincoln County.

Quilici Formation QULC01
1. Middle Pennsylvanian
2. Nevada (NE)
3. Riva, John, 1970, Geol. Soc. America Bull., v. 81, no. 9,

p. 2699-2700
4. Basal chert pebble conglomerate and upper limestone with siltstone and sandstone beds
6. 106 m
7. Ledge-forming
9. Unconformably overlies Agort Chert or Noh Formation; disconformably underlies Buckskin Mountain Formation
10. Type locality: W flank of range at base of cliff where Bloody Gulch turns to NE and 0.8 km SSW of Tiser Spring, Elko County.

Quimby Formation U QMBY01
1. Upper Ordovician (?)
2. Maine (WC)
3. Moench, R. H., 1969, U.S. Geol. Survey Bull. 1274-L, p. L4-L12, L14-L16
4. Metashale and metagraywacke, cyclically interbedded, with subordinate felsic metavolcanic rocks
5. Gray to black, weathers rusty
6. 900 m
7. Very thin- to thick-bedded; shale is variably metamorphosed to carbonaceous slate, phyllite, or schist
8. Informal graywacke and shale members
9. Overlies Dixville Formation; conformably underlies Greenvale Cove Formation
10. Type area: N of Rangeley Lake; lower part of formation exposed between Quimby Pond and Hunter Cove, upper part exposed between Hunter Cove and village of Rangeley, Franklin County.

Quinnville Quartzite (Blackstone Group) U QNVL01
1. Precambrian Z
2. Rhode Island (NC)
3. Quinn, A. W., 1971, U.S. Geol. Survey Bull. 1295, p. 8-13
4. Quartzite with interbedded schist
5. Gray
6. Range 1000-1500 m
9. Overlies Mussey Brook Schist; underlies Sneech Pond Schist
10. Type locality: Exposures N of village of Quinnville extending N to W end of Blackstone River bridge on George Washington Highway, State Highway 116, Pawtucket Quadrangle, Providence County.

Rabbit Flat Member (Logtown Ridge Formation) U RBFL03
1. Middle and Upper Jurassic (Callovian)
2. California (C)
3. Duffield, W. A., and Sharp, R. V., 1975, U.S. Geol. Survey Prof. Paper 827, p. 10
4. Greenstone flows and breccia
6. 640 m, range 640-2000 m
7. Coarsely porphyritic augite basalt clasts in breccia; structurally truncated at Drytown
9. Lowermost member of Logtown Ridge Formation; in fault contact at base; conformably underlies Goat Hill Member
10. Type locality: N bank of Mokelumne River, sec. 17, T. 5 N., R. 11 E., about 3 km S of Rabbit Flat, Amador County.

Rader Creek Granodiorite RDCK09
1. Upper Cretaceous
2. Montana (SW)
3. Tilling, R. I., 1964, U.S. Geol. Survey Prof. Paper 501-D,

p. 8-13
5. Gray
7. Medium-grained
8. Forms major part of Boulder Batholith. Slightly older than Butte Quartz Monzonite
10. Type locality: 24 k SE of Butte, lat 45°50′ N., long 112°20′ W., Jefferson County.

Radnor Till Member (Glasford Formation) RDNR01
1. Pleistocene (Illinoian)
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 57
4. Silty till
5. Gray
6. 7 m
7. Compact
9. Overlies Toulon or Hulick Till Member (Glasford Formation); underlies Roxana Silt
10. Type section: Jubilee College section, roadcut, SW1/4SW1/4SW1/4 sec. 7, T. 10 N., R. 7 E., Peoria County. Named for Radnor Township.

Ragged Mountain Member (Bluffer Pond Formation) RGDM03
1. Middle Ordovician
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 22-23
4. Aphanitic and porphyritic rhyolite
5. Gray
6. < 300 m
10. Type section: Ragged Mountain, Spider Lake Quadrangle, T 9 R 10, Piscataquis County.

Railroad Canyon Rhyolite RLDC02
1. Oligocene
2. New Mexico (SW)
3. Elston, W. E., Coney, P. J., and Rhodes, R. C., 1970, New Mexico Geol. Soc. Guidebook 21, p. 82-84
4. Rhyolite ash-flow tuff
6. 50-150 m
7. Crystal-rich, characterized by phenocrysts of moonstone (sanidine cryptoperthite)
9. Overlies Deadwood Gulch Rhyolite or unnamed latite lava; underlies Bearwallow Mountain Formation
10. Type area: Exposed around Corduroy Canyon depression, NE of Beaverhead, and on State Highway 78 in Railroad Canyon, NW of Beaverhead, Catron County.

Rainbow Gardens Formation RBGD01
1. Cretaceous(?)
2. Nevada (SE)
3. Longwell, C. R., 1973, Geol. Soc. America Bull., v. 84, no. 11, p. 3718
4. Basal conglomerate overlain by alternating units of shale and freshwater limestone
6. > 100 m
9. Unconformably overlies Chinle Formation and Aztec Sandstone; underlies Thumb Formation
10. Type area: Frenchman Mountain, E of Las Vegas, Clark County.

Rainsboro Drift/Till RSBR02
1. Pleistocene (Illinoian)
2. Ohio (SW)
3. Rosengreen, T. E., 1974, Ohio Div. Geol. Survey Rept. Inv. 92, p. 5-6
4. Calcareous till
5. Dark-gray (unoxidized), yellowish-brown (oxidized)
6. 4 m
7. Abundant pebbles and cobbles in compact, locally cemented loam matrix
9. Overlies pre-Rainsboro till; underlies Boston Till/Drift
10. Type area: Highland County. Named for village of Rainsboro.

Ra Jadero Member (Treasure Mountain Tuff) U RJDR01
1. Oligocene, upper
2. Colorado (SC)
3. Lipman, P. W., and Steven, T. A., 1970, U.S. Geol. Survey Prof. Paper 700-C, p. C21-C23
4. Quartz latite ash-flow tuff
5. Dark-brown
6. 20 m
7. Densely welded, has reversed magnetic polarity
9. Conformably overlies Ojito Creek Member (Treasure Mountain Tuff); underlies informal upper tuff of Treasure Mountain tuff, or younger rocks
10. Type locality: Ra Jadero Canyon, 26 km SE of Platoro, lat 37°14′ N., long 106°16′ W., Conejos County.

Ralston Buttes Formation RLSB01
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 135-136
4. Amphibolitic gneiss with intercalated tactite and quartzite, and lenses of quartz, granite, and pegmatite
6. 2100 m
9. Underlies Belcher Hill Formation
10. Type area: Along Ralston Creek, sec. 25, T. 2 N., R. 71 W., Jefferson County.

Ramona Hill Member (Wann Formation) RMHL01
1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Desjardins, L. A., 1973, Tulsa Geol. Soc. Digest, v. 37, p. 68
4. Limestone
6. 46 m
9. Overlies Tall Chief Member; unconformably underlies Clem Creek Sandstone Member
10. Type area: T. 24 N., R. 12 E., Tulsa County.

Rapid Creek Greenstone (Flag Rock Group) U RPCK05
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A7
4. Greenstone pillow lavas, clastic volcanic rocks, mafic lavas
7. Dense, massive, ridge-forming
8. 3 units in different areas but at same stratigraphic horizon
9. Conformably overlies Montana Mine Formation or unconformably(?) overlies Moonshine Gulch Quartzite; interbedded with or

underlies Nahant Schist; conformably underlies Rochford Formation
10. Type locality: E of Rapid Creek, sec. 15, T. 2 N., R. 3 E., N Black Hills, Pennington County.

Ratcliffe Formation/Beds (Madison Group) RCLF02
1. Lower Mississippian
2. Canada (Saskatchewan), Montana, North Dakota
3. Fuzesy, L. M., 1973, Saskatchewan Dept. Mineral Resources Rept. 163, 63 p.
4. Limestone, minor dolomite and anhydrite
5. Light-gray
6. 45 m
7. Subsurface, microcrystalline, bedded
8. Basal Midale evaporite, Oungre evaporite, upper unnamed evaporite
9. Conformably overlies Midale Beds; conformably underlies Poplar Beds
10. Type section: Socony Central Leduc Del Rio Ratcliffe No. 1 well, Lsd 5-30-1-15w2, renamed Mobil CDR Flat Lake 5-30-1-15, depth-interval 1935-1980 m, Williston Basin, Saskatchewan, Canada.

Rattler Granodiorite U RTLR01
1. Upper Cretaceous
2. Arizona (SC)
3. Cornwall, H. R., Banks, N. G., and Phillips, C. H., 1971, U.S. Geol. Survey Geol. Quad. Map GQ-1021
4. Granodiorite, quartz diorite, aplite
7. Stock, granitic texture
9. Cuts Paleozoic sedimentary rocks; intruded by Laramide dikes
10. Type locality: Exposures near Rattler Mine, sec. 26, T. 3 S., R. 14 E., Sonora Quadrangle, Pinal County.

Rattlesnake Hill Muscovite Granite RLKH05
1. Middle Devonian
2. Massachusetts (C)
3. Skehan, J. W., in Zen, E-an, and others, eds., 1968, New York, Interscience Publishers, p. 281-290
4. Quartz-albite-orthoclase-muscovite leuco-granite
5. Gray-white
7. Massive, medium-grained
10. Type area: Rattlesnake Hill, near Shaft A of Wachusett-Marlborough Tunnel, near Clinton, Worcester County.

Rattlesnake Spring Granodiorite U RKSP06
1. Upper Cretaceous
2. Nevada (NW)
3. Smith, J. G., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-606
4. Granodiorite
7. Massive, coarse-grained
9. Intrudes Triassic(?) quartzite and amphibolite unnamed units; unconformably underlies Tertiary volcanic rocks
10. Type locality: Rattlesnake Spring, sec. 26, T. 45 N., R. 30 E., Pine Forest Range, Denio Quadrangle, Humboldt County.

Ratto Spring Rhyodacite U RSPG19
1. Oligocene

2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 6
4. Rhyodacite with some tuffaceous sandstone
5. Gray to light-brown, reddish-brown
9. Unconformably underlies Pinto Peak Rhyolite
10. Type section: Vicinity of Ratto Spring near head of Ratto Canyon, 1.6 km N of W from Surprise Peak, sec. 27, T. 18 N., R. 53 E., Pinto Summit Quadrangle, Eureka County.

Ravinia Sand Member (Lake Michigan Formation) RVINO1

1. Holocene
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 78
4. Beach sand
5. White
9. Grades laterally into Waukegan Member
10. Type area: Beach of Lake Michigan at Ravinia in S Highland Park, W1/2 sec. 31, T. 43 N., R. 13 E., Lake County.

Rawhide Formation RWHD01

1. Oligocene
2. Nevada (C)
3. Cook, H. E., 1968, Geol. Soc. America Mem. 116, p. 110-114
4. Rhyolite tuff and lapilli tuff
5. Varicolored
6. 275-1680 m
7. Crystal-vitric, moderately to intensely welded; upper member forms steep cliffs
8. Informal lower ignimbrite, middle ignimbrite, and upper ignimbrite members
9. Unconformably overlies Gilmore Gulch Formation or Paleozoic rocks; unconformably underlies Italian Springs Formation
10. Type areas: For lower and middle ignimbrite members: Hot Creek Canyon, SE1/4 of T. 8 N., R. 49 E.; for upper ignimbrite member: Tybo Canyon, Sw1/4 of T. 6 N., R. 50 E., Nye County. Named for Rawhide Mountain, S of Tybo Canyon.

Ready Bullion Formation U RDBL01

1. Holocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 15, 17-21
4. Loess with forest beds
5. Gray to black (frozen), tan (thawed)
6. 2 m
9. Unconformably overlies Goldstream Formation; grades laterally into and is equivalent of Engineer Loess
10. Type section: E wall of Ready Bullion bench mining cut on Ready Bullion Creek, SW1/4 sec. 6, T. 1 S., R. 2 W., 17 km W of Fairbanks, Fairbanks D-3 Quadrangle.

Reany Creek Formation (Chocolay Group) U RCRK08

1. Precambrian X
2. Michigan (NC)
3. Puffett, W. P., 1969, U.S. Geol. Survey Bull. 1274-F, p. F1-F23
4. Basal conglomerate, graywacke, chloritic slate, interbedded arkose, quartzite, slate, graywacke, and conglomerate

6. 1500 m, range 910-1500 m
9. Unconformably overlies or in fault contact with Mona Schist
10. Type locality: Exposures extending N from Dead River Basin for 530 m, 120 m W of and parallel to W boundary of secs. 5 and 8, T. 48 N., R. 26 W., Marquette County. Named for stream in area.

Reausaw Slate (Windy Flats Group) U RUSW01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Slate and schist
5. Gray and black
9. Conformably overlies Hay Creek Greenstone (Windy Flats Group); unconformably(?) underlies Roubaix Formation
10. Type locality: N of Reausaw Lake, secs. 34 and 35, T. 4 N., R. 4 E., Black Hills, Lawrence County.

Red Cliff Basalt (North Shore Group) RDCF02
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. Amygdaloidal ophitic olivine basalt
6. 270 m
9. Overlies Kimball Creek Felsite; underlies Devil Track Felsite
10. Type locality: Red Cliff, Cook County.

Red Dog Loess RDDG01
1. Pleistocene (Illinoian(?))
2. South Dakota (SW)
3. Harksen, J. C., 1968, South Dakota Geol. Survey Rept. Inv. 98, p. 6-9
4. Calcareous sandy silt
5. Tan
6. 18 m
7. Massive, poorly consolidated, weathers to vertical faces
9. Overlies sand marking top of Pleistocene terrace deposits; underlies Holocene soil and loess
10. Type section: Exposed near top of cliff on N face of Red Dog Table, SE1/4 sec. 35, T. 40 N., R. 46 W., Shannon County.

Red Draw Member (Jelm Formation) U RDDR02
1. Upper Triassic
2. Wyoming (SE)
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D13
4. Shale, siltstone, sandstone
5. Reddish-brown, greenish-gray
6. 30 m, range 11-43 m
7. Interbedded siltstone makes lime-cemented ripple-marked ledges
9. Disconformably overlies Alcova Limestone; disconformably underlies Sips Creek Member (Jelm Formation)
10. Type section: SW Freezeout Mountains, NW1/4NW1/4 sec. 25 and NE1/4 sec. 26, T. 24 N., R. 80 W., Carbon County. Named for Red Draw, 4 km to N.

Red Lake Falls Formation/Member (Coleharbor Formation) RLKF01
1. Pleistocene (Wisconsinan)
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 11-13
4. Unbedded pebble-loam
5. Brownish-gray (dry), olive-brown (wet)
6. Range 2-22 m
9. Overlies Gervais, St. Hilaire, or Marcoux Formations; underlies Wylie Formation
10. Type section: Clearwater section, NE1/4NW1/4 sec. 22, T. 151 N., R. 44 W., Red Lake County, Minn. Named for Red Lake Falls.

Red Mountain Hornblende Syenite RDMN16
1. Precambrian Y
2. Wyoming (SE)
3. Smith, B. D., Hodge, D. S., and Smithson, S. B., 1970, Wyoming Univ. Contr. Geology, v. 9, no. 1, p. 27-38
4. Hornblende syenite with megacrysts of K feldspar and hornblende
5. Red
7. Fine- to medium-grained at borders; grades to porphyritic, medium-grained rock
10. Type locality: S Laramie Range, Albany County. Named for Red Mountain.

Redondo Creek Member (Valles Rhyolite) U RDCK01
1. Pleistocene
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P15-P16
4. Rhyolite dome, dike flows, interlayered tuffs
6. 150 m, range 0-150 m
9. Conformably overlies Deer Canyon Member; unconformably underlies Valle Grande Member
10. Type locality: Steep slopes on W side of Sulphur Creek, between Sulphur Springs and La Cueva. Named for Redondo Creek, Sandoval County.

Red Rock Rhyolite (North Shore Group) RRCK08
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316
4. Porphyritic rhyolite
5. Red
6. 60 m
9. Overlies Deronda Bay Andesite; underlies Hovland Lavas
10. Type locality: Cook County.

Red Valley Member (Box Butte Formation) RDVL10
1. Miocene
2. Nebraska (NW)
3. Galusha, Ted, 1975, Am. Mus. Nat. History Bull., v. 156, art. 1, p. 29-39
4. Sand, silt
5. Red
6. 11 m
7. Fine-grained

9. Overlies Runningwater Formation; underlies Dawes Clay Member (Box Butte Formation)
10. Type section: Sand Canyon Quarry of former Frick Laboratory of American Museum of Natural History, on N side of sharp bend in Sand Canyon, NE1/4SW1/4 sec. 29, T. 30 N., R. 47 W., Dawes County.

Reed Pond Member (Munsungun Lake Formation) RDPD01
1. Middle Ordovician
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 25-27
4. Volcanic breccia
5. Greenish-gray to bluish-gray
6. 300 m
10. Type locality: Not stated. Named for Reed Pond in Spider Lake Quadrangle, T 8 R 10, Piscataquis County.

Relica Peak Rhyolite RCPK02
1. Tertiary
2. New Mexico (NC)
3. Clark, K. F., and Read, C. B., 1972, New Mexico Bur. Mines and Mineral Resources Bull. 94, p. 55
4. Rhyolite porphyry
5. Gray or cream
7. Plug dissected by erosion along structural line of weakness
10. Type locality: Exposure in gulch 1.6 km NNW of Wheeler Peak Village, Taos County.

Rendezvous Metagabbro U RDZV01
1. Precambrian W
2. Wyoming (NW)
3. Reed, J. C., Jr., and Zartman, R. E., 1973, Geol. Soc. America Bull., v. 84, no. 2, p. 565-566, 568
4. Hornblende-plagioclase metagabbro
7. Nonlayered, blotchy appearance
10. Type locality: E slopes of Rendezvous Mountain, N of aerial tramway at Jackson Hole ski area, 2.5 km N. 65° W. of lower terminus of tramway in Teton Village, Teton County.

Rendleman Oolite Bed (Walnut Grove Limestone Member of Lingle Formation) RDLM01
1. Middle Devonian
2. Illinois (SC)
3. North, W. G., 1969, Illinois Geol. Survey Circ. 441, p. 30-31, 43
4. Oolites in limestone matrix
5. Brownish-gray
6. 0.5 m
7. Significant key bed in Lingle Formation
10. Type section: 1.2 m above base of Walnut Grove Limestone Member type section, SE1/4SE1/4SW1/4 sec. 22, Union County. Named for Rendleman School, 1.6 km to E.

Renova Formation (Bozeman Group) RNOV01
1. Eocene and Oligocene
2. Montana (SW)
3. Kuenzi, W. D., and Fields, R. W., 1971, Geol. Soc. America Bull., v. 82, no. 12, p. 3378-3380
4. Limestone, mudstone, siltstone in alternating beds

5. Grayish-yellow to grayish-orange
6. 300 m, range 300-1100 m
7. Fine-grained
8. Bone Basin Member, Climbing Arrow Member, Dunbar Creek Member
9. Overlies pre-basin Paleozoic and Mesozoic rocks; underlies Sixmile Creek Formation by erosional and (or) angular unconformity
10. Type section: 2 km SE of Renova along bluffs E of Jefferson River, NW1/4NW1/4 sec. 33, T. 1 N., R. 4 W., Jefferson County. Named for village of Renova, on W side of Jefferson River.

Rescue Canyon Rhyolite RSCC01
1. Tertiary
2. Nevada (EC)
3. Iddings, J. P., 1892, U.S. Geol. Survey Monograph 20, p. 237, 379
4. Lava flow
5. Red
9. Overlies Nevada Formation
10. Type locality: Along Rescue Fault in Rescue Canyon, Eureka District, Eureka County.

Reservation Hill Formation U RVHL01
1. Pennsylvanian(?) and Permian(?)
2. Nevada (NC)
3. Coats, R. R., 1969, U.S. Geol. Survey Bull. 1274-A, p. A26-A27
4. Dolomitic sandstone or siltstone with interbedded metasedimentary and metavolcanic rocks
5. Weathers creamy-white to reddish-brown
9. Overlies Mountain City Formation in thrust contact; intruded by Cretaceous quartz monzonite; underlies Tertiary rocks
10. Type locality: Reservation Hill, secs. 22 and 23, T. 46 N., R. 53 E., Mountain City and Owyhee Quadrangles, Elko County.

Reservation River Diabase Complex (Keweenawan Supergroup) RVRV02
1. Precambrian Y (Middle Keweenawan)
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 330
4. Ophitic olivine gabbro
7. Sills, dikes
9. Cuts and merges with Hovland Lava/Diabase Complex
10. Type locality: At and E of Reservation River, secs. 27, 28, 29, 31, 32, 33, 34, T. 63 N., R. 5 E., and secs. 4, 5, 6, T. 62 N., R. 5 E., Cook County.

Resort Lava RSRT01
1. Quaternary
2. Oregon (C)
3. Higgins, M. W., and Waters, A. C., 1968, Oregon Dept. Geology and Mineral Industries Bull. 62, p. 64
10. Type locality: SE corner of East Lake in Newberry Crater, 40 km S of Bend, Deschutes County.

Reynolds Basin Group RLDB01
1. Miocene, upper, to Pliocene, lower
2. Idaho (SW)
3. McIntyre, O. H., 1972, Idaho Bur. Mines and Geology Pamph. 51, p. 23

4. Intertonguing sequence of olivine basalt flows, silicic tuff, diatomites, arkosic sands, granitic gravels, latite flows
6. 300 m
8. Boston Ranch Formation, Toll Gate Olivine Basalt, Soldier Cap Olivine Basalt, Hoot Nanny Olivine Basalt
9. Unconformably overlies Salmon Creek Volcanics; unconformably underlies Pliocene rhyolitic welded ash flow tuff
10. Type area: Reynolds Basin area centered about Reynolds Creek, in Owyhee Mountains bordering Payette Section of Snake River Plain, 64 km SW of Boise, Owyhee County.

Rice Gneiss U RICE02

1. Precambrian Z
2. Massachusetts (NC)
3. Nelson, A. E., 1974, U.S. Geol. Survey Bull. 1395-E, p. E1, E6-E8
4. Plagioclase-quartz-biotite gneiss interlayered with other gneiss, schist, and quartzite
5. Gray
6. 760 m
9. Lower part intruded by Dedham Granodiorite; conformably underlies Westboro Quartzite
10. Type locality: Exposure just NE of intersection of Massachusetts Highway 30 and Rice Road in NW part of Natick Quadrangle, Middlesex County.

Rich Acres Norite RCAC01

1. Paleozoic
2. Virginia (SC)
3. Conley, J. F., and Toewe, E. C., Virginia Div. Mineral Resources Rept. Inv. 16, p. 17-19, 27-28
5. Greenish-gray
7. Porphyritic, coarse-grained; develops spheroidal weathering rinds and decomposes into thick mantle of saprolite
9. Intrudes Leatherwood Granite and older metasedimentary rocks; intruded by upper Paleozoic(?) pegmatite dikes and Triassic diabase dikes
10. Type locality: Exposure of fresh rock 46 m NW of Rich Acres Christian Church, 4 km S of city boundary of Martinsville, Henry County.

Richmond Mountain Andesite U RCMM01

1. Oligocene
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 7
4. Andesite flows and associated dikes
5. Weathers dark reddish-brown
6. 213 m
9. Unconformably overlies Pinto Peak Rhyolite
10. Type locality: Richmond Mountain, secs. 19 and 20, T. 19 N., R. 54 E., Eureka and Pinto Summit Quadrangles, Eureka County.

Richtex Formation U RCTX01

1. Precambrian Z or Cambrian
2. South Carolina (C)
3. Secor, D. T., and Wagener, H. D., 1968, South Carolina Div. Geology Geol. Notes, v. 12, no. 4, p. 67-84
4. Slate and phyllite

5. Yellow, brownish-red
6. 1000 m
7. Slatey cleavage, minute laminae
9. Overlies Persimmon Fork Formation
10. Type area: Cedar Creek-Blythewood area, near Columbia, Richland and Fairfield Counties. Possibly named for the "shale" quarry at Richtex Brick Plant.

Rincon Valley Formation (Santa Fe Group) RCVL04

1. Miocene
2. New Mexico (SC)
3. Seager, W. R., Hawley, J. W., and Clemons, R. E., 1971, New Mexico Bur. Mines and Mineral Resources Bull. 97, p. 14-15, 35
4. Gypsiferous claystone and siltstone, conglomerate, and conglomeratic sandstone
5. Pink and reddish-brown
6. 163 m
9. Transitionally overlies Hayner Ranch Formation (Santa Fe Group); interbedded with Selden Basalt; unconformably underlies Camp Rice Formation
10. Type section: Rincon Valley, SE of San Diego Mountain, NE1/4NW1/4 sec. 8, T. 20 S., R. 1 W., Dona Ana County.

Rio Bonito Member (San Andres Formation) RBNT01

1. Lower Permian (Leonardian)
2. New Mexico (EC)
3. Kelley, V. C., 1971, New Mexico Bur. Mines and Mineral Resources Mem. 24, p. 9-12
4. Dolomite and limestone with oolitic beds
5. Gray
6. Range 76-106 m
9. Overlies Yeso Formation; intertongues with Glorieta Sandstone Member (San Andres Formation); underlies Bonney Canyon Member (San Andres Formation)
10. Type locality: Sunset section, sec. 20, T. 11 S., R. 19 E., E end of Capitan Mountains, Lincoln County. Named for Rio Bonito.

Rio Mimbres Sandstone (Montoya Group) RMMB01

1. Upper Ordovician
2. New Mexico (SW), Texas
3. LeMone, D. V., 1969, New Mexico Bur. Mines and Mineral Resources Circ. 104, p. 22
5. White
6. 1 m
7. Extremely local
9. Overlies El Paso Group; underlies Cable Canyon Sandstone (Montoya Group)
10. Type section: W side of Mimbres Valley, sec. 26, T. 17 S., R. 11 W., Grant County, N. Mex.

Rion Adamellite RION01

1. Permian
2. South Carolina (NC)
3. Wagener, H. D., 1970, South Carolina Div. Geology Map Ser. MS-17, p. 19, 21-24
7. Strongly discordant pluton, medium- to fine-grained
9. Emplaced in Winnsboro Granite

10. Type locality: SW of Winnsboro and N of Morris Creek, Fairfield County. Named for Rion Quarry.

Ritter Formation RTTR01
1. Pliocene, upper, and Pleistocene, lower
2. California (SE)
3. Kahle, J. E., 1975, California Div. Mines and Geology Spec. Rept. 118, p. 203-207
4. Interbedded sandstone and siltstone
5. White, gray, brown
6. 460 m
9. Overlies Anaverde Formation; underlies unnamed alluvium; in thrust-fault contact with Pelona Schist and gneiss-diorite complex
10. Type locality: Along powerline road S from Elizabeth Lake Road near center of E1/2 sec. 23, T. 6 N., R. 13 W., Los Angeles County. Named for Ritter Canyon in sec. 22.

Riverview Limestone Member (Bond Formation) RVRV01
1. Upper Pennsylvanian
2. Indiana (SW)
3. Wier, C. E., 1970, in Shaver, R. H., and others, 1970, Indiana Geol. Survey Bull. 43, p. 140
4. Argillaceous limestone
5. Gray
6. 0.1-0.3 m
7. Fossiliferous
9. Overlies black shale and unnamed coal bed
10. Type section: NE edge of Riverview, SW1/4SW1/4SE1/4 sec. 24, T. 9 N., R. 11 W., Sullivan County.

Roaring Mountain Member (Plateau Rhyolite) U RRGM01
1. Pleistocene
2. Wyoming (NW), Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B14-B15
4. Phenocryst-poor rhyolitic lava flows with abundant fresh obsidian
5. Black
8. Crystal Spring, Obsidian Cliff, Cougar Creek, and Riverside flows
9. Overlies Lava Creek Tuff, Swan Lake Flat Basalt, and parts of Obsidian Creek Member (Plateau Rhyolite); underlies Madison River Basalt and Pleistocene and Holocene surficial deposits
10. Type area: N of Yellowstone Caldera, Yellowstone National Park, Park County, Wyo.

Robbins Chapel Sandstone Member (Wise Formation) U RBCP02
1. Middle Pennsylvanian
2. Virginia (SW)
3. Miller, R. L., 1969, U.S. Geol. Survey Bull. 1280, p. 1, 25-27
4. Quartzose sandstone
5. Brown, gray, or orange
6. 24 m, range 9-24 m
7. Massive, resistant, crossbedded
9. Underlies Keokee Sandstone Member
10. Type section: Robbins Chapel, State Road 606, at top of long hill 570 m S. 27° W. of brick church, Lee County.

