

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/ As part of the U.S. GeoFramework Initiative discussion topic, Jessica Czajkowski (Washington Geological Survey) and Mark Yacucci (Illinois State Geological Survey) held an interactive session using Mentimeter to conduct real-time polling of staff-level opinions on agency capabilities (e.g., staffing levels and skill sets, and available data sets) to participate in the NCGMP U.S. GeoFramework Initiative. Polling questions pertained to data types and formats, data management, map scale users, availability, and formats, stratigraphic correlations, GeMS, GIS, 3D modeling, copyright, and other topics. Most questions were aimed at State Geological Surveys, and several questions were asked of USGS staff. In parallel with similar Mentimeter polling of State Geologists and USGS managers during the U.S. GeoFramework Initiative Strategic Implementation Workshop a month prior, polling results reflected the high degree of variability across State Geological Surveys regarding their data availability, types, formats, and processes, their enterprise systems, and technical ability to contribute to the U.S. GeoFramework Initiative.

After the polling, brief breakout discussions identified some key issues and potential including:

- The need for better subsurface information (e.g., water well locations). In some cases, a state can't yet create GIS compilations, but could use the funds to clean up ancillary data useful for geologic mapping.
- 2. Administrative issues (e.g., GIS staff funding and retention, centralized staff serving multiple agencies, software purchasing requirements) may determine a State's ability to participate.
- 3. More long term (i.e., more than one year) predictability in funding is essential for planning a States's participation in this Initiative. Especially for hiring plans and various science issues such as prioritization for converting legacy maps to GeMS.

Staff-Level Survey of Capabilities for the **USGS GeoFramework Initiative**

Digital Mapping Techniques, June 2021



Is your state building, maintaining or considering ancillary databases regardless of participation in the GeoFramework Initiative?

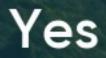






Does your state collect and manage borehole and(or) water well information?

53



3

No



Does your state collect and manage oil and gas well information?



45

8

No



Does your state collect and manage coal resource information?

37







Does your state collect and manage paleontologic information?

33

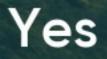
Yes





Does your state collect and manage geochronologic information?

38

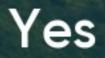


No



Does your state collect and manage geochemical information?

45

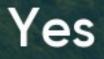






Does your state collect and manage geophysical information?

46







How are your ancillary data managed?

single databases

7

comprehensive database

2

38

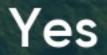
separate files

some of each



Does your survey have an up-to-date, in-house statewide stratigraphic chart?

23





We rely on Geolex



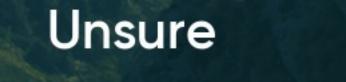
Does your survey have a statewide geologic names lexicon?

16

No



11



9

We use

Geolex



Is your survey currently able to create GeMS (Level 2 or 3) files?

42



12

No



Does your survey plan to use GeMS for non-USGS deliverables?

Yes

9

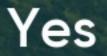




In part



Does your state have the resources to convert high-priority paper maps to GeMS?







Does your state have the resources to convert high-priority GIS files to GeMS?

36





No



Does your state have the resources to export geologic map data from your corporate system to GeMS?

22



14

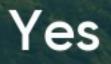
11

No

Not applicable



Does your survey have a database schema suitable for creating regional compilations?

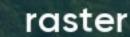








If your survey is creating subsurface data such as top of More rock or thickness of unconsolidated materials, what is the format?



8

vector

6







not applicable



Does your survey create or plan to create 3D data or models?

40

Yes

11

No



Does your survey copyright your publications?

4

Yes

24

No

16

Some publications are copyrighted.

5

Unknown



States: Based on your current mapping inventory, could your state compile a seamless statewide 2D map in GeMS at an appropriate scale?

21

We already have done this or could easily do this

We would need to mix multiple scales of mapping to make seamless

18



We cannot compile a statewide map without having gaps



FedMappers: Is your desired output product a 1:50,000 or less detailed geologic map?

64%









FedMappers: Can your basic or applied research objectives be addressed MMMe by 1:50,000 or less detailed geologic mapping?

43%

Yes

36%

21%



Unsure



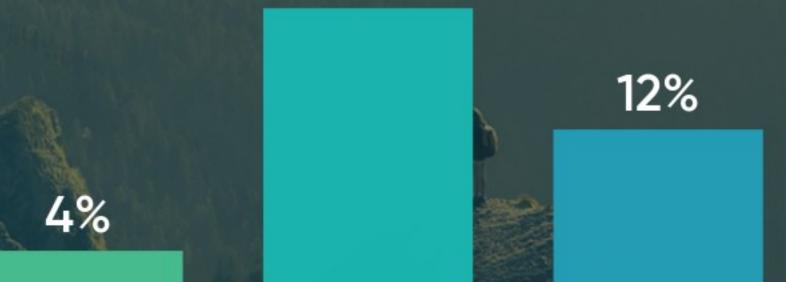
States: Do you have the ability to partner with neighboring states for edgemapping or stratigraphic issues?

40%



We partner regularly with or without legal agreements/contracts in place

We occasionally partner for smaller projects



20%

Our state is limited by policy or mandate from such partnerships

We have never done this in the past, but are open to it

There is some geographic variability in our ability to partner



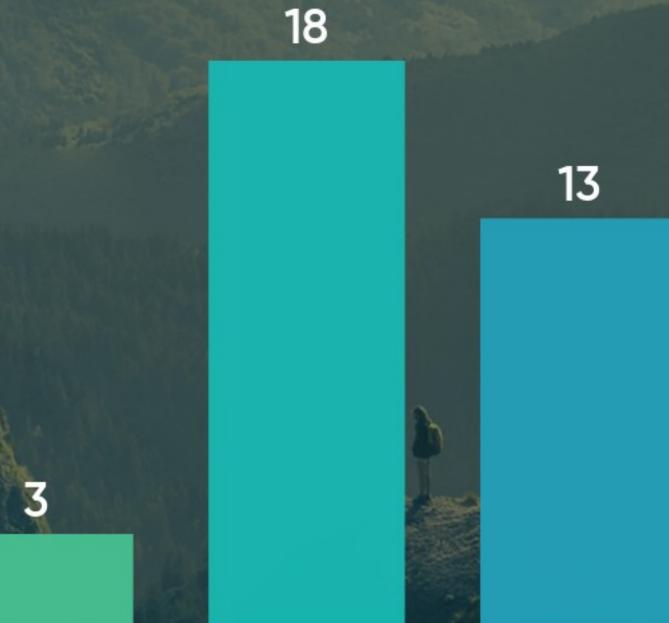
States: Characterize your state's borehole data. (check all that apply)



We have a spatially complete dataset that meets most of our needsneeds

12

Our state's data is patchy or mostly shallow



