

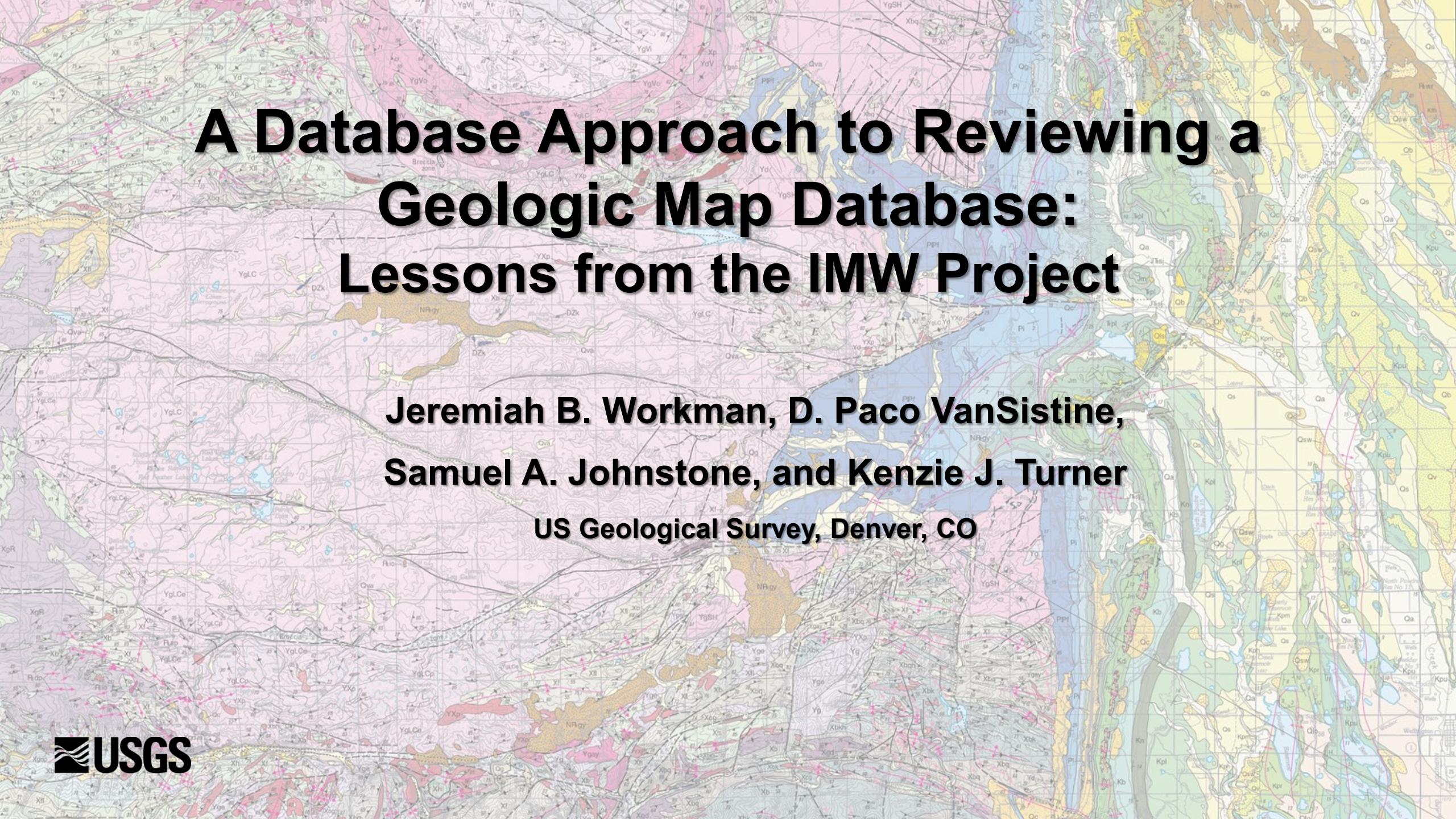
DIGITAL MAPPING TECHNIQUES 2021

The following was presented at DMT'21
(June 7 - 10, 2021 - A Virtual Event)

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2021)

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

A detailed geologic map of a region, likely the Denver area, showing various geological units in different colors (pink, yellow, green, blue, brown) and a grid of latitude and longitude coordinates. The map includes labels for various geological units and features.

A Database Approach to Reviewing a Geologic Map Database: Lessons from the IMW Project

**Jeremiah B. Workman, D. Paco VanSistine,
Samuel A. Johnstone, and Kenzie J. Turner**
US Geological Survey, Denver, CO

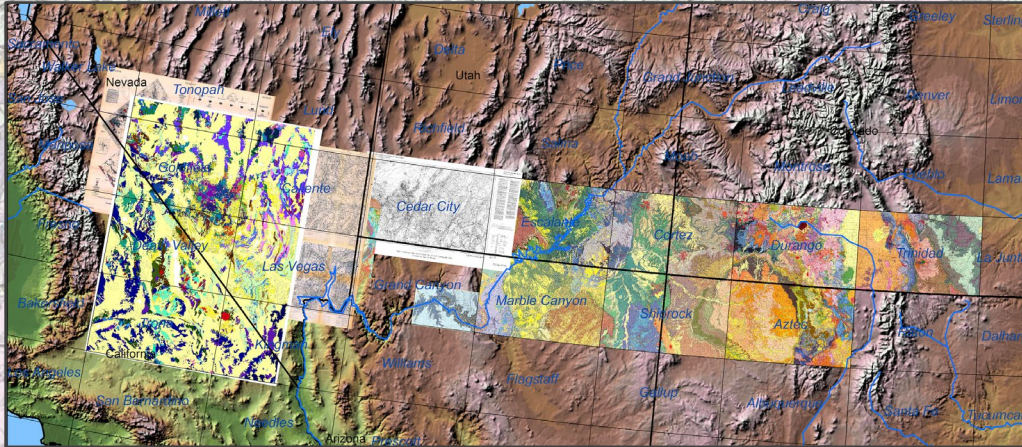
The background of the slide is a detailed geologic map. It features a grid of latitude and longitude lines. Various colored regions represent different geological units, with labels such as 'Xh', 'YgVI', 'YgSH', 'Xba', 'Qs', 'Ov', 'Kpu', and 'Qa'. The map shows complex geological structures, including what appears to be a river valley or a fault system running through the center.