Robein Silt ROBN02
1. Pleistocene (Wisconsinan)
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 64-65
4. Silt, sandy silt, organic silt, peat
6. Range 0.1-1.5 m
7. Distinctive marker bed
9. Overlies Peddicord Formation, Roxana Silt, Glasford Formation, or Capron Till Member (Winnebago Formation); underlies Morton Loess or Wedron Formation
10. Type section: Creek bank, NE1/4SW1/4SE1/4 sec. 30, T. 26 N., R. 3 W., Tazewell County.

Roberts Draw Limestone U RBRD02
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Basal conglomerate, slate, graywacke, and limestone
9. Conformably overlies Estes Conglomerate; underlies metagabbro dikes and sills and Buck Mountain Quartzite
10. Type locality: Exposures in Roberts Draw, NW1/4 sec. 34, T. 3 N., R. 5 E., Black Hills, Lawrence County.

Roche de Boeuf Member (Tymochtee Formation) RCBF01
1. Upper Silurian
2. Ohio (NW)
3. Kahle, C. F., and Floyd, J. C. 1971, Geol. Soc. America Bull., v. 82, no. 8, p. 2071
4. Dolomite
5. Gray
6. 9 m
7. Medium-bedded
9. Overlies Maumee River Member (Tymochtee Formation); underlies Put-in-Bay Formation
10. Type section: Waterville Quarry, N of Roche de Boeuf Island in Maumee River, SW of Waterville, Wood County.

Rochford Formation (Flag Rock Group) U RCFD02
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A5-A6, A9-A20
4. Ferruginous chert containing cummingtonite or grunerite rosettes and garnet
9. Conformably overlies Nahant Schist or Rapid Creek Greenstone (Flag Rock Group); conformably underlies Poverty Gulch Slate
10. Type locality: Exposures near Rochford, secs. 23 and 24, T. 2 N., R. 3 E., N Black Hills, Pennington County.

Rocket Wash Member (Thirsty Canyon Tuff) U RCKW01
1. Miocene
2. Nevada (SC)
3. Noble, D. C., Bath, G. D., Christiansen, R. L., and Orkild, P. P., 1968, U.S. Geol. Survey Prof. Paper 600-C, p. C61-C65
4. Rhyolite ash-flow tuff
6. 120 m
7. Partly to densely welded, devitrified except at cooling breaks;

high-angle reverse remanent magnetization
9. Unconformably overlies Timber Mountain tuff and unnamed Tertiary volcanics; underlies Spearhead Member (Thirsty Canyon Tuff)
10. Type area: Vicinity of Rocket Wash and East Fork Thirsty Canyon, in S1/3 of Thirsty Canyon Quadrangle, Nye County.

Rockford Granite (Pinckneyville Granite Complex) RCKF03
1. Paleozoic, lower
2. Alabama (C), Georgia
3. Wampler, J. M., Neathery, T. L., and Bentley, R. D., 1970, Alabama Geol. Soc. Guidebook 8, p. 88
10. Type locality: T. 24 N., R. 20 E., Coosa County, Ala.

Rockhouse Valley Sandstone Member (Wise Formation) U RCKV08
1. Middle Pennsylvanian
2. Virginia (SW), Kentucky
3. Miller, R. L., and Roen, J. B., 1973, U.S. Geol. Survey Geol. Quad. Map GQ-1098
4. Sandstone
5. Light-colored
6. Range 11-38 m
7. Forms prominent cliffs
9. Overlies Marcum Hollow Sandstone Member; underlies Jesse(?) or Reynolds Sandstone Member
10. Type locality: Middle slopes of Little Black Mountain and on abandoned road to stripping on Pardee coal bed up right (W) fork of Rockhouse Valley, Lee County, Va., and Harlan County, Ky. Named for feature in NE corner of Pennington Gap Quadrangle.

Rock Mills Granite (Dadeville Complex) RCKM06
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 28
4. Granite gneiss
7. Coarse-grained, foliated
10. Type locality: Exposed as extensive pavement areas at Rock Mills, Randolph County.

Rock Pens Member (Boquillas Formation) U RCKP17
1. Upper Cretaceous (Gulfian)
2. Texas (C)
3. Pessagno, E. A., Jr., 1969, Geol. Soc. America Mem. 111, p. 62-63
4. Calcareous siltstone, mudstone, limestone flags
6. 46 m
7. Paraconformity near top; planktonic foraminifera
9. Disconformably(?) overlies Buda Limestone; gradationally underlies Langtry Member (Boquillas Formation)
10. Type locality: Lozier Canyon, 1.2 km S of U.S. Highway 90, 4.8 km W of Val Verde County line, Terrell County. Named for Rock Pens Ranch, just E of exposure.

Rock River Formation (Mesaverde Group) U RKRV01
1. Upper Cretaceous
2. Wyoming (SE)
3. Gill, J. R., Merewether, E. A., and Cobban, W. A., 1970, U.S.

Geol. Survey Prof. Paper 667, p. 20-24
4. Sandstone with beds of sandy shale
6. 477 m
7. Soft, very fine- to fine-grained, with hard, concretionary layers; marine fossils
9. Gradationally overlies Steele Shale; intertongues to W with Allen Ridge Formation (Mesaverde Group); disconformably underlies Pine Ridge Sandstone (Mesaverde Group)
10. Type section: 3.2 km SE of town of Rock River, SE1/4 sec. 8, SW1/4 sec. 9, and NW1/4 sec. 16, T. 20 N., R. 76 W., Albany County.

Rocky Point Member (Peedee Formation) RCKP16
1. Upper Cretaceous
2. North Carolina (SE), South Carolina
3. Wheeler, W. H., and Curran H. A., 1974, Am. Assoc. Petroleum Geologists Bull., v. 58, no. 9, p. 1751-1757
4. Alternating biosparrudite and quartz arenite
6. 10 m
9. Unconformably underlies Castle Hayne Formation
10. Type locality: Superior Stone Company Quarry, 5.6 km NE of Castle Hayne, New Hanover County, N.C. Named for town of Rocky Point, 11 km WNW of type locality.

Rocky Springs Station Member (Frederick Limestone) U RKSS01
1. Upper Cambrian (Dresbachian)
2. Maryland (NC)
3. Reinhardt, Juergen, 1974, Maryland Geol. Survey Rept. Inv. 23, p. 6, 11-24
4. Limestone, with dolomite, sparse limestone breccias, and quartz sand
5. Gray
6. 300 m
7. Thin-bedded, sparse fauna
9. Overlies Araby Formation; underlies Adamstown Member (Frederick Limestone)
10. Type section: NW of Frederick, Frederick County. Named for town of Rocky Springs Station on NW boundary of Frederick.

Rodolfo Formation U RDLF01
1. Triassic
2. Arizona (SC)
3. Cooper, J. R., 1971, U.S. Geol. Survey Prof. Paper 658-D, p. D1, D15-D22
4. Sandstone, siltstone, and conglomerate red beds, and andesitic breccia
5. Grayish-red
6. 730 m
8. 3 unnamed members
9. Unconformably overlies Rainville Formation; disconformably underlies Whitcomb Quartzite
10. Type locality: E, SE, and W of Helmet Peak, Twin Buttes Quadrangle, Pima County. Named for Rodolfo Wash.

Roopville Formation (Heard Group) RPVL02
1. Precambrian and Paleozoic, lower
2. Georgia (WC), Alabama
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 14-15

4. Interlayered sequence of schist and metagraywacke; produces white, sandy soil
9. Adjoins Glenloch Formation (Heard Group) to S
10. Type locality: Exposures on Georgia Highway 5 in Roopville, Carroll County, Ga.

Rooster Hill Formation RRHL01
1. Precambrian
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 14
6. 250 m
7. Gneiss contains well aligned megacrysts of K feldspar
9. Overlies Peck Lake Formation; underlies Jackson Summit Formation
10. Type locality: Exposed at East Stoner Lake near Canada Lake, Fulton County. Named for Rooster Hill along W side of road.

Root Glacier Formation U RGLC01
1. Upper Jurassic
2. Alaska (EC)
3. MacKevett, E. M., Jr., 1969, U.S. Geol. Survey Bull. 1274-A, p. A35-A41
4. Mudstone and siltstone with some graywacke, arenite, shale, limy concretions, and conglomerate
5. Greenish-gray, weathers brown
6. 1200 m
7. Marine
9. Unconformably overlies Nizina Mountain Formation or, locally, Lubbe Creek Formation; unconformably underlies Wrangell Lava
10. Type locality: Hillside E of upper McCarthy Creek, McCarthy C-5 Quadrangle. Named for Root Glacier in McCarthy C-5 and C-6 Quadrangles.

Ropes Creek Amphibolite (Dadeville Complex) RPCK03
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 29-30
7. Layered
10. Type locality: Exposures along Ropes Creek in NE Lee County, Ala.

Roseburg Formation RBRG01
1. Paleocene and Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 1-40
4. Basalt and interbedded conglomerate and tuffaceous sandstone
6. 4500 m
7. Pillows
9. Overlies Hunters Cove, Cape Sebastian, and Hornbrook Formations; unconformably underlies Lookingglass Formation or Tyee Formation
10. Type section: Along N fork Umpqua River from Frear bridge, 4.8 km W of Glade, to confluence with South Fork; and in Red Hill anticline along U.S. Highway I-5 from Turkey Hill to center of syncline along Calapooya Creek near Oakland. Named for town of Roseburg.

Roslyn Till/Member (Manhasset Formation) RSLN04
1. Pleistocene
2. New York (SE)
3. Mills, H. C., and Wells, P. D., 1974, Geol. Soc. America Bull., v. 85, no. 3, p. 357-367
4. Hard, compacted clayey till containing numerous erratics
6. 10 m
9. Overlies Roslyn outwash
10. Type locality: Open pits on Manhasset Neck along W shore of Hempstead Harbor near Port Washington, Nassau County.

Round Pass Mudflow U RDPS01
1. Holocene
2. Washington (C)
3. Crandell, D. R., 1971, U.S. Geol. Survey Prof. Paper 677, p. 49-58
4. Cobbles and boulders in sand, silt, and clay matrix
5. Purplish-gray to pink
6. 8 m
10. Type locality: Round Pass, W of Emerald Ridge, SW Mount Rainier National Park Quadrangle, Pierce County.

Rowland Formation RLND01
1. Pleistocene
2. Oregon (WC)
3. Balster, C. A., and Parsons, R. B., 1969, Northwest Sci., v. 43, no. 3, p. 119-122
4. Gravel, clayey sand, clay
6. Range 13-72 m
7. Crossbedded
8. Linn Member, Diamond Hill Member
9. Unconformably underlies Willamette Formation
10. Type section: Banks of Little Muddy Creek, NW1/4SW1/4 sec. 9, T. 15 S., R. 3 W., Linn County.

Royal Mountain Member (Green Lake Formation) RLMN01
1. Precambrian
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 14
4. Andesine-quartz-hornblende gneiss
5. Weathers white
6. 760 m
7. Medium-grained
10. Type locality: Ledge across from Canada Lake Store at E end of Canada Lake, Fulton County. Named for exposures on ski slopes of Royal Mountain.

Ruby Star Granodiorite U RBSR01
1. Paleocene
2. Arizona (SC)
3. Lovering, T. G., Cooper, J. R., Drewes, Harald, and Cone, G. C., 1970, U.S. Geol. Survey Prof. Paper 700-B, p. B5-B8
4. Granodiorite with several quartz monzonite facies and porphyritic core phase
5. Light-gray
7. Large composite stock
9. Intrudes intensely deformed rocks of Precambrian to Late Cretaceous age; unconformably underlies Quaternary alluvium

10. Type area: T. 17 and 18 S., R. 12 and 13 E., Pima mining district, Sierrita Mountains, Pima County. Named for Ruby Star Ranch.

Russell Mountain Formation U RSLM01
1. Middle Silurian
2. Massachusetts (WC)
3. Hatch, N. L., Jr., Stanley, R. S., and Clark, S. F., Jr., 1970, U.S. Geol. Survey Bull. 1324-B, p. B1-B10
4. Interbedded calc-silicate-quartzite and calc-silicate-granulite
5. Alternating light and dark
6. 34 m
9. Unconformably overlies Cobble Mountain Formation and schists and gneisses that intertongue with Hawley Formation; underlies Goshen Formation
10. Type locality: 75 m N 30° W of intersection of Westfield corporate boundary and General Knox Road, S end of Russell Mountain, Hampden County.

Rutland Limestone Bed (Stanton Formation) RLND05
1. Upper Pennsylvanian (Missourian)
2. Kansas (SE)
3. Heckel, P. H., 1975, Kansas Geol. Survey Bull. 210, p. 17-18
4. Calcarenite
5. Tan to orange-brown
6. 2 m
7. Coarse-grained, bioclastic
9. Overlies Timber Hill Siltstone Bed at N
10. Type section: Quarried ledge S of driveway in NE corner, sec. 2, T. 33 S., R. 14 E., Montgomery County. Named for Township of Rutland.

Sacaton Quartz Latite SCTN03
1. Tertiary
2. New Mexico (WC)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 236, 237
4. Porphyritic quartz latite
6. 900 m
10. Type locality: Sacaton Mountain, Wilcox mining district, Mogollon Mountains, Catron County.

Sage Junction Formation U SGJC01
1. Lower Cretaceous
2. Wyoming (SW)
3. Rubey, W. W., 1973, U.S. Geol. Survey Bull. 1372-I, p. I19-I23
4. Siltstone, sandstone, and thin beds of grit and conglomerate, with some porcelanite, limestone, and coal beds
5. Gray and tan
6. 692 m, range 692-1036 m
9. Overlies Quealy and Cokeville Formations; underlies Tertiary and Quaternary rocks
10. Type section: N side of U.S. Highway 30N at Sage Junction, from NE1/4NW1/4SE1/4 to NW1/4SW1/4NW1/4 sec. 7, T. 21 N., R. 119 W., Lincoln County.

Sag River Formation/Sandstone U SGRV05
1. Upper Triassic
2. Alaska (NE)

3. Fackler, W. C., 1970, in Adkison, W. L., and Brosgé, M. M., eds., Am. Assoc. Petroleum Geologists, Pacific Sec., p. P1-P3
4. Sandstone, siltstone
5. Greenish-gray
6. 13 m
9. Overlies Shublik Formation; underlies Kingak Shale
10. Type section: ARCO-Humble Sag River State No. 1 well, depth-interval 2570-2583 m, sec. 4, T. 10 N., R. 15 E, Prudhoe Bay oil field, North Slope.

Sagwon Member (Sagavanirktok Formation) U SGWN01

1. Paleocene and Eocene
2. Alaska (NE)
3. Detterman, R. L., Reiser, H. N., Brosgé, W. P., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Prof. Paper 886, p. 37-39
4. Lignite and carbonaceous shale interbedded with clay shale and siltstone; sandstone and conglomerate at top
6. 143 m
7. Massive, crossbedded
9. Conformably overlies Kogosukruk Tongue (Prince Creek Formation); conformably(?) underlies Franklin Bluffs Member (Sagavanirktok Formation)
10. Type section: From VABM Gard S for 1.6 km along river bluff on W side of Sagavanirktok River, 3.2 km NW of Sagwon, lat 69°23′30" to 69°24′30" N., long 148°39′30" to 148°41′ W.

Salero Formation U SLR001

1. Upper Cretaceous
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4, C11-C12
4. Dacite flows; dacitic flow breccia containing exotic blocks; rhyodacitic welded tuff; tuffaceous sandstone, agglomerate, and conglomerate; and arkosic fanglomerate, conglomerate, sandstone, and tuff
6. 1500 m
8. 5 unnamed members
9. Unconformably overlies Squaw Gulch Granite or, locally, conformably overlies Fort Crittenden Formation; intruded by Josephine Canyon Diorite
10. Type area: Vicinity of Salero Ranch and Mine, Santa Cruz County.

Salmon Creek Volcanics SMCK01

1. Miocene
2. Idaho (SW)
3. McIntyre, D. H., 1972, Idaho Bur. Mines and Geology Pamph. 151, p. 23
4. Andesite and olivine basalts, basaltic pyroclastics
6. > 1150 m
9. Overlies granitic basement rocks; underlies Reynolds Basin Group
10. Type section: Measured sections, NE1/4 sec. 29, T. 2 S., R. 4 W., Owyhee County.

Samaria Limestone Member (Jefferson Formation) SMRI02

1. Upper Devonian
2. Utah (NE), Idaho
3. Beus, S. S., 1968, Am. Assoc. Petroleum Geologists Bull.,

v. 52, no. 5, p. 789
4. Limestone with minor orthoquartzite, sandstone, and siltstone
6. 180 m
7. Fossiliferous
9. Unconformably overlies Water Canyon Formation; conformably underlies Hyrum Member (Jefferson Formation)
10. Type section: Along E-W ridge crest, 6 km WNW of Portage, sec. 34, T. 15 N., R. 4 W., Box Elder County, Utah.

San Clemente Lens (Capistrano Formation) SCLM01
1. Miocene, upper
2. California (SE)
3. Weser, O. E., 1971, Soc. Econ. Paleontologists and Mineralogists, Pacific Sec., Guidebook, p. 55-70
4. Sand, conglomerate, organic-rich siltstone
5. Tan, white, brown
6. 12 m
7. Turbidity current deposit
10. Type locality: 96 km SE of Los Angeles near San Clemente State Park, Orange County.

Sanctuary Formation U SNCR01
1. Miocene, lower and (or) middle
2. Alaska (EC)
3. Wahrhaftig, Clyde, Wolfe, J. A., Leopold, E. B., and Lanphere, M. A., 1969, U.S. Geol. Survey Bull. 1274-D, p. D12-D16
4. Shale
5. Gray, weathers yellow-brown
6. Range 0-110 m
7. Fine-banded
9. Conformably overlies Healy Creek Formation or older rocks; conformably underlies Suntrana Formation
10. Type section: Outcrops E of Suntrana Mine tipple, SW1/4 sec. 24, T. 12 S., R. 7 W., Healy D-4 Quadrangle. Named for exposures on E bank of Sanctuary River, 1 km S of Mt. McKinley National Park.

Sand Butte Bed (Laney Member of Green River Formation) U SNDB04
1. Eocene, middle
2. Wyoming (SW)
3. Roehler, H. W., 1973, U.S. Geol. Survey Bull. 1372-E, p. E7-E8, E18-E22
4. Tuffaceous sandstone and siltstone with minor limestone, tuff, shale, and mudstone
5. Gray to brown
6. 270 m
9. Overlies and intertongues with LaClede Bed (Laney Member); intertongues with Hartt Cabin Bed (Laney Member) in SE; transitionally underlies Kinney Rim Member (Washakie Formation) in W
10. Type section: On Kinney Rim, NE1/4 sec. 19, N1/2 sec. 20, NW1/4 sec. 21, T. 14 N., R. 99 W., Sweetwater County. Named for Sand Butte, part of Kinney Rim, sec. 21, T. 16 N, R. 100 W.

Sandia Granite SNDI05
1. Precambrian
2. New Mexico (NC)
3. Kelley, V. C., and Northrop, S. A., 1975, New Mexico Bur. Mines and Mineral Resources Mem. 29, p. 23-28

4. Microcline phenocrysts in granitoid groundmass of quartz, feldspar, and mica
5. Gray, pink, reddish-brown
7. Porphyritic; pluton
9. Underlies Pennsylvanian rocks
10. Type area: Escarpment of Sandia Mountains, Bernalillo and Sandoval Counties.

Sangerville Formation SGVL03

1. Lower and Middle Silurian
2. Maine (C)
3. Ludman, Allan, and Griffin, J. R., 1974, New England Intercollegiate Geol. Conf. Guidebook 66, Trip B-3, p. 155-160
4. Interbedded shale, siltstone, sandstone
5. Weathers gray to black
6. > 1000 m
7. Turbidite features and minor deformation
8. Informal granule conglomerate member, ribbon limestone member, carbonaceous shale member
9. Underlies Parkman Hill or Fall Brook Formation; interfingers with Canaan and Waterville Formations
10. Type locality: Exposures on State Highway 23 between North Dexter and Sangerville, Guilford Quadrangle, Piscataquis County.

San Miguel Volcanics SMGL03

1. Oligocene and Miocene
2. California (SC)
3. Weaver, D. W., and Doerner, D. P., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists Pacific Secs., Spec. Pub., p. 31
4. Basalt flows, volcanic breccia, dacite porphyry
6. 720 m
8. Lower basaltic flow member, upper plug-like dacite porphyry member
9. Gradationally overlies Rincon Formation; underlies Monterey Formation
10. Type area: E San Miguel Island.

Santa Cruz Island Andesite/Volcanics U SCZI03

1. Oligocene, upper, to Miocene, middle
2. California (SC)
3. Nolf, Bruce, and Nolf, Penny, 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 91, 94
4. Andesite, basalt, and dacite flows and flow breccias
6. Range 1670-2430 m
8. Griffith Canyon, Stanton Ranch, Devils Peak, and Prisoners Harbor Members
9. Unconformably underlies Monterey Formation or Potato Harbor Formation
10. Type locality: Exposures on N side of Santa Cruz Island fault on Santa Cruz Island.

Santa Cruz Island Schist SCZI06

1. Paleozoic or Mesozoic, lower
2. California (SC)

3. Weaver, D. W., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 11-13
4. Metamorphosed chloritic schists and greenstones
5. Olive-green to gray-green, weathers red
7. Derived from sediments interbedded with volcanics; basement rocks of Santa Cruz Island
9. Intruded by Alamos Tonalite; in fault contact with Willows Diorite
10. Type area: Santa Cruz Island.

Sapinero Mesa Tuff U SPRM03

1. Oligocene, upper
2. Colorado (SW)
3. Olson, J. C., Hedlund, D. C., and Hansen, W. R., 1968, U.S. Geol. Survey Bull. 1251-C, p. C19-C20
4. Devitrified welded tuff with basal vitrophyre
5. Reddish-brown, black
6. 43 m; range 24-67 m
7. Regionally widespread outflow sheet
8. Eureka Member (reduced in rank from Eureka Tuff)
9. Overlies Dillon Mesa Tuff or Blue Mesa Tuff; underlies Fish Canyon Tuff
10. Type locality: Tenmile Springs, in S part of Cebolla Quadrangle, Gunnison County. Named for conspicuous exposures on Sapinero Mesa in Sapinero, Cebolla, and Gateview Quadrangles, Gunnison County.

Sarsapkin Tonalite (Toats Coulee Group) SRPK04

1. Upper Triassic
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3029-3031
4. Hornblende with secondary biotite
5. Light-gray
7. Fine- to medium-grained
10. Type locality: T. 39-40 N., R. 25 E., Okanogan County.

Saskatoon Member (Duperow Formation) SSKN01

1. Upper Devonian
2. Canada (Saskatchewan), Montana
3. Kent, D. M., 1968, Saskatchewan Dept. Mineral Resources Rept. 99, p. 22-25
4. Carbonate rocks with interbedded anhydrites
5. Yellowish-brown
6. 27 m
9. Overlies Souris River Formation; underlies Elstow Member (Duperow Formation)
10. Type section: United States Borax and Chemical Company Elstow 5-22A well (Lsd. 5-22-34-1W3), Saskatchewan, Canada. Named for city of Saskatoon, 48 km NW of type well.

Sawmill Run Member (Catskill Formation) SMLR06

1. Upper Devonian
2. Pennsylvania (EC)
3. Epstein, J. B., Sevon, W. D., and Glaeser, J. D., 1974, Pennsylvania Geol. Survey Atlas 195cd, p. 179-182
4. Sandstone and siltstone
5. Red

6. 129 m
7. Crossbedded
9. Overlies Packerton Member; underlies Berry Run Member
10. Type section: Along W bank of Lehigh River ENE of town of Packerton, N of Packerton Member type section in railroad cuts, Carbon County. Named for stream, Sawmill Run.

Sawtooth Peak Formation U STPK01

1. Oligocene
2. Utah (SW)
3. Conrad, O. G., 1969, Utah Geol. and Mineralog. Survey Spec. Studies 29, p. 12-14
4. Phenodacite tuff
5. Gray
6. 91 m
7. Crystal-vitric, ignimbrite of 3 or more similar units; exposed in upthrown, E-tilted fault block
9. Overlies Indian Peak Formation; underlies Beers Spring or Needles Range Formation
10. Type section: Sawtooth Peak, NE1/4 sec. 15, T. 28 S., R. 18 W., Beaver County.

Scherr Formation (Greenland Gap Group)/(Chemung Group) U SCRR15

1. Upper Devonian
2. West Virginia (EC), Maryland, Pennsylvania, Virginia
3. Dennison, J. M., 1970, Southeastern Geology, v. 12, no. 1, p. 53-54
4. Siltstone, sandstone, shale
5. Olive-gray
6. Range 200-355 m
9. Overlies Brallier Formation; disconformably underlies Foreknobs Formation (Greenland Gap Group)
10. Type section: Along West Virginia Highway 42, lat 39°11′45" N., long 79°10′48" W., Grant County, W. Va. Named for village of Scherr.

Schroeder Basalt (North Shore Group) SCRD01

1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 319-320
4. Amygdaloidal ophitic olivine tholeiites
6. 1210 m
9. Overlies Manitou Trachybasalt or Bell Harbor Lava
10. Type locality: Extends from Schroeder and Taconite Harbor to Cook-Lake County line and Little Marais.

Schulze Formation U SCLZ02

1. Lower (?) and Upper Cretaceous
2. Alaska (EC)
3. Jones, D. L., and MacKevett, E. M., Jr., 1969, U.S. Geol. Survey Bull. 1274-K, p. K4-K5
4. Porcelanite and chert, with interbedded sandstone and arenite
5. Gray, weathers yellow to brown
6. Range 30-68 m
9. Discordantly overlies Kennicott Formation; underlies Chititu Formation
10. Type area: Upland N of Sourdough Peak, E of upper reaches of

Nikolai Creek, S Wrangell Mountains, McCarthy B-5 Quadrangle. Named for Schulze copper prospect.

Schweizer Member (Wilhelmi Formation) SCZR02
1. Lower Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 13, 50
4. Argillaceous dolomite and dolomitic shale
5. Dark-gray
6. 8 m
9. Overlies Maquoketa Group; underlies Birds Member (Wilhelmi Formation)
10. Type section: Schweizer West section, Wills County. Named for Schweizer School, 1.6 km E of type section.

Science Hill Sandstone Member (Warsaw Formation) U SCCH01
1. Upper Mississippian (Meramecian)
2. Kentucky (SC)
3. Lewis, R. Q., Sr., and Taylor, A. R., 1975, U.S. Geol. Survey Bull. 1405-A, p. A18-A19, A24-A25, A28-A30
4. Sandstone
5. Reddish-brown
6. 13 m, range 0-13 m
7. Thin- to thick-bedded, crossbedded, quartz geodes in lower 1-2 m
9. Overlies Muldraugh Member (Borden Formation); underlies Salem-Warsaw Formations, undivided
10. Type section: Along upper part of Sams Branch and across State road 1246 on NE side of Bethel Knob, lat 37°13′42" N., long 84°44′32" W., Carter Coordinates (6-I-58) 300 m from W line, 525 m from N Line, 10 km NW of town of Science Hill, Pulaski County.

Scorpion Mountain Formation (Copper Basin Group) SCPM02
1. Upper Mississippian
2. Idaho (SC)
3. Paull, R. A., Wolbrink, M. A., Volkmann, R. G., and Grover, R. L., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 8, p. 1389-1392
4. Chert-quartzite-argillite granule and pebble conglomerate interbedded with quartzite
5. Gray
6. 1100 m
9. Gradationally overlies Drummond Mine Limestone; gradationally underlies Muldoon Canyon Formation
10. Type section: Ridge crest above S tributary of Little Copper Creek and along ridge, sec. 25, T. 4 N., R. 21 E. to sec. 19, T. 4 N., R. 22 E., Custer and Blaine Counties.

Scott Creek Member (Poison Creek Formation) SCCK01
1. Pliocene
2. Idaho (SW)
3. Smiley, C. J., Shah, S. M. I., and Jones, R. W., 1975, Idaho Bur. Mines and Geology Inf. Circ. 28, p. 3-5
4. Sandstone
6. 365 m
7. Coarse
9. Overlies Hog Creek Member (Poison Creek Formation);

unconformably underlies Idaho Formation
10. Type section: Near mouth of Scott Creek, Weiser area, Washington County.

