

DIGITAL MAPPING TECHNIQUES 2020

The following was presented at DMT'20
(June 8 - 10, 2020 - A Virtual Event)

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2020)

<http://ngmdb.usgs.gov/info/dmt/>

FY21 STATEMAP Update and GeMS Requirement

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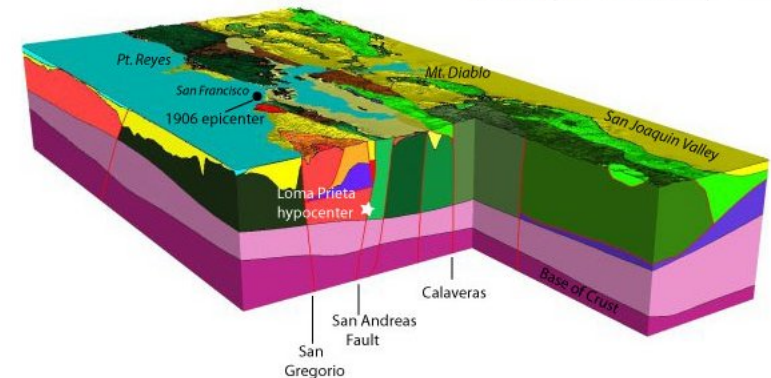
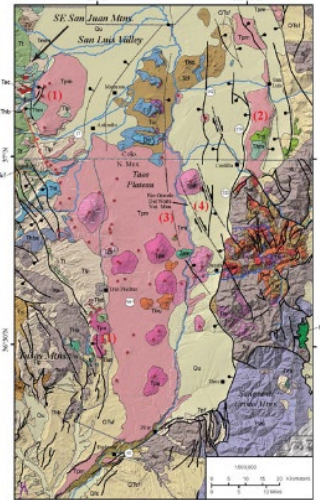
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National Cooperative Geologic Mapping Program (NCGMP)

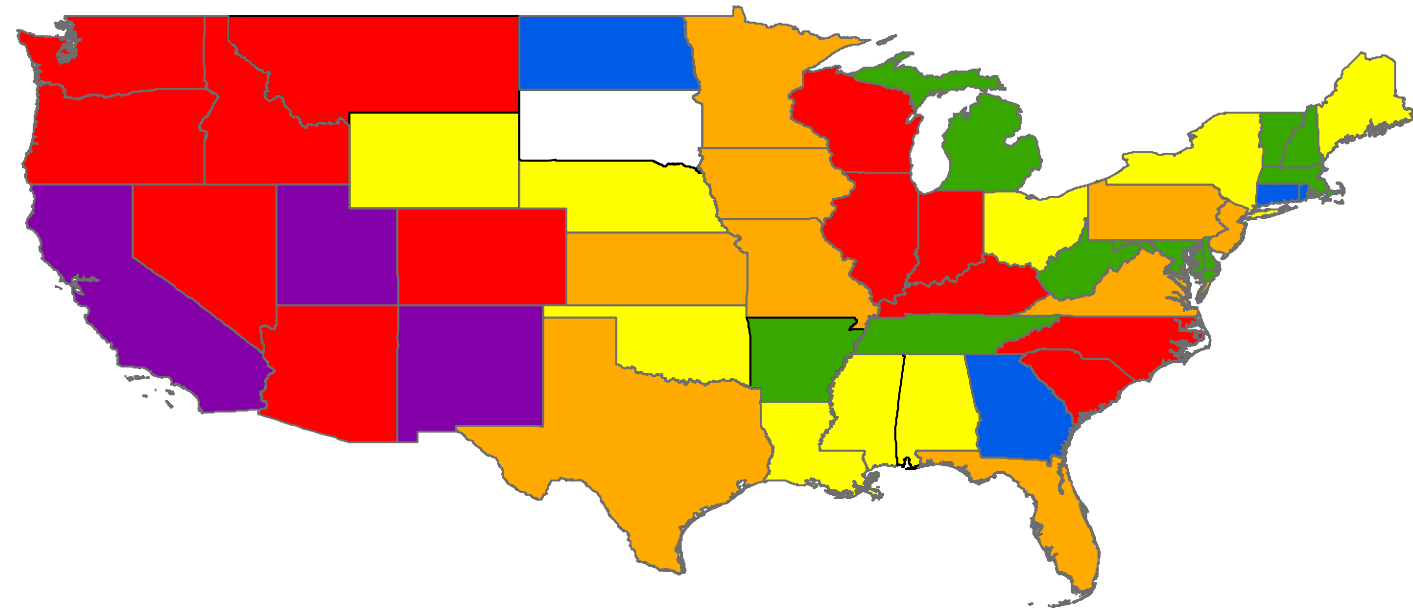
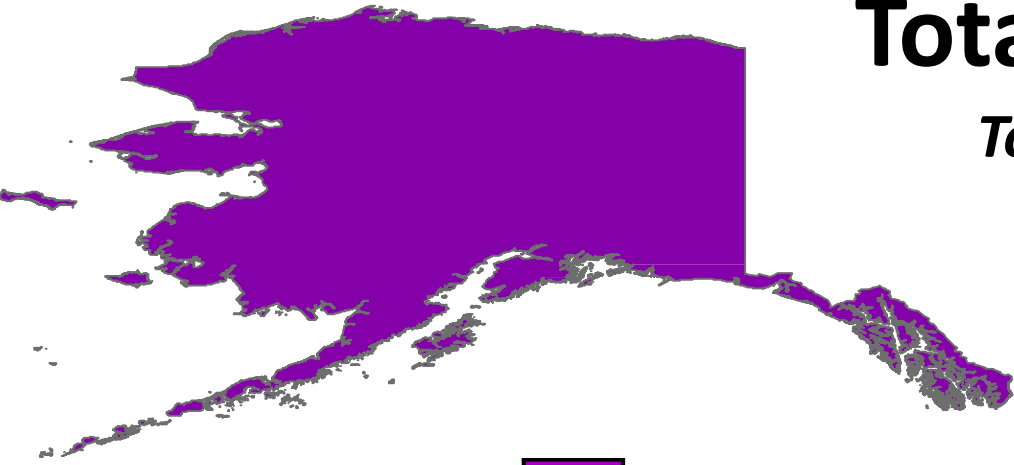
NCGMP was established by the National Geologic Mapping Act (NGMA) of 1992 and reauthorized by Congress in 2019 at \$64M. NCGMP is a national Program, in partnership with the State geological surveys to map the 3D geology of the Nation. Current appropriated funding level is \$34.4M.