Introduction

The following presentation, given at the '21 DMT virtual conference, addresses the process of technical/peer scientific review of geologic maps in the age of standardized database structure. The USGS FedMap Intermountain West project is producing a regional-scale, seamless, integrated geologic map database built upon a modified GeMS schema and is in the process of submitting the multi-authored product for technical review. In order to manage the complexity of the review process for such a large and diverse product, we have turned to the power of the GIS database environment. By migrating the technical review stage into the native data space of the geologic map itself, we create increased functionality for both the reviewers, the authors, and the approving officials.

The review data structure outlined here is a preliminary and basic framework being used provisionally between our project and external state survey partners performing the technical/peer review. The hope is to expand this approach within the NCGMP where formal standards can be built and widespread use can lead to a new and better, more efficient, easily documented process shared across the program. This will facilitate easier collaboration in cross-agency reviews, better data management, and eventual tool development to assist the GeoFramework effort in its goal to create a national, seamless, integrated geologic map database by 2030.

Intermountain West Project (IMW) & GeoFramework Initiative



IMW: Phase 1—

Seamless geologic mapping centered along 37°N latitude from High Plains to Sierra Nevadas (covering 14x 250k quadrangles) at intermediate scale

Develop technology, data structure, and workflows necessary to create, **review**, and deliver seamless geologic map databases of large areas

Developmental, project-level FedMap effort within larger NCGMP GeoFramework Initiative

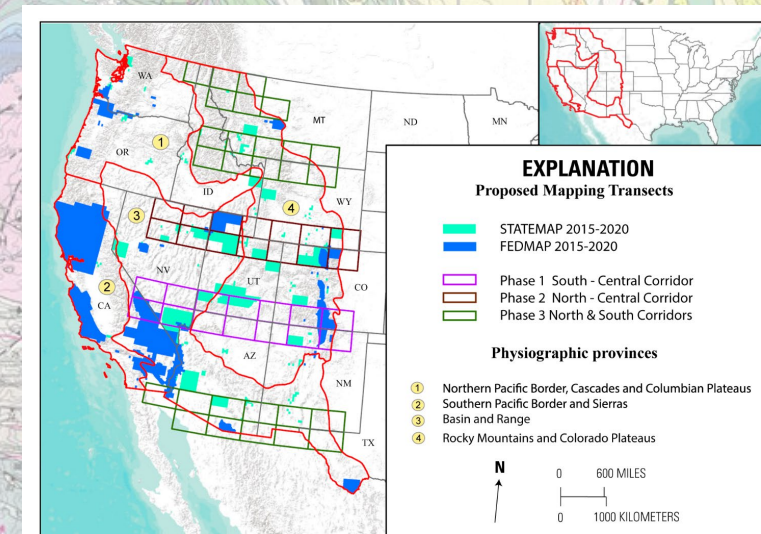
IMW: Phases 2 & 3—

Extend geologic mapping effort north and south across entire intermountain west region following methodologies developed during Phase 1 maintaining a transect based approach

GeoFramework Initiative:

Create an integrated, 3D, digital geologic map of the United States and its territories to address the changing needs of the Nation by the year 2030

Support operational integration of FedMap and StateMap work towards this central goal under “Phase 3” of NGMDB



Intermountain West Project (IMW) Geologic Mapping

Developing and using SIGMa extension to GeMS
Seamless Integrated Geologic Mapping extension
(formerly referred to as rGeMS)

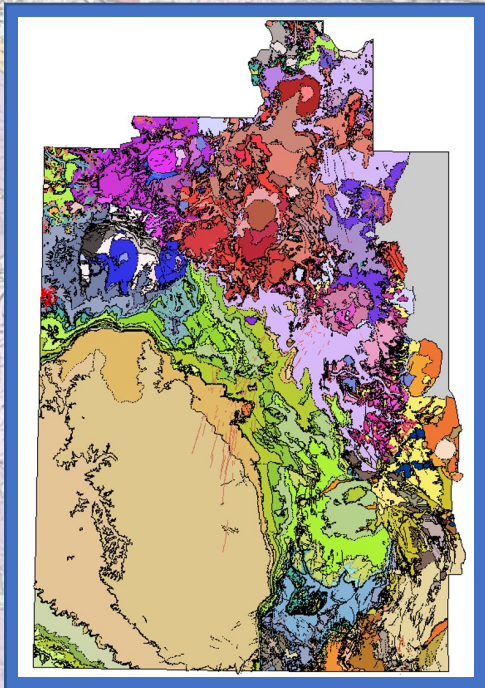
**SURFICIAL MAP
FeatureDataset**

GeMS compliant extension allowing seamless integration of
many (100s) source maps and new original mapping
into a coherent regional geologic map database

Currently 15+ geologists with various roles and expertise
producing map data within an enterprise GIS system

Sliding spectrum between straight compilation/data conversion
and complex geologic reinterpretation and new mapping

Plans to incorporate data produced by other USGS teams and
state survey data produced under Phase3 supplemental contracts



**BEDROCK MAP
FeatureDataset**



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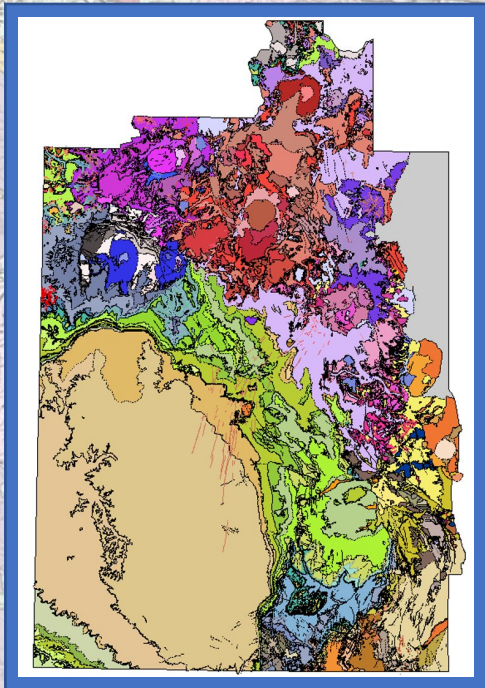
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Not a map catalog