Scout Mountain Member (Pocatello Formation) U SCMN06
1. Precambrian Z
2. Idaho (SE)
3. Crittenden, M. D., Jr., Schaeffer, F. E., Trimble, D. E., and Woodward, L. A., 1971, Geol. Soc. America Bull., v. 82, no. 3, p. 583-585
4. Diamictite, quartzite, cobble conglomerate, with minor argillite, siltstone, and limestone
6. Range 900-1200 m
7. Partly of glacial and submarine origin
9. Conformably lies between unnamed lower and upper argillite members; interfingers with Bannock Volcanic Member
10. Type locality: Exposures on Scout Mountain summit and on ridge 3.2 km to N and S, 24 km SSE of Pocatello, Tps. 8 and 9 S., R. 35 E., Bannock County. Reference section is composite of 3 partial sections in SW1/4 sec. 15, W1/2 sec. 27, and NW1/4 sec. 34, T. 7 S., R. 35 E.

Scoville Point Flow (Portage Lake Volcanics) U SCVP01
1. Precambrian Y (middle Keweenawan)
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C13
4. Porphyrite
6. 30 m, range 30-60 m
7. Fine-grained matrix with millimeter-sized plagioclase crystals
9. Erupted after Edwards Island Flow (Portage Lake Volcanics) and before Copper Harbor Conglomerate
10. Type locality: Scoville Point at E end of Rock Harbor, E Isle Royale, Keweenaw County.

Scripps Formation (La Jolla Group) U SCRP01
1. Eocene, middle and upper
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 717
4. Sandstone containing discontinuous siltstone beds and cobble-conglomerate layers
5. Pale yellowish-brown
6. 67 m
7. Medium-grained, massive
10. Type section: N side of mouth of Blacks Canyon, about 1 km N of pier at Scripps Institute of Oceanography, San Diego County.

Sea View Member (Shavers Well Formation) SVIW02
1. Pliocene
2. California (SE)
3. Babcock, E. A., 1974, Geol. Soc. America Bull., v. 85, no. 3, p. 321-332
4. Sandstone, conglomerate
5. Tan, maroon
6. 550 m
7. Fine- to coarse-grained
9. Underlies Skeleton Canyon Member
10. Type locality: Bat Caves Buttes, Durmid Hill, on NE side of Salton Sea, Imperial County.

Sedgwick Peak Member (Brigham Quartzite) U SKPK01
1. Lower Cambrian
2. Idaho (SE)
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 9-10
4. Quartzite with interbedded argillite and siltstone
5. Tan and light-green
6. 90 m
7. Thin- to medium-bedded
9. Conformably overlies Windy Pass Argillite Member (Brigham Quartzite); underlies Twin Knobs Formation
10. Type section: Exposures on SW side of Twin Knobs, SW1/4NE1/4 sec. 12, T. 10 S., R. 38 E., Bannock and Caribou Counties. Named for Sedgwick Peak, Portneuf Range.

Segovia Formation (Edwards Group) SGOV01
1. Lower Cretaceous (Comanchean)
2. Texas (C)
3. Rose, P. R., 1972, Texas Bur. Econ. Geology Rept. Inv. 74, p. 34-43
4. Marly limestone, dolomite, biosparite limestone
6. 64 m
8. Burt Ranch Member, Allen Ranch Breccia Member, informal "Gryphaea", Orr Ranch, and Black beds
9. Overlies Fort Terrett Formation (Edwards Group); underlies Del Rio Clay
10. Type section: Joy Creek composite section in roadcuts of U.S. Highway I-10 from 8 to 16 km SE of Segovia, Kimble County.

Semilla Sandstone Member (Mancos Shale) U SMLL02
1. Upper Cretaceous
2. New Mexico (NW)
3. Dane, C. H., Kauffman, E. G., and Cobban, W. A., 1968, U.S. Geol. Survey Bull. 1254-F, p. F1-F6, F17-F19
4. Sandstone, silty, with concretions
5. Yellowish-brown
6. 21 m
7. Massive, ledge-forming, fossiliferous
8. 2 informal units
9. Overlies and underlies unnamed units of Mancos Shale
10. Type section: 60 to 90 m N of Ojo del Espiritu Santo and 1.6 km E of New Mexico Highway 44, Sandoval County. Named for Arroyo Semilla.

Sepulcher Formation (Washburn Group) U SPLC03
1. Eocene, lower and middle
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Andesitic and dacitic volcanic sediments
6. 910 m
8. Elk Creek Basalt Member, Lost Creek Tuff Member, Daly Creek Member, Fortress Mountain Member
9. Overlies conglomerate facies resting on Precambrian rocks; underlies or grades laterally into Lamar River Formation
10. Type area: Cliffs on N face of Sepulcher Mountain, Yellowstone National Park, Park County, Wyo.

Seventy-Six Shale Member (Bainbridge Formation)/(Bainbridge Limestone) SVSX02
1. Middle Silurian
2. Missouri (EC), Illinois
3. Satterfield, I. R., and Thompson, T. L., 1975, Missouri Geol. Survey Rept. Inv. 57, p. 109-115
4. Calcareous, glauconitic shale with hematitic "buttons"
5. Green, brick-red
6. 0.2 m
9. Overlies Sexton Creek Limestone; underlies basal limestone beds of Bainbridge Formation
10. Type section: Along Clines Branch, Farmmarket Road D, SE1/4NE1/4SW1/4 sec. 29, T. 25 N., R. 13 E., Perry County, Mo. Named for village of Seventy-Six, 1.6 km NE of type section.

Shady Lane Coal Member (Mansfield Formation) SDLN01
1. Middle Pennsylvanian
2. Indiana (WC)
3. Hutchison, H. C., 1960, Indiana Geol. Survey Bull. 16, p. 12
6. Range 0.1-1 m
7. Pyritiferous, shiny, breaks into cubes. Iridescent
9. Overlies Ferdinand Limestone Member
10. Type locality: Exposed in stream bed near Shady Lane, on U.S. Highway 40, SE1/4 sec. 23, T. 13 N., R. 6 W., Clay County.

Shapleigh Group SPLG01
1. Lower Devonian
2. Maine (SW)
3. Hussey, A. M., 1968, II, in Zen, E-an, and others, eds., New York, Interscience Publishers, p. 295-297, 299-300
4. Slate, phyllite, schist, quartzite
6. Range 2280-3200 m
8. Gonic, Rindgemere, and Towow Formations
9. Conformably overlies Berwick Formation
10. Type locality: Not stated. Named for town of Shapleigh, near center of outcrop belt, York County.

Shavers Well Formation SVWL01
1. Pliocene and Pleistocene
2. California (SE)
3. Babcock, E. A., 1974, Geol. Soc. America Bull., v. 85, no. 3, p. 321-332
4. Sandstone, conglomerate
5. Tan, maroon
6. 765 m
8. Sea View Member, Skeleton Canyon Member
9. Underlies Borrego Formation
10. Type locality: Bat Caves Buttes, Durmid Hill, on NE side of Salton Sea, Imperial County.

Sheboygan Member (Lake Michigan Formation) SBGN01
1. Pleistocene (Wisconsinan)
2. Illinois (NE), Michigan, Wisconsin
3. Lineback, J. A., Ayer, N. J., and Gross, D. L., 1970, Illinois Geol. Survey Environmental Geology Notes 35, p. 11, 17-18
4. Clay
5. Reddish-brown, gray
6. 1.1 m
8. Wilmette Bed lies between unnamed lower and upper clay units

9. Overlies South Haven Member; underlies Winnetka Member
10. Type section: Core 143, depth-interval 112-219.3 cm, lat 42°21′8" N., long 87°10′8" W., Lake Michigan, 51 km E of Waukegan, Lake County, Ill. Named for Sheboygan, Sheboygan County, Wis.

Sheep Creek Member (Totatlanika Schist) U SPCK23
1. Mississippian(?)
2. Alaska (EC)
3. Wahrhaftig, Clyde, 1968, U.S. Geol. Survey Bull. 1254-E, p. E17-E18
4. Schist, slate
5. Black, purple, green
6. Range 1200-1500 m
9. Overlies Mystic Creek Member
10. Type section: Along Sheep Creek upstream from mouth of Rogers Creek to top of highest exposed beds in trough of Sheep Creek syncline, N flank Alaska Range.

Sheep Crossing Formation SPCG01
1. Miocene, upper
2. Arizona (EC)
3. Merrill, R. K., and Péwé, T. L., 1971, Arizona Acad. Sci. Jour., v. 6, no. 3, p. 226-229
4. Gravelly sand
5. Gray-brown
6. 3.2 m, range 3.2-40 m
7. Poorly sorted, unstratified
10. Type section: Railroad cut 200 m E of Sheep Crossing, where Arizona Highway 273 crosses West Fork of Little Colorado River, S1/2NW1/4 sec. 33, T. 7 N., R. 27 E., Apache County.

Sheep Pasture Formation SPPR02
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Geol. Quad. Map 36, p. 5-6
4. Porphyritic rhyolite and vitric tuff
5. Grayish-purple to reddish-brown
6. 160 m
9. Underlies Barrell Springs Formation
10. Type locality: S side of Sheep Pasture Mountain, Jeff Davis County.

Shell Creek Sandstone Member (Nellie Bly Formation) SLCK22
1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Bennison, A. P., 1972, Tulsa Geol. Soc. Digest, v. 37, p. 59
7. Forms prominent bluffs
10. Type locality: Exposed along Shell Creek, N of Prattville, Osage County.

Sherack Formation/Member (Coleharbor Formation) SRCK12
1. Pleistocene
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol Survey Misc. Ser. 52, p. 25-27
4. Laminated clay, silty clay, and silt
5. Light-gray (unoxidized); yellow-gray to olive-brown (oxidized)

6. 9 m
9. Overlies Brenna, Huot, or Poplar River Formation; unconformably underlies Walsh Formation
10. Type section: Boring 68-12M, Oslo Dike, U.S. Army Corps Engineers, at Oslo, Minn., NE1/4SE1/4SE1/4 sec. 31, T. 155 N., R. 50 W. Named for village of Sherack, Polk County, Minn.

Shingle Mill Limestone Member (Oquirrh Formation) U SGLM01
1. Middle Pennsylvanian (Des Moinesian)
2. Utah (NC)
3. Baker, A. A., 1972, U.S. Geol. Survey Geol. Quad. Map GQ-998
4. Limestone and quartzite with chert nodules
5. Gray and tan
6. Range 61-137 m
7. Ledge-forming
8. Overlies and underlies unnamed quartzitic sandstone members
10. Type locality: Exposures on walls of Shingle Mill Canyon drainage basin, secs. 18 and 19, T. 6 S., R. 4 E., Utah County.

Shire Member (Wasatch Formation) U SHIR01
1. Eocene
2. Colorado (NW)
3. Donnell, J. R., 1969, U.S. Geol. Survey Bull. 1274-M, p. M12-M13
4. Claystone
5. Purple, red
6. 180 m, range 180-550 m
9. Upper member of Wasatch Formation; overlies Molina Member; upper part intertongues with Douglas Creek Member (Green River Formation)
10. Type section: Shire Gulch, 11 km N of Mesa, NE1/4 sec. 19, T. 9 S., R. 96 W., Mesa County.

Shorewood Till/ Member (Wedron Formation) SHRD05
1. Pleistocene
2. Wisconsin (SE), Michigan, Illinois
3. Lineback, J. A., Gross, D. L., and Meyer, R. P., 1974, Illinois Geol. Survey Environmental Geology Notes 69, p. 10-11
4. Clayey till
5. Brownish, pinkish, to reddish-gray
6. 1.4 m
9. Overlies Wadsworth Till Member; underlies Manitowoc Till Member
10. Type section: Core 911, lat 43°13′9" N., long 87°22′1" W., Lake Michigan, 48 km E of town of Shorewood, Milwaukee County, Wis.

Shoshone Volcanics SHSN02
1. Pliocene
2. California (EC)
3. Haefner, Richard, 1974, Geol. Soc. America Cordilleran Sec. Guidebook, no. 1, pt. 2, p. 59-64
4. Lava flows, tuffs
5. Pink, yellow, gray
6. 900 m
7. Layered, giving striped appearance to landscape
9. Unconformably overlies Cenozoic acid volcanics; underlies Greenwater Volcanics
10. Type area: Exposed in belt 26 km long, Greenwater Range and Dublin Hills, Black Mountains, Inyo County.

Siemens Creek Formation (Powder Mill Group) U SMCK22
1. Precambrian Y (lower Keweenawan)
2. Michigan (NW), Wisconsin
3. Hubbard, H. A., 1975, U.S. Geol. Survey Jour. Research, v. 3, no. 5, p. 529-535
4. Basalt with some andesite
5. Olive-gray to dark greenish-gray
6. 1340 m
7. Holocrystalline lava flows, subophitic to intersertal
9. Conformably overlies Bessemer Quartzite; unconformably(?) underlies Kallander Creek Formation (Powder Mill Group)
10. Type locality: Along Powder Mill Creek valley and hills to E, secs. 5 and 8, T. 47 N., R. 46 W., and sec. 33, T. 48 N., R. 44 W., Gogebic County, Mich.

Sierra Springs Tuff Member (Pinto Peak Rhyolite) U SSPG16
1. Oligocene
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 7
4. Welded ash-flow tuff
6. 183 m
9. Overlies Pinto Basin Tuff Member
10. Type section: Ratto Canyon, sec. 2, T. 17 N., R. 53 E., about 3.2 km SE from upper Sierra Spring, Eureka County.

Sillem Member (Fowkes Formation) U SLLM01
1. Eocene
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 34-36, 41, 46-47
4. Mudstone and claystone, partly tuffaceous, basal conglomerate, minor marlstone, limestone, and sandstone
5. Pale-varicolored to gray
6. 33 m; range 30-122 m
9. Overlies Bullpen Member (Wasatch Formation); gradationally underlies Bulldog Hollow Member (Fowkes Formation)
10. Type section: E side of Boulder Ridge, N of Sage, measured from center sec. 5, T. 21 N., R. 119 W., to center sec. 33, T. 22 N., R. 119 W., Lincoln County. Named for good exposures on Sillem Ridge, S of Sage.

Siloam Granite SLOM01
1. Permian
2. Georgia (NC)
3. Jones, L. M., and Walker, R. L., 1973, Geol. Soc. America Bull., v. 84, no. 11, p. 3653-3658
4. Coarsely porphyritic. Pink microcline phenocrysts
5. Pink, white
10. Type area: Covers S half of Green County. Named for town of Siloam.

Silver Point Quartz Monzonite U SLVP03
1. Eocene
2. Washington (NE)
3. Miller, F. K., 1969, Washington Div. Mines and Geology Geol. Map GM-6, p. 5
4. Hornblende-biotite quartz monzonite
7. Porphyritic, large pluton

9. Intrudes Wallace and older formations of Belt Supergroup; in contact with unnamed plutonic rocks of Loon Lake batholith; almost all contacts concealed
10. Type locality: Silver Point, on W shore of Loon Lake, sec. 4, T. 29 N., R. 41 E., Stevens County.

Sinagua Formation SNGU01
1. Pleistocene
2. Arizona (NC)
3. Updike, R. G., and Péwé, T. L., 1970, Plateau, v. 43, no. 1, p. 21-26
4. Fanglomerate
6. 35 m, range 35-50 m
7. 8 major fans
9. Overlies Pliocene or Pleistocene basalt; underlies volcanic ash
10. Type locality: Sinagua Valley, SE1/4 sec. 31, T. 24 N., R. 8 E., from Sugarloaf Mountain, NE flank of San Francisco Peaks, NE to Deadman Wash, N of Flagstaff, Coconino County.

Sinlahekin Tonalite (Toats Coulee Group) SNLK04
1. Upper Triassic
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3013-3048
5. Medium-gray
7. Fine- to medium-grained, commonly gneissose
10. Type locality: Secs. 17 and 18, T. 37 N., R. 25 E., Okanogan County. Named for Sinlahekin Creek.

Siphon Draw Member (Superstition Tuff) U SPDR08
1. Miocene
2. Arizona (C)
3. Stuckless, J. S., and Sheridan, M. F., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3236-3240
4. Quartz latite ash-flow tuff
5. Red
6. 670 m
7. Typically densely welded and devitrified; complex cooling unit, with partings of thin dacite breccias or airfall lenses
9. Conformably onlaps unnamed older dacite domes of Superstition cauldron complex; unconformably underlies Geronimo Head Formation
10. Type section: Siphon Draw, in Superstition Mountains, secs. 7 and 8, T. 1 N., R. 9 E., Pinal County.

Sips Creek Member (Jelm Formation) U SPCK18
1. Upper Triassic
2. Wyoming (SC), Colorado
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D13-D15
4. Sandstone, overlain by siltstone
5. Reddish-brown, yellow
6. 96 m; range 0-96 m
7. Beds of siltstone pebbles cemented by white crystalline calcite form ledges near top of member
9. Gradationally to disconformably overlies Red Draw Member (Jelm Formation); conformably underlies Popo Agie Formation
10. Type section: 3.2 km W of Sips Creek, near Bennett Mountains,

NE1/4 sec. 22, center N1/2N1/2 sec. 23, SW1/4SW1/4 sec. 13; and NW1/4NW1/4 sec. 24, T. 25 N., R. 84 W., Carbon County, Wyo.

Sitkalidak Formation U SKDK01
1. Eocene and Oligocene
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A29
4. Sandstone and siltstone with conglomerate beds
6. 3000 m
9. Overlies Ghost Rocks Formation in fault contact; gradationally underlies Sitkinak Formation or unconformably underlies Narrow Cape Formation
10. Type section: Along N coast and near E end of Sitkalidak Island, from 3 km to 7 km NW of Cape Barnabas.

Sitkinak Formation U SKNK01
1. Oligocene
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A29
4. Continental coal-bearing siltstone, sandstone, and conglomerate with basal beach and shallow marine sediments
6. 1500 m
9. Gradationally overlies Sitkalidak Formation; conformably underlies Narrow Cape Formation
10. Type section: Along S shore of Sitkinak Island, 15 km SW of Kodiak Island.

Siwash Formation SWSH01
1. Tertiary
2. Washington (NE)
3. Marjaniemi, D. K., and Robins, J. W., 1975, Lucius Pitkin, Inc. Prepared for U.S. Energy Research and Devel. Adm., p. 29
4. Tuff, shale
5. Gray, greenish-gray
6. 350 m
9. Overlies andesite; underlies Antoine Formation
10. Type locality: Exposed on E side of Okanogan River N of Tonasket, Duffy's Mountain measured section, NW1/4 sec. 2, T. 37 N., R. 27 E., Okanogan County.

Sixty Mile Formation (Chuar Group) SXML02
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1243-1260
4. Sandstone with basal breccia
5. Red
6. 36 m
7. Fine-grained, flat-bedded
9. Overlies Walcott Member (Kwagunt Formation) with erosional unconformity; unconformably underlies Tapeats Sandstone
10. Type section: Topmost part of Nankoweap Butte and on N side of Sixty Mile Canyon and Awatubi Canyon, lat 36°12' N., long 111°50' W., Coconino County.

Skeleton Canyon Member (Shavers Well Formation) SKLC04
1. Pliocene and Pleistocene
2. California (SE)
3. Babcock, E. A., 1974, Geol. Soc. America Bull., v. 85, no. 3,

p. 321-332
4. Sandstone
5. Tan
6. 220 m
7. Medium- to fine-grained
9. Overlies Sea View Member (Shavers Well Formation); underlies Borrego Formation
10. Type locality: Bat Caves Buttes, Durmid Hill, on NE side of Salton Sea, Imperial County.

Skinner Canyon Granite SKRC02
1. Eocene to Oligocene
2. Nevada (EC)
3. Best, M. G., and others, 1974, Geol. Soc. America Bull., v. 85, no. 8, p. 1277-1286
4. Border facies of leucocratic granite; core facies of biotite granite
7. Graphic or porphyritic to equigranular
9. Intrudes Uvada Granite
10. Type locality: Exposed NW of Skinner (Hoodoo) Canyon and constitutes smaller SE lobe of Kern Mountains pluton, White Pine County.

Skokomish Gravel U SKKM01
1. Pleistocene
2. Washington (WC)
3. Molenaar, Dee, and Noble, J. B., 1970, Washington Dept. Water Resources Water-Supply Bull. 29, p. 12-13
4. Gravel, with discontinuous interbeds of sand, silt, and clay
5. Red to reddish-brown
6. > 900 m; range 0-> 900 m
7. Coarse, poorly sorted, alluvial-fan deposit from Olympic Mountains
9. Overlies and interfingers with Kitsap Formation; underlies Vashon Drift
10. Type locality: Exposures along road down escarpment on S side of Skokomish River valley, from upland to near river level, NW1/4NE1/4 sec. 13 to SE1/4NE1/4 sec. 12, T. 21 N., R. 4 W., Mason County.

Skolai Group U SKOL02
1. Lower Permian
2. Alaska (EC)
3. Smith, J. G., and MacKevett, E. M., Jr., 1970, U.S. Geol. Survey Bull. 1274-Q, p. Q1-Q26
4. Metamorphosed lava flows and volcaniclastic rocks intruded by gabbro masses, felsic plutons, and andesite dikes
6. 2400 m, range 1500-2400 m
8. Station Creek Formation and Hasen Creek Formation with its Golden Horn Limestone Lentil
9. Underlies Triassic sedimentary rocks, Nikolai Greenstone, Wrangell Lava, or Frederika Formation
10. Type area: SE from SW corner sec. 15, T. 2 S., R. 17 E., to terminal moraine of Frederika Glacier, S Wrangell Mountains, McCarthy C-4 Quadrangle.

Skull Ridge Member (Tesuque Formation) SKRG02
1. Miocene, middle and upper
2. New Mexico (NC)

3. Galusha, Ted, and Blick, J. C., 1971, Am. Mus. Nat. History Bull., v. 144, art. 1, p. 53-59
4. Sand and silt with clay beds and conglomerate lenses, and 37 distinct ash beds
5. Pink, tan, gray sand; white, gray, blue, green, black ash
6. 228 m
9. Overlies Nambe Member; disconformably underlies Pojoaque Member
10. Type section: Composite of 2 measured sections: lower part is S of Arroyo Seco in N1/2 sec. 21, T. 20 N., R. 9 E.; upper part is along divide between Arroyo Seco and White Operation Wash, secs. 8 and 17, T. 20 N., R. 9 E., Santa Fe County.

Slana Spur Formation (Mankomen Group) U SLSP01
1. Middle Pennsylvanian to Lower Permian
2. Alaska (EC)
3. Richter, D. H., and Dutro, J. T., Jr., 1975, U.S. Geol. Survey Bull. 1395-B, p. B1, B3-B10, B13, B19-B21
4. Calcareous and noncalcareous volcaniclastic rocks
5. Dark-gray, dark-green, and maroon
6. 1387 m
9. Conformably overlies Tetelna Volcanics; conformably underlies Eagle Creek Formation (Mankomen Group)
10. Type locality: Eagle Creek valley and adjacent Slana Spur, a N-trending mountain ridge separating Eagle Creek and Slana River valleys, secs. 1 and 12, T. 14 N., R. 5 E.; sec. 6, T. 14 N., R. 6 E.; secs. 26 and 34, T. 15 N., R. 5 E.; and sec. 31, T. 15 N., R. 6 E., Mt. Hayes A-1 Quadrangle, E Alaska Range.

Slippery Rock Till SPRK01
1. Pleistocene, lower
2. Pennsylvania (WC)
3. White, G. W., 1969, Geol. Soc. London Quart., v. 124, p. 139-140
6. 6 m
7. Extremely weathered
10. Type area: Subsurface in E side of Grand River lobe. Named for village of Slippery Rock, Butler County.

Sloane Peak Member (State Bridge Formation) U SLPK01
1. Lower Triassic
2. Colorado (WC)
3. Freeman, V. L., 1971, U.S. Geol. Survey Bull. 1324-F, p. F9, F14-F16
4. Sandstone with clayey siltstone band
6. Range 40-76 m
7. Fine-grained, homogeneous, crossbedded, cliff-forming
9. Conformably overlies and underlies unnamed units of State Bridge Formation
10. Type section: 8 km W of Sloane Peak in Bionaz Gulch, SE1/4SW1/4 sec. 15, T. 8 S., R. 86 W., Woody Creek Quadrangle, Pitkin County.

Sloat Brook Formation SLBK01
1. Upper Devonian
2. Pennsylvania (EC), New York
3. Fletcher, F. W., and Woodrow, D. L., 1970, Pennsylvania Geol. Survey Atlas 223, p. 50-58

4. Silty shale, siltstone
5. Dark-gray
6. > 72 m
7. Thin-bedded, with cross-laminae and groove casts; fossiliferous
9. Overlies Sparrow Bush Formation; gradationally underlies Millrift Formation
10. Type section: W bank of Sloat Brook, NE-flowing tributary of Saw Kill Creek, Milford Township, Pike County, Pa.

Slough Creek Tuff Member (Mount Wallace Formation) U SGCK07
1. Eocene, middle
2. Montana (SC), Wyoming
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Rhyodacite welded ash-flow tuff
6. 210 m
10. Type area: W of Slough Creek, NE of Yellowstone National Park, Park County, Mont.

Smithboro Till/Member (Glasford Formation) SMBR02
1. Pleistocene (Illinoian)
2. Illinois (SC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 57-58
4. Calcareous silty till
5. Gray
9. Basal member of Glasford Formation; underlies Mulberry Grove Silt Member or Vandalia Till Member
10. Type section: Borrow pits E of Mulberry Grove along U.S. Highway I-70, SW1/4SW1/4 sec. 31, T. 6 N., R. 1 W., Fayette County, Ill. Named for Smithboro, Bond County, Ill.

Smith Mountain Peridotite (Dadeville Complex) SMMN05
1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 30-31
9. Underlies Agricola Schist-Gneiss
10. Type locality: At Smith Mountain, E of Dadeville, EC Tallapoosa County.

Smith Prairie Basalt U SMPR01
1. Pleistocene
2. Idaho (SW)
3. Howard, K. A., and Shervais, J. W., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-818
4. Olivine basalt
5. Dark-gray
6. 120 m
9. Unconformably overlies unnamed Pliocene or Pleistocene rocks or Steamboat Rock Basalt; unconformably underlies unnamed Pleistocene gravel
10. Type section: SW1/4NW1/4 sec. 24, T. 2 N., R. 7 E., part of Smith Prairie, Elmore County.

Smiths Formation U SMTS01
1. Lower Cretaceous
2. Wyoming (SW)
3. Rubey, W. W., 1973, U.S. Geol. Survey Bull. 1372-I,

p. I5-I10, I14
4. Ferruginous shale, lower member, and quartzitic sandstone, upper member
5. Black and tan
6. 210 m
8. 2 informal members
9. Overlies Draney Limestone (Gannett Group); underlies and intertongues with Cokeville and Thomas Fork Formations
10. Type section: Across ridge 1.7 to 2.2 km N. 68° W. of Smiths Fork Ranger Station, NW1/4NE1/4 sec. 27, T. 29 N., R. 118 E., Lincoln County.

Smoky Creek Member (Delaho Formation) SKCK06
1. Miocene, lower
2. Texas (SW), Mexico
3. Stevens, M. S., Stevens, J. B., and Dawson, M. R., 1969, Texas Memorial Mus., Pearce-Sellards Ser. no. 15, p. 5, 8, 9-10
4. Conglomerate, sandstone, siltstone
6. 330 m
9. Disconformably overlies lower member of Delaho Formation, Chisos, and South Rim Formations
10. Type locality: Exposures near mouth of Smoky Creek, Big Bend National Park, Brewster County, Tex.

Smoky Hollow Member (Straight Cliffs Formation) U SMKH09
1. Upper Cretaceous
2. Utah (SC)
3. Peterson, Fred, 1969, U.S. Geol. Survey Bull. 1274-J, p. J5-J14, J24-J26
4. Sandstone, mudstone, coal
6. 35 m, range 7-100 m
7. Fine- to coarse-grained, poorly-sorted, crossbedded
8. 3 informal units: coal zone, barren zone, and Calico bed
9. Conformably overlies Tibbet Canyon Member; underlies John Henry Member with intraformational regional angular unconformity
10. Type section: E side of S-trending spur on W side of Smoky Hollow, tributary to Warm Creek, NE1/4NE1/4SW1/4 sec. 5, T. 42 S., R. 4 E., Kane County.