- **Federal Component (FEDMAP)**
Geologic maps and research, and 3D framework models directed by high priority national issues.
- **State Grants (STATEMAP)**
Long-standing partnership with States - matching funds double the USGS investment.
- **Education Grants (EDMAP)**
Training the next generation of geologic mappers - matching funds double the USGS investment.
- **National Geologic Map Database (NGMDB)**
Public catalog of geologic maps for the Nation, GeMS standardization
- **Great Lakes Geologic Mapping Coalition (GLGMC)**
Understanding of 3D distribution of deposits overlying the glaciated Midwest
- **Earth Mapping Resources Initiative (Earth MRI)**
State geologic mapping for critical minerals



Total STATEMAP Funding 1993-2020

*Total funding to State Geological Surveys since 1993:
\$150,441,176 (matched dollar for dollar)*



Mapping In Progress



Source: [NGMDB - Progress Reports](#)






Mapping in Progress provides information on current mapping projects, prior to inclusion of their products in the NGMDB map catalog. Click any map or table record for contact information.

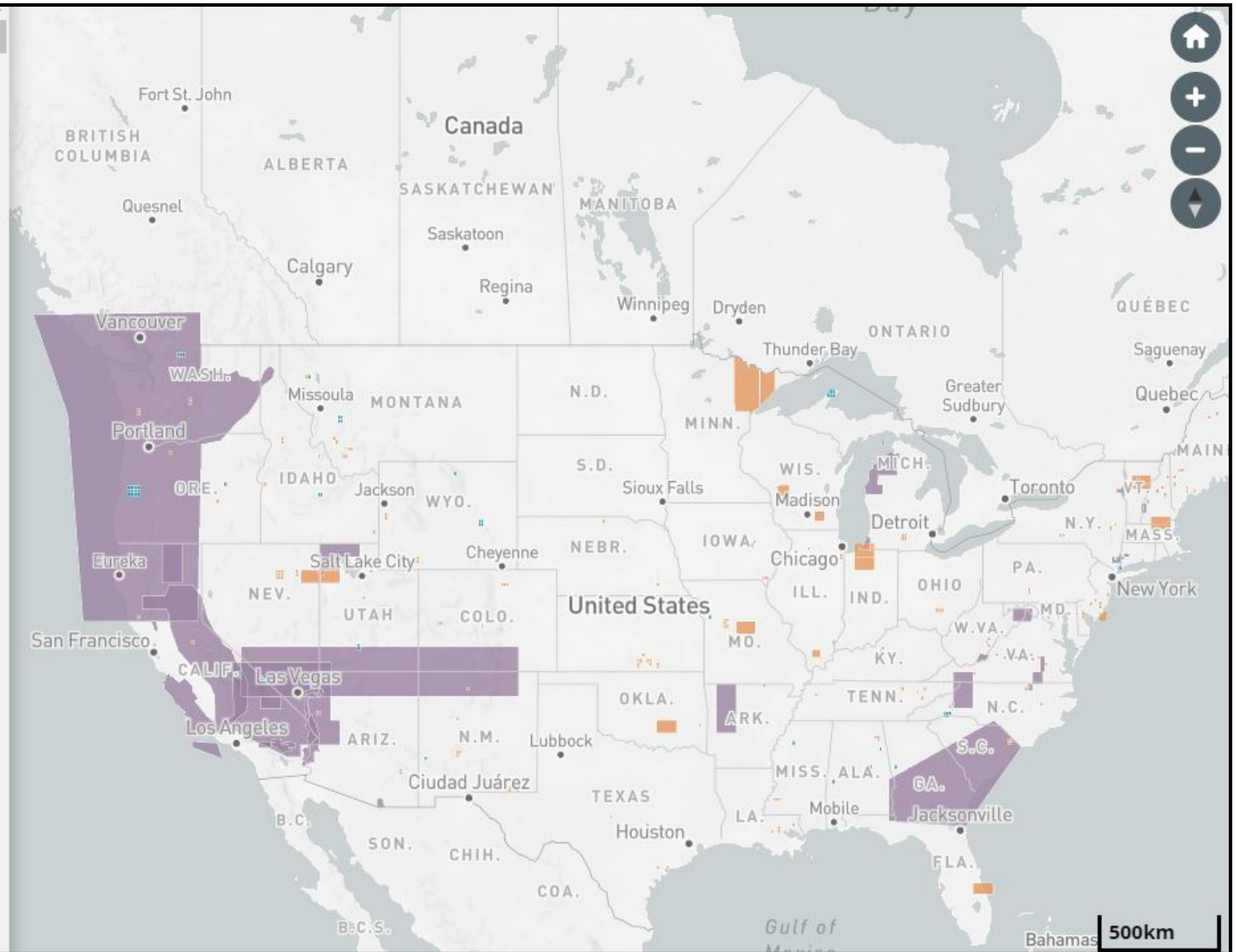
ALL STATEMAP EDMAP FEDMAP

Showing **263** projects on screen.

Filter by quad, project, or affiliation name

Project Affiliation Program Scale

| | |
|--|---|
| Ada (OK) Quadrangle, Oklahoma Geological Survey |  |
| Scale: 100000 Mapping Year: 2019 | |
| Adams (KS) Quadrangle, Kansas Geological Survey |  |
| Scale: 24000 Mapping Year: 2019 | |
| Adobe Summit (NV) Quadrangle, Nevada Bureau of Mines and Geology |  |
| Scale: 24000 Mapping Year: 2019 | |
| Agate Mountain (CO) Quadrangle, Colorado Geological Survey |  |
| Scale: 24000 Mapping Year: 2019 | |
| Albany (NY) Quadrangle, New York State Geological Survey |  |
| Scale: 24000 Mapping Year: 2019 | |



<https://ngmdb.usgs.gov/mip/>

DMT 2020
National Cooperative Geologic Mapping Program



2018 – 2030 NCGMP Strategic Plan:

The **renewed vision** of the USGS National Cooperative Geologic Mapping Program is to: *Create an integrated, three-dimensional, digital geologic framework model and derivative map(s) of the United States and its territories to address the changing needs of the Nation by the year 2030.*

New NCGMP Decadal Goals:

- Achieve excellence in the performance and relevance of the FEDMAP, STATEMAP and EDMAP Program components, and maximize beneficial partnering between all Program Components.
- Optimize the use of field-based, remote sensing and geophysical technologies, and construct the infrastructure to house a national integrated 2D/3D geologic framework model.
- Populate a geospatial infrastructure to create national integrated 2D/3D geologic framework model that enables the seamless construction of geologic maps within user-defined regions-of-interest across all of U.S. by the Year 2030.