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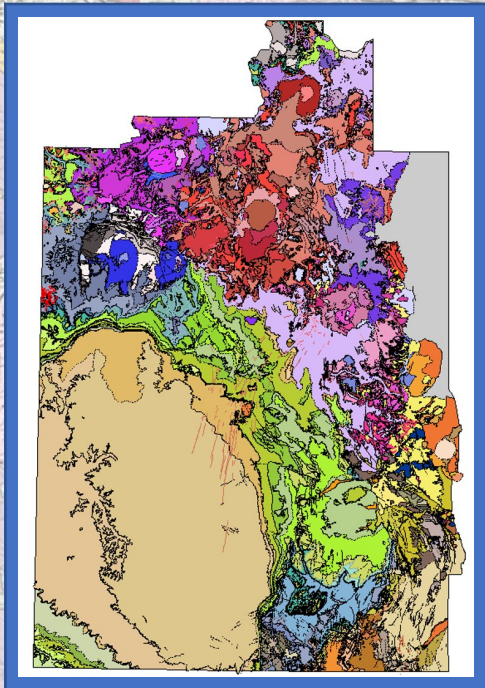
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Plans to incorporate data produced by other USGS teams and
state survey data produced under Phase3 supplemental contracts

This is a seamless, multi-authored interpretive product



**BEDROCK MAP
FeatureDataset**



TECHNICAL PEER REVIEW AT THE USGS

“Peer review is required for virtually all science information products” – Survey Manual 502.3 [3A]

“Peer reviewed information products submitted for Bureau approval must include the original comments from all peer reviewers, reconciliation indicating how review comments were addressed, and the revised manuscript after reconciliation” – Survey Manual 502.3 [3G]

“This Bulletin establishes that important scientific information shall be peer reviewed by qualified specialists before it is disseminated by the federal government” – OMB M-05-03 (December 16, 2004)

TECHNICAL PEER REVIEW AT THE USGS

Peer review of geologic maps was last addressed in the USGS in 2010

Revised and updated training materials by M. Reynolds and others, 1990

Cooperative effort led by S. Beard (USGS Flagstaff) to discuss the topic across the FedMap program and produce new guidelines (available on NGMDB website)

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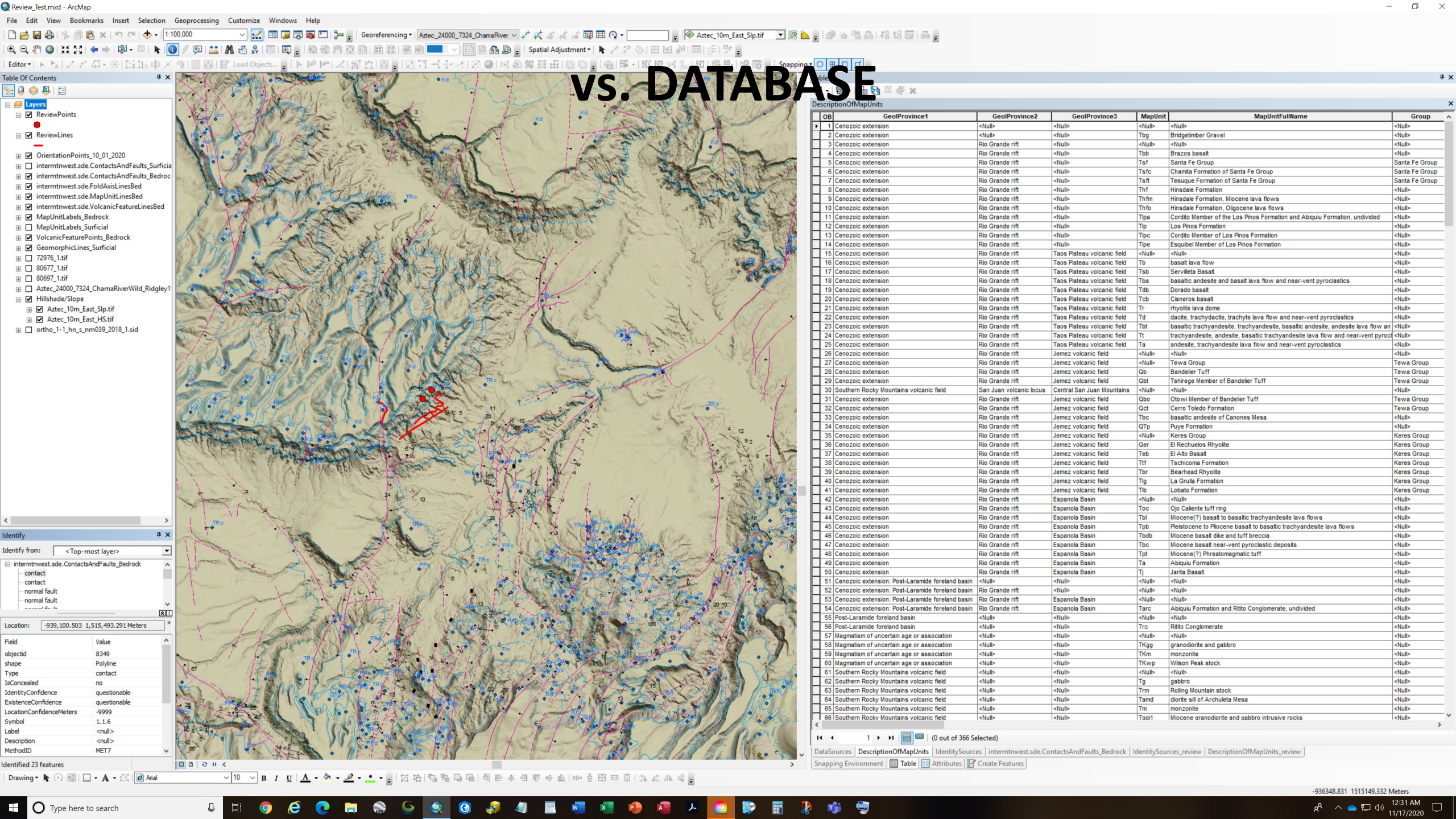
P. Stone and D. Bedford (USGS Menlo) led effort to revive internal training for peer review of geologic maps