Smyrna Bed (Tully Limestone) SMRN01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 33
4. Sandy calcarenite and chamosite oolite
6. 0.3 m
9. Overlies Carpenter Falls Bed; underlies Taughannock Falls Bed
10. Type locality: On either side of Smyrna, Chenango County.

Snider Till Member (Wedron Formation) SNDR01
1. Pleistocene (Wisconsinan)
2. Illinois (EC), Indiana
3. Johnson, W. H., Gross, D. L., and Moran, S. R., 1971, Ohio State Univ. Press, p. 184-216
4. Calcareous, clayey, with few pebbles
5. Gray-brown to olive-brown (oxidized); dark-gray (unoxidized)
6. 5 m
9. Overlies Batestown Till Member
10. Type section: Emerald Pond section, NE1/4SW1/4SW1/4 sec. 33,

T. 20 N., R. 12 W., Vermilion County, Ill. Named for town of Snider.

Snow School Formation SSCL01
1. Pleistocene
2. North Dakota (C)
3. Ulmer, J. H., and Sackreiter, D. K., 1973, North Dakota Geol. Survey Rept. Inv. 51, 1 sheet
4. Till, sand, and gravel
5. Reddish-brown, yellow-brown
6. 6.8 m, range 0.5-11 m
7. Middle member massive, compact, good stratigraphic marker; upper member very compact
8. 3 unnamed members
9. Overlies Horseshoe Valley Formation or Medicine Hill Formation; underlies Oahe Formation
10. Type section: Bluffs of Dead Man Coulee Bay, E shore of Lake Sakakawea, SE1/4NW1/4NE1/4 sec. 22, T. 147 N., R. 84 W., McLean County.

Socastee Formation SCST03
1. Pleistocene
2. South Carolina (EC), North Carolina
3. DuBar, J. R., and others, 1974, Utah State Univ. Press, p. 139-173
4. Quartzose sands, argillaceous sands, clays
5. Variegated
6. 5 m
9. Unconformably overlies Canepatch Formation; unconformably underlies Waiter Island Formation and Ocean Forest Peat
10. Type locality: NW bank of Intracoastal Waterway near Socastee Swamp, 0.3 km SW of U.S. Highway 501, Horry County, S.C.

Soldier Cap Olivine Basalt (Reynolds Basin Group) SDCP01
1. Miocene, upper, and Pliocene, lower
2. Idaho (SW)
3. McIntyre, D. H., 1972, Idaho Bur. Mines and Geology Pamph. 151, p. 30-32
5. Gray, weathers brown
6. 270 m
10. Type section: E side of N-S trending ridge SSW of Soldier Cap, Owyhee County.

Soldier Meadow Tuff U SDMD01
1. Miocene, upper
2. Nevada (NW)
3. Noble, D. C., McKee, E. H., Smith, J. G., and Korringa, M. K., 1970, U.S. Geol. Survey Prof. Paper 700-D, p. D28-D29
5. Bluish, gray, tan, greenish, orange-brown, weathers deep-brown
6. 120 m
7. Vertical columnar jointing and horizontal jointing
9. Overlies and underlies unnamed tuff units
10. Type section: NW Calico Mountains, 8 km WSW of Soldier Meadow Ranch, lat 41°22'30" N., long 119°15'40" W., Humboldt County.

Soldier Summit Member (Green River Formation) SDSM01
1. Eocene
2. Utah (NC)
3. Moussa, M. T., 1969, Geol. Soc. America Bull., v. 80, no. 9,

p. 1743-1744
4. Flaky and paper shale with interbedded limestone and marlstone
5. Light-brown
6. 140 m
9. Overlies Tabbyune Creek Tongue (Colton Formation)
10. Type section: E wall of canyon of Middle Fork, 1.6 km NE of Soldier Summit, sec. 18, T. 10 S., R. 8 E., Wasatch County.

Solor Church Formation (Keweenawan Supergroup) SLCC01
1. Precambrian Y
2. Minnesota (SC)
3. Morey, G. B., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 440-445
4. Cyclic interbedded sandstone, siltstone, and shale, with illite-chlorite-montmorillonite regolith
5. Red to gray
6. 579 m, range 579-980 m
7. Dense, well-indurated, poorly-sorted alluvial deposit
9. Unconformably underlies Hinckley Sandstone or Paleozoic rocks
10. Type section: Lonsdale 65-1 well, depth-interval 287-866 m, SW1/4SW1/4 sec. 14, T. 112 N., R. 21 W., Webster Township, Rice County. Named for Solor Church, 4.8 km NW of well.

Sol se Mete Member (Wild Cow Formation) U SLSM01
1. Upper Pennsylvanian
2. New Mexico (C)
3. Myers, D. A., 1973, U.S. Geol. Survey Bull. 1372-F, p. F8-F9
4. Basal arkosic clastic unit with petrified logs, shale and red bed unit, and upper limestone unit
5. Gray
6. Range 45-90 m
9. Conformably overlies Los Moyos Limestone; conformably underlies Pine Shadow Member (Wild Cow Formation)
10. Type section: Exposures on W side of Priest Canyon in E-draining ravine, sec. 7, T. 3 N., R. 5 E., Valencia County. Named for Sol se Mete, hill in SW1/4 sec. 28, T. 9 N., R. 5 E., Mount Washington Quadrangle, Bernalillo County.

Soper Limestone Member (Bokchito Formation) SOPR02
1. Lower Cretaceous (Comanchean)
2. Oklahoma (SE)
3. Huffman, G. G., Alfonsi, P. P., Dalton, R. C., Duarte-Vivas, Andres, and Jeffries, E. L., 1975, Oklahoma Geol. Survey Bull. 120, p. 16-17
6. 0.5 m
7. Resistant, ledge-forming, fossiliferous
9. Overlies Denton Clay Member; underlies Weno Clay Member
10. Type locality: Exposure in railroad cut 8 km SE of Soper, NE1/4SW1/4 sec. 13, T. 6 S., R. 15 E., Choctaw County.

Souhegan Member (Littleton Formation) SHGN01
1. Lower Devonian
2. New Hampshire (SC)
3. Greene, R. C., 1970, New Hampshire Dept. Resources and Econ. Devel. Bull. 4, p. 1, 7-11
4. Mica schist with lenses of granulite, plagioclase, and quartz
5. Gray
6. 2000 m
7. Medium-grained, foliated

9. Underlies Peterborough Member (Littleton Formation); intruded by Massabesic Gneiss, Spaulding Quartz Diorite, and Middle Devonian pluton
10. Type locality: Roadcuts along State Highway 31 N of Greenville, SW Hillsboro County.

Southbridge Formation U SBDG06
1. Ordovician(?) to Silurian(?)
2. Massachusetts (C), Connecticut
3. Pease, M. H., Jr., 1972, U.S. Geol. Survey Geol. Quad. Map GQ-1023
4. Lower biotite gneiss and schist alternating with quartz-feldspar gneiss; upper heterogeneous schist and gneiss
5. Gray
6. 4100 m
8. Lower and upper informal members
9. In fault contact with Hebron Formation or Eastford Gneiss to SE; in fault contact with Bigelow Brook Formation to NW
10. Type section: Nearly continuous exposures in hills N of Quinnebaug River and E of town of Southbridge, along line extending N. 48° W. from point where Dudley Hill Road leaves Southbridge Quadrangle to Cady Brook NW of Carlton Street School, Worcester County, Mass.

South Haven Member (Lake Michigan Formation) SHVN01
1. Pleistocene (Wisconsinan)
2. Illinois (NE), Michigan, Wisconsin
3. Lineback, J. A., Ayer, N. J., and Gross, D. L., 1970, Illinois Geol. Survey Environmental Geology Notes 35, p. 11, 13, 18
4. Clay
5. Reddish-gray
6. > 1.1 m
9. Overlies Carmi Member (Equality Formation); underlies Sheboygan Member (Lake Michigan Formation)
10. Type section: Core 143, depth-interval 219.3-326 cm, water depth 119 m, lat 42°21.8′ N., long 87°10.8′ W., Lake Michigan, 51 km E of Waukegan, Lake County, Ill. Reference section: Core 151, depth-interval 170.5-200 cm, water depth 152 m, lat 42°36.5′ N., long 86°47.4′ W., 54 km WNW of South Haven, Van Buren County, Mich., for which it is named.

South Hill Sandstone Member (Nevada Formation) U STHL01
1. Middle Devonian
2. Nevada (EC)
3. Nolan, T. B., Merriam, C. W., and Blake, M. C., Jr., 1974, U.S. Geol. Survey Misc. Geol. Inv. Map I-793, p. 3
4. Quartzite or quartzitic sandstone with some interbedded sandy dolomite
5. White to light-gray
6. 61 m
9. Overlies Sentinel Mountain Dolomite Member; underlies Bay State Dolomite Member
10. Type section: Along W side of Grays Canyon on NW slope of South Hill, 457 m from summit, sec. 10 (projected), T. 17 N., R. 53 E., Fish Creek Range, Pinto Summit Quadrangle, Eureka County.

South Park Formation SPRK13
1. Paleocene

2. Colorado (C)
3. DeVoto, R. H., 1971, Colorado School Mines Quart., v. 66, no. 3, p. 24
4. Gravel, conglomerate
6. 2400 m
9. Name replaces Denver Formation on W side of Front Range in South Park area; unconformably overlies Laramie Formation; underlies Balfour Formation
10. Type area: South Park, Park County.

South Point Formation STPN01

1. Eocene
2. California (SC)
3. Weaver, D. W., and Doerner, D. P., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 37-45
4. Sandstone with shale and siltstone
5. Buff, gray
6. Range 210-1000 m
9. Overlies Cañada Formation or is in fault contact with Jalama Formation; conformably underlies Cozy Dell Formation
10. Type locality: South Point, Santa Rosa Island.

South Willow Formation STWL02

1. Oligocene, lower
2. Nevada (NW)
3. Bonham, H. F., 1969, Nevada Bur. Mines Bull. 70, p. 10-12
4. Andesite, basalt, and dacite flows, agglomerates, mudflow breccia, dacite porphyry dikes
5. Gray, weathers reddish-brown
6. > 910 m
9. Unconformably overlies pre-Tertiary rocks; unconformably underlies Cañon Rhyolite and Pliocene basalt flows
10. Type locality: Canyon of South Willow Creek extending S from Leadville Mine to Hualapi Flat, T. 36 and 37 N., R. 23 E., Washoe County.

Spanish Camp Gneiss SPCP01

1. Triassic to Lower Jurassic
2. Washington (NC)
3. Hawkins, J. W., Jr., 1968, Geol. Soc. America Bull. v. 79, no. 12, p. 1790-1801
4. Metamorphic rocks, including amphibole-rich and biotite-rich gneisses, quartz diorite, and alaskite
7. Heterogeneous, layered, foliated to unfoliated
10. Type area: Exposures near Spanish Camp Fire Guard Station, Okanogan County.

Sparrow Bush Formation SPRB02

1. Upper Devonian
2. Pennsylvania (NE)
3. Fletcher, F. W., and Woodrow, D. L., 1970, Pennsylvania Geol. Survey Atlas 223, p. 51-58
4. Coquinite, calcareous sandstone
6. 13 m
7. Sandstone is fine grained, with parallel laminae; fossiliferous
9. Overlies unnamed upper member of Mahantango Formation; underlies Sloat Brook Formation

10. Type section: At base of cliffs on W side of Delaware River, Westfall Township, Pike County, Pa.; opposite main house of Eddy Farm, village of Sparrow Bush, N.Y.

Spectacle Formation (Anarchist Group) U SPCC01
1. Upper(?) Permian
2. Washington (NC)
3. Rinehart, C. D., and Fox, K. F., Jr., 1972, Washington Div. Mines and Geology Bull. 64, p. 8-10
4. Siltstone, graywacke, limestone, slate, conglomerate
5. Light-gray, black, pale-green
6. 4,500 m
9. Base not exposed; conformably underlies Bullfrog Mountain Formation (Anarchist Group)
10. Type locality: Between Wannacut Lake and Palmer Mountain, E Loomis Quadrangle, Okanogan County.

Spider Lake Formation SPLK02
1. Upper Silurian and Lower Devonian
2. Maine (NC)
3. Hall, B. A., 1970, Maine Geol. Survey Bull. 22, p. 34-37
4. Andesitic volcanic flows and pyroclastic rocks with dacite and sedimentary rocks
6. 3,200 m
9. Unconformably overlies Bluffer Pond, Blind Brook, and Munsungun Lake Formations
10. Type locality: Spider Lake, T 9 R 11 and T 9 R 12, Spider Lake Quadrangle, Piscataquis County.

Spiketon Formation (Puget Group) U SPKN02
1. Eocene, upper (?)
2. Washington (WC)
3. Gard, L. M., Jr., 1968, U.S. Geol. Survey Prof. Paper 388-B, p. B1, B5, B11-B15
4. Arkosic sandstone and siltstone, shale, and coal
5. Gray to buff, brown
6. 1100 m
9. Overlies Northcraft Formation; conformably underlies Ohanapecosh Formation
10. Type locality: Valley walls of South Prairie Creek near abandoned coal-mining town of Spiketon, SE1/4 sec. 15, T. 19 N., R. 6 E., Pierce County.

Spiral Butte Andesite SPLB01
1. Quaternary
2. Washington (SC)
3. Ellingson, J. A., 1972, Northwest Sci., v. 46, no. 1, p. 9-24
4. Dense lava
5. Light-gray
7. Strong linear flow-banding
10. Type locality: Crops out on both sides of White Pass Highway from summit to 4.8 km E of Spiral Butte and W and NW of Tumac Plateau, Yakima County.

Spring Canyon Member (Walker Andesite Breccia) SPGC01
1. Oligocene
2. New Mexico (C)
3. Thompson, T. B., 1972, Geol. Soc. America Bull., v. 83, no. 8, p. 2341-2356

4. Andesite flow
5. Grayish-white
6. 21 m
10. Type locality: 8 km S. of lat 33°30′ N. and W. of long 105°45′ W. Named for exposures in Spring Canyon area, Lincoln County.

Spring Lake Coal Member (Carbondale Formation) SPLK01
1. Middle Pennsylvanian (Des Moinesian)
2. Illinois (NC)
3. Peppers, R. A., 1970, Illinois Geol. Survey Bull. 93, p. 59-60
6. < 1 m
9. Overlies No. 5A coal (Briar Hill) member; underlies No. 6 coal (Herrin) member
10. Type section: Sec. 20, outcrop on E bank of Vermilion River at greenhouse, SE1/4SW1/4SW1/4 sec. 23, T. 31 N., R. 3 E., La Salle County. Named for Spring Lake, 1.6 km W of Streator.

Spuhler Peak Formation SPPK01
1. Precambrian X
2. Montana (SW)
3. Gillmeister, N. M., 1972, Northwest Geology, v. 1, p. 21-24
4. Metamorphosed mafic rocks, basal quartzite
7. Synclinal structure
9. Unconformably overlies Cherry Creek and Pony Groups
10. Type locality: Tobacco Root Mountains, lat 45°30′ to 45°37′5" N., long 112° W., Madison County.

Squaw Gulch Granite U SQGC02
1. Jurassic
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4, C8
4. Granite to quartz monzonite
5. Pink
9. Intrudes Piper Gulch Monzonite; unconformably underlies Salero or Temporal Formation
10. Type area: Middle reaches of Squaw Gulch, E of Salero Mine, Santa Rita Mountains, Pima County.

Squire Member (Pismo Formation) U SQUR01
1. Pliocene, upper
2. California (SC)
3. Hall, C. A., Jr., 1973, U.S. Geol. Survey Misc. Field Studies Map MF-511
4. Calcareous arkosic sandstone
5. White to tan
6. 170 m
7. Massive, fine- to medium-grained, fossiliferous
9. Unconformably overlies Edna, or Miguelito Member (Pismo Formation) or overlaps Monterey Formation; underlies Paso Robles (?) Formation
10. Type section: Squire Canyon, within Pismo syncline, T. 31 S., R. 12 E., San Luis Obispo County; best exposed near UCLA fossil locality 5291 on S side of Squire Canyon.

Stadium Conglomerate (Poway Group) U STDM01
1. Eocene, middle(?) and upper
2. California (SE)
3. Kennedy, M. P., and Moore, G. W., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 5, p. 719

4. Massive cobble and boulder conglomerate composed of porphyritic rhyolite welded tuff, so-called "Poway clasts", with friable sandstone matrix
5. Grayish-red, yellowish-brown
6. 50 m
10. Type section: N wall of Mission Valley, about 1 km W of Murphy Canyon Road, San Diego County.

Stamping Ground Member (Lexington Limestone) U SPGG01
1. Middle Ordovician
2. Kentucky (C)
3. Cressman, E. R., 1973, U.S. Geol. Survey Prof. Paper 768, p. 38-39
4. Limestone and shale
5. Gray mottled yellowish-orange
6. 2.7 m, range 2.7-3 m
9. Conformably overlies and gradationally underlies Tanglewood Limestone Member
10. Type section: In quarry (measured sec. 1005) on N side of Switzer-Stamping Ground Road, 820 m W of its intersection with U.S. Highway 227, Scott County.

Stanton Ranch Member (Santa Cruz Island Volcanics) SNRC04
1. Miocene, lower
2. California (SC)
3. Nolf, Bruce, and Nolf, Penny, 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 91-94
4. Andesite flows and flow breccias, with subordinate tuff breccias
5. Red-brown
6. Range 140-400 m
9. Conformably overlies Griffith Canyon Member; discordantly underlies Devils Peak Member
10. Type locality: Steep slopes NW of Stanton Ranch, N Santa Cruz Island.

Starr Flat Member (Duchesne River Formation) SRFL01
1. Oligocene
2. Utah (NE)
3. Anderson, D. W., 1972, Utah Geol. and Mineralog. Survey Bull. 97, p. 15
4. Sandstone, interbedded with fine-grained rocks and conglomerate
5. Reddish-brown
6. 234 m
7. Thick-bedded, massive, structureless
9. Overlies Lapointe Member (Duchesne River Formation); underlies Miocene glacial deposits and gravels
10. Type section: Center sec. 22, T. 1 N., R. 2 W., on S slope of John Starr Flat, NW to highest point on ridge at boundary of secs. 34 and 35, T. 2 N., R. 3 W., Duchesne County.

Starvation Flat Quartz Monzonite U SVFL01
1. Cretaceous
2. Washington (NE)
3. Clark, L. D., and Miller, F. K., 1968, Washington Div. Mines and Geology Geol. Map GM-5, p. 3
4. Hornblende-biotite quartz monzonite

5. Pink K-feldspar
7. Mostly medium- to coarse-grained, nonporphyritic, hypidiomorphic granular; large pluton, forming topographic low
9. Intrudes Precambrian and Cambrian metasedimentary rocks; intruded by leucocratic dikes related to Cretaceous Phillips Lake Granodiorite
10. Type area: Exposures within 1.6 km of Starvation Flat, 21 km N of Chewelah, along Little Bear Creek, NE1/4 sec. 10 T. 34 N., R. 40 E., Stevens County.

Station Creek Formation (Skolai Group) U SCRK12

1. Lower Permian
2. Alaska (EC)
3. Smith, J. G., and MacKevett, E. M., Jr., 1970, U.S. Geol. Survey Bull. 1274-Q, p. Q4, Q6-Q16
4. Basalt and andesite flows, breccia and volcanilutite
5. Green, red, blue, gray
6. 2000 m
8. Informal lower volcanic and upper volcaniclastic members
9. Conformably underlies Hasen Creek Formation
10. Type area: Area extending 5.6 km W from point 1.6 km S of Station Creek, E-flowing tributary of Frederika Creek, S Wrangell Mountains, McCarthy C-4 Quadrangle.

Steamboat Rock Basalt U SBRK08

1. Pliocene or Pleistocene
2. Idaho (SW)
3. Howard, K. A., and Shervais, J. W., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-818
4. Basalt
5. Medium- to dark-gray
6. 180 m
9. Unconformably overlies unnamed pre-Pliocene rocks; unconformably underlies unnamed Pliocene or Pleistocene gravel or Smith Prairie Basalt
10. Type section: Cliff in NE1/4SW1/4 sec. 28, T. 2 N., R. 7 E., in Smith Prairie, Elmore County. Named for nearby Steamboat Rock, sec. 4, T. 1 N., R. 7 E.

Stendal Limestone Member (Petersburg Formation) SNDL03

1. Middle Pennsylvanian
2. Indiana (SW)
3. Burger, A. M., and Wier, C. E., 1970, in Shaver, R. H., and others, Indiana Geol. Survey Bull. 43, p. 172
4. Argillaceous limestone
5. Black
6. 1 m
7. Dense, fossiliferous
9. Overlies black shale above Houchin Creek Coal Member
10. Type section: SE1/4NE1/4SW1/4 sec. 3, T. 3 S., R. 7 W., near Stendal, Pike County.

Step Conglomerate U STEP03

1. Lower Permian
2. Alaska (NE)
3. Brabb, E. E., 1969, U.S. Geol. Survey Bull. 1274-I, p. I7-I9
4. Chert-pebble conglomerate, sandstone, thin interbeds of bioclastic limestone
6. 600 m

7. Rounded chert pebbles in matrix of sand-size chert and quartz grains; fossiliferous
9. Unconformably overlies Ford Lake Shale; unconformably underlies Glenn Shale or, locally, Biederman Argillite
10. Type section: In Step Mountains, NW of Nation River, 40 km NE of bench mark 3977 (Nat), from NE1/4 sec. 20, T. 8 N., R. 31 E. (lower contact), to SE1/4 sec. 28 (upper contact), Charley River C-1 and B-1 Quadrangles.

Sterling Formation (Kenai Group) SRLG03
1. Pliocene
2. Alaska (C)
3. Calderwood, K. W., and Fackler, W. C., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 4, p. 739-754
4. Massive sandstones, conglomeratic sandstones, and interbedded claystones
5. Gray
6. 1400 m
9. Unconformably overlies Beluga Formation; unconformably underlies Pleistocene gravels
10. Type section: Union Oil Company Sterling unit No. 23-15, NE1/4SW1/4 sec. 15, T. 15 N., R. 10 W., Seward Meridian, Cook Inlet Basin.

Sterling Till Member (Glasford Formation) SRLG02
1. Pleistocene (Illinoian)
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 55
4. Silty till with high illite content
5. Gray
6. 12 m
7. Compact
9. Overlies Ogle Till Member (Glasford Formation); underlies Winnebago Formation, Robein Silt, Wedron Formation, or Peoria Loess
10. Type section: Emerson Quarry, 3.2 km W of Sterling, SE1/4NW1/4SE1/4 sec. 13, T. 21 N., R. 6 E., Whiteside County.

St. Hilaire Formation/Member (Coleharbor Formation) SHLR01
1. Pleistocene
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 10-11
4. Unbedded pebble-loam till
5. Gray (dry), dark-gray (wet)
6. Range 0.3-1.2 m
9. Overlies Marcoux Formation; underlies Red Lake Falls Formation
10. Type section: Powerline Section, SE1/4SE1/4NE1/4 sec. 5, T. 151 N., R. 43 W. Named for village of St. Hilaire, Pennington County, Minn.

St. Joseph Island Volcanics U SJPI01
1. Devonian(?)
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 27-33
4. Basalt flows and pyroclastics, interlayered with minor siltstone, shale, and limestone

5. Dark-green
6. > 3000 m
7. Amygdaloidal, massive flows, pillow structures
9. Lower and upper contacts not exposed; in fault contact with Descon Formation
10. Type area: St. Joseph Island, 3.2 km N of Noyes Island, off W coast of Prince of Wales Island.

St. Leonard Member (Choptank Formation) SLRD01
1. Miocene, middle
2. Maryland (SE), Virginia
3. Gernant, R. E., 1970, Maryland Geol. Survey Rept. Inv. 12, p. 17-20, 68-69
4. Muddy sand
5. Blue, green, brown
6. Range 1-7 m
9. Conformably overlies Drumcliff Member; gradationally underlies Boston Cliffs Member
10. Type section: Cliffs on Chesapeake Bay at Matoaka Cottages, 0.5 km N of Calvert Beach, Calvert County, Md.

St. Maurice Till Member (Jessup Formation) SMRC01
1. Pleistocene
2. Indiana (EC)
3. Teller, J. T., 1972, Geol. Soc. America Bull., v. 83, no. 7, p. 2186-2187
4. Chert-rich pebble-loam till with clay inclusions
6. 2 m
9. Overlies Paleozoic bedrock
10. Type section: 1.1 km W of town of St. Maurice, SW1/4SW1/4 sec. 30, T. 11 N., R. 11 E., Decatur County.

St. Meinrad Coal Member (Mansfield Formation) SMRD01
1. Lower Pennsylvanian
2. Indiana (SC)
3. Hutchison, H. C., 1970, in Shaver, R. H., and others, Indiana Geol. Survey Bull. 43, p. 147-148
4. Coal with inorganic partings
6. 1 m
7. Moderately bright, clean
10. Type locality: Near St. Meinrad, Spencer County.

Stone Ridge Group SRDG05
1. Lower Devonian
2. New York (SE), New Jersey
3. Boucot, A. J., Gauri, K. L., and Southard, John, 1970, Palaeontographica, Abt. A, Bd. 135, Lief. 1-2, p. 29-32
4. Mudstone, siltstone, sandstone, and pebble conglomerate sequence
8. Esopus, Pine Hill, and Leeds Formations
9. Overlies Connelly Conglomerate; underlies Cornwall Shale
10. Type area: Near Highland Mills, in Green Pond outlier, Orange County, N.Y.

Stoneville Formation (Dan River Group) SNVL04
1. Upper Triassic
2. North Carolina (NC)
3. Thayer, P. A., 1970, Southeastern Geology, v. 12, no. 1, p. 1, 9, 13-15

4. Clastic lenses consisting of intertonguing conglomerate, sandstone, and siltstone facies
6. 110 m
9. Conformably overlies Cow Branch and Pine Hall Formations (Dan River Group); in fault contact with Precambrian(?) metamorphic rocks in NW
10. Type section: Along U.S. Highway 220 Bypass, 400 m N of its intersection with Rockingham County Road 2208, near Mayodan, SW of town of Stoneville, Rockingham County.

Stonington Granite SNNG02
1. Lower Mississippian
2. Maine (SC)
3. Brookins, D. G., and Spooner, C. M., 1970, Jour. Geology, v. 78, no. 5, p. 570
5. Light-red
7. Massive, with rapakivi texture
10. Type area: Deer Isle and surrounding islands, E Penobscot Bay, Hancock County.

Strodes Creek Member (Lexington Limestone) U SDCK26
1. Upper Ordovician
2. Kentucky (NC)
3. Black, D. B. F., and Cuppels, N. P., 1973, U.S. Geol. Survey Bull. 1372-C, p. C1-C16
4. Lime mudstone with abundant stromatoporoids
5. Brownish-gray
6. 9 m
7. Lens or tongue, distinctive bouldery beds
10. Type section: Roadcuts extending N along U.S. Highway 227 from hillcrest to crossing of Strodes Creek, NC Austerlitz Quadrangle, Clark County.

Stumps Creek Formation/Tongue (Wash Creek Slate) SPCK24
1. Paleozoic, middle
2. Alabama (C)
3. Carrington, T. J., 1972, Geol. Soc. America Southeastern Sec. Guidebook 21, Trip 1, p. 21
4. Slate
5. Green
6. 370 m
7. Fine-grained, laminated
9. Gradationally overlies Brewer Phyllite
10. Type locality: Along Stumps Creek, N Chilton County.

Sturgeon River Drift U SGRV08
1. Pleistocene
2. Alaska (SC)
3. Karlstrom, T. N. V., 1969, in Karlstrom, T. N. V., and Ball, E. G., eds., Toronto, Ontario, Ryerson Press, p. 20-54
4. Glacial drift
10. Type locality: Sturgeon River drainage area, SW Kodiak Island.