NCGMP 2019- GeMS Requirement

- Formed GeMS Working group
- Outlined the process by which NCGMP will require GeMS-compliant map data for all NCGMP-funded products
- Provided recommendations on the above to be included in the NCGMP Implementation Plan of the 2018-2030 NCGMP Strategic Plan
- NGMDB will develop a system and repository to track and store GEMS compliant databases, and an associated maintenance plan
- A balance between mapping and cartography needs to be maintained
- Without more funding, states will achieve compliance within a much slower timeframe



NCGMP 2019- 3 levels of GeMS Compliance

- **Level One** -- GIS format/adheres to GeMS topology requirements; stratigraphic nomenclature differences with Geolex are documented
- **Level Two** – Level One requirements, plus the GeMS schema is implemented for the map (but only specified fields must have appropriate content, and GeMS validation script must be run)
- **Level Three** -- Level 2 requirements, plus legitimate content for all required fields not noted for Level 2, and population of optional fields is strongly encouraged

<https://ngmdb.usgs.gov/Info/standards/GeMS/draftimplplan.pdf>



GeMS Working Group Recommendations: STATEMAP

- **FY20 Products (due Summer 2021, *NOT dependent on additional resources*)**
 - PDF map(s) of FY20 deliverables; publication-quality cartography IS NOT REQUIRED
 - Program Officer will choose a published map from the NGMDB for evaluation by review panel; must be a recent (within 5 years) STATEMAP product
 - **One database with Level 1 GeMS compliance; can be for any recent published STATEMAP map**
- **FY21 Products (due Summer 2022, *dependent on additional resources*)**
 - PDF map(s) of FY21 deliverables; publication-quality cartography IS NOT REQUIRED
 - Program Officer will choose a **published map** from the NGMDB for evaluation by review panel; must be a recent (within 5 years) STATEMAP product
 - One database with Level 2 or 3 GeMS compliance on any recent published STATEMAP map; will also include a reconciliation document describing aspects that don't conform to GeMS
- **FY22 Products (due Summer 2023, *dependent on additional resources*)**
 - PDF map(s) of FY22 deliverables; publication-quality cartography IS NOT REQUIRED
 - One database with Level 3 GeMS compliance for one recently (within 5 years) published map database (to be submitted to the NGMDB repository); can be for any recent STATEMAP map
 - Program Officer will use PDF generated from delivered GeMS database of a published map from NGMDB for evaluation by review panel

