

# DIGITAL MAPPING TECHNIQUES 2023

The following was presented at DMT'23

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The contents of this document are provisional

See Presentations and Proceedings  
from the DMT Meetings (1997-2023)

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

# State Geological Surveys Capabilities Building an Interactive Dashboard with Tableau

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# Vision

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Map-based application on Association of American State Geologists (AASG) and National Geologic Database Management (NGMDB) websites allowing filter/query of state capabilities for easy identification of states with those resources and their availability for loan, contract, and consultation.



# Questionnaires for state geological surveys

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- Survey attributes
- Capabilities (GeMS, laboratory, equipment, etc.)
- Storage availability
- Staff positions







# User Requirements

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1. Must be **editable** in real time by state surveys as information changes
2. Must be **'fun'** enough to use to gain traction
3. Must have ability to **query/filter** data
4. Must have a **map**
5. Must be **publicly available**



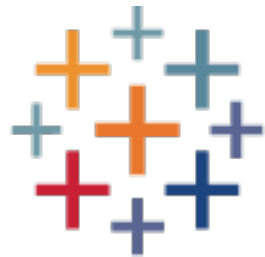


# What tools to use?

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Google Sheets



+ a b l e a u®





## State Specific Google Sheet

### State-Specific Google Sheet

- Pre-formatted Google Sheet
- State fills out entries
- Updated by anyone with link



# State Specific Google Sheet

The image displays a Google Sheet interface for Washington, divided into two main sections: a survey form and a data table. A central diagram titled "STATE CAPABILITY" is overlaid on the right side of the data table, showing various capability categories.

**Survey Form Section:**

State	Survey Taken?
Washington	Yes

**Data Table Section:**

State	Category	Method/Procedure	Method Type	Capability	Additional Detail	Availability	Comments
State	Capability category. Add additional capabilities in rows below (optional)	Method or procedure for capability category	Type of method/procedure	For each row, indicate whether this is a tool/method your survey is capable of completing in-house with current infrastructure, equipment, and staff.	Provide more detailed information, if needed (depth, diameter, specifications, brand, etc.)	If you answered 'Yes' in Capability, use the dropdown to select appropriate response. This field indicates willingness on the part of your Survey to loan equipment or contract a service OR willingness to advise/discuss the equipment/use/specifications with others. This is not intended to capture capabilities a state Survey may access from others or capabilities that state Surveys must contract out to obtain.	Qualified answers can be clarified by using the comments field
Washington	Boreholes	Inclinometers	Logging	No			
Washington	Boreholes	Extensometer	Logging	No			
Washington	Boreholes	Piezometers	Logging	No			
Washington	Boreholes	Hand auger	Logging	No			
Washington	Boreholes	Russian sampler	Logging	No			
Washington	Boreholes	Eijkelkamp	Logging	No			
Washington	Boreholes	Roto-sonic	Logging	No			
Washington	Boreholes	Sonic drilling	Drilling	No			
Washington	Boreholes	Directional drilling	Drilling	No			
Washington	Laboratory	General sample preparation	Description and analysis	Yes		Item/Capability is not available for loan ...	
Washington	Laboratory	Bulk sampling, sample splitting, mechanical size separation	Description and analysis	Yes		Item/Capability is not available for loan ...	
Washington	Laboratory	Particle size (sedigraph, pipette, hydrometer, sieve, etc)	Analysis	Yes		Item/Capability is not available for loan ...	
Washington	Laboratory	Carbonate content (Chittick, Leco)	Analysis	No			
Washington	Laboratory	X-ray diffraction	Analysis	Yes		Able to contract for ...	
Washington	Laboratory	Bulk density, water content, void ratio	Analysis	Yes		Item/Capability is not available for loan ...	
Washington	Laboratory	Atterburg limits (LL, PL)	Analysis	No			
Washington	Laboratory	Degradation	Analysis	No			
Washington	Laboratory	Bulk magnetic susceptibility	Analysis	Yes		Item/Capability is not available for loan ...	
Washington	Laboratory	Thermal conductivity	Analysis	No			
Washington	Laboratory	Sensitive geochemistry (pore water Eh-pH, O <sub>2</sub> , some C, S)	Analysis	No			
Washington	Laboratory	Organic geochemistry of sediments	Analysis	No			

**STATE CAPABILITY Diagram:**

The diagram features a central node labeled "STATE CAPABILITY" connected to twelve surrounding nodes: BOREHOLES, LABORATORY, GEOCHRON, LOGISTICS, GEOPHYSICS, REMOTE SENSING, GIS, GEMS, 3D, IT & MISC, STORAGE, and STAFF & SKILLS.