Sturgis Formation U STRG01
1. Upper Pennsylvanian
2. Kentucky (WC)
3. Kehn, T. M., 1973, U.S. Geol. Survey Bull. 1394-B, p. B1-B24
4. Sandstone interbedded with siltstone, shale, limestone, and coal

5. Light- to dark-gray
6. 650 m
8. Providence Limestone, Anvil Rock Sandstone, Madisonville Limestone, and Carthage Limestone Members
9. Overlies and intergrades with Carbondale Formation; top of formation eroded
10. Type area and composite section: Peabody Coal Company core holes P-47 and P-49, 8 km NE of Sturgis, Union County, and Cities Service Oil Company stratigraphic test hole 1801 at Camp Breckinridge, 4.8 km NE of hole P-49.

St. Wendel Sandstone Member (Bond Formation) SWDL03

1. Upper Pennsylvanian
2. Indiana (SW)
3. Wier, C. E., 1970, in Shaver, R. H., and others, Indiana Geol. Survey Bull. 43, p. 149-150
4. Micaceous sandstone
6. Range 0.3-17 m
7. Massive
9. Overlies Shoal Creek Limestone Member
10. Type section: Near St. Wendel, NW1/4NW1/4SE1/4 sec. 19, T. 5 S., R. 11 W., Posey County.

Sucker River Basalt (North Shore Group) SKRV08

1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Mixed basalts, mostly ophitic
6. 1500 m
9. Overlies Lakewood Basalt; underlies Larsmont Ophitic Basalt
10. Type locality: Extends from Stony Point SW to Talmadge River, St. Louis County. Named for Sucker River.

Sugar River Limestone (Trenton Group) SGRV07

1. Middle Ordovician
2. New York (NC)
3. Kay, Marshall, 1968, Naturaliste Canadien, v. 95, no. 6, p. 1376-1377
4. Shaly calcarenite and calcisiltite
6. 12 m
7. Thin-bedded, fossiliferous
9. Overlies Kings Falls Limestone; underlies Camp Member (Denley Limestone)
10. Type section: Palisades on Sugar River, from lower contact above rippled ledge at top of main fall above New York Central Railroad bridge, to upper contact with Denley Limestone type section 0.4 km above bridge, Leyden Township, Lewis County.

Sugar Run Formation SGRR01

1. Middle Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 22-23
4. Dolomite
5. Light-gray, weathers brown
6. 7.6 m
9. Overlies Joliet Formation; underlies Racine Formation
10. Type section: Joliet-National Quarry section, on S side of

Sugar Run, tributary of Des Plaines River, S of Joliet, NE1/4SE1/4 sec. 21, T. 35 N., R. 10 E., Will County.

Sullivan Siltstone Member (Bonneterre Dolomite) SLVN20
1. Upper Cambrian
2. Missouri (C)
3. Kurtz, V. E., Thacker, J. L., Anderson, K. H., and Gerdemann, P. E., 1975, Missouri Geol. Survey Rept. Inv. 55, p. 6-8
6. 7 m
7. Regular thin beds
9. Overlies Lamotte Sandstone; underlies Whetstone Creek Member (Bonneterre Dolomite)
10. Type section: Crooked Creek cryptovolcanic structure, NE1/4 sec. 17, T. 36 N., R. 4 W., Crawford County. Named for town of Sullivan, N of Franklin-Crawford County line.

Sullivan Buttes Latite U SLVB03
1. Oligocene, upper(?), and Miocene, lower
2. Arizona (C)
3. Krieger, M. H., Creasey, S. C., and Marvin, R. F., 1971, U.S. Geol. Survey Prof. Paper 750-B, p. B157-B160
4. Volcanic plugs, domes, flows, breccias, agglomerates, mudflows, and latitic gravels
9. Unconformably overlies and underlies basalts and gravels
10. Type locality: Sullivan Buttes, SE Simmons and SW Paulden Quadrangles, Yavapai County.

Sulphur Peak Member (Bullion Canyon Volcanics) SPPK05
1. Oligocene
2. Utah (SW)
3. Caskey, C. F., and Shuey, R. T., 1975, Utah Geology, v. 2, no. 1, p. 17-25
4. Andesite flow
5. Gray groundmass, locally yellow, red, or purple
6. 300 m
7. Associated with dome or spine
9. Overlies Tertiary pre-volcanic conglomerates; underlies Dry Hollow Formation
10. Type locality: Exposed at Sulphur Peak, near Cove Fort, Millard County.

Summerhouse Formation U SMRS12
1. Lower Ordovician
2. Idaho (SC)
3. Ruppel, E. T., Ross, R. J., Jr., and Schleicher, David, 1975, U.S. Geol. Survey Prof. Paper 889-B, p. 25, 27-33
4. Sandstone, quartzitic, glauconitic, fossiliferous, calcareous, or dolomitic
5. Brownish- to reddish-gray
6. 306 m, range 0-310 m
7. Heterogeneous, resulting from near-shore, lagoonal, environment
9. Unconformably overlies Swauger Formation or Wilbert Formation; unconformably underlies Kinnikinic Quartzite
10. Type section: On E wall of Summerhouse Canyon, SE1/4SE1/4 sec. 35, T. 12 N., R. 25 E., and SW1/4SW1/4 sec. 36, T. 12 N., R. 25 E., Lemhi Range, Gilmore Quadrangle, Custer County.

Summit Creek Breccia SMCK11
1. Paleozoic, upper

2. Idaho (SC)
3. Dover, J. H., 1969, Idaho Bur. Mines and Geology Pamph. 142, p. 35-36
4. Chert-quartzite breccia and laminated quartzite
6. 240 m
7. Allochthonous block
9. Overlies Wood River Formation; in fault contact with Phi Kappa Formation
10. Type area: Summit Pass on ridge between upper Summit and Wilson Creeks, WC Pioneer Mountains, Blaine and Custer Counties.

Summit Lake Tuff U SMLK04
1. Miocene, upper
2. Nevada (NW)
3. Noble, D. C., McKee, E. H., Smith, J. G., and Korringa, M. K., 1970, U.S. Geol. Survey Prof. Paper 700-D, p. D27
4. Densely welded tuff
5. Dark-brown to reddish-brown
6. 30 m
7. Discontinuous horizontal jointing
10. Type locality: Vicinity of Summit Lake, SW1/4NW1/4 sec. 35, T. 43 N., R. 26 E., Black Rock Range, Rock Spring Table Quadrangle, Humboldt County.

Sunlight Group (Absaroka Supergroup) U SNLG03
1. Eocene, middle
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Pyroxene andesite lava flows and volcaniclastic rocks, and potassic basalts
6. 2400 m
8. Mount Wallace Formation and its Slough Creek Tuff Member, Crescent Hill Basalt, Wapiti Formation and its Jim Mountain Member, Trout Peak Trachyandesite and its Pacific Creek Tuff Member
9. Overlies Washburn Group or Precambrian rocks; underlies Thorofare Creek Group
10. Type area: Sunlight Creek, Yellowstone National Park, Park County, Wyo.

Suntrana Formation U SNRN01
1. Miocene, middle
2. Alaska (EC)
3. Wahrhaftig, Clyde, Wolfe, J. A., Leopold, E. B., and Lanphere, M. A., 1969, U.S. Geol. Survey Bull. 1274-D, p. D16-D19
4. 6 to 12 repeated sequences of pebbly sandstone grading upward through finer-grained sandstone to clay and coal
6. Range 0-390 m
9. Conformably overlies Sanctuary Formation; conformably underlies Lignite Creek Formation
10. Type locality: Walls of Suntrana Creek, SE1/4 sec. 23, T. 12 S., R. 7 W., C Alaska Range, Healy D-4 Quadrangle.

Superstition Tuff U SPRS04
1. Miocene
2. Arizona (C)
3. Stuckless, J. S., and Sheridan, M. F., 1971, Geol. Soc. America

Bull., v. 82, no. 11, p. 3236-3240
4. Quartz latite ash-flow tuff
5. Red
6. < 1000 m
7. Typically densely welded and devitrified; members distinguished from each other by relative phenocryst percentages and radiometric ages
8. Siphon Draw, Dogie Spring, and Canyon Lake Members
9. Conformably overlies older dacite domes of Superstition cauldron complex; intertongues with Geronimo Head Formation; underlies basalt of Canyon Lake and younger rhyolitic conglomerate
10. Type section: Composite of type sections of its 3 members in Superstition and Goldfield Mountains, Maricopa and Pinal Counties.

Surveyor Flow/Basalt SRVR01
1. Holocene
2. Oregon (C)
3. Peterson, N. V., and Groh, E. A., 1969, The Ore Bin, v. 31, no. 4, p. 76
4. Basaltic aa lava flow
10. Type locality: S flank of Newberry Volcano, 40 km S of Bend and 56 km E of crest of High Cascades, Deschutes County.

Swan Lake Flat Basalt U SLKF01
1. Pleistocene
2. Wyoming (NW)
3. Christiansen, R. L., and Blank, R, H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B15
5. Gray
6. 200 m
9. Overlies Lava Creek Tuff (Yellowstone Group); locally underlies Plateau Rhyolite
10. Type area: Sheepeater Cliffs on E side of canyon of Gardner River SE of Bunsen Peak, Yellowstone National Park, Park County. Named for valley of Swan Lake Flat, 8 km SW of Mammoth.

Swede Gulch Formation U SDGC01
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Bull. 1332-A, p. A8
4. Graphitic slate, argillaceous schist, and graywacke
9. Conformably overlies Poverty Gulch Slate
10. Type locality: Along Swede Gulch, secs. 31, 32, 33, T. 3 N., R. 3 E., N Black Hills, Lawrence County.

Sweeney Formation SWNY01
1. Lower Silurian (Alexandrian)
2. Illinois (NW)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 28
4. Dolomite in thin wavy beds with clay partings
5. Pinkish-gray
6. 17 m
9. Conformably overlies Blanding Formation; conformably underlies Marcus Formation
10. Type section: Bluff of Mississippi River in Mississippi Palisades State Park at parking area, 1.5 km N of Savanna-

Sabula Bridge, SW1/4SE1/4NE1/4 sec. 33, T. 25 N., R. 3 E., Carroll County. Named for Sweeney Islands in Mississippi River.

Sweepstake Norite (Hillsboro Group)/Quartz Diorite (Hillsboro Group) SPSK01
1. Devonian
2. New Hampshire (SE)
3. Sundeen, D. A., 1971, New England Intercollegiate Geol. Conf. Guidebook 63, Trip A-7, p. 53-63
5. Greenish- to purplish-gray, black
10. Type locality: Outcrop in Pine Grove Cemetery, Salem Center, Rockingham County.

Sweetwater Formation STTR06
1. Eocene
2. California (SE)
3. Artim, E. R., and Pinckney, C. J., 1973, Geol. Soc. America Bull., v. 84, no. 3, p. 1075
4. Lower gritty sandstone overlain by claystone
5. Red
9. Underlies Otay Formation
10. Type locality: E of San Diego Bay along E side of La Nacion Fault, San Diego County.

Tabbyune Creek Tongue (Colton Formation) TBCK01
1. Eocene
2. Utah (C)
3. Moussa, M. T., 1969, Geol. Soc. America Bull., v. 80, no. 9, p. 1742-1743
4. Sandstone and mudstone
5. Gray, brown
6. 94 m
7. Massive
9. Overlies Middle Fork Tongue (Green River Formation); underlies Soldier Summit Member (Green River Formation)
10. Type section: Along Tabbyune Creek, SE of town of Soldier Summit, E1/2 sec. 14, T. 11 S., R. 8 E., Uinta Basin, Utah County.

Tabonuco Formation U TBNC01
1. Lower Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F8-F11
4. Volcanic sandstone, mudstone, and minor volcanic breccia and conglomerate
5. Gray
6. 1000 m
9. Conformably overlies volcaniclastic rocks; conformably underlies Hato Puerco Formation
10. Type section: In tributary of Rio Mameyes, 6 km S of Mameyes, extending upstream from point 300 m W of river to Coco Falls at highway, 53,880 N., 223,330 E., to 54,110 N., 222,290 E., El Yunque Quadrangle. Named for Quebrada Tabonuco, 3 km S of Mameyes.

Tadpole Ridge Quartz Latite TPRG05
1. Oligocene
2. New Mexico (SW)

3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 234, 235
4. Ash flows
6. Range 300-600 m
7. Welded and unwelded, columnar jointing
9. Overlies unnamed rhyolite tuff; underlies Alum Mountain Formation
10. Type locality: Along Cherry Creek, NE Grant County.

Taliaferro Metamorphic Complex/Complex TLFR01

1. Upper Jurassic
2. California (NW)
3. Suppe, John, and Armstrong, R. L., 1972, Am. Jour. Sci., v. 272, no. 3, p. 222-227
4. Chert, mudstone, graywacke, and basalt
5. White, blue
6. 1000 m
7. Thin-bedded, high-grade metamorphic; folded and faulted thrust sheet in anticlinorium
9. In low-angle thrust-fault contact with younger, less-metamorphosed facies of Franciscan assemblage
10. Type area: Bear Creek, between elev. 1256 and 1548 m, Buck Rock Quadrangle, Mendocino County. Named for Taliaferro Ridge, which runs from Leech Lake Mountain NE to Middle Fork of Eel River.

Tallahassee Creek Conglomerate U TLCK12

1. Oligocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C9-C11
4. Conglomerate
5. Weathers gray or grayish-pink
6. 107 m
9. Overlies Wall Mountain Tuff; underlies Thirtynine Mile Andesite
10. Type locality: Exposures at junction of 3 forks of Tallahassee Creek, sec. 31, T. 17 S., R. 72 W. and sec. 36, T. 17 S., R. 73 W., in SW corner of Cover Mountain Quadrangle and SE corner of Black Mountain Quadrangle, Fremont County.

Tallassee Metaquartzite (Jacksons Gap Group) TLLS07

1. Paleozoic, middle
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 115
4. Metaquartzite interbedded with graphitic and sandy-schistose units
7. Massive
10. Type area: Base of Thurlow Dam, across from Tallassee Mill, E1/2 sec. 19, T. 18 N., R. 22 E., Tallapoosa County.

Tall Chief Member (Wann Formation) TLCF01

1. Upper Pennsylvanian (Missourian)
2. Oklahoma (NE)
3. Desjardins, L. A., 1973, Tulsa Geol. Soc. Digest, v. 37, p. 68
4. Shale and sandstone
6. 61 m
7. Deltaic structure of foreset beds

9. Underlies Keystone Park or Ramona Hill Member
10. Type locality: T. 21 N., R. 11 E., Osage County.

Tammany Member (Shawangunk Formation) U TMMN01
1. Middle Silurian
2. New Jersey (NW), Pennsylvania
3. Epstein, J. B., and Epstein, A. G., 1972, U.S. Geol. Survey Prof. Paper 744, p. 12-14, 23-24
4. Quartzose conglomeratic sandstone and minor argillite
6. 460 m
9. Overlies or intertongues with Lizard Creek Member (Shawangunk Formation); underlies Bloomsburg Red Beds with irregular and transitional contact
10. Type section: Along U.S. Highway I-80, Delaware Water Gap, Warren County, N.J. Named for Mount Tammany overlooking Delaware Water Gap.

Tanana Formation U TANN01
1. Pleistocene, lower or middle
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 6-8
4. Solifluction deposits
6. 1 m, range 1-25 m
9. Unconformably overlies bedrock or Cripple Gravel; underlies Chena Alluvium, Fairbanks Loess, Gold Hill Loess, or Goldstream Formation; in valley bottoms grades laterally into Fox Gravel
10. Type locality: Borrow pit on S valley wall of Pedro Creek at junction with Twin Creek, SE1/4 sec. 11, T. 2 N., R. 1 E., Livengood D-3 Quadrangle.

Tanner Member (Galeros Formation) TNNR01
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1243-1260
4. Shale with minor dolomite
6. 195 m
9. Unconformably overlies Nankoweap Group; conformably underlies Jupiter Member (Galeros Formation)
10. Type section: Overlooking Tanner Rapids in cliffs of Basalt Canyon, E Grand Canyon, lat 36°05′ N., long 111°50′ W., Coconino County.

Tapers Ranch Sandstone Member (Haystack Mountains Formation) U TPRC01
1. Upper Cretaceous
2. Wyoming (SC)
3. Gill, J. R., Merewether, E. A., and Cobban, W. A., 1970, U.S. Geol. Survey Prof. Paper 667, p. 12-18
4. Glauconitic sandstone, containing laminae of sandy shale
5. Grayish-green, dark-gray
6. 83 m
7. Fine- to coarse-grained, thin bedded, sparse fossils (index ammonite)
9. Conformably and gradationally overlies Steele Shale; as basal member of Haystack Mountains Formation, underlies unnamed lower shale member
10. Type section: In Haystack Mountains, 10 km N of Sinclair, NE1/4NE1/4 sec. 22, NE1/4 sec. 23, and SE1/4SE1/4 sec. 14,

T. 22 N., R. 86 W., Carbon County. Named for Tapers Ranch, S1/2 sec. 3, T. 24 N., R. 86 W.

Taughannock Falls Bed (Tully Limestone) TGKF01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 35
4. Limestone
6. 1.5 m
7. Well-bedded
9. Overlies Smyrna Bed in E, and Carpenter Falls Bed in W; underlies West Brook Shale Bed in E, and Bellona Coral Bed in W
10. Type area: Taughannock Falls, Tompkins County.

Taylor Creek Rhyolite TLCK04
1. Oligocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 238
4. Flow-banded rhyolite with quartz and sanidine phenocrysts
7. Surface expression of ring-dike complex
10. Type locality: Not stated. Named for Taylor Creek tin mining district, Black Range, Sierra County.

Taylor River Limestone Member (Gothic Formation) TLRV02
1. Middle Pennsylvanian
2. Colorado (WC)
3. Bartleson, Bruce, 1972, Colorado School Mines Quart., v. 67, no. 4, p. 187-248
5. Gray, brown
6. 64 m
7. Fossiliferous
9. Underlies Brush Creek Limestone Member
10. Type section: 0.4 km N of Taylor River Road, Colorado Highway 306, between Jacks Cabin cutoff road and Rarick Creek, in HG section, 8 km NE of Almont, sec. 21, T. 15 S., R. 84 W., Gunnison County. Named for exposures N of Taylor River.

Tea Cup Granodiorite U TCUP01
1. Paleocene
2. Arizona (SE)
3. Cornwall, H. R., and Krieger, M. H., 1975, U.S. Geol. Survey Geol. Quad. Map GQ-1206, p. 1
4. Granodiorite
7. Medium- to coarse-grained, porphyritic in places
9. Intrudes Ruin Granite and Pinal Schist; intruded by Paleocene and younger Tertiary dikes
10. Type locality: Along wash in SE1/4 sec. 36, T. 4 S., R. 12 E., Grayback Quadrangle, Pinal County. Named for Tea Cup Ranch, NW1/4 sec. 7, T. 5 S., R. 13 E.

Teckla Sand Member (Lewis Shale) TCKL01
1. Upper Cretaceous
2. Wyoming (EC)
3. Runge, J. S., Wicker, W. L., and Eckelberg, D. J., 1973, Earth Sci. Bull., v. 6, no. 3, p. 3
4. Sub-arkose sandstone, bentonitic shale
6. 34 m
8. Informal lower sand, bentonitic shale, and upper sand units

10. Type section: Gulf Oil Corp. No. 1 Government-Teckla well, SE1/4SE1/4 sec. 10, T. 41 N., R. 70 W., 8.4 km ESE of Teckla Post Office, Campbell County.

Temporal Formation U TMPL03
1. Lower Cretaceous
2. Arizona (SE)
3. Drewes, Harald, 1968, U.S. Geol. Survey Bull. 1274-C, p. C4, C8-C9
4. Rhyolitic to andesitic tuffs, porphyritic latite flows, rhyodacite breccia, and arkosic, polymictic, and boulder conglomerates
6. Range 300-600 m
8. 3 informal members
9. Unconformably overlies Squaw Gulch Granite or Jurassic and Triassic rocks; disconformably underlies Bathtub Formation
10. Type area: Temporal Gulch between ranch and mouth of Mansfield Canyon, SE Santa Rita Mountains, Santa Cruz County.

Teneriffe Silt TNRF02
1. Pleistocene (Illinoian)
2. Illinois (WC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 60-61
4. Silt with beds of sand and clay
6. Range 1.5-3 m
9. Overlies Hulick Till or Kellerville Till Member (Glasford Formation); underlies Roxana Silt
10. Type section: Roadcuts 1.2 km SW of Teneriffe School, NW1/4NE1/4SW1/4 sec. 11, T. 4 S., R. 4 W., Pike County.

Tenmile Member (Lookingglass Formation) TNML06
1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 14
4. Sandstone, siltstone
5. Gray, brown
6. 970 m
7. Thin, rhythmically bedded
9. Overlies Bushnell Rock Member; underlies Olalla Creek Member
10. Type area: Tenmile Valley from Tenmile to Olalla Creek, Douglas County.

Terrace Point Basalt (North Shore Group) TRCP01
1. Precambrian Y
2. Minnesota (NE)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 316, 318
4. Thomsonite-bearing ophitic basalt
6. 49 m
9. Overlies Good Harbor Bay Andesite; underlies Lutsen Basalt
10. Type area: Cook County.

Terrebonne Shale TRBN01
1. Pleistocene, lower
2. Louisiana (SC)
3. Sachs, J. B., and Skinner, H. C., 1973, Tulane Studies in Geology and Paleontology, v. 10, no. 3, p. 124

4. Marine transgressive shale
6. 320 m
9. Overlies and underlies regressive sandstones
10. Type section: Gulf Oil Corp. A-1 OCS 0498 well, depth-interval 1780-2100 m, South Timbalier Area Block 128, offshore Terrebonne, in Block 135 field, Terrebonne Parish.

Theodore Quartz Diorite U THDR01

1. Jurassic
2. Nevada (NW)
3. Smith, J. G., 1973, U.S. Geol. Survey Misc. Geol. Inv. Map I-606
4. Quartz diorite containing small hornblendite bodies
9. Intrudes Triassic(?) foliated quartzite and amphibolite; unconformably underlies Tertiary volcanics
10. Type locality: Exposures surrounding Theodore Basin, T. 44 N., R. 29 E., Pine Forest Range, NW Duffer Peak Quadrangle, Humboldt County.

Thin Elk Formation (Ogallala Group) TELK01

1. Miocene
2. South Dakota (SC)
3. Harksen, J. C., and Green, Morton, 1971, South Dakota Geol. Survey Rept. Inv. 100, 7 p.
4. Sand and gravel, containing minor volcanic ash and limestone blocks locally derived from Rosebud Formation
5. Yellow, brown
6. > 9 m
7. Deposited by E-flowing stream from Black Hills, garnet placers, cemented ledge-forming lenses near top
9. Overlies Rosebud Formation as channel fill; upper contact not exposed
10. Type section: Joe Thin Elk gravel pit, 10 km N of Mission, NE1/4 sec. 35, T. 40 N., R. 28 W., Mellette County.

Third Canyon Formation TRDC01

1. Tertiary
2. Nevada (C)
3. Vitaliano, C. J., and Vitaliano, D. B., 1972, Geol. Soc. America Bull., v. 83, no. 11, p. 2370
4. Rhyodacitic to andesitic flows and tuffs
5. Gray, reddish-brown, greenish
6. 330 m
8. 4 informal units
9. Overlies Mission Spring Formation
10. Type locality: Third Canyon, W slope of Shoshone Mountains, SC part of sec. 27, T. 11 N., R. 40 E., lat 38°45'30" N., long 117°34'51" W., Nye County.

Thirteenmile Creek Tongue (Green River Formation) U TMCK10

1. Eocene
2. Colorado (NW)
3. Duncan, D. C., Hail, W. J., Jr., O'Sullivan, R. B., and Pipiringos, G. N., 1974, U.S. Geol. Survey Bull. 1394-F, p. F6-F10
4. Heterogeneous sequence of mostly marlstone, with sandstone, ostracodal beds, limestone, and oil-shale beds
5. Light-gray and brown
6. 42 m, range 18-61 m

9. Intertongues with Uinta Formation; merges laterally to W with main body of Green River Formation
10. Composite type section: Lower part, in SE1/4NE1/4SE1/4 sec. 27; upper part, in NW1/4SE1/4SE1/4 and NE1/4SW1/4SE1/4 sec. 27, both in T. 2 S., R. 95 W., No Name Ridge Quadrangle, N Piceance Creek Basin, Rio Blanco County.

Thomas Fork Formation U TMFK01
1. Lower Cretaceous
2. Wyoming (SW)
3. Rubey, W. W., 1973, U.S. Geol. Survey Bull. 1372-I, p. I8-I14, I17
4. Mudstone and sandstone, conglomeratic in part
5. Variegated and gray to buff
6. 330 m
9. Overlies Smiths Formation; underlies and intertongues with Cokeville Formation
10. Type section: Along N bank of Thomas Fork, from SE1/4NE1/4NW1/4 sec. 26 to SW1/4SW1/4NW1/4 sec. 25, T. 28 N., R. 119 W., Lincoln County.

Thorn Ranch Tuff U TRRC02
1. Oligocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C1, C4, C16-C18
4. Tuff
5. Weathers pinkish-white to reddish-brown
6. 75 m
9. Overlies Antero Formation and East Gulch Tuff; underlies Gribbles Park Tuff
10. Type locality: Along mesa near Thorn Ranch, S1/2 sec. 23 and N1/2 sec. 26, T. 17 S., R. 73 W., SE Black Mountain Quadrangle, Fremont County.

Thorofare Creek Group (Absaroka Supergroup) U TFCK03
1. Eocene
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Volcaniclastic strata and andesite lavas
6. 1800 m
8. Langford Formation with its Promontory Member, Two Ocean Formation, Tepee Trail Formation, and Wiggins Formation
9. Overlies rocks of Sunlight or Washburn Groups or prevolcanic rocks
10. Type area: Thorofare Creek, near SE corner of Yellowstone National Park, Teton County, Wyo.

Tibbet Canyon Member (Straight Cliffs Formation) U TBCN01
1. Upper Cretaceous
2. Utah (SC)
3. Peterson, Fred, 1969, U.S. Geol. Survey Bull. 1274-J, p. J2-J6, J26-J27
4. Sandstone
5. Grayish-orange
6. 32 m, range 21-56 m
7. Very fine- to medium-grained, very thin- to thick-bedded, horizontally and cross-stratified, fossiliferous

9. Gradationally overlies and intertongues with Tropic Shale; conformably underlies Smoky Hollow Member (Straight Cliffs Formation)
10. Type section: Cliff on E side of SE-trending spur on N side of Tibbet Canyon, N1/2NE1/4NE1/4 sec. 14, T. 42 S., R. 3 E., Kane County.

Tierra Redonda Formation U TRDD01

1. Miocene, middle
2. California (C)
3. Durham, D. L., 1968, U.S. Geol. Survey Bull. 1255, p. 11-15
4. Sandstone, calcareous in lower part; boulder conglomerate
5. White, yellowish-gray
6. 500 m
7. Fine- to coarse-grained, thick-bedded, friable to well-cemented
9. Conformably overlies Vaqueros Formation; conformably underlies Sandholdt Member (Monterey Shale)
10. Type locality: Tierra Redonda Mountain, sec. 10, T. 25 S., R. 9 E., San Luis Obispo County.

Tijeras Greenstone TJRS01

1. Precambrian
2. New Mexico (NC)
3. Kelley, V. C., and Northrop, S. A., 1975, New Mexico Bur. Mines and Mineral Resources Mem. 29, p. 22
5. Dark-green
7. Nonfoliated to highly schistose
10. Type locality: Occurs in belt 1.6 km wide and 8.8 km long between Tijeras fault and Cibola Gneiss and Cerro Pelon Ridge, Tijeras Canyon, secs. 29, 31, 32, T. 10 N., R. 5 E., Bernalillo County.

Tillman Mountain Tonalite (Toats Coulee Group) TLMM01

1. Upper Triassic
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11, p. 3013-3048
4. Hornblende and biotite tonalite
5. Dark-gray
7. Medium-grained, secondary cataclastic gneissose structures
10. Type locality: Not stated. Named for Tillman Mountain, T. 38 N., R. 24 E., Okanogan County.

Tilton Till Member (Banner Formation) TLTN01

1. Pleistocene (Kansan)
2. Illinois (EC)
3. Johnson, W. H, Gross, D. L., and Moran, S. R., 1971, in Goldthwait, R. P., ed., Ohio State Univ. Press, p. 196
4. Calcareous till with interbedded silt, sand, and gravel. Upper part weathered and leached.
5. Dark-gray
6. Range 2-3 m
9. Overlies Hillery Till Member (Banner Formation); underlies Petersburg Silt, Vandalia Till Member (Glasford Formation), or Glenburn Till Member (Wedron Formation)
10. Type locality: School House Branch section, SE1/4NE1/4NE1/4 sec. 2, T. 19 N., R. 12 W., Vermilion County. Named for town of Tilton.