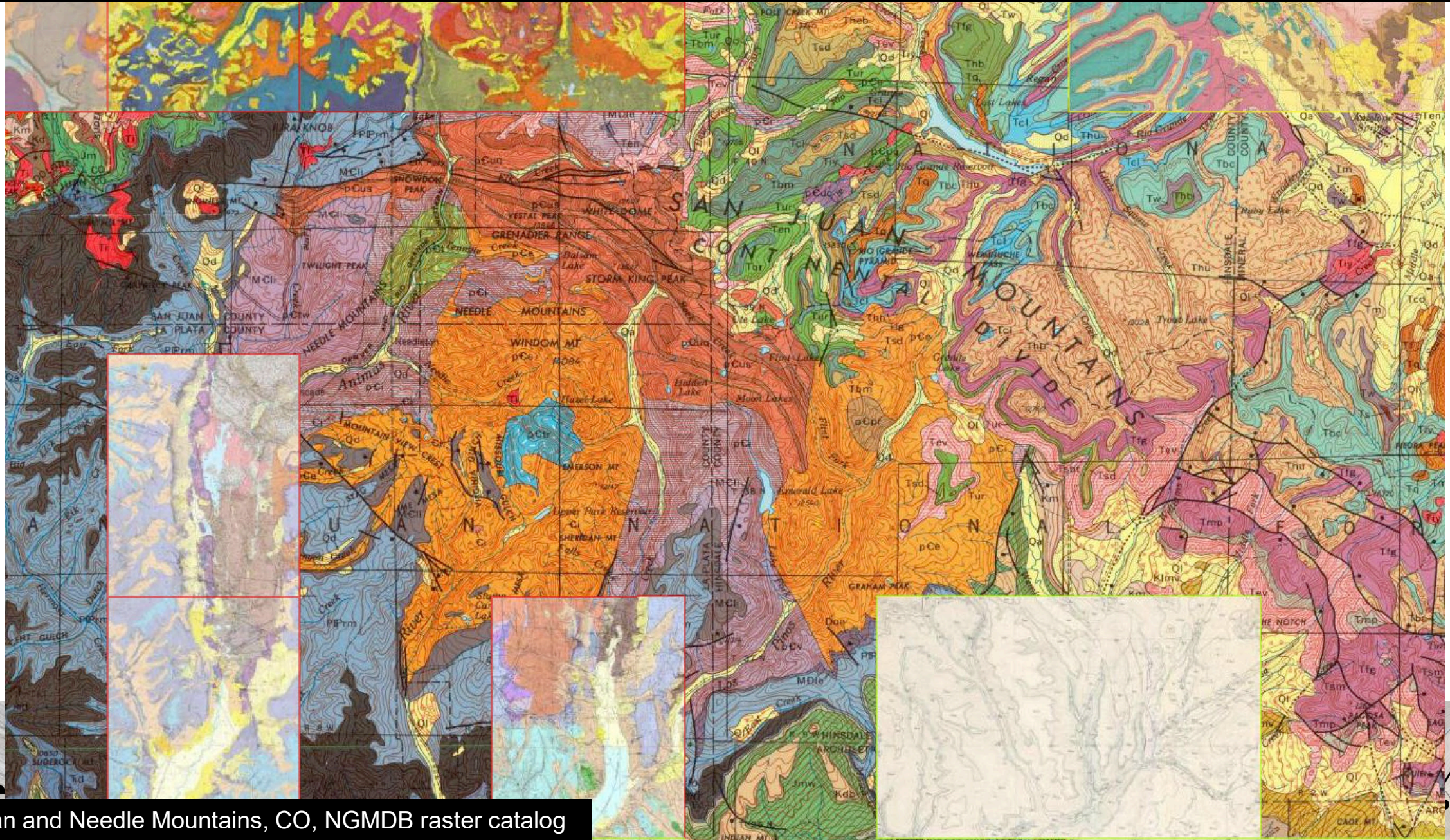


NCGMP 2020- Phase Three of the NGMDB

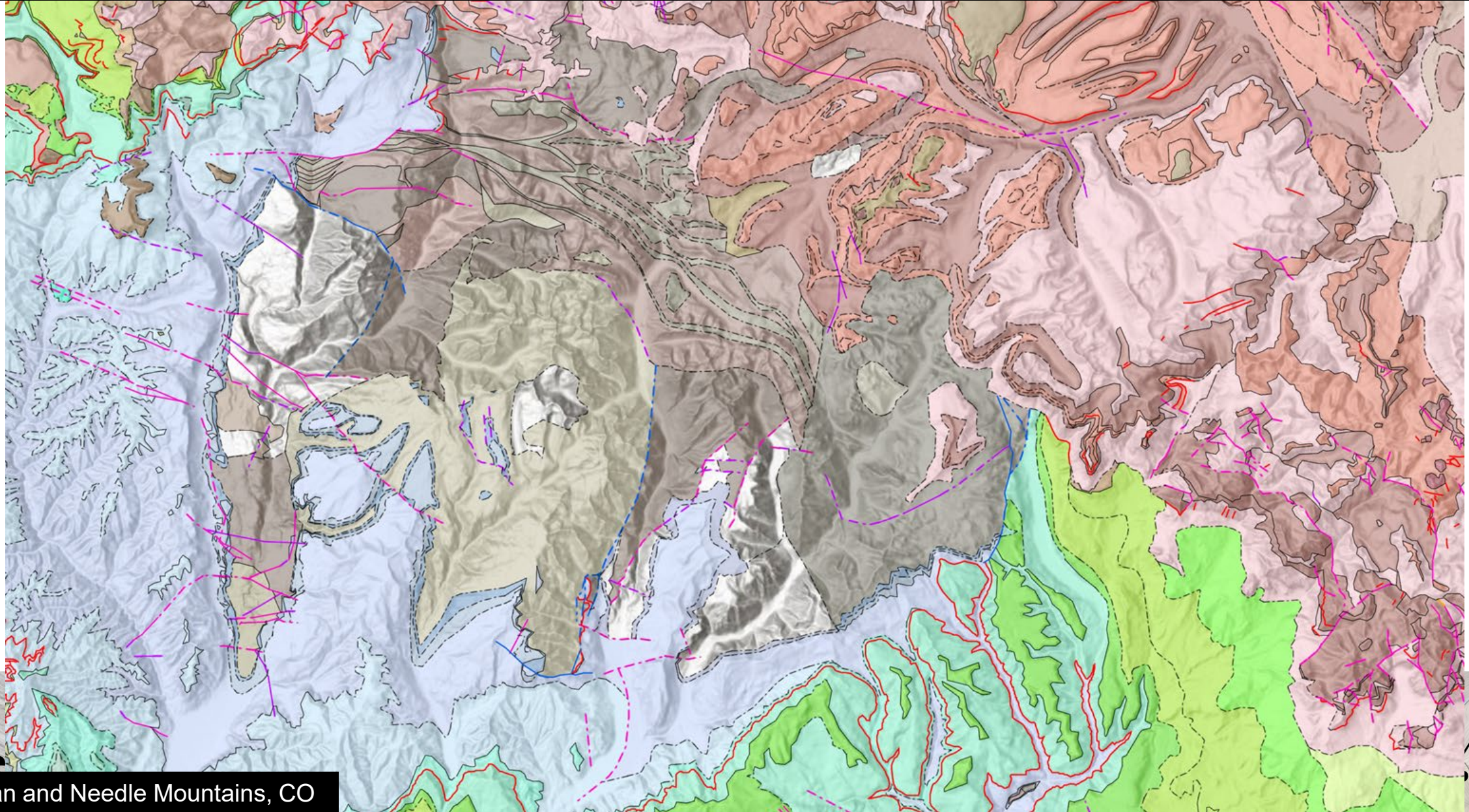
- \$10M increase in the NCMGP to “support launch of Phase Three of the National Geologic Map Database that will bring together detailed national and continental-resolution 2D and 3D information produced throughout the Survey and by federal and state partners.”
- Supports NCGMP’s effort to create a national integrated 2D/3D geologic framework that enables the seamless construction of **standardized** geologic maps within user-defined regions-of-interest across all of U.S.