State-Specific  
Google Sheet

All States  
Google Sheet

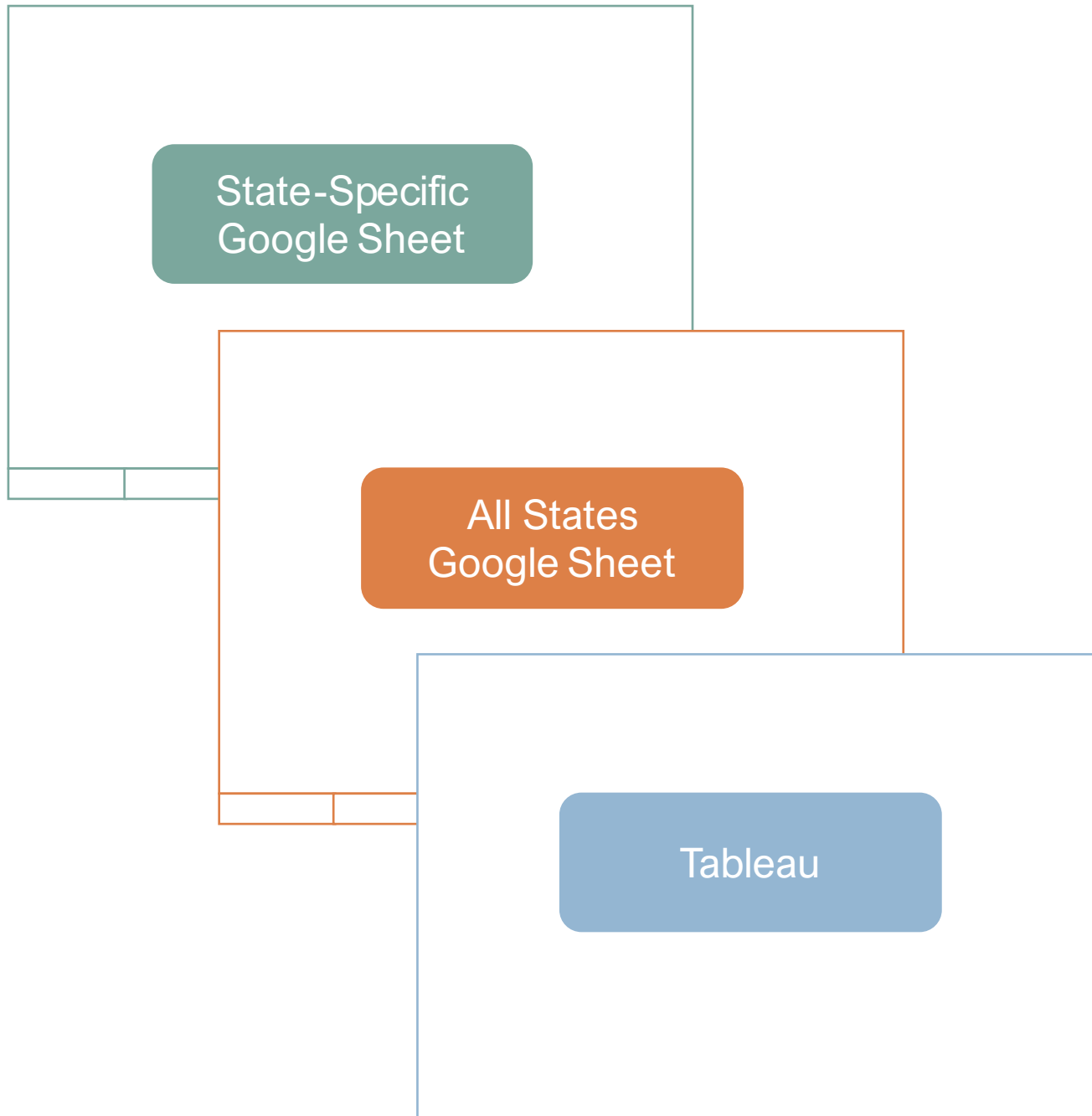
### All States (Combined) Google Sheet

- Combines data from state-specific sheet using IMPORTRANGE function
- Owner has editing access