Timber Hill Siltstone Bed (Stanton Formation) TMBH02
1. Upper Pennsylvanian (Missourian)
2. Kansas (SE)
3. Heckel, P. H., 1975, Kansas Geol. Survey Bull. 210, p. 17
4. Quartz siltstone
5. Light-gray, weathers tan
6. Range 0.6-1.2 m
7. Wavy, thin-bedded to massive, hard
9. Overlies Eudora Member; underlies Rock Lake Member or Rutland Limestone Bed
10. Type section: Roadcut along E side of Timber Hill, center NW1/4 sec. 25, T. 32 S., R. 14 E., Montgomery County.

Tiser Limestone TISR01
1. Middle Ordovician
2. Nevada (NE)
3. Riva, John, 1970, Geol. Soc. America Bull., v. 81, no. 9, p. 2696
4. Limestone with chert stringers and nodules and shale beds
5. Pale-blue
6. 27 m, range 27-46 m
7. Fine-grained, medium-bedded
9. Gradationally overlies Valder Formation; underlies Noh Formation
10. Type section: S flank of Bell Mountain, 0.8 km above head of Corral Canyon, NE HD Range, Elko County.

Tiskilwa Till Member (Wedron Formation) TSKL01
1. Pleistocene (Wisconsinan)
2. Illinois (NC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 68-69
4. Calcareous till
5. Tan to reddish-brown
6. Range 3-46 m
9. Overlies Delavan, Esmond, or Lee Center Till Member; underlies Haeger or Malden Till Member
10. Type section: Roadcut 8 km NW of Tiskilwa, SE1/4SE1/4SW1/4 sec. 31, T. 16 N., R. 8 E., Bureau County, Ill.

Tlevak Basalt U TLVK01
1. Cenozoic
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1294-A, p. A25-A28
4. Olivine basalt flows
6. < 30 m
7. Microlitic; strongly jointed, forming thin horizontal slabs, locally columnar jointed, spheroidally weathered
9. Unconformably overlies Ladrones Limestone, or older Peratrovich and Port Refugio Formations; upper contact not exposed
10. Type area: Low-relief shorelines of small islands and projections of W coast of Prince of Wales Island near N entrance to Tlevak Strait, Craig B-4 Quadrangle.

Toats Coulee Magma Series/Group TSCL16
1. Upper Triassic
2. Washington (NC)
3. Hibbard, M. J., 1971, Geol. Soc. America Bull., v. 82, no. 11,

p. 3013-3048
8. Loomis Granodiorite, Sarsapkin Tonalite, Tillman Mountain Tonalite, Sinlahekin Tonalite, Douglas Mountain Tonalite Porphyry
10. Type locality: Not stated. Named for Toats Coulee, Tps. 39-40 N., R. 23 E., Okanogan County.

Tobin Harbor Flow (Portage Lake Volcanics) U TBHB01
1. Precambrian Y (middle Keweenawan)
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C13
4. Porphyrite, fine-grained matrix; tending toward glomeroporphyrite
6. 15 m, range 15-30 m
9. Erupted after Washington Island Flow; before Long Island Flow
10. Type locality: Along N side of Tobin Harbor, S arm of Porter Island, E Isle Royale, Keweenaw County.

Toll Gate Olivine Basalt (Reynolds Basin Group) TLGT01
1. Miocene, upper, and Pliocene, lower
2. Idaho (SW)
3. McIntyre, D. H., 1972, Idaho Bur. Mines and Geology Pamph. 151, p. 32-34
4. Nonporphyritic and porphyritic basalt with basal tuff and tuff-breccia
5. Dark-gray to black
6. 21 m
10. Type locality: Exposures at Toll Gate, near center sec. 24, T. 3 S., R. 4 W., and for 1.6 km upstream along Reynolds Creek, Owyhee County.

Tollhouse Flat Member (Eureka Valley Tuff) U TLFL03
1. Miocene, upper
2. California (C), Nevada
3. Noble, D. C., Slemmons, D. B., Korringa, M. K., Dickinson, W. R., Al-Rawi, Yehya, and McKee, E. H., 1974, Geol. Soc. America Geology, v. 2, no. 3, p. 139-142
4. Ash-flow tuff sheet
5. Gray
6. 64 m, range 64-91 m
9. Overlies Table Mountain Latite; underlies By-Day Member (Eureka Valley Tuff)
10. Type locality: E bank of West Walker River at Tollhouse Flat, lat 38°25′35" N., long 119°26′45" W., Mono County, Calif.

Toma de Agua Vitrophyre Member (Cambalache Formation) TMAG01
1. Upper Cretaceous
2. Puerto Rico (NE)
3. Seiders, V. M., 1971, U.S. Geol. Survey Bull. 1294-F, p. F26
5. Black
6. Range 0-50 m
7. Platy and columnar jointed
9. At top of Cambalache Formation
10. Type locality: Near Toma de Agua settlement in Barrio Canovanas, 58,040 N., 208,630 E., NW El Yunque and NE Gurabo Quadrangles.

Toms River Member (Shark River Formation) TMRV01
1. Eocene, middle

2. New Jersey (EC)
3. Enright, Richard, 1969, in Subitzky, Seymour, ed., Rutgers Univ. Press, p. 18-19
4. Quartz sand, micaceous, clayey, and glauconitic
6. 24 m
9. Gradationally overlies Squankum Member (Shark River Formation); unconformably underlies Kirkwood Formation
10. Type section: Toms River Chemical Company well No. 84, depth-interval 67-91 m, Toms River, Ocean County.

Torrecilla Breccia U TRCL01

1. Lower Cretaceous
2. Puerto Rico (C)
3. Briggs, R. P., 1969, U.S. Geol. Survey Bull. 1274-O, p. 07-015
4. Tuff breccia, lava breccia, tuff, lava, with limestone lenses
5. Gray, greenish-gray, black
6. Range 1000-2050 m
8. Aguas Buenas Limestone Member, Barros Tuff Member
9. Overlies unnamed older rocks; underlies Robles Formation
10. Type section: Exposures along Route 156, 2.1 km W of W peak of La Torrecilla, 40,180 N., 160,950 E., to 41,140 N., 160,990 E., and exposures in Rio Botijas, 100 m E, Barranquitas Quadrangle.

Torrey Member (Moenkopi Formation) TRRY07

1. Lower and Middle Triassic
2. Utah (SE)
3. Blakey, R. C., 1974, Utah Geol. and Mineralog. Survey Bull. 104, p. 35-45
4. Sandstone
5. Red, gray, brown
6. 82 m
7. Ledge- and cliff-forming
9. Overlies Sinbad Limestone Member; underlies Moody Canyon Member
10. Type locality: W side of mesa S of Torrey, center sec. 8, T. 29 S., R. 5 E., Wayne County.

Torreya Formation U TRRY06

1. Miocene, lower
2. Florida (NC)
3. Banks, J. E., and Hunter, M. E., 1973, Gulf Coast Assoc. Geol. Socs. Trans. 23, p. 355-363
4. Sand with lime inclusions, passing gradually into sandy marl
5. Gray to bluish-green
6. 30 m
9. Overlies St. Marks Formation to E and Chattahoochee Formation to W; underlies Chipola Formation to E and Hawthorn Form ion to W
10. Type section: Rock Bluff Landing, E bank of Apalachicola River, Torreya State Park, SW1/4 sec. 17, T. 2 N., R. 7 W., Liberty County.

Torrivio Member (Gallup Sandstone) TRRV03

1. Upper Cretaceous
2. New Mexico (NW)
3. Molenaar, C. M., 1973, Four Corners Geol. Soc. Mem. 1, p. 85-110
5. Pink to red
6. 17 m, range 0-30 m

7. Fine- to coarse-grained, fluvial, braided channel complex
9. Overlies nonmarine shale of Gallup Sandstone; underlies Dilco Member (Crevasse Canyon Formation)
10. Type section: On Nutria Hogback 3.2 km E of Gallup, SW1/4SE1/4NE1/4 sec. 13, T. 15 N., R. 18 W., McKinley County. Named for exposures on Torrivio Mesa, 12.8 km W and SW of Gallup.

Tortilla Quartz Diorite U TRTL01
1. Upper Cretaceous
2. Arizona (SC)
3. Cornwall, H. R., Banks, N. G., and Phillips, C. H., 1971, U.S. Geol. Survey Geol. Quad. Map GQ-1021
4. Quartz diorite ranging from pyroxene-hornblende diorite through biotite-hornblende quartz diorite or tonalite
5. Gray
7. Small stocks, fine- to medium-grained hypidiomorphic-granular
9. Intrudes rocks older than and including Naco Limestone
10. Type section: N of Gila River and W of Mineral Creek, sec. 2, T. 4 S., R. 13 E., Kearny Quadrangle, Pinal County. Named for exposures in Tortilla Mountains.

Toulon Member (Glasford Formation) TULN01
1. Pleistocene (Illinoian)
2. Illinois (NC)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 57
4. Calcareous silt and sand overlying weakly developed soil
5. Gray
6. 3 m
9. Overlies Hulick Till Member; underlies Radnor Till Member
10. Type section: Exposures in borrow pit 1.2 km W of Toulon, NW1/4NW1/4SW1/4 sec. 24, T. 13 N., R. 5 E., Stark County.

Towamensing Member (Catskill Formation) TMSG01
1. Upper Devonian
2. Pennsylvania (EC)
3. Epstein, J. B., Sevon, W. D., and Glaeser, J. D., 1974, Pennsylvania Geol. Survey Atlas 195cd, p. 158-160
4. Sandstone, with siltstone layers
5. Gray
6. 58 m
7. Well-indurated, poorly-sorted, mudcracks, ripple marks, scoured surfaces
9. Overlies Trimmers Rock Formation; underlies Walcksville Member (Catskill Formation)
10. Type section: Steep S limb of Weir Mountain syncline, in roadcut on Pennsylvania Highway 248 between Bowmanstown and Parryville, E bank of Lehigh River in Lower Towamensing Township, Carbon County.

Toyosa Member (Maravillas Formation) U TOYS01
1. Upper Cretaceous
2. Puerto Rico (C)
3. R. P. Briggs, 1969, U.S. Geol. Survey Bull. 1274-O, p. 026-028
4. Calcareous tuffaceous sandstone and tuffaceous calcarenite
5. Gray
6. Range 40-350 m
9. Overlies San Diego Member (Maravillas Formation); conformably

underlies Coamo Formation
10. Type section: Exposures 2.8 km W of Montes la Toyosa, along Route 111 from 34,460 N., 149,370 E., E to junction of Routes 111 and 553, then S along Route 553 to 33,820 N., 150,000 E., SC Orocovis Quadrangle.

Trail Canyon Limestone TRLC03
1. Lower Permian
2. Idaho (SE)
3. Cramer, H. R., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 10, p. 1793
4. Coarsely crystalline to almost lithographic limestone with chert beds and nodules
5. Dark-blue or gray
6. 1300 m
9. Overlies Tussing Sandstone; underlies Heydlauff Sandstone
10. Type section: Dividing ridge of Sublett Range from head of Tussing Canyon S to head of Trail Canyon, from NE1/4 sec. 22 to SW1/4 sec. 26, T. 12 S., R. 30 E., Power County.

Trap Falls Formation (Hartland Group) TPFL01
1. Middle and Upper Ordovician
2. Connecticut (SW)
3. Crowley, E. F., 1968, Connecticut Geol. and Nat. History Survey Quad. Rept. 24, p. 9
4. Leucocratic feldspathic gneiss with interlayered schist and pegmatite
9. Overlies Straits Schist; underlies Southington Mountain Formation or Prospect Gneiss
10. Type locality: E and W shores of Trap Falls Reservoir, N of Bridgeport, Long Hill Quadrangle, Fairfield County.

Triangle Formation (Sonyea Group) TRGL01
1. Upper Devonian
2. New York (C)
3. Sutton, R. G., Bowen, Z. P., and McAlester, A. L., 1970, Geol. Soc. America Bull., v. 81, no. 10, p. 2977-2978
4. Shale, siltstone, mudstone
5. Gray
6. 64 m
7. Crossbedded
9. Gradationally overlies Montour Shale; underlies Sawmill Creek Shale
10. Type section: Exposures in quarries and roadcuts 1.6 km W of village of Triangle, Broome County.

Tripon Pass Limestone TRPP04
1. Lower Mississippian
2. Nevada (NE)
3. Oversby, Brian, 1973, Am. Assoc. Petroleum Geologists Bull., v. 57, no. 9, p. 1779-1783
4. Clastic limestone
6. 470 m
7. Allochthonous, at least partly deposited by turbidity currents
9. Disconformably overlies Guilmette Formation; conformably underlies Diamond Peak Formation
10. Type locality: 2 km S of Tripon Pass, N1/2 sec. 22, T. 39 N., R. 64 E., Windermere Hills, Elko County.

Tripp Limestone Member (Lingle Formation) TRPP01
1. Middle Devonian
2. Illinois (SC)
3. North, W. G., 1969, Illinois Geol. Survey Circ. 441, p. 25-28, 44-45
4. Limestone, with chert, siltstone, shale, dolomite, and phosphate-pellet beds
5. Light-gray to dark brownish-gray
6. 5.2 m, range 0-25 m
7. Sublithographic to coarse-grained, fossiliferous
9. Disconformably overlies Howardton Limestone Member (Lingle Formation); conformably underlies Misenheimer Shale Member (Lingle Formation); grades laterally into Blocher Shale to E
10. Type section: S side of Kratzinger Hollow, 60 m S of bridge on Illinois Highway 146, 1.6 km NW of Jonesboro, N1/2NE1/4NW1/4 sec. 23, T. 12 S., R. 2 W., Union County. Named for Tripp School, 180 m NW of type section.

Tristates Group TRSS01
1. Lower Devonian
2. New York (SC)
3. Rickard, L. V., 1975, New York State Mus. and Sci. Service Map and Chart Ser. 24
4. Sedimentary rocks including limestone, conglomerate, shale, sandstone
8. Port Jervis Limestone, Glenerie Limestone, Connelly Conglomerate, Oriskany Sandstone, Esopus Shale, Carlisle Center Shale, Pine Hill Shale and Sandstone, Aquetuck Limestone and Shale, Saugerties Limestone, Schoharie Formation, Rickard Hill Limestone and Sandstone, Bois Blanc Limestone
9. Overlies Helderberg Group; underlies Onondaga Formation
10. Type section: Exposures along top and W flank of Trilobite Mountain, N of village of Tristates in Port Jervis Quadrangle, Orange County.

Troutman Member (Kankakee Formation) TRMN05
1. Lower Silurian
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 18, 49
4. Dolomite, with clay partings
5. Greenish-gray to pinkish-gray
6. 8 m
9. Overlies Offerman Member; underlies Plaines Member
10. Type section: Plaines East section; abandoned quarry S side of Des Plaines River, 2.4 km SW of Brandon Bridge; Plaines West section; S side of Des Plaines River, 2.8 km SW of Brandon Bridge; sec. 30, T. 35 N., R. 10 E., Will County. Named for Troutman Grove Cemetery, 3.2 km S of type section.

Trout Peak Trachyandesite (Sunlight Group) U TRPK02
1. Eocene, middle
2. Wyoming (NW), Montana
3. Nelson, W. H., and Pierce, W. G., 1968, U.S. Geol. Survey Bull. 1254-H, p. H1, H2
4. Lava flows interbedded with volcaniclastic rocks
5. Gray, weathers reddish-brown
6. 300 m
7. Vesicular, brecciated

8. Pacific Creek Tuff Member
9. Conformably overlies Wapiti Formation; underlies Langford Formation (Thorofare Creek Group) or Wiggins Formation
10. Type section: On Trout Peak, 16 km NW of Wapiti Post Office, Park County, Wyo.

Tsankawi Pumice Bed (Tshirege Member of Bandelier Tuff) U TSNK01

1. Pleistocene
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P14-P15
4. Air-fall rhyolitic pumice and ash, with distinctive pumice containing hornblende needles
5. Light-gray to white
6. Range 0.6-1.2 m
8. 3 informal units
9. Overlies Otowi Member (Bandelier Tuff) or Cerro Toledo Rhyolite; underlies unnamed ash flows
10. Type locality: Vicinity of Tsankawi Ruin, Pajarito Plateau, Los Alamos and Sante Fe Counties.

Tuafanua Formation TUFN01

1. Pliocene
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 446-448
4. Basalt flows with interbedded ash, tuff, and breccia
7. Two coalescing shields each of which forms central portion of an island
8. Informal Sili member, A'ofa intra- and extra-caldera members
9. Overlies Asaga Formation
10. Type area: Ofu and Olosegu Islands. Named for area on N shore of Ofu Island.

Tugidak Formation U TGDK01

1. Pliocene
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A34-A35
4. Interbedded sandstone and siltstone with cobble conglomerate
6. 1500 m
7. Fossiliferous
9. In fault contact with older rocks; conformably underlies unnamed Pleistocene rocks
10. Type section: Exposures along W coast of Tugidak Island, SW of Kodiak Island.

Tularosa Canyon Rhyolite TLRC03

1. Oligocene
2. New Mexico (WC)
3. Smith, E. I., and Rhodes, R. C., 1974, Geol. Soc. America Bull., v. 85, no. 12, p. 1865-1868
4. Pumiceous ash-flow tuff, with interbedded tuffaceous sandstone
5. Gray to white
6. 40 m
9. Conformably overlies andesites and clastic sedimentary rocks
10. Type section: Tularosa Canyon, sec. 33, T. 6 S., R. 18 W., Catron County.

Tule Creek Granite Complex U TLCK14
1. Triassic or Jurassic
2. California (NW)
3. Irwin, W. P., Wolfe, E. W., Blake, M. C., Jr., and Cunningham, C. G., Jr., 1974, U.S. Geol. Survey Geol. Quad. Map GQ-1111
4. Soda granite with granitic and quartz-feldspar porphyry dikes in mafic volcanic rocks; may include soda rhyolite
9. Intrudes Rattlesnake Creek terrane of Paleozoic and Triassic(?) age
10. Type locality: Exposures in upper reaches of Tule Creek in NE Pickett Peak Quadrangle, Trinity County.

Tully Valley Bed (Tully Limestone) TLVL02
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 23
4. Sandy to pure limestone
6. 0.8 m
7. Massive
9. Overlies Meeker Hill Bed; underlies Vesper Bed
10. Type locality: 1.8 km NE of Tully, and W of Tully, on either side of Tully Valley, Onondaga County.

Tumac Mountain Olivine Basalt TMCM01
1. Quaternary
2. Washington (SC)
3. Ellingson, J. A., 1972, Northwest Sci., v. 46, no. 1, p. 9-24
10. Type locality: Tumac Plateau along Cascade Crest between Carlton Pass and White Pass, Lewis County.

Tungstonia Granite TNGS01
1. Paleocene
2. Nevada (EC)
3. Best, M. G., Armstrong, R. L., Graustein, W. C., Embree, G. F., and Ahlborn, R. C., 1974, Geol. Soc. America Bull., v. 85, no. 8, p. 1277-1286
4. Border facies: protoclastic mylonite and leucocratic aplitic granite; core facies: muscovite-biotite granite with muscovite books
7. Allotriomorphic to hypidiomorphic; forms castle-like monoliths
10. Type locality: Not stated. Named for Tungstonia Canyon and abandoned mine, Kern Mountains, White Pine County.

Tunk Lake Granite TKLK03
1. Upper Devonian
2. Maine (SE)
3. Karner, F. R., 1968, Geol. Soc. America Bull., v. 79, no. 2, p. 193-222
9. Intrudes Ellsworth Schist, Bays-of-Maine igneous complex, and Middle Devonian biotite granite and quartz monzonite
10. Type area: Along Atlantic Coast NE of Mount Desert Island, Hancock County.

Tunnel Spring Tuff U TSPG17
1. Oligocene
2. Utah (WC)
3. Bushman, A. V., 1973, Brigham Young Univ. Geology Studies, v. 20, pt. 4, p. 159-190
4. Ash-flow tuff

5. White
6. 350 m, range 350-570 m
7. Unsorted, non-welded, friable
9. Unconformably overlies Paleozoic sedimentary rocks; underlies Skull Rock Pass Conglomerate or Cottonwood Wash Tuff Member (Needles Range Formation)
10. Type section: Crystal Peak area, secs. 23, 24, 25, 26, T. 23 S., R. 16 W., Millard County. Named for Tunnel Spring Mountains, T. 23 S., R. 17 W.

Tunoa Formation TUNO01
1. Pleistocene
2. American Samoa, Manu'a Islands
3. Stice, G. D., and McCoy, F. W., Jr., 1968, Pacific Sci., v. 22, no. 4, p. 434, 437
4. Basalt lava
7. Small shield volcano, with collapsed summit, thin-bedded, pahoehoe flows
10. Type area: NW end of Ta'u Island. Named for Tunoa Ridge which forms E rim of collapsed area.

Tunp Member (Wasatch Formation) U TUNP01
1. Eocene
2. Wyoming (SW)
3. Oriel, S. S., and Tracey, J. I., Jr., 1970, U.S. Geol. Survey Prof. Paper 635, p. 22-28
4. Diamictite, consisting chiefly of conglomeratic mudstone and blocky breccia in mudstone matrix
5. Red
6. 30- > 150 m
7. Very poorly sorted, contains locally derived clasts, some extremely large, originated as channel fill and from slides on steep slopes of structural Fossil Basin
9. Unconformably overlies Mesozoic rocks; grades laterally into Bullpen Member and other basinal facies of Wasatch Formation, and intertongues with Green River Formation
10. Type area: Dempsey Ridge in Tunp Range, Tps. 23, 24, and 25 N., R. 118 W., Lincoln County.

Tupman Shale Member (Etchegoin Formation) U TPMN01
1. Pliocene, upper
2. California (SC)
3. Berryman, W. M., 1973, U.S. Geol. Survey Bull. 1332-D, p. D12-D15, D46-D53
4. Silty shale with sandstone beds
5. Olive-gray
6. 400 m
9. Overlies Reef Ridge Shale; underlies Carman Sandstone Member (Etchegoin Formation)
10. Type section: Naval Petroleum Reserve No. 1 well, 324-19R, depth-interval 1030-1430 m, Elk Hills oil field, San Joaquin Valley, Kern County.

Turkey Creek Canyon Formation TKCC01
1. Precambrian X
2. Colorado (NC)
3. Lickus, R. J., and Leroy, L. W., 1968, Colorado School Mines Quart., v. 63, no. 1, p. 149
4. Sillimanitic mica schist or gneiss and garnet-rich banded

granite gneiss
5. Gray
9. Underlies Idledale Formation
10. Type locality: Turkey Creek Canyon, NE1/4 sec. 15, T. 5 S., R. 70 W., Jefferson County.

Turquillo Member (Tererro Formation) U TRQL03
1. Upper Mississippian
2. New Mexico (NC)
3. Armstrong, A. K., and Mamet, B. L., 1974, New Mexico Geol. Soc. Guidebook 25, p. 149-151
4. Mudstone-wackestone, rich in foraminifera
6. 2 m, range 1.2-4.5 m
9. Disconformably overlies Espiritu Santo Formation or Macho Member (Tererro Formation); underlies Manuelitas Member (Tererro Formation)
10. Type section: Section 65A-16, on E side of Rincon Range, 6.4 km S of village of Turquillo on New Mexico Highway 38 and 0.8 km W on logging road into deep canyon, Mora County.

Turtle Butte Formation TRLB02
1. Miocene, lower
2. South Dakota (SC)
3. Skinner, M. F., Skinner, S. M., and Gooris, R. J., 1968, Am. Mus. Nat. History Bull., v. 138, art. 7, p. 381-436
4. Sandy siltstone and claystone
5. Gray to white
6. 21 m
9. Unconformably overlies Rosebud Formation; unconformably underlies Pliocene rocks
10. Type locality: W end of Turtle Butte, NW1/4 sec. 9, T. 95 N., R. 76 W., 6.4 km NW of Wewela, Tripp County.

Turtle Cove Member (John Day Formation) TLCV01
1. Miocene, lower
2. Oregon (C)
3. Fisher, R. V., and Rensberger, J. M., 1972, California Univ. Pubs. Geol. Sci., v. 101, p. 10
4. Diagenetically altered tuffs, some zeolitized
5. Green, buff, pale-red
6. 370 m
9. Overlies Big Basin Member; underlies Kimberly Member
10. Type section: Sec. 32, T. 10 S., R. 26 E., Foree State Park, Picture Gorge Quadrangle, Grant County.

Tussing Sandstone TSNG01
1. Lower Permian
2. Idaho (SE)
3. Cramer, H. R., 1971, Am. Assoc. Petroleum Geologists Bull., v. 55, no. 10, p. 1792
4. Sandstone and calcareous quartzite with interbedded limestone
5. Tan, brown, light-gray
6. 800 m
9. Overlies unnamed limestone; underlies Trail Canyon Limestone
10. Type section: Along dividing ridge of Sublett Range between Tussing Canyon and Alney Canyon. Base of section is in SE1/4 sec. 13, and top is in NE1/4 sec. 22, T. 12 S., R. 30 E., Power County.

Twin Knobs Formation U TKBS01
1. Middle Cambrian
2. Idaho (SE), Utah
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 20-22, 37
4. Claystone, calcareous sandstone, quartzite, and limestone
5. Brown, green
6. 180 m
8. 3 informal members and uppermost Naomi Peak Tongue
9. Overlies and intertongues with Brigham Quartzite; underlies Lead Bell Shale or its Spence Tongue
10. Type section: Near S knob of Twin Knobs, SW1/4 sec. 7, T. 10 S., R. 39 E., Bancroft Quadrangle, Bannock and Caribou Counties, Idaho. Named for Twin Knobs N of Windy Pass, sec. 12, T. 10 S., R. 38 E.

Twin Mountains Rhyolite TNMS01
1. Oligocene
2. Colorado (SC)
3. Mertzman, S. A., Jr., 1971, New Mexico Geol. Soc. Guidebook 22, p. 265-272
4. Silicified and mineralized rhyolite
10. Type locality: Outcrops W of Summer Coon Volcano, secs. 17-20 and secs. 29-32, T. 41 N., R. 5 E., Saguache County.

Twin Sisters Pumice Conglomerate Bed (Mitchell Pass Member of Gering Formation) TSSR02
1. Miocene
2. Nebraska (WC)
3. Vondra, C. F., Schultz, C. B., and Stout, T. M., 1969, Nebraska Geol. Survey Paper 18, p. 1, 4
4. Pumice-pebble conglomerate in matrix of silty sandstone
6. 2 m
9. Disconformably overlies Helvas Canyon Member
10. Type locality: Twin Sisters, SW1/4SW1/4 sec. 19, T. 20 N., R. 53 W., Banner County.

Twisp Formation (Newby Group) TWSP01
1. Lower to Middle Jurassic
2. Washington (NC)
3. Barksdale, J. D., 1975, Washington Div. Geology and Earth Resources Bull. 68, p. 22-24
4. Argillites and interbedded lithic sandstones
5. Black
6. 1200 m
7. Thin-bedded; weathers into long, sharp, pencil-like fragments
9. Unconformably underlies Buck Mountain Formation
10. Type area: Channel walls of Methow and Lower Chewack Rivers, between Twisp and point 3.2 km N of Winthrop, Okanogan County.

Two Harbors Basalt (North Shore Group) THRB01
1. Precambrian Y
2. Minnesota (EC)
3. Green, J. C., 1972, in Sims, P. K., and Morey, G. B., eds., Minnesota Geol. Survey Centennial Volume, p. 317, 321
4. Melaphyres and quartz tholeiites
6. 310 m
9. Overlies Larsmont Ophitic Basalt; underlies Gooseberry River

Basalt
10. Type area: Two Harbors, Burlington Bay area, Lake County.

Two Ocean Formation (Thorofare Creek Group) U TOCN03
1. Eocene, middle
2. Wyoming (NW)
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Andesitic volcaniclastic alluvial facies, grading into vent facies
6. 610 m
9. Unconformably overlies Langford Formation; underlies Tepee Trail and Wiggins Formations
10. Type area: Along E edge of Two Ocean Plateau, SE Yellowstone National Park, Park County.