Things have changed since 2010 and it's time to take a new look

A SHIFT IN PHILOSOPHY AND THINKING

The product is a database, not a traditional map graphic

The review should occur within the database environment



VS. DATABASE

OB	GeolProvince1	GeolProvince2	GeolProvince3	MapUnit	MapUnitFullName	Group
1	Cenozoic extension	<Null>	<Null>	<Null>	<Null>	<Null>
2	Cenozoic extension	<Null>	<Null>	Tbg	Bridgetimber Gravel	<Null>
3	Cenozoic extension	Rio Grande rift	<Null>	<Null>	<Null>	<Null>
4	Cenozoic extension	Rio Grande rift	<Null>	Tbb	Brazos basalt	<Null>
5	Cenozoic extension	Rio Grande rift	<Null>	Tsf	Santa Fe Group	Santa Fe Group
6	Cenozoic extension	Rio Grande rift	<Null>	Tsfc	Chamita Formation of Santa Fe Group	Santa Fe Group
7	Cenozoic extension	Rio Grande rift	<Null>	Tsft	Tesque Formation of Santa Fe Group	Santa Fe Group
8	Cenozoic extension	Rio Grande rift	<Null>	Thf	Hinsdale Formation	<Null>
9	Cenozoic extension	Rio Grande rift	<Null>	Thfm	Hinsdale Formation, Miocene lava flows	<Null>
10	Cenozoic extension	Rio Grande rift	<Null>	Thfo	Hinsdale Formation, Oligocene lava flows	<Null>
11	Cenozoic extension	Rio Grande rift	<Null>	Tlpa	Cordito Member of the Los Pinos Formation and Abiquiu Formation, undivided	<Null>
12	Cenozoic extension	Rio Grande rift	<Null>	Tlp	Los Pinos Formation	<Null>
13	Cenozoic extension	Rio Grande rift	<Null>	Tlpc	Cordito Member of Los Pinos Formation	<Null>
14	Cenozoic extension	Rio Grande rift	<Null>	Tlpe	Esquibel Member of Los Pinos Formation	<Null>
15	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	<Null>	<Null>	<Null>
16	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tb	basalt lava flow	<Null>
17	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tsb	Servilleta Basalt	<Null>
18	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tba	basaltic andesite and basalt lava flow and near-vent pyroclastics	<Null>
19	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tdb	Dorado basalt	<Null>
20	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tcb	Cineros basalt	<Null>
21	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tr	rhyolite lava dome	<Null>
22	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Td	dacite, trachydacite, trachyte lava flow and near-vent pyroclastics	<Null>
23	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tbt	basaltic trachyandesite, trachyandesite, basaltic andesite, andesite lava flow and	<Null>
24	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Tl	trachyandesite, andesite, basaltic trachyandesite lava flow and near-vent pyrocl	<Null>
25	Cenozoic extension	Rio Grande rift	Taos Plateau volcanic field	Ta	andesite, trachyandesite lava flow and near-vent pyroclastics	<Null>
26	Cenozoic extension	Rio Grande rift	Jemez volcanic field	<Null>	<Null>	<Null>
27	Cenozoic extension	Rio Grande rift	Jemez volcanic field	<Null>	Tewa Group	Tewa Group
28	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Ob	Bandelier Tuff	Tewa Group
29	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Qbt	Tshirege Member of Bandelier Tuff	Tewa Group
30	Southern Rocky Mountains volcanic field	San Juan volcanic locus	Central San Juan Mountains	<Null>	<Null>	<Null>
31	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Obo	Otowi Member of Bandelier Tuff	Tewa Group
32	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Oct	Cerro Toledo Formation	Tewa Group
33	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Tbc	basaltic andesite of Canones Mesa	<Null>
34	Cenozoic extension	Rio Grande rift	Jemez volcanic field	OTp	Puye Formation	<Null>
35	Cenozoic extension	Rio Grande rift	Jemez volcanic field	<Null>	Keres Group	Keres Group
36	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Oer	El Rechuelos Rhyolite	Keres Group
37	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Teb	El Alto Basalt	Keres Group
38	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Tlf	Tschicomma Formation	Keres Group
39	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Tbr	Bearhead Rhyolite	Keres Group
40	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Tlg	La Grulla Formation	Keres Group
41	Cenozoic extension	Rio Grande rift	Jemez volcanic field	Tlb	Lobato Formation	Keres Group
42	Cenozoic extension	Rio Grande rift	Espanola Basin	<Null>	<Null>	<Null>
43	Cenozoic extension	Rio Grande rift	Espanola Basin	Toc	Ojo Caliente tuff ring	<Null>
44	Cenozoic extension	Rio Grande rift	Espanola Basin	Tbl	Miocene(?) basalt to basaltic trachyandesite lava flows	<Null>
45	Cenozoic extension	Rio Grande rift	Espanola Basin	Tpb	Pleistocene to Pliocene basalt to basaltic trachyandesite lava flows	<Null>
46	Cenozoic extension	Rio Grande rift	Espanola Basin	Tbdb	Miocene basalt dike and tuff breccia	<Null>
47	Cenozoic extension	Rio Grande rift	Espanola Basin	Tbc	Miocene basalt near-vent pyroclastic deposits	<Null>
48	Cenozoic extension	Rio Grande rift	Espanola Basin	Tpt	Miocene(?) Phreatomagmatic tuff	<Null>
49	Cenozoic extension	Rio Grande rift	Espanola Basin	Ta	Abiquiu Formation	<Null>
50	Cenozoic extension	Rio Grande rift	Espanola Basin	Tj	Jarta Basalt	<Null>
51	Cenozoic extension: Post-Laramide foreland basin	<Null>	<Null>	<Null>	<Null>	<Null>
52	Cenozoic extension: Post-Laramide foreland basin	Rio Grande rift	<Null>	<Null>	<Null>	<Null>
53	Cenozoic extension: Post-Laramide foreland basin	Rio Grande rift	Espanola Basin	<Null>	<Null>	<Null>
54	Cenozoic extension: Post-Laramide foreland basin	Rio Grande rift	Espanola Basin	Tarc	Abiquiu Formation and Ritto Conglomerate, undivided	<Null>
55	Post-Laramide foreland basin	<Null>	<Null>	<Null>	<Null>	<Null>
56	Post-Laramide foreland basin	<Null>	<Null>	Trc	Ritto Conglomerate	<Null>
57	Magmatism of uncertain age or association	<Null>	<Null>	<Null>	<Null>	<Null>
58	Magmatism of uncertain age or association	<Null>	<Null>	TKgg	granodiorite and gabbro	<Null>
59	Magmatism of uncertain age or association	<Null>	<Null>	TKm	monzonite	<Null>
60	Magmatism of uncertain age or association	<Null>	<Null>	TKwp	Wilson Peak stock	<Null>
61	Southern Rocky Mountains volcanic field	<Null>	<Null>	<Null>	<Null>	<Null>
62	Southern Rocky Mountains volcanic field	<Null>	<Null>	Tg	gabbro	<Null>
63	Southern Rocky Mountains volcanic field	<Null>	<Null>	Trm	Rolling Mountain stock	<Null>
64	Southern Rocky Mountains volcanic field	<Null>	<Null>	Tamd	diorite sill of Archuleta Mesa	<Null>
65	Southern Rocky Mountains volcanic field	<Null>	<Null>	Trm	monzonite	<Null>
66	Southern Rocky Mountains volcanic field	<Null>	<Null>	Toa1	Miocene granodiorite and gabbro intrusive rocks	<Null>