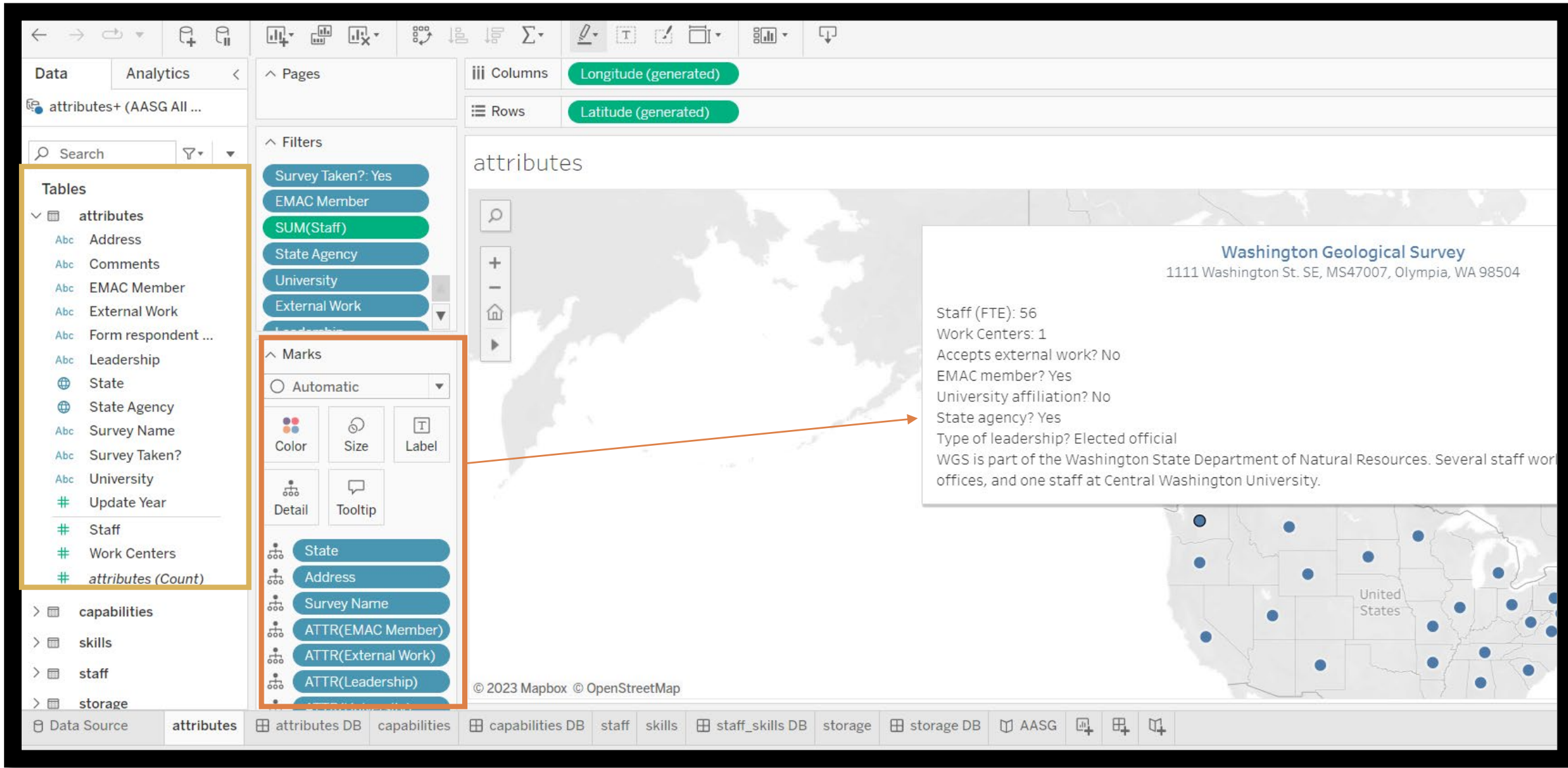






### Tableau

- Reads from All States Google Sheet
- Automatic updates
- Owner has editing access



Dashboard

Layout

Default  
Phone

Device Preview

Size  
Desktop Browser (100...)