Two Rivers Till TRVR11
1. Pleistocene
2. Wisconsin (EC), Michigan
3. Evenson, E. B., 1973, Geol. Soc. America Bull., v. 84, no. 7, p. 2281-2297
4. Clay, till
5. Red
6. 3 m
9. Overlies Manitowoc Till Member (Wedron Formation)
10. Type locality: Gravel pit on E side of State Highway 42 on N edge of Two Rivers, Manitowoc County, Wis.

Tyee Mountain Member (Tyee Formation) TMNN01
1. Eocene, middle
2. Oregon (WC)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 20-22
4. Sandstone
5. Bluish-gray to gray
6. 460 m
7. Rhythmically bedded
9. Overlies Roseburg Formation; underlies Hubbard Creek Member (Tyee Formation)
10. Type area: Tyee Mountain, N of Coles Valley near upstream entrance of Umpqua River Canyon through Coast Range, Douglas County.

Tyndall Sand TNDL01
1. Pleistocene (Kansan)
2. South Dakota (SE)
3. Christensen, C. M., 1974, South Dakota Geol. Survey Bull. 21, pt. 1, p. 12
5. White
6. 8 m
7. Horizontal and crossbedded
10. Type section: Exposures along creek valley, SW1/4SW1/4NE1/4SE1/4 sec. 13, T. 92 N., R. 61 W., Bon Homme County. Named for town of Tyndall.

Uchee Complex UCHE01
1. Paleozoic, lower
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc.

Guidebook 8, p. 39
4. Migmatite, granite gneiss
7. Coarsely crystalline
8. Phenix City Gneiss, and informal Mulberry gneiss, Standing Boy quartz biotite, and Hudson Rapids ultramafic amphibolite.
10. Type area: Lee County, Ala., and Muscogee and Talbot Counties, Ga.

Uinkaret Basalt UNKR01
1. Cenozoic, upper or Quaternary
2. Arizona (NW), Utah
3. Best, M. G., and Brimhall, W. H., 1970, Utah Geol. Soc. Guidebook 23, p. 62, 66-67
4. Basalt with olivine phenocrysts
5. Black
7. Flows and ejecta
9. Interlayered with Grand Wash Basalt
10. Type area: Uinkaret Plateau, Mohave County, Ariz.

Underdown Tuff UDRD02
1. Oligocene
2. Nevada (C)
3. Bonham, H. F., 1970, Nevada Bur. Mines Map 38
4. Densely welded rhyolite ash-flow tuff units separated by sandstone conglomerate
5. Brownish-gray
6. 490 m
7. Columnar jointed
9. Unconformably overlies Pablo Formation; unconformably underlies Bonita Canyon Formation
10. Type locality: S wall of Underdown Canyon at its mouth, Shoshone Mountains, Lander-Nye County line.

Undine Falls Basalt U UDFL02
1. Pleistocene
2. Wyoming (NW), Montana
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B12
4. Thin basaltic flows
6. 6 m
9. Overlies Cretaceous shale and sandstone or Mount Jackson Rhyolite; conformably underlies Lava Creek Tuff
10. Type locality: Cliff on N side of Lava Creek Canyon W of Undine Falls on Lava Creek near Mammoth-Tower Junction Road, S of Mount Everts, Yellowstone National Park, Park County, Wyo.

University Sand UVRS02
1. Pleistocene
2. Louisiana (C)
3. Smith, C. G., Jr., 1969, Louisiana Water Res. Research Inst. Bull. GT-4, p. 11, 13
4. Sand and gravel aquifer
6. 48 m
7. River channel deposit
9. Overlies "400-600 ft" aquifer which is continuous with Citronelle Formation; underlies "alluvial aquifer" and Port Hickey terrace
10. Type section: Well EB-820, sec. 54, T. 7 S., R. 1 W., East Baton Rouge Parish.

Upper Basin Member (Plateau Rhyolite) U UPRB01
1. Pleistocene
2. Wyoming (NW)
3. Christiansen, R. L., and Blank, R. H., Jr., 1972, U.S. Geol. Survey Prof. Paper 729-B, p. B12-B13
4. Postcaldera rhyolitic lava flows and pyroclastic deposits
9. Overlies Mallard Lake Member (Plateau Rhyolite) and Lava Creek Tuff; underlies Central Plateau Member (Plateau Rhyolite)
10. Type area: Upper Geyser Basin along Firehole River, WC Yellowstone National Park, Teton County.

Ute Ridge Tuff U URDG01
1. Oligocene, upper
2. Colorado (SW)
3. Lipman, P. W., Steven, T. A., Luedke, R. G., and Burbank, W. S., 1973, U.S. Geol. Survey Jour. Research, v. 1, no. 6, p. 630-631
4. Densely welded phenocryst-rich quartz latite ash-flow tuff
5. Red to brown
6. 200 m
9. Overlies early intermediate-composition lavas and breccias of Oligocene age; underlies Blue Mesa Tuff
10. Type area: Lower slopes of Ute Ridge S of upper Rio Grande, in Rio Grande Pyramid Quadrangle, Hinsdale County.

Uvada Granite UVAD01
1. Cenozoic, lower
2. Nevada (EC)
3. Best, M. G., Armstrong, R. L., Graustein, W. C., Embree, G. F., and Ahlborn, R. C., 1974, Geol. Soc. America Bull., v. 85, no. 8, p. 1277-1286
4. Quartz-perthite-plagioclase-biotite granite with microcline-perthite phenocrysts
5. Dark-gray
7. Cataclastic, fine-grained
9. Intruded by Skinner Canyon Granite
10. Type area: S of Uvada, Kern Mountains pluton, White Pine County.

Uyak Formation U UYAK01
1. Triassic
2. Alaska (SC)
3. Moore, G. W., 1969, U.S. Geol. Survey Bull. 1274-A, p. A28
4. Shale, tuff, sandstone, chert, limestone, pillow basalt
5. Black, green
6. 6000 m
9. Thrust over younger rocks to SE
10. Type section: W shore of Uyak Bay, Kodiak Island.

Valle Grande Member (Valles Rhyolite) U VLGD01
1. Pleistocene
2. New Mexico (NC)
3. Bailey, R. A., Smith, R. L., and Ross, C. S., 1969, U.S. Geol. Survey Bull. 1274-P, p. P16-P17
4. Rhyolite domes, flows, and associated pyroclastic rocks
9. Unconformably overlies Redondo Creek Member in NW; disconformably underlies Battleship Rock, El Cajete, and Banco Bonito Members
10. Type locality: Valles Caldera moat, Santo Domingo Pueblo

Quadrangle, Sandoval County. Named for Valle Grande in SE Valles Caldera.

Vandalia Till/Member (Glasford Formation) VNDL02
1. Pleistocene (Illinoian)
2. Illinois (C), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 58
4. Compact sandy till
5. Gray
6. Range 7.5-15 m
9. Overlies Mulberry Grove Silt Member, Smithboro Till Member (Glasford Formation), or Tilton Till Member (Banner Formation); underlies Hagarstown or Roby Silt Member (Glasford Formation), or Batestown Till Member (Wedron Formation)
10. Type locality: Vandalia Bridge section, along Kaskaskia River, at Vandalia, NW1/4NE1/4SE1/4 sec. 16, T. 6 N., R. 1 E., Fayette County, Ill.

Vanderlehr Formation U VDRL01
1. Precambrian
2. South Dakota (SW)
3. Redden, J. A., 1968, U.S. Geol. Survey Prof. Paper 297-F, p. 347-354
4. Metamorphic rocks, largely amphibole schist, quartzite, metaconglomerate, and calcite-tremolite gneiss
5. Variegated, brown, gray, green, white
6. 610 m
9. Base not exposed, but believed to be lowermost Precambrian rocks in area; underlies Loues Formation, probably conformably
10. Type section: Along Vanderlehr Creek from few hundred m W of bench mark 5821 to point approximately 300 m N of NW corner of sec. 26, T. 2 S., R. 3 E., and thence to N along small valley to contact with Paleozoic rocks, Pennington County.

Vernon Fork Member (Jeffersonville Limestone)/(Grand Tower Limestone) VRFK01
1. Middle Devonian
2. Indiana (WC), Illinois
3. Droste, J. B., and Shaver, R. H., 1975, Am. Assoc. Petroleum Geologists Bull., v. 59, no. 3, p. 393-412
4. Dolomite, with quartz sand and bentonite
6. 5 m
7. Fine-grained, laminated
8. Pendleton Sandstone Bed; Tioga Bentonite Bed
9. Overlies and underlies unnamed limestone members of Jeffersonville Limestone
10. Type area: Near Vernon and North Vernon along Vernon Fork of Muscatatuck River, Jennings County, Ind. Reference section: Berry Materials Corp. quarry at N edge of North Vernon, NE1/4 sec. 34, T. 7 N., R. 8 E.

Vesper Bed (Tully Limestone) VSPR01
1. Middle Devonian
2. New York (C)
3. Heckel, P. H., 1973, Geol. Soc. America Spec. Paper 138, p. 24
4. Siltstone, silty limestone
6. < 1 m
7. Thin-bedded

9. Overlies Tully Valley Bed; underlies Carpenter Falls Bed
10. Type area: SE of Vesper on W side of Tully Valley, Onondaga County.

Veyo Basalt VEYO01
1. Quaternary
2. Utah (SW)
3. Embree, G. F., 1970, Brigham Young Univ. Geology Studies, v. 17, pt. 1, p. 75-76
4. Basalt flows
5. Black
6. 18 m
7. Glassy, vesicular, poorly jointed
8. Five flows
9. Overlies Gunlock Basalt or Jurassic or Cretaceous rocks
10. Type locality: Around flanks of Veyo Cone, Washington County.

Victor Member (Fiddlers Green Formation) VCTR08
1. Upper Silurian
2. New York (WC)
3. Ciurca, S. J., Jr., 1973, New York Geol. Assoc. Guidebook 45, Trip D, p. 1-14
4. Dolostone, limestone
6. 6 m
7. Massive, crystalline, fossiliferous, mineralized vugs
9. Overlies Morganville Waterlime Member; underlies Phelps Waterlime Member
10. Type section: Mud Creek, East Victor, S of New York Highway 96, Ontario County. Reference section: along New York State Thruway N of Phelps.

Victorio Hills Formation (El Paso Group) VCHL01
1. Lower Ordovician
2. New Mexico (SW), Texas
3. LeMone, D. V., 1969, New Mexico Bur. Mines and Mineral Resources Circ. 104, p. 20
4. Carbonate rock
6. 30 m, range 30-88 m
7. Fossiliferous
9. Overlies Cooks Formation; disconformably underlies José Formation
10. Type section: Victorio Mountains, SE1/4NE1/4 sec. 28, T. 24 S., R. 12 W., Luna County.

View Formation (Dove Creek Group) VIEW01
1. Paleozoic
2. Idaho (SC)
3. Armstrong, R. L., 1968, Geol. Soc. America Bull., v. 79, no. 10, p. 1302-1303
4. Schist and quartzite with conglomerate lenses
5. Gray
6. 370 m
9. Overlies Cassia Dolomite
10. Type section: SW1/4 sec. 34, T. 11 S., R. 24 E., Cassia County. Named for town of View in Snake River plain to W.

Vivi Quartz Diorite Porphyry U VIVI01
1. Eocene (?)
2. Puerto Rico (C)

3. Mattson, P. H., 1968, U.S. Geol. Survey Geol. Inv. Map I-519
4. Quartz diorite porphyry, hydrothermally altered, with copper mineralization
5. Greenish-gray
7. Small stocks
9. Intrudes rocks of Eocene age
10. Type locality: Exposures in exploratory adit of Ponce Mining Company at 575 m elevation, 40,227 N., 125,750 E., Municipio de Adjuntas, Adjuntas Quadrangle.

Wacoochee Complex WCCH01

1. Precambrian
2. Alabama (EC), Georgia
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 34
4. Feldspathic mica schist and biotite gneiss with cataclastic augen gneiss
7. Lowest unit of Pine Mountain block between Towaliga and Goat Rock fault zones
9. Underlies Pine Mountain Group; cut by granitic plutons.
10. Type locality: Not stated. Probably named for community of Wacoochee Valley, Lee County, Ala.

Wadleigh Limestone U WDLG01

1. Middle and Upper Devonian
2. Alaska (SE)
3. Eberlein, G. D., and Churkin, Michael, Jr., 1970, U.S. Geol. Survey Bull. 1284, p. 37-42
4. Fossil-fragmental limestone with beds of argillaceous limestone and calcareous shale
5. Gray
6. 300 m
7. Massive, thick- to medium-bedded
9. Conformably overlies Karheen Formation or Coronados Volcanics; conformably underlies or is intercalated with Port Refugio Formation, or underlies Peratrovich Formation
10. Type locality: S end of Wadleigh Island, from SW shore N of Alberto Islands to SE shore at triangulation station Upat.

Wadsworth Till Member (Wedron Formation) WDSR01

1. Pleistocene (Wisconsinan)
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 70
4. Clayey till associated with moraines
5. Gray
6. 2 m
9. Overlies Haeger Till Member (Wedron Formation) to N and Yorkville Till Member (Wedron Formation) to S; underlies Carmi Member (Equality Formation), Shorewood Till Member (Wedron Formation), or Waukegan Member (Lake Michigan Formation)
10. Type section: Roadcut at intersection of Illinois Highway 131 and Wadsworth Road, 3.2 km E of Wadsworth, SE1/4SE1/4SW1/4 sec. 30, T. 46 N., R. 12 E., Lake County.

Wagner Formation WGNR02

1. Pleistocene (Kansan)
2. South Dakota (SE)
3. Hedges, L. S., 1975, South Dakota Geol. Survey Bull. 22, pt. 1,

p. 15-19
4. Gravelly sand
5. Pinkish "rainbow sand"
6. 18 m
7. Unconsolidated non-glacial, fluvial channel deposit
9. Overlies Cretaceous bedrock or glacial till of probable Kansan age; underlies glacial deposits of Illinoian to late Wisconsinan age
10. Type section: Test hole 9.6 km NW of Wagner, NW1/4SW1/4SW1/4NW1/4 sec. 14, T. 96 N., R. 64 W., Charles Mix County.

Wah Wah Summit Formation WWSM01
1. Upper Cambrian
2. Utah (SW)
3. Hintze, L. F., and Robison, R. A., 1975, Geol. Soc. America Bull., v. 86, no. 7, p. 881-891
4. Dolomitic limestone
5. Gray, mottled
6. 300 m
8. Informal lower ledge and upper white marker members
9. Overlies Fish Springs Member (Trippe Limestone); underlies Orr Formation
10. Type section: 14 km N of Wah Wah Summit highway pass in Wah Wah Mountains, NE1/4 sec. 23, T. 25 S., R. 16 W., Millard County.

Waimanalo Formation WMNL01
1. Pleistocene
2. Hawaii (NC)
3. Lum, Daniel, and Stearns, H. T., 1970, Geol. Soc. America Bull., v. 81, no. 1, p. 11-13
4. Coral reef facies and calcareous sand lagoonal-deltaic facies
5. White, brown
6. Range 11-14 m
9. Unconformably overlies Bellows Field Formation; unconformably underlies deposits of late Pleistocene age
10. Type locality: Not stated. Named for type locality of Waimanalo stand of the sea, SE Oahu Island.

Walcott Member (Kwagunt Formation) WLCT06
1. Precambrian Y
2. Arizona (NC)
3. Ford, T. D., and Breed, W. J., 1973, Geol. Soc. America Bull., v. 84, no. 4, p. 1243-1260
4. Dolomite, shale
5. Black
6. 25 m
8. Informal flaky dolomite bed
9. Overlies Awatubi Member (Kwagunt Formation); underlies Sixty Mile Formation with erosional unconformity
10. Type section: Head of Walcott Glen and upper part of Nankoweap Butte, E Grand Canyon, lat 36°15′ N., long 111°50′ W., Coconino County.

Wales Canyon Tuff Member (Dry Hollow Formation) WLSC01
1. Oligocene
2. Utah (SW)
3. Caskey, C. F., and Shuey, R. T., 1975, Utah Geology, v. 2,

no. 1, p. 17-25
6. 200 m
9. Overlies Bullion Canyon Volcanics; underlies Clear Creek Tuff Member (Dry Hollow Formation)
10. Type locality: E side of Wales Canyon, near Cove Fort, N of U.S. Highway I-70, and Utah Highway 4, Millard County.

Walker Andesite Breccia (Sierra Blanca Volcanics) WLKR03
1. Oligocene
2. New Mexico (C)
3. Thompson, T. B., 1972, Geol. Soc. America Bull., v. 83, no. 8, p. 2341-2349
4. Andesite flows and breccia
5. Reddish-brown
6. 720 m
8. Spring Canyon Member
9. Overlies McRae Formation; underlies Church Mountain Latite, Godfrey Hills Trachyte, or Nogal Peak Trachyte (Sierra Blanca Volcanics)
10. Type locality: Lat 33°18′ to 33°38′ N., long 106° to 105°30′ W., Lincoln County and N Otero County. Named for exposures near Walker Ranch.

Wallaces Peak Tuff Member (Needles Range Formation) WCPK04
1. Oligocene
2. Utah (SW)
3. Best, M. G., Shuey, R. T., Caskey, C. F., and Grant, S. K., 1973, Geol. Soc. America Bull., v. 84, no. 10, p. 3272-3273
4. Tuff
5. Gray
6. 67 m
7. Poorly welded
9. Overlies Lund Tuff Member; underlies Isom Formation
10. Type section: N side of Wallaces Peak, S of Wah Wah Springs, sec. 11, T. 27 S., R. 15 W., Beaver County.

Wall Lake Latite WLLK03
1. Miocene
2. New Mexico (SW)
3. Elston, W. E., 1968, Arizona Geol. Soc. Southern Arizona Guidebook III, p. 234, 238
9. Overlies Deadwood Gulch Rhyolite; underlies Bearwallow Mountain Formation
10. Type locality: Not stated. Named for Wall Lake S of Beaverhead, Mogollon Plateau, Grant County.

Wall Mountain Tuff U WLMN02
1. Oligocene
2. Colorado (C)
3. Epis, R. C., and Chapin, C. E., 1974, U.S. Geol. Survey Bull. 1395-C, p. C1, C4, C7-C15
4. Tuff
5. Weathers reddish-brown to yellowish-buff
6. 27 m
9. Overlies Echo Park Alluvium; underlies Tallahassee Creek Conglomerate
10. Type locality: Along S end of Wall Mountain, sec. 32, T. 16 S., R. 73 W., EC Black Mountain Quadrangle, Fremont County.

Walnut Grove Limestone Member (Lingle Formation) WLGV02
1. Middle Devonian
2. Illinois (SC)
3. North, W. G., 1969, Illinois Geol. Survey Circ. 441, p. 29-31, 43-44
4. Dolomitic, cherty, glauconitic limestone with interbedded shale
5. Brown
6. 9 m, range 3-15 m
7. Fine-grained, fossiliferous
8. Rendleman Oolite Bed
9. Overlies Misenheimer Shale Member (Lingle Formation); grades laterally into Sweetland Creek Shale; underlies Alto Formation
10. Type section: Outcrop near top of gully of small tributary to Clear Creek, 3.2 km S of town of Alto Pass, SE1/4SE1/4SW1/4 sec. 22, T. 11 S., R. 2 W., Union County. Named for Walnut Grove School.

Walsh Formation WLSH01
1. Holocene
2. North Dakota (NE)
3. Bluemle, J. P., 1973, North Dakota Geol. Survey Bull. 57, pt. 1, p. 33-36
4. Clay, sand and silt, and gravel facies
5. Gray
6. Range < 3-7 m
7. Mammal bones, organic material
9. Overlies Coleharbor Group
10. Type area: Tps. 157-158 N., Rs. 53-55 W., Walsh County. Named for Walsh County, where it is widespread.

Wapiti Formation (Sunlight Group) U WPIT02
1. Eocene, lower or middle
2. Wyoming (NW), Montana
3. Nelson, W. H., and Pierce, W. G., 1968, U.S. Geol. Survey Bull. 1254-H, p. H1-H9
4. Lava flows and pyroclastic breccia, sandstone, siltstone, and conglomerate beds
6. Range 520-1160 m
8. Jim Mountain Member
9. Conformably overlies Mount Wallace Formation (Sunlight Group), or discordantly overlies Cathedral Cliffs and Willwood Formations or Lamar River Formation (Washburn Group); conformably underlies Trout Peak Trachyandesite
10. Type section: Jim Mountain, N of Wapiti Post Office, 29 km W of Cody, Park County, Wyo.

Waresville Formation (Dadeville Complex) WRVL09
1. Paleozoic, lower
2. Georgia (WC), Alabama
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 26-27
4. Interlayered metavolcanic rocks including amphibolite, chlorite-actinolite schist, metaquartzite
10. Type locality: Not stated. Named for Waresville, Heard County, Ga.

Wasco Member (Henry Formation) WSCO01
1. Pleistocene (Wisconsinan)
2. Illinois (NE)

3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 72
4. Sand and gravel with boulders and till lenses
6. 5 m
7. Kames, eskers, deltas
10. Type section: Gravel pit along Chicago and Great Western Railroad, SE1/4NW1/4 sec. 24, T. 40 N., R. 7 E., Kane County. Named for town of Wasco.

Washburn Group (Absaroka Supergroup) U WSBR03
1. Eocene, lower and middle
2. Wyoming (NW), Montana
3. Smedes, H. W., and Prostka, H. J., 1972, U.S. Geol. Survey Prof. Paper 729-C, p. 1-33
4. Lavas composed of hornblende and pyroxene andesite, biotite andesite, and dacite; minor basaltic lavas and rhyodacite ash-flow tuffs
6. 910 m
8. Sepulcher Formation with its Elk Creek Basalt, Lost Creek, Daley Creek and Fortress Mountain Members, Lamar River Formation with its Elk Creek Basalt Member, Cathedral Cliffs Formation, Golmeyer Creek Volcanics, Hyalite Peak Volcanics
9. Unconformably overlies rocks of Precambrian to Paleocene age; underlies Sunlight Group or Thorofare Creek Group
10. Type area: Washburn Range, NC Yellowstone National Park, Park County, Wyo.

Washington Island Flow (Portage Lake Volcanics) U WGID01
1. Precambrian Y (middle Keweenawan)
2. Michigan (NW)
3. Huber, N. K., 1973, U.S. Geol. Survey Prof. Paper 754-C, p. C20
4. Ophite, "glomeroporphyritic," with poikilitic augite crystals and characteristic dark greenish chlorite splotches
6. 60 m, range 0-60 m
9. Erupted after Greenstone Flow and before Tobin Harbor Flow
10. Type locality: S side of Washington Island, W Isle Royale, Keweenaw County.

Watahomigi Formation (Supai Group) U WTMG01
1. Lower and Middle Pennsylvanian (Morrowan and Atokan)
2. Arizona (NW)
3. McKee, E. D., 1975, U.S. Geol. Survey Bull. 1395-J, p. J1-J4, J6, J9-J11
4. Limestone and mudstone, with conglomerate
5. Pale-red to dark-red
6. 65 m
7. Forms ledgy slope
9. Unconformably overlies Redwall Limestone; conformably underlies Manakacha Formation (Supai Group)
10. Type section: W side of Havasu Canyon about 2.4 km NW of Supai village and directly below Watahomigi Point, Coconino County.

Waukegan Member (Lake Michigan Formation) WKGN01
1. Holocene
2. Illinois (NE), Michigan, Wisconsin
3. Lineback, J. A., Ayer, N. J., and Gross, D. L., 1970, Illinois State Geol. Survey Environmental Geology Notes 35, p. 6, 8
4. Silt or silty clay, sand, and gravel
5. Gray to brown

6. < 0.2 m
7. Offshore facies, becoming coarser shoreward
9. Overlies Lake Forest or Winnetka Member (Lake Michigan Formation), or Wadsworth Till Member (Wedron Formation); grades laterally into shore facies of Ravinia Sand Member (Lake Michigan Formation)
10. Type section: Core 143, depth-interval 0-16 cm, water depth 119 m, lat 42°21.8′ N., long 87°10.8′ W., Lake Michigan, 51 km E of Waukegan, Lake County, Ill.

Wawarsing Formation/Limestone (Salina Group) WRSG01
1. Upper Silurian
2. New York (SE), Pennsylvania
3. Bird, P. H., 1941, The Delaware Water Supply News, no. 62, p. 278
4. Limestone with shaly layers
5. Greenish-gray
6. 29 m
7. Fine- to medium-grained
9. Overlies Shawangunk Formation; underlies High Falls Shale
10. Type section: Underground in Shaft 2, S heading of Rondout-West Branch Tunnel at Wawarsing, Ulster County, N.Y.

Webb Formation U WEBB01
1. Lower Mississippian
2. Nevada (NE)
3. Smith, J. F., Jr., and Ketner, K. B., 1968, U.S. Geol. Survey Bull. 1251-I, p. I8-I12, I16-I17
4. Siliceous mudstone and claystone
7. Wedge-shaped unit
9. Unconformably overlies Devils Gate Limestone, Woodruff Formation, and Vinini Formation; conformably underlies Chainman Shale
10. Type section: Near N edge of sec. 19, T. 31 N., R. 53 E., and in SE1/4 sec. 13, T. 31 N., R. 52 E., 17 km SE of Carlin, Elko County. Named for exposures near Webb Creek.

Webb Canyon Gneiss U WBCN01
1. Precambrian W
2. Wyoming (NW)
3. Reed, J. C., Jr., and Zartman, R. E., 1973, Geol. Soc. America Bull., v. 84, no. 2, p. 563-565
4. Biotite-hornblende gneiss with layers of amphibolite
7. Forms large concordant bodies, medium- to coarse-grained, foliated
10. Type locality: Lower part of cliffs on NW side of Moose Creek in lower part of Webb Canyon 3 km S 78° E of Owl Peak, Teton County.

Wedron Formation U WDRN01
1. Pleistocene (Woodfordian)
2. Illinois (NE), Indiana, Michigan, Wisconsin
3. Frye, J. C., Willman, H. B., Rubin, Meyer, and Black, R. F., 1968, U.S. Geol. Survey Bull. 1274-E, p. E16-E17
4. Interbedded outwash and calcareous till, topped by gravel
6. 19 m
8. Informal Shelbyville, Bloomington, Normal, Cropsey, and Farm Ridge tills
9. Overlies Farmdale Silt or Glasford Formation; underlies

Richland Loess
10. Type section: At Wedron, Wedron Silica Company No. 1 pit, SE1/4SE1/4SW1/4 sec. 9, T. 34 N., R. 4 E., LaSalle County, Ill.

Wehutty Formation (Great Smoky Group) U WTTY01
1. Precambrian Z
2. North Carolina (WC), Georgia, Tennessee
3. Hernon, R. M., 1969, U.S. Geol. Survey Bull. 1274-A, p. A49-A52
4. Alternating phyllitic schists and metasandstones ranging from quartzite to metagraywacke
6. > 1200 m
9. Overlies Copperhill Formation; underlies Hughes Gap Formation
10. Type locality: Roads running NW-SE from Mt. Olive Church, NE1/4 Isabella Quadrangle, Cherokee County, N. C. Named for town of Wehutty.

Weiders Member (Shawangunk Formation) U WDRS12
1. Upper Ordovician(?) and Lower Silurian
2. Pennsylvania (EC)
3. Epstein, J. B., and Epstein, A. G., 1972, U.S. Geol. Survey Prof. Paper 744, p. 2-5, 39-42
4. Conglomerate and quartzite
6. Range 15-57 m
7. Crossbedded
9. Unconformably overlies Pen Argyl Member (Martinsburg Formation); underlies Minsi Member (Shawangunk Formation)
10. Type section: Along abandoned Lehigh and New England Railroad in Lehigh Gap, Palmerton Quadrangle, Northampton County. Named for Weiders Crossing, 300 m S of Lehigh Gap.

Wescogame Formation (Supai Group) U WCGM01
1. Upper Pennsylvanian (Virgilian)
2. Arizona (NW)
3. McKee, E. D., 1975, U.S. Geol. Survey Bull. 1395-J, p. J1-J6, J8-J9
4. Sandstone with minor mudstone
5. Pinkish-gray to pale-red or reddish-orange
6. 61 m
7. Massive, crossbedded, forms prominent cliff
9. Unconformably overlies Manakacha Formation; unconformably underlies Esplanade Sandstone
10. Type section: Along Apache trail which begins in Supai village and winds up on E side of Havasu Canyon toward Manakacha Point, Coconino County.