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- Layers
 - ReviewPoints
 - ReviewLines
 - OrientationPoints_10_01_2020
 - intermtnwest.sde.ContactsAndFaults_Surfacia
 - intermtnwest.sde.ContactsAndFaults_Bedroc
 - intermtnwest.sde.FoldAxisLinesBed
 - intermtnwest.sde.MapUnitLinesBed
 - intermtnwest.sde.VolcanicFeatureLinesBed
 - MapUnitLabels_Bedrock
 - MapUnitLabels_Surfacial
 - VolcanicFeaturePoints_Bedrock
 - GeomorphicLines_Surfacial
 - 72976_1.tif
 - 80677_1.tif
 - 80697_1.tif
 - Aztec_24000_7324_ChamaRiverWild_Ridgley1
 - Hillshade/Slope
 - Aztec_10m_East_Slp.tif
 - Aztec_10m_East_HS.tif
 - ortho_1-1_hn_s_nm039_2018_1.sid

Identify

Identify from: <Top-most layer>

- intermtnwest.sde.ContactsAndFaults_Bedrock
 - contact
 - contact
 - normal fault
 - normal fault

Location: -939,100.503 1,515,493.291 Meters

Field	Value
objectid	8349
shape	Polyline
Type	contact
IsConcealed	no
IdentityConfidence	questionable
ExistenceConfidence	questionable
LocationConfidenceMeters	-9999
Symbol	1.1.6
Label	<null>
Description	<null>
MethodID	MET7

Identified 23 features

A SHIFT IN PHILOSOPHY AND THINKING

The product is a database, not a traditional map graphic

The review should occur within the database environment

All routing and approval steps should also use the map database which represents the entire complexity and detail of the publication

A SHIFT IN PHILOSOPHY AND THINKING

Multi-author map data and regional geologic mapping under the GeoFramework initiative will require many authors responding to reviews

Versioning can lead to multiple stages of review

The review is part of a continuous process

There may be many reviewers and many authors over a prolonged period of creation, compilation, and editing

A SHIFT IN PHILOSOPHY AND THINKING

Reviews, responses, and approval steps are data

Databases allow management of data

Current USGS routing uses the Information Product Data System (IPDS) database for logging steps in the process

The actual reviews and responses are stored in separate files with no data structure or interconnection within IPDS

(scans of paper with handwriting)

A SHIFT IN PHILOSOPHY AND THINKING

This all supports a database approach to technical review of geologic map data

A SHIFT IN PHILOSOPHY AND THINKING

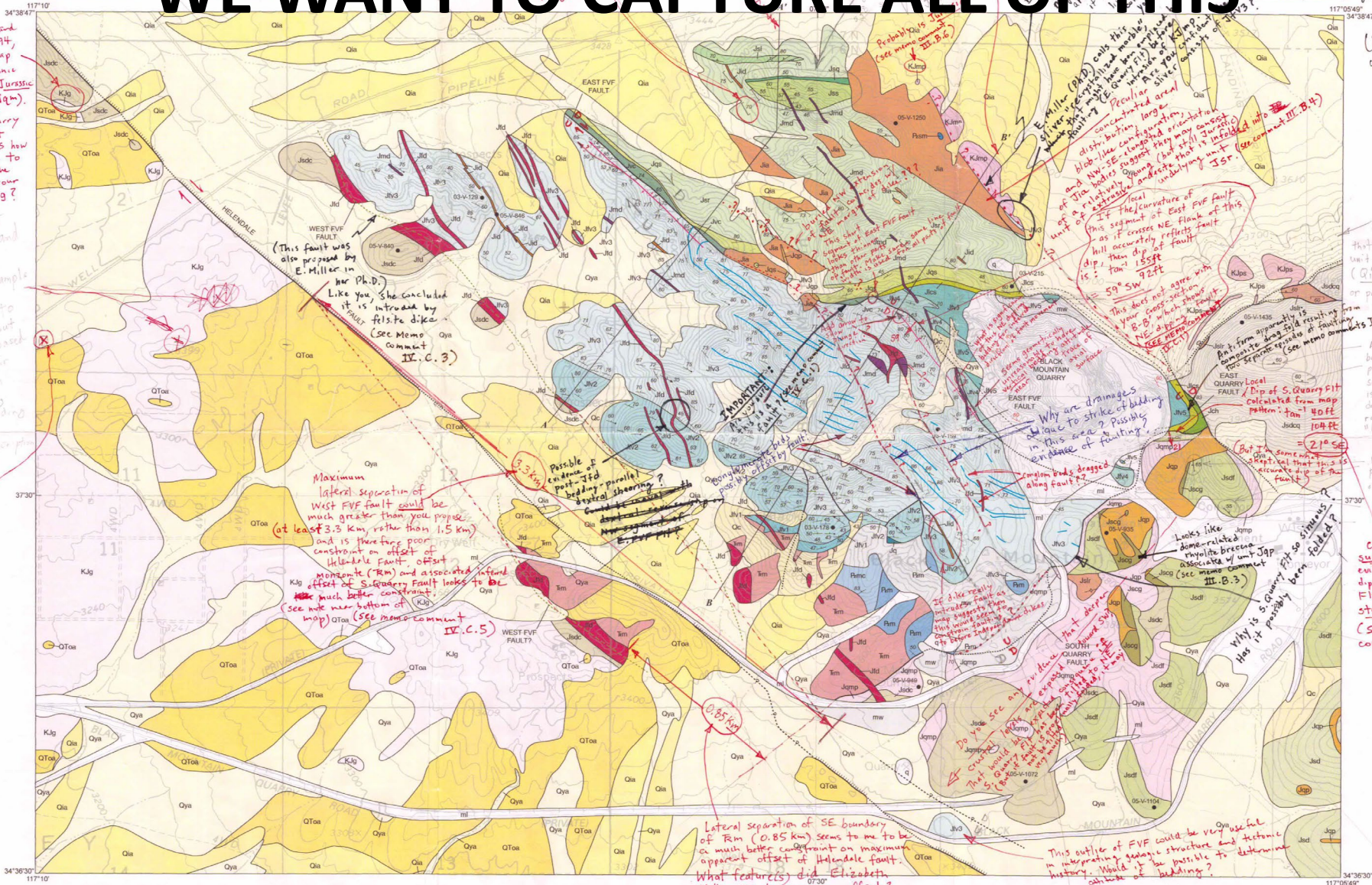
This all supports a database approach to technical review of geologic map data