Sheets

- attributes
- capabilities
- staff
- skills
- storage

Objects

- Horizontal Container
- Vertical Container
- Text
- Extension
- Ask Data
- Image
- Blank
- Workflow
- Web Page
- Navigation
- Download

Tiled Floating

Show dashboard title

Learn about different state geological surveys using the filters below. Select a state on the map to view details about the survey.

Does the survey accept external work?  
(All)

Emergency Management Assistance Compact (EMAC) member?  
(All)

University affiliation?  
(All)

State agency?  
(All)

Type of leadership?  
(All)

Staff (FTE)  
1 140

Work Centers  
1 6

Canada

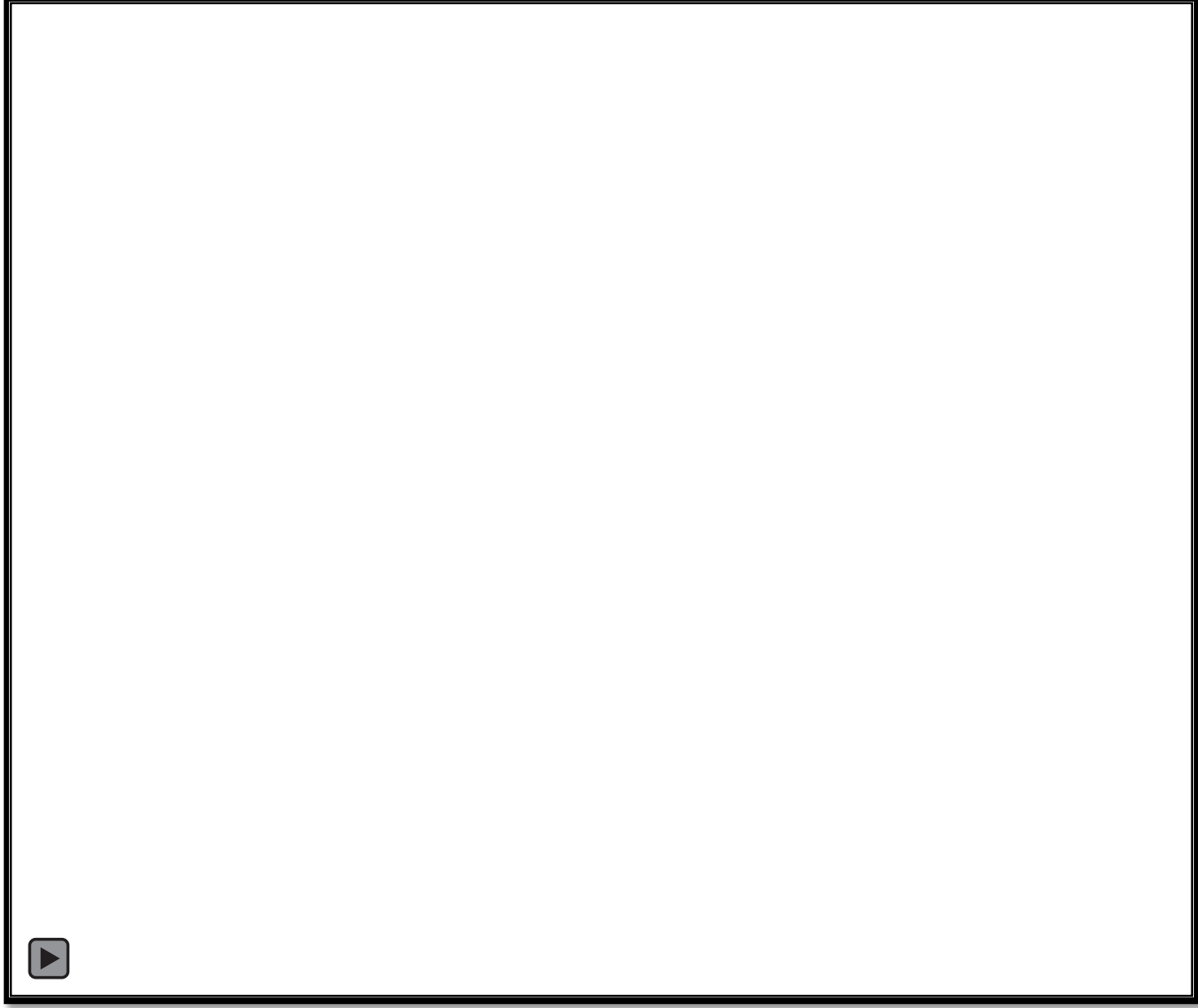