More than a century of geologic mapping has covered the Nation with a patchwork of thousands of maps, made at different times, at different scales, to answer a wide range of questions – here is an example of the resulting patchwork:



More than a century of geologic mapping has covered the Nation with a patchwork of thousands of maps, made at different times, at different scales, to answer a wide range of questions – here is an example of an *integrated seamless GeMS GIS format geologic framework data product (fine scale to expanded intermediate scale) constructed for the same region:*



STATEMAP FY20 Update

- Supplemental Program Announcement supporting Phase Three opened in early February, 2020 for 1 month.
- Supplemental Guidance was developed in close coordination with AASG; virtual review of Supplemental Proposals was conducted in March by the STATEMAP Panel.
- FY20 Base proposals (44 State surveys): ~\$10.6M requested (\$5.6M available).
- FY20 Supplemental proposals (33 State surveys): ~\$5.1M requested (\$4.6M available).
- FY20 revisions are being processed and awards are being issued; to date, 19/44 State surveys have requested no-cost extensions on their FY19 awards due to COVID-19-related impacts.



STATEMAP FY20 – Supplemental Guidance

1. Update the NGMDB catalog (12/33)
2. Develop the capability to produce fully-attributed GeMS-compliant (Level 3) geologic map databases (24/33)
3. Construct seamless, integrated, GeMS-compliant geologic map databases at output data scales in the range of 1:250,000 to 1:100,000 based on two-layer map compilations consisting of surficial and bedrock layers. (16/33)
4. Construct seamless, statewide compilations delivered as GeMS-compliant databases derived from existing maps at scales of 1:500,000 or larger (15/33)
5. Provide a report that presents the scope and methodology required for the state to reconcile national resolution (1:500,000 scale) geologic map compilation with all neighboring states. (9/33)
6. Develop a status map of geologic mapping that presents a prioritized list of regions and quadrangles in the state of interest that will require new GeMS-compliant original mapping or the conversion of existing maps. (20/33)
7. Fieldwork needed to support the activities above. (22/33)