West Foreland Formation (Kenai Group) WFLD01
1. Tertiary
2. Alaska (C)
3. Calderwood, K. W., and Fackler, W. C., 1972, Am. Assoc. Petroleum Geologists Bull., v. 56, no. 4, p. 739-754
4. Tuffaceous siltstone-claystone with conglomeratic sandstone and coal beds
5. Gray, white
6. 270 m
9. Unconformably overlies Mesozoic strata; unconformably underlies Hemlock Conglomerate (Kenai Group)
10. Type section: Pan American et al West Foreland No.1 well, 27 m from S line and 20 m from E line, sec. 21, T. 8 N., R. 14 W., Seward Base and Meridian, Cook Inlet Basin.

West Fork Formation (Lemhi Group) U WFRK04
1. Precambrian Y
2. Idaho (C)
3. Ruppel, E. T., 1975, U.S. Geol. Survey Prof. Paper 889-A, p. 1, 5-10, 18
4. Siltite, with lenticular algal limestone
5. Medium to dark greenish-gray
6. 460 m
7. Mostly thick-bedded to massive, cross-laminated, ripple-marked, blocky fractures
9. Gradationally overlies Inyo Creek Formation; gradationally underlies Big Creek Formation
10. Type locality: Head of West Fork of Big Creek in S part of Patterson Quadrangle, Lemhi Range, Lemhi County.

West Potrillo Basalt (Potrillo Volcanics) WPRL01
1. Pleistocene
2. New Mexico (SC)
3. Hoffer, J. M., 1973, El Paso Geol. Soc. Guidebook 7, p. 26-32
4. Basalt flows
6. Range 120-300 m
7. Cinder cones, maar cones
10. Type area: West Potrillo Mountains, Dona Ana County.

Whetstone Formation/Group WTSN04
1. Precambrian Z
2. South Carolina (NW)
3. Hatcher, R. D., 1969, South Carolina Div. Geology Geol. Notes, v. 13, no. 4, p. 105-147
4. Metamorphosed sediments including quartz-oligoclase-biotite-muscovite metasandstone and muscovite-biotite-quartz-oligoclase schist
10. Type area: Near Whetstone crossroads, Oconee County.

Whetstone Creek Member (Bonneterre Dolomite) WCRK13
1. Upper Cambrian
2. Missouri (SC), Arkansas, Oklahoma
3. Kurtz, V. E., Thacker, J. L., Anderson, K. H., and Gerdemann, P. E., 1975, Missouri Geol. Survey Rept. Inv. 55, p. 8-9, 13-15
4. Dolomite with numerous pellet glauconite and reworked brachiopod layers
6. 10 m
9. Overlies Sullivan Siltstone Member (Bonneterre Dolomite); underlies Davis Formation (Elvins Group)
10. Type section: St. Joe Minerals Corp. Core no. 64W133 (WR-1), SE1/4SE1/4 sec. 16, T. 29 N., R. 13 W., Wright County, Mo. Named for Whetstone Creek near core hole.

Whiskey Creek Formation WKCK02
1. Middle Devonian
2. Michigan (C)
3. Kesling, R. V., Segall, R. T., and Sorensen, H. O., 1974, Michigan Univ., Mus. Paleontology Papers on Paleontology 7, p. 110-114
4. Dolomite, limestone, chert beds
5. Gray
6. 14 m
7. Compact, fossiliferous
9. Overlies Petoskey Formation; underlies Jordan River Formation

10. Type locality: On and near shore of Lake Michigan between Norwood and Whiskey Creek, 0.8 km S of Whiskey Creek, SE1/4 sec. 22 and NE1/4 sec. 27, T. 33 N., R. 9 W., SW Charlevoix County.

Whitcomb Quartzite U WCMB01

1. Lower Cretaceous(?)
2. Arizona (SC)
3. Cooper, J. R., 1971, U.S. Geol. Survey Prof. Paper 658-D, p. D1-D2, D24-D26
4. Orthoquartzite with lenticular beds of rhyolitic tuff
5. Yellowish-gray
6. Range 90-180 m
9. Disconformably overlies Rodolfo Formation; disconformably underlies Angelica Arkose
10. Type area: Exposures at Whitcomb Hill W of Helmet Peak, N for 1.2 km, Twin Buttes Quadrangle, Pima County.

White Creek Member (Poultney Formation) WCRK08

1. Lower Ordovician
2. New York (EC), Vermont
3. Potter, D. B., 1972, New York State Mus. and Sci. Service Map and Chart Ser. 19, p. 19-20
4. Slate containing ribbon limestone, and thin-bedded calcareous quartzite in slate matrix
5. Gray to black
6. 52 m
9. Overlies Hatch Hill Formation; underlies Owl Kill Member (Poultney Formation)
10. Type area: Fields and hills from 0.8 to 1.6 km NE of Center White Creek, Rensselaer County, N.Y.

Whitehorn Granodiorite U WTRN05

1. Upper Cretaceous
2. Colorado (C)
3. Wrucke, C. T., 1974, U.S. Geol. Survey Bull. 1394-H, p. H1-H8
4. Granodiorite
5. Gray
7. Pluton
9. Intrudes Precambrian igneous and metamorphic rocks and Paleozoic sedimentary rocks; underlies Tertiary volcanic rocks
10. Type locality: Cameron Mountain, near center of pluton, NE of Salida on E side of Arkansas Valley and W of ghost mining town of Whitehorn, Chaffee County.

White Mountain Volcanics WMNN01

1. Tertiary
2. Idaho (SC)
3. Dover, J. H., 1969, Idaho Bur. Mines and Geology Pamph. 142, p. 49-50
4. Heterogeneous succession of tuffaceous and porphyritic flows, rhyolite, and rhyolite breccia
6. > 600 m
7. Flow-banded, layered
9. Overlies upper Paleozoic clastic rocks
10. Type area: Exposed in White Mountain and Bellas Canyon areas, Custer County.

White Point Sandstone Member (Summerville Formation) WTPN01
1. Upper Jurassic
2. Utah (SC)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 24-26
4. Alternating sandstone and siltstone beds
5. Grayish-white and reddish-brown
6. 24 m
9. Overlies Entrada Sandstone; unconformably underlies Salt Wash Member (Morrison Formation)
10. Type section: 4.8 km from White Point, SW1/4 sec. 11, T. 38 S., R. 5 E., near boundary of Kane and Garfield Counties.

White River Ash Bed (Engineer Loess) U WRVR29
1. Holocene
2. Alaska (EC)
3. Lerbekmo, J. F., Hanson, L. W., and Campbell, F. A., 1968, Internat. Geol. Cong. 23, Prague, Proc., v. 2, p. 283-295
4. Tephra ash
6. 0.75 m
10. Type section: N side of White River, about 13 km downstream from source of river, McCarthy D-2 Quadrangle.

Whitestone Formation WTSN06
1. Tertiary
2. Washington (NE)
3. Marjaniemi, D. K., and Robins, J. W., 1975, Lucius Pitkin, Inc., prepared for U.S. Energy Research and Devel. Adm., p. 1-64
4. Basal conglomerate, tuffaceous sandstone, and crystal tuff
5. Gray, yellow, green
6. 390 m
9. Overlies Anarchist Group; underlies andesite
10. Type locality: Along Okanogan River, Tonasket area, Okanogan County. Measured sections at Tonasket, sec. 5, T. 37 N., R. 27 E., and Whitestone Mountain, sec. 30, T. 38 N., R. 27 E.

White Tail Ridge Member (Flournoy Formation) WTRG01
1. Eocene
2. Oregon (SW)
3. Baldwin, E. M., 1974, Oregon Dept. Geology and Mineral Industries Bull. 83, p. 18
4. Sandstone, conglomerate
6. 460 m
9. Unconformably overlies Lookingglass Formation; underlies Camas Valley Member (Flournoy Formation) or Tyee Formation
10. Type locality: Along Lookingglass Creek, Douglas County. Named for White Tail Ridge.

Wiggler Wash Member (Carmel Formation) WGLW02
1. Middle Jurassic
2. Utah (SC)
3. Thompson, A. E., and Stokes, W. L., 1970, Utah Geol. and Mineralog. Survey Bull. 87, p. 1, 2, 10-11
4. Limestone, gypsum, calcareous sandstone, gypsiferous siltstone, and shale
5. Red, gray
6. 17 m, range 15-17 m
9. Overlies Winsor Member (Carmel Formation); underlies Gunsight

Butte Member (Entrada Sandstone)
10. Type section: Wiggler Wash, 6.4 km E of Kodachrome State Park, secs. 17, 18, 19, 20, T. 38 S., R. 1 W., Kane County.

Wilber Ash Bed (Engineer Loess) U WLBR06
1. Holocene
2. Alaska (EC)
3. Péwé, T. L., 1975, U.S. Geol. Survey Prof. Paper 862, p. 18
4. Ash
5. White
6. < 0.01 m
9. Bed within Engineer Loess in Fairbanks area and N to Livengood; may be same ashfall as Jarvis Ash Bed, also in Engineer Loess
10. Type section: W wall of Wilber Creek gold placer mining cut, 10 km SE of Livengood, Livengood B-3 Quadrangle.

Wilbert Formation U WLBR05
1. Precambrian Z
2. Idaho (SE)
3. Ruppel, E. T., Ross, R. J., Jr., and Schleicher, David, 1975, U.S. Geol. Survey Prof. Paper 889-B, p. 25, 27-29, 33
4. Quartzite, with some grit and conglomerate
5. Brownish-gray to pale-red
6. 290 m, range 0-310 m
7. Poorly-sorted, laminated and cross-laminated, hematitic, partly glauconitic, and partly calcareous
9. Unconformably overlies Swauger Formation or Gunsight Formation; unconformably underlies Summerhouse Formation
10. Type section: Near Wilbert Mine at South Creek, S Lemhi Range, Butte County.

Wildcat Ridge Ash Bed (Mitchell Pass Member of Gering Formation) WCRG01
1. Miocene
2. Nebraska (WC)
3. Vondra, C. F., Schultz, C. B., and Stout, T. M., 1969, Nebraska Geol. Survey Paper 18, p. 1, 5
4. Volcanic ash and marl
5. White
6. 1.5 m
9. Lies at top of Mitchell Pass Member (Gering Formation); underlies Monroe Creek Formation
10. Type locality: Redington Gap, W1/2SE1/4 sec. 14, T. 19 N., R. 52 W., Morrill County.

Wild Cherry Formation WLDC08
1. Oligocene
2. Texas (WC)
3. Anderson, J. E., Jr., 1968, Texas Univ. Bur. Econ. Geology Quad. Map 36, p. 8-9
4. Porphyritic rhyolite, vitrophyre, tuff
5. Purplish-gray to brown, pink
6. 108 m, range 34-108 m
7. Foliated
9. Overlies Barrell Springs, Eppenauer Ranch, Merrill, or Mount Locke Formation; underlies Jones, Medley, or Goat Canyon Formation
10. Type section: N slope of hill on S side of Texas Highway 118, 1.3 km W of Wild Cherry Creek, Jeff Davis County.

Wild Cow Formation (Madera Group) U WLDC10
1. Upper Pennsylvanian and Lower Permian
2. New Mexico (C)
3. Myers, D. A., 1973, U.S. Geol. Survey Bull. 1372-F, p. F8-F11
4. Sandstone and conglomerate, siltstone and shale, and limestone in rhythmic sequences
5. Gray, yellow, red
6. Range 160-230 m
8. Sol se Mete, Pine Shadow, and La Casa Members
9. Conformably overlies Los Moyos Limestone (Madera Group); underlies Bursum Formation (Madera Group) or Abo Formation
10. Type section: Exposures on W side of Priest Canyon in E-draining ravine that cuts hogback, sec. 7, T. 3 N., R. 5 E., Valencia County. Named for Wild Cow Spring, NE1/4 sec. 19, T. 4 N., R. 5 E., Torreon Quadrangle, Torrance County.

Wildhorse Member (Conejos Formation) WLDR04
1. Oligocene
2. Colorado (SC)
3. Burroughs, R. L., 1971, New Mexico Geol. Soc. Guidebook 22, p. 280
4. Mudflows and basaltic-appearing flow breccia grading upward into autobreccia and overlying lava flows
6. 200 m
7. Crossbedded fluvial sediments
9. Unconformably underlies La Sauses Member
10. Type locality: Exposures at N end of Wildhorse Ridge, 2.8 km E of La Sauses, along lower portion of scarp, Conejos County.

Wildhorse Branch Formation U WDBC01
1. Precambrian or Cambrian
2. South Carolina (C)
3. Secor, D. T., and Wagener, H. D., 1968, South Carolina Div. Geology Geol. Notes, v. 12, no. 4, p. 67-84
4. Greenstone, felsic tuffaceous phyllite, and graphitic phyllite
5. Greenish-gray
6. > 3000 m
9. Underlies Persimmon Fork Formation
10. Type area: Cedar Creek-Blythewood area, Carolina Slate Belt near Columbia, Richland and Fairfield Counties.

Wildhorse Canyon Gneiss Complex WLDC11
1. Precambrian
2. Idaho (SC)
3. Dover, J. H., 1969, Idaho Bur. Mines and Geology Pamph. 142, p. 1, 7-13
4. Sedimentary gneisses including quartzitic gneiss, dolomitic marble, granitic gneiss, and mafic gneiss
6. > 2100 m
9. Surrounded by granitic rocks of Pioneer Mountains pluton; underlies Hyndman Formation
10. Type area: Upper Wildhorse Creek and Kane Creek areas, Pioneer Mountains, Blaine and Custer Counties.

Wilhelmi Formation WLLM01
1. Lower Silurian (Alexandrian)
2. Illinois (NE)
3. Willman, H. B., 1973, Illinois Geol. Survey Circ. 479, p. 12, 13, 50

4. Dolomite, argillaceous dolomite, dolomitic shale
5. Gray
6. 12 m
8. Birds Member, Schweizer Member
9. Overlies Brainard Shale (Maquoketa Group); underlies Elwood Formation
10. Type section: Railroad cut on SE side of Des Plaines Valley, 3.2 km N of Millsdale, SE1/4SW1/4SE1/4 sec. 35, T. 35 N., R. 9 E., Will County. Named for Wilhelmi Airport, 7.2 km NE of type section.

Willows Diorite WLLS03

1. Upper Jurassic
2. California (SC)
3. Weaver, D. W., 1969, in Weaver, D. W., and others, Am. Assoc. Petroleum Geologists-Soc. Econ. Paleontologists and Mineralogists, Pacific Secs., Spec. Pub., p. 13
4. Quartz-hornblende diorite, hornblendite, and serpentinized hornblendite
9. In fault contact with Santa Cruz Island Schist on N and with Tertiary rocks on S
10. Type area: Along Willows fault, N of Willows Anchorage, W Santa Cruz Island.

Wilmette Bed (Sheboygan Member of Lake Michigan Formation) WLMT01

1. Pleistocene (Wisconsinan)
2. Illinois (NE), Michigan, Wisconsin
3. Lineback, J. A., Ayer, N. J., and Gross, D. L., 1970, Illinois Geol. Survey Environmental Geology Notes 35, p. 11, 17-18
4. Clay
5. Gray
6. < 0.2 m
7. Persistent marker bed
9. Lies between lower and upper clay units of Sheboygan Member
10. Type section: Core 143, depth-interval 152-174 cm, water depth 119 m, lat 42°21.8′ N., long 87°10.8′ W., Lake Michigan, 51 km E of Waukegan, Lake County, Ill. Named for Wilmette, Cook County, Ill.

Windham Formation (Merrimack Group) WNDM06

1. Middle Silurian
2. Maine (SW)
3. Hussey, A. M., II, 1971, Maine Geol. Survey Map Ser. GM-1, p. 2-3, 14
4. Metapelite, ribbon limestone, muscovite-biotite-quartz schist, and quartzite
6. Range 610-760 m
8. 2 informal unnamed members
9. Conformably underlies Berwick Formation
10. Type locality: Dundee Falls on Presumpscot River, Gray Quadrangle, Cumberland County. Named for town of Windham.

Windsor Formation WDSR02

1. Pleistocene
2. Virginia (SE)
3. Coch, N. K., 1968, Virginia Div. Mineral Resources Rept. Inv. 17, p. 14-17
4. Sand and gravel grading upward into silty clay and sand
6. Range < 1.5-10.5 m

9. Unconformably overlies Bacons Castle, Sedley, or Yorktown Formation; unconformably underlies sand facies of Norfolk Formation
10. Type section: Core boring W-1211 on farm road 90 m NW of State Road 634, 0.6 km NE of U.S. Highway 460, near Kings Fork, Nansemond County. Named for town of Windsor, Isle of Wight County.

Windy Flats Group U WDFL02
1. Precambrian X
2. South Dakota (WC)
3. Bayley, R. W., 1972, U.S. Geol. Survey Misc. Geol. Inv. Map I-712
4. Metabasalt, slate, schist, and chert
8. Hay Creek Greenstone and Reausaw Slate
9. Conformably overlies Gingrass Draw Slate; unconformably(?) underlies Roubaix Formation
10. Type locality: Sec. 1, T. 3 N., R. 4 E., and secs. 34 and 35, T. 4 N., R. 4 E., Black Hills, Lawrence County. Named for exposures on Windy Flats, 1.6 km W in T. 4 N., R. 4 E.

Windy Hill Sandstone Member (Sundance Formation) U WDHL02
1. Upper Jurassic
2. Wyoming (SC), Colorado, South Dakota
3. Pipiringos, G. N., 1968, U.S. Geol. Survey Prof. Paper 594-D, p. D23
4. Limy, oolitic marine sandstone
6. Range 1.5-17 m
7. Ledge-forming
9. Disconformably overlies Redwater Shale Member or Pine Butte Member (Sundance Formation); underlies Morrison Formation
10. Type section: E Freezeout Mountains, W1/2SW1/4SW1/4 sec. 29, T. 25 N., R. 78 W., Carbon County, Wyo. Named for Windy Hill, 6.4 km E of type section.

Windy Pass Argillite Member (Brigham Quartzite) U WDPS01
1. Precambrian Z
2. Idaho (SE)
3. Oriel, S. S., and Armstrong, F. C., 1971, U.S. Geol. Survey Prof. Paper 394, p. 7-9
4. Mudstone, claystone, and siltstone interbedded with quartzite in lenses and beds
5. Green, tan, gray, brown, pink
6. 230 m
7. Thin-bedded
9. Conformably overlies Kasiska Quartzite Member; conformably underlies Sedgwick Peak Member
10. Type section: On spur extending SW from N knob of Twin Knobs, center sec. 12, T. 10 S., R. 38 E., Bancroft Quadrangle, Bannock and Caribou Counties. Named for exposures at Windy Pass, SW1/4 sec. 12, T. 10 S., R. 38 E.

Winnetka Member (Lake Michigan Formation) WNTK01
1. Pleistocene (Wisconsinan)
2. Illinois (NE), Michigan, Wisconsin
3. Lineback, J. A., Ayer, N. J., and Gross, D. L., 1970, Illinois Geol. Survey Environmental Geology Notes 35, p. 8, 17, 9-10
4. Clay containing black beds
5. Brownish-gray

6. 0.8 m
9. Overlies Sheboygan Member or older sediments; underlies Lake Forest Member or Waukegan Member
10. Type section: Core 143, depth-interval 35.5-112 cm, water depth 119 m, lat 42°21.8′ N., long 87°10.8′ W., Lake Michigan, E of Waukegan, Lake County, Ill. Named for Winnetka, Cook County, Ill.

Winnsboro Granite WSBR07
1. Pennsylvanian
2. South Carolina (NC)
3. Wagener, H. D., 1970, South Carolina Div. Geology Map Ser. MS-17, p. 5,
4. Quartz-perthite-plagioclase granitoid rocks
5. Pinkish-gray
7. Pluton complex, coarse-grained
9. Intruded by Rion Adamellite; cut by aplite and mafic dikes
10. Type area: Underlies town of Winnsboro on U.S. Highway 321, Fairfield County.

Winslow Till/Member (Glasford Formation) WNSL02
1. Pleistocene (Illinoian)
2. Illinois (NC), Wisconsin
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 55
5. Gray
6. 4 m
9. Overlies bedrock or residual soil
10. Type section: Roadcuts W of Winslow, SW1/4SE1/4SW1/4 sec. 21, T. 29 N., R. 6 E., Stephenson County, Ill.

Woodruff Formation U WDRF01
1. Lower to Upper Devonian
2. Nevada (NE)
3. Smith, J. F., Jr., and Ketner, K. B., 1968, U.S. Geol. Survey Bull. 1251-I, p. I14-I7
4. Siliceous mudstone and chert with minor shale, siltstone, dolomite, and limestone
6. > 900 m
9. Unconformably underlies Webb Formation or Chainman Shale
10. Type area: Along upper part of Woodruff Creek, SSE of Carlin, secs. 24 and 25, T. 32 N., R. 52 E., and sec. 30, T. 32 N., R. 53 E., Elko County.

Woodworth Pond Quartzite WDPD01
1. Precambrian
2. New York (EC)
3. McLelland, James, 1969, New England Intercollegiate Geol. Conf. Guidebook 61, Trip 11, p. 7
6. 30 m
10. Type area: Outcrops N of Gloversville, Fulton County.

Wrenshall Formation WRSL01
1. Pleistocene (Wisconsinan)
2. Minnesota (NE)
3. Wright, H. E., Jr., Mattson, L. A., and Thomas, J. A., 1970, Minnesota Geol. Survey Geol. Map Ser. GM-3, p. 26-27
4. Clay and silt with carbonate concretions
5. Blue gray, yellow, and red

10. Type locality: Abandoned clay pits near Wrenshall, Carlton County.

Wyatt Member (Willamette Silt) WYTT01
1. Pleistocene, upper
2. Oregon (WC)
3. Balster, C. A., and Parsons, R. B., 1969, Northwest Sci., v. 43, no. 3, p. 123-125
4. Sandy and silty alluvium
5. Yellowish-brown
6. 3 m
7. Channel deposits
9. Unconformably overlies Diamond Hill Member (Rowland Formation); underlies Greenback or Irish Bend Member (Willamette Silt)
10. Type locality: Secs. 25 and 26, T. 15 S., R. 4 W., near Wyatt School, Linn County.

Wygal Sandstone Member (Temblor Formation) U WYGL01
1. Oligocene, upper
2. California (SC)
3. Dibblee, T. W., Jr., 1973, U.S. Geol. Survey Prof. Paper 764, p. 20-22
4. Sandstone with glauconitic and fossiliferous calcareous beds
5. Gray
6. 23 m, range 23- > 90 m
9. Conformably overlies Cymric Shale Member; conformably underlies Santos Shale Member
10. Type section: In Zemorra Creek, sec. 9, T. 29 S., R. 20 E., Kern County. Named for Wygal Spring, T. 28 S., R. 19 E.

Wylie Formation/Member (Coleharbor Formation) WYLI01
1. Pleistocene (Wisconsinan)
2. Minnesota (NW), North Dakota
3. Harris, K. L., Moran, S. R., and Clayton, Lee, 1974, North Dakota Geol. Survey Misc. Ser. 52, p. 14
4. Clay and silt
5. Olive gray and brown
6. Range 0.6-2.1 m
7. Thinly laminated
9. Overlies Gardar or Red Lake Falls Formation; underlies Huot, Falconer, and Poplar River Formations
10. Type section: Clearwater section, NE1/4NW1/4 sec. 22, T. 151 N., R. 44 W., Red Lake County, Minn. Named for village of Wylie.

Wymark Member (Duperow Formation) WMRK01
1. Upper Devonian
2. Canada (Saskatchewan), Montana
3. Kent, D. M., 1963, Saskatchewan Dept. Mineral Resources Rept. 73, p. 14-21
4. Limestone and dolomite alternating with evaporites
5. Yellowish-brown
6. 120 m
9. Overlies Elstow Member; underlies Seward Member
10. Type section: Tidewater Wymark Crown No. 1 well (Lsd. 3-10-14-14W3), depth interval 1640-1760 m, Saskatchewan, Canada. Named for town of Wymark, 8.6 km SE of type well.

Yachats Basalt U YCTS01
1. Eocene, upper
2. Oregon (WC)
3. Snavely, P. D., Jr., and MacLeod, N. S., 1974, U.S. Geol. Survey Jour. Research, v. 2, no. 4, p. 395-403
4. Basalt, grading to basaltic andesite and andesite
5. Gray
6. 750 m
9. Overlies Tyee Formation; overlaps Nestucca Formation; underlies unnamed basaltic sandstone and marine siltstone
10. Type section: Outcrops along Yachats River extending NW from base of sequence near center sec. 31, T. 14 S., R. 11 W., to top of sequence in low sea cliffs at Yachats, SE1/4 sec. 22, T. 14 S., R. 12 W., Lincoln County.

Yellow Creek Tongue (Green River Formation) U YLCK05
1. Eocene
2. Colorado (NW)
3. Duncan, D. C., Hail, W. J., Jr., O'Sullivan, R. B., and Pipiringos, G. N., 1974, U.S. Geol. Survey Bull. 1394-F, p. F3-F5
4. Marlstone
5. Light-gray to light-brown
6. 14 m, range 0-23 m
9. Intertongues with Uinta Formation; merges laterally southward with Parachute Creek Member (Green River Formation)
10. Type section: NE1/4SE1/4 sec. 13, T. 1 N., R. 98 W., Barcus Creek SE Quadrangle, N Piceance Creek Basin, Rio Blanco County.

Yellow Spring Group YSPG01
1. Upper Devonian
2. Iowa (C)
3. Dorheim, F. H., Koch, D. L., and Parker, M. C., 1969, Iowa Geol. Survey Rept. Inv. 9, p. 1-28
4. Clastic sequence of shale, dolomite, and siltstone
6. Range 15-95 m
8. Sheffield Formation, Aplington Formation, Maple Mill Shale, and English River Formation
9. Overlies Lime Creek Formation; unconformably underlies North Hill Group
10. Type section: Reed No. 1 gas storage stratigraphic test well, NE1/4NE1/4SW1/4 sec. 16, T. 72 N., R. 3 W., Yellow Spring Township, Des Moines County.

Yorkville Till Member (Wedron Formation) YKVL01
1. Pleistocene (Wisconsinan)
2. Illinois (NE)
3. Willman, H. B., and Frye, J. C., 1970, Illinois Geol. Survey Bull. 94, p. 69
4. Clayey, pebbly, calcareous till with abundant dolomite pebbles
6. 61 m
9. Overlies Malden Till Member (Wedron Formation); underlies Haeger or Wadsworth Till Member (Wedron Formation) or Richland Loess
10. Type section: Roadcut at intersection of Illinois Highways 71 and 47, 1.6 km S of Yorkville, SE1/4SE1/4SE1/4 sec. 5, T. 36 N., R. 7 E., Kendall County.

Zana Granite ZANA01

1. Paleozoic, lower
2. Alabama (EC)
3. Bentley, R. D., and Neathery, T. L., 1970, Alabama Geol. Soc. Guidebook 8, p. 18-19
4. Quartz monzonite plutons with marginal halos of large K-feldspar porphyroblasts
9. Intrusive into Heard Group
10. Type area: Exposed near Zana, Tallapoosa County.

Zimmer Ridge Member (Oreville Formation) U ZMRG01

1. Precambrian
2. South Dakota (WC)
3. Ratte, J. C., and Wayland, R. G., 1969, U.S. Geol. Survey Bull. 1271-B, p. B2-B5
4. Metagraywacke
6. Range 0-300 m
7. Thick-bedded, massive to foliated
10. Type locality: Belt of outcrops 1.5 km wide along Zimmer Ridge, SW corner Hill City Quadrangle, Black Hills, Pennington County.

Zooks Corner Formation U ZKCR02

1. Middle Cambrian
2. Pennsylvania (SE)
3. Meisler, Harold, and Becher, A. E., 1968, U.S. Geol. Survey Bull. 1254-G, p. G2-G7
4. Dolomite with interbedded sandstone and limestone
5. Gray
6. 500 m
7. Crossbedded, ripple marks
9. Overlies and interfingers with Ledger Dolomite; underlies Buffalo Springs Formation
10. Type locality: Exposures along Conestoga Creek, 0.8 km W of town of Zooks Corner, Lancaster County.