United States

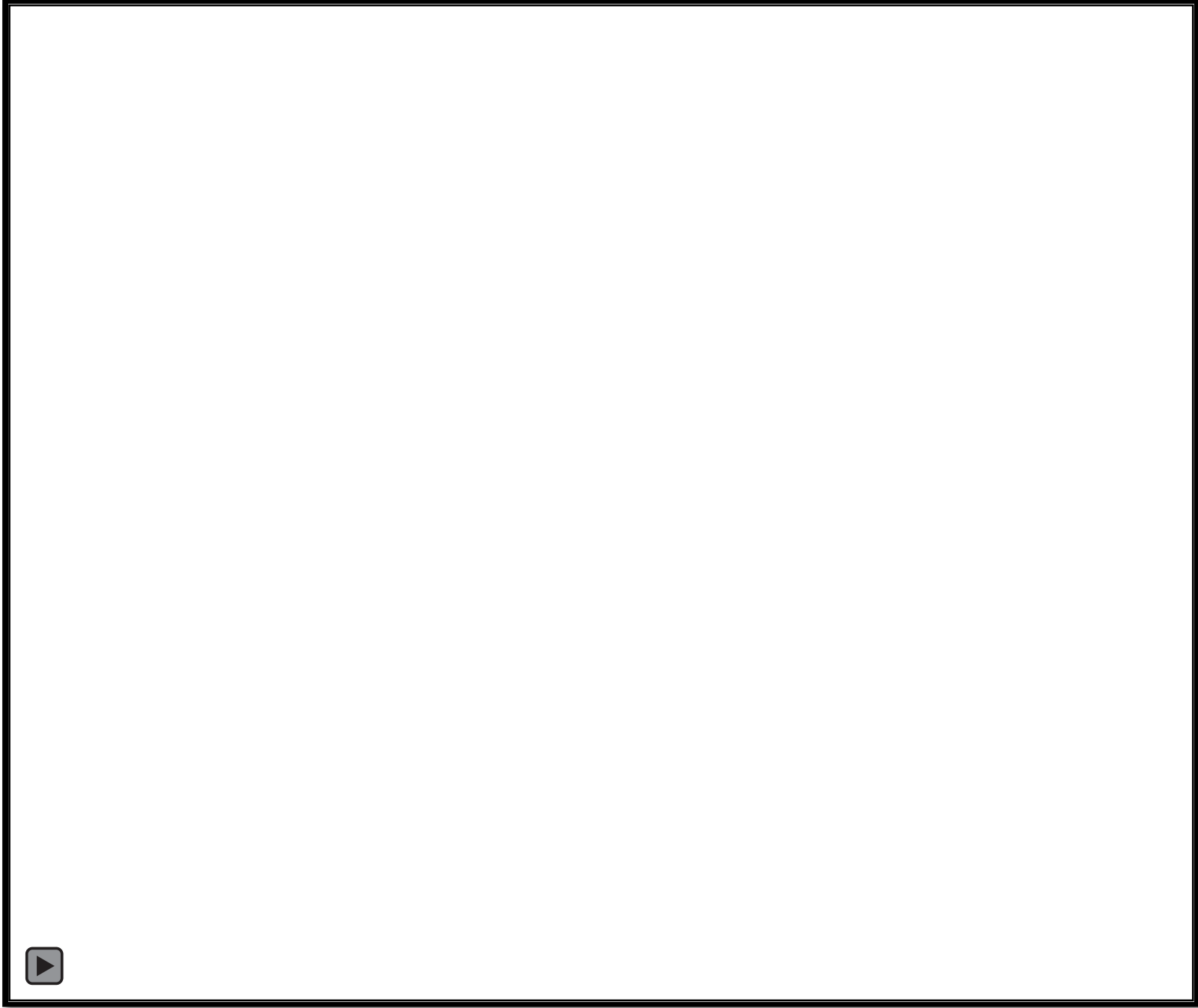
Mexico

AASG  
Association of American State Geologists

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# Tableau

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- Free version available with limitations
- Connects to Google Drive and other data sources
- Quickly import and visualize data
- Create custom dashboards with filter, query tools
- Includes a basic but useful spatial mapping component
- Users can view and download information







# State Geological Surveys Capabilities Dashboard

[Tableau Link](#)

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