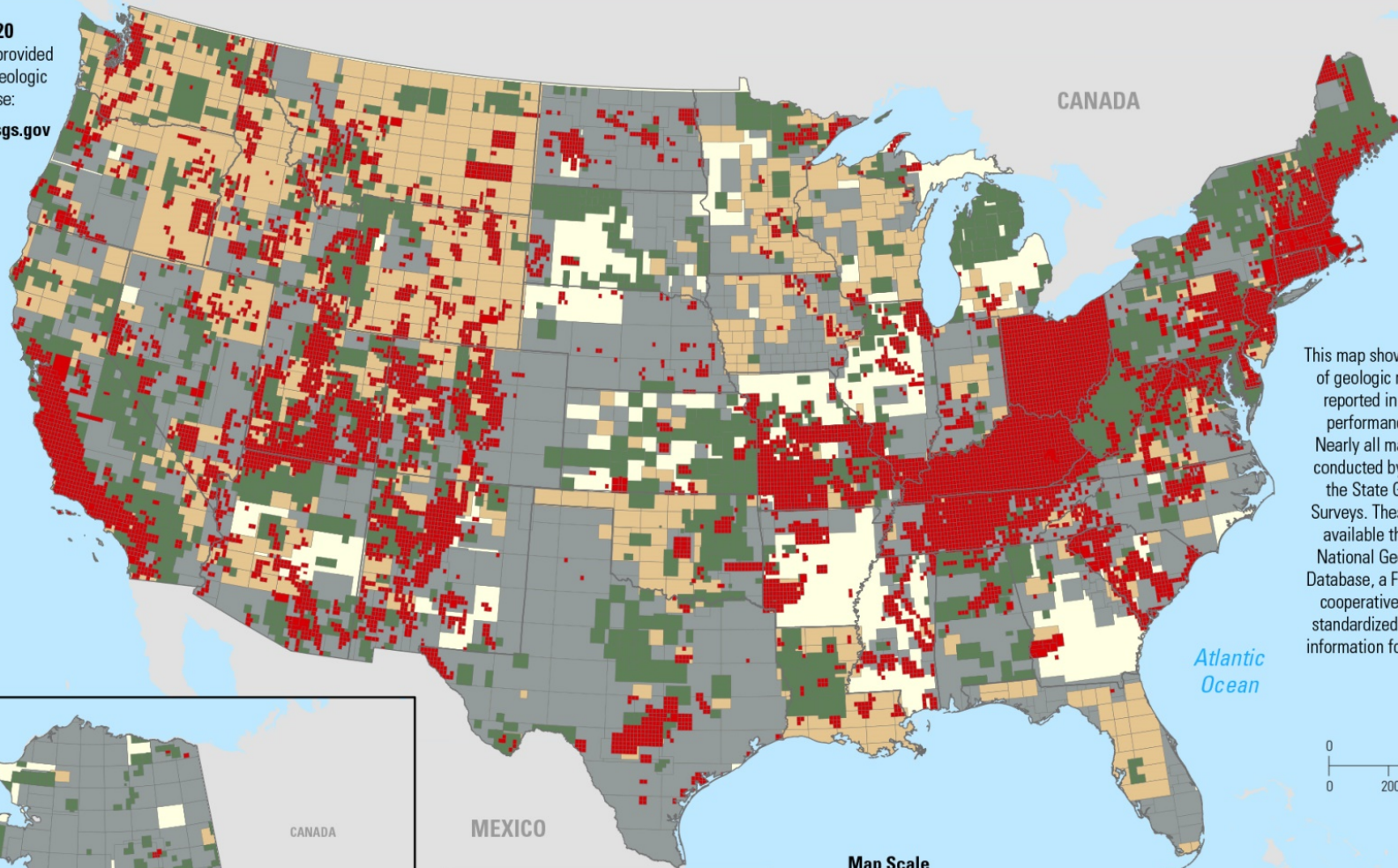
STATEMAP FY21 Update

- Kim Dove (SM Grants Officer) is retiring in August, 2020
- FY21 Program Announcement will open in September, 2020 (ONE announcement)
- FY21 Guidance includes the following:
 - New mapping
 - **Level 2 GeMS requirement** for one database of previous publication
 - Derivative mapping
 - GeMS capability development
 - GeMS-compliant compilation projects (Statewide and more detailed) and supporting fieldwork
 - Updating the NGMDB catalog
- Proposal cap will likely increase (contingent on FY21 funding level)
- Proposal Preparation Webinar in late August/early September



As of 5/2020
Data for this map provided
by the National Geologic
Map Database:
<https://ngmdb.usgs.gov>

Pacific Ocean



This map shows the extent of geologic mapping as reported in NCGMP's performance metric. Nearly all mapping was conducted by USGS and the State Geological Surveys. These maps are available through the National Geologic Map Database, a Federal/State cooperative archive of standardized geoscience information for the nation.