How do we capture the traditional technical peer review within a database?

WE WANT TO CAPTURE ALL OF THIS

(See memo comment II.C.2)
Schermmer and Bosby (1994, fig. 7) map this plutonic rock as Jurassic in age (Jqm). Does this opinion carry any weight insofar as how you decide the age of your unit KJg?

Site of Miller and Martin K-Ar sample 73C seems to be about here, based on their location map, but according to the label description it plots here.



(This fault was also proposed by E. Miller in her Ph.D.)
Like you, she concluded it intruded by R1 site dikes (See Memo comment IX.C.3)

Maximum lateral separation of West FVF fault could be much greater than you propose (at least 3.3 km rather than 1.5 km) and is therefore poor constraint on offset of Helendale fault. Offset of S. Quarry Fault looks to be much better constraint. See note near bottom of map (See memo comment IX.C.5)

Possible evidence of east-west post-Jfd bedding-parallel drag along fault? (See memo comment IX.C.5)

Lateral separation of SE boundary of Rm (0.85 km) seems to me to be a much better constraint on maximum apparent offset of Helendale fault. What features did Elizabeth Miller use to constrain offset?

Why are drainages due to strike of bedding in this area? Possible evidence of faulting?

Do you see an evidence that the dip of the S. Quarry Fault is steeper than the dip of the East FVF Fault?

This outlier of FVF could be very useful in interpreting tectonic structure and tectonic history. Would it be possible to determine attitude of bedding?

What is inferred age of cleavage? and significance of tectonic feature (e.g. axial-plane cleavage)?
This cleavage is younger than contemporaneous with FV3. (See memo comment II.B.4)

Local distribution of Jia and NW-SE elongated orientation of a relatively young unit as it crosses NE flank of this fault will accurately reflect fault dip. This dip of fault is: tan 15.5° = 27.4%

This does not agree with 59° SW. This is a fault.

Looks like dome-related, mylonite breccia associated with unit Jap (See memo comment III.B.3)

Why is S. Quarry fit so sinuous? Has it possibly been followed?

(See memo comment IX.C.4)
Topography seems to suggest that an older alluvial unit is present here (Qia or QToa?) or perhaps Qc?

Are these symbols based on flattened pumice lapilli? If so, then this fabric is more accurately described as 'flattened' rather than 'layering'.

Calculated dip is suspect. Other evidence suggests dip of S. Quarry Fit is generally steep to SW. (See memo comment IX.C.2)

A SHIFT IN PHILOSOPHY AND THINKING

This all supports a database approach to technical review of geologic map data

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**Annotation of a digital graphic
sticky notes on a PDF**

most common approach to create “digital” review comments

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NOT A TRUE DATA DRIVEN APPROACH

A SHIFT IN PHILOSOPHY AND THINKING

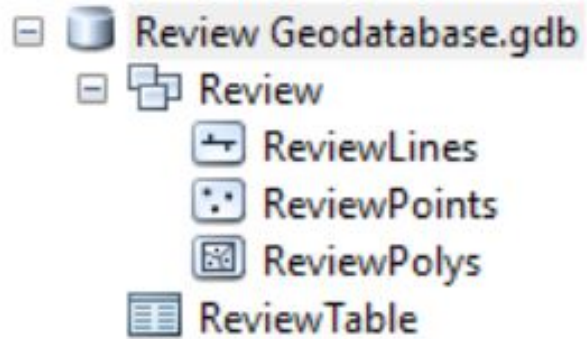
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A TRUE DATA DRIVEN APPROACH CREATES FUNCTIONALITY FOR THE REVIEWER, THE RESPONDING AUTHORS, AND THE APPROVING OFFICIALS

RECORDING REVIEW COMMENTS

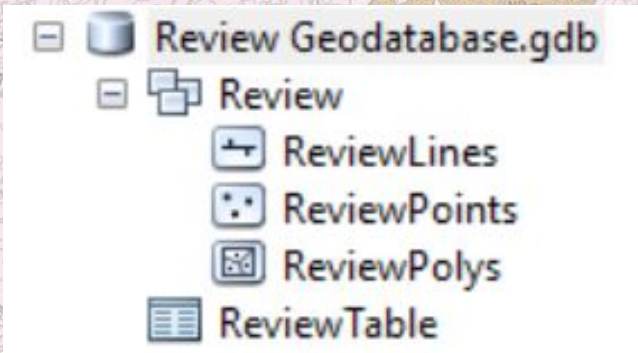
Allow the reviewer all feature types of GIS to provide comments:



- Polygons (**ReviewPolys**)
- Lines (**ReviewLines**)
- Points (**ReviewPoints**)
- Tables (**ReviewTable**)

RECORDING REVIEW COMMENTS

Allow the reviewer all feature types of GIS to provide comments:

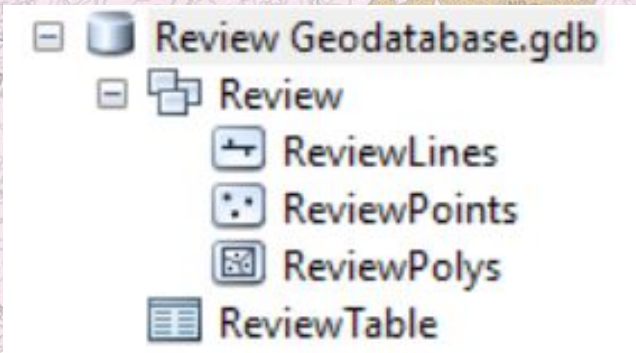


- Polygons (**ReviewPolys**)
- Lines (**ReviewLines**)
- Points (**ReviewPoints**)
- Tables (**ReviewTable**)

Separate database from the GeMS database being reviewed

RECORDING REVIEW COMMENTS

Allow the reviewer all feature types of GIS to provide comments:



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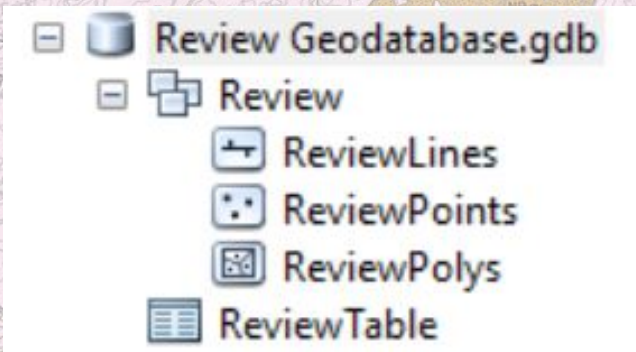
Polys can be used to circle a bunch of lines

A point can be snapped to a line to comment

Can copy and edit a line to suggest new geometry

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Can copy and edit a line to suggest new geometry

Tabular comments are best suited to address a tabular field

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment
- Progress of the comment (routing step)

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment
- Progress of the comment (routing step)
 - **Data targeted by the comment**

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment
- Progress of the comment (routing step)
 - Data targeted by the comment
 - **Comment open text**

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment
- Progress of the comment (routing step)
 - Data targeted by the comment
 - Comment open text
 - Author response open text

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment
- Progress of the comment (routing step)
 - Data targeted by the comment
 - Comment open text
 - Author response open text
- **Approving official response open text**

RECORDING REVIEW COMMENTS

Attribution to address comment and routing of comment:

- Name of reviewer making comment
- Name of author responding to comment
- Progress of the comment (routing step)
 - Data targeted by the comment
 - Comment open text
 - Author response open text
- Approving official response open text
- **Approval check-box to close out the comment**

RECORDING REVIEW COMMENTS

Spatial feature comments vs Tabular feature comments

Field Name	Data Type
OBJECTID	Object ID
shape	Geometry
reviewer	Text
responder	Text
progress	Text
featuredataset	Text
featureclass	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

Field Name	Data Type
OBJECTID	Object ID
reviewer	Text
responder	Text
progress	Text
tablename	Text
commentid	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

RECORDING REVIEW COMMENTS

Spatial feature comments vs Tabular feature comments


Field Name	Data Type
OBJECTID	Object ID
shape	Geometry
reviewer	Text
responder	Text
progress	Text
featuredataset	Text
featureclass	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

Field Name	Data Type
OBJECTID	Object ID
reviewer	Text
responder	Text
progress	Text
tablename	Text
commentid	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

IDENTIFY THE TARGET FEATURE OF THE COMMENT

RECORDING REVIEW COMMENTS

Spatial feature comments vs Tabular feature comments



Field Name	Data Type
OBJECTID	Object ID
shape	Geometry
reviewer	Text
responder	Text
progress	Text
featuredataset	Text
featureclass	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

Field Name	Data Type
OBJECTID	Object ID
reviewer	Text
responder	Text
progress	Text
tablename	Text
commentid	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

FeatureDataset for multi-map databases

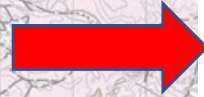
FeatureClass to identify the target feature type (concatenation)

Use spatial review features (poly, line, point) to identify specific target

RECORDING REVIEW COMMENTS

Spatial feature comments vs Tabular feature comments

Field Name	Data Type
OBJECTID	Object ID
shape	Geometry
reviewer	Text
responder	Text
progress	Text
featuredataset	Text
featureclass	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text



Field Name	Data Type
OBJECTID	Object ID
reviewer	Text
responder	Text
progress	Text
tablename	Text
commentid	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

TableName to identify the target table
CommentID (or FieldID?) to identify the row of the table
FieldName to identify comments for entire fields?

RECORDING REVIEW COMMENTS

Analyzing the review process?

Field Name	Data Type
OBJECTID	Object ID
shape	Geometry
reviewer	Text
responder	Text
progress	Text
featuredataset	Text
featureclass	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

Field Name	Data Type
OBJECTID	Object ID
reviewer	Text
responder	Text
progress	Text
tablename	Text
commentid	Text
commenttype	Text
comment	Text
comment2	Text
authorresponse	Text
approvingofficialcomment	Text
approval	Text

CommentType is a field intended to record general categories of comments

Allow post assessment of the process:

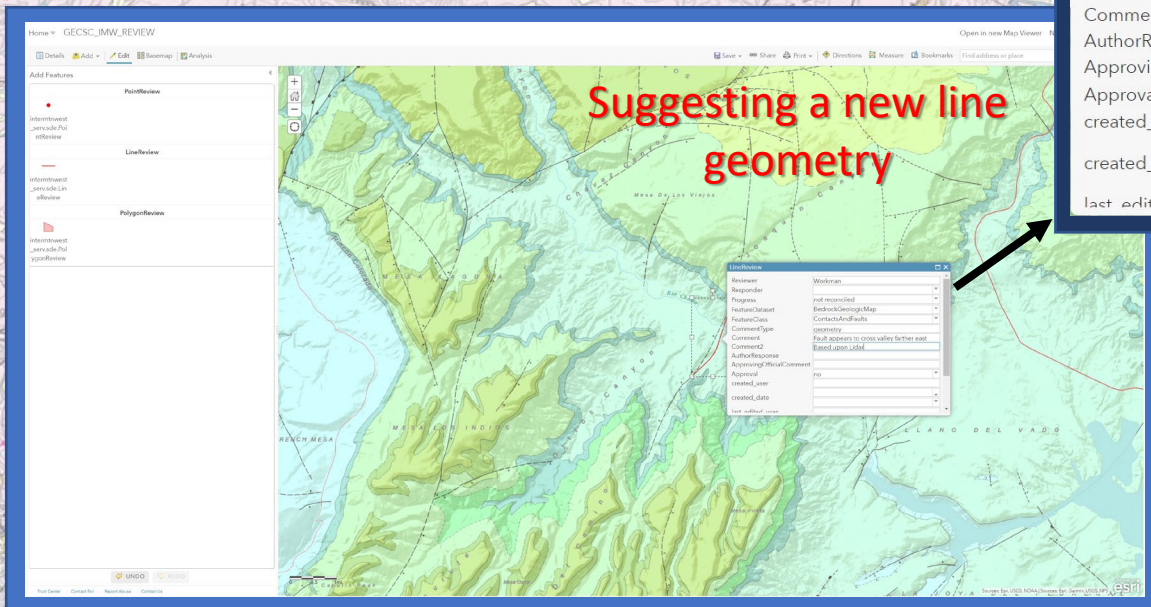
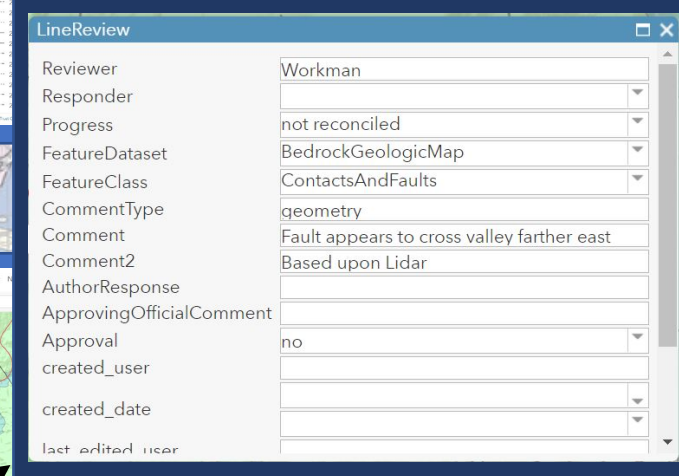
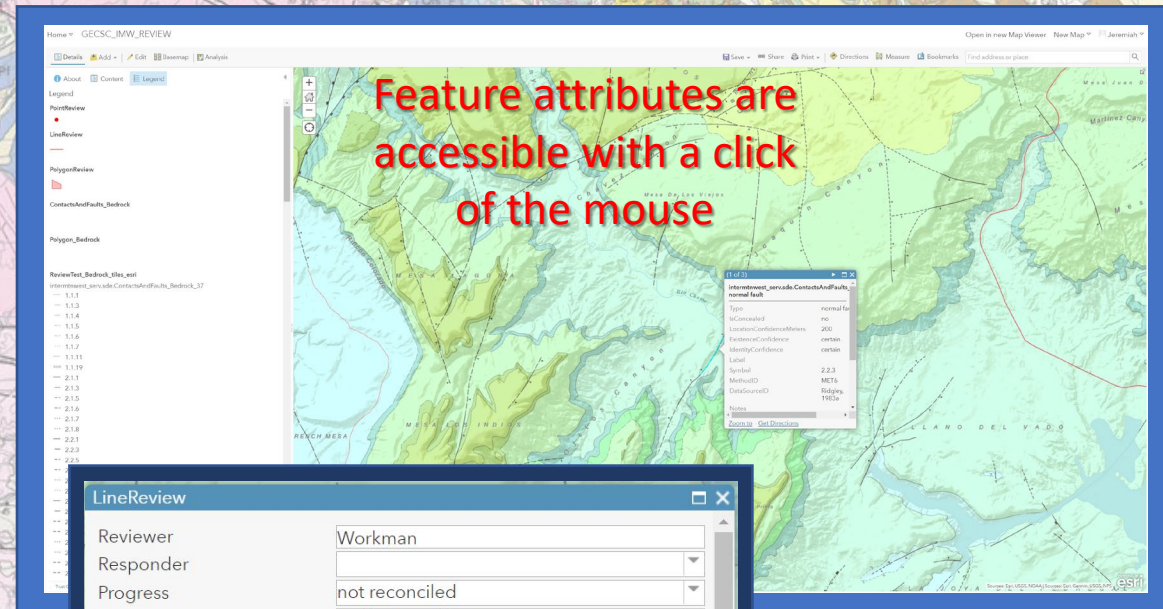
What types of comments are we getting?

Are different areas/rock types/etc. producing different problems?

Are different coauthors' workflows producing inconsistencies?

METHODS MADE POSSIBLE IN A DATABASE ENVIRONMENT

- Use of AGOL MapViewer for technical peer review
- TileService provides smooth viewing of symbolized map
 - map author controls visualization
- Queryable FeatureService provides controlled access to GeMS map database for querying – data remain secure
 - Allows map authors full control over their pre-publication data**
- Editable FeatureService provides full access to review database – technical reviewer can draw and attribute comments



- Web interface only requires the technical reviewer has an Org AGOL account
- Simple review feature/comment creation tools
- Domains create easy drop-down attribution
- Low technology threshold for reviewer

MANAGING THE REVIEW COMMENTS

Map authors can track progress while addressing review comments

Project managers overseeing multi-authored maps can use spatial and attribute queries of review comments to assign response duties and track progress

Multiple reviews can be managed simultaneously with ease due to comment level metadata

Routing and approval for updates to sections of a previously approved database can be treated in a more continuous workflow

Review comments can easily be archived in a uniform format and accessed later for full transparency of process



A BASIC FRAMEWORK FOR A STANDARD

A database approach requires a standard

A standard will facilitate construction of tools and consistency in the technical peer review process

The GeoFramework Initiative requires consistency of process across all agencies involved and may incorporate work from 100's of geologists as authors and as reviewers (crowd sourcing)

Management of this process will require a robust data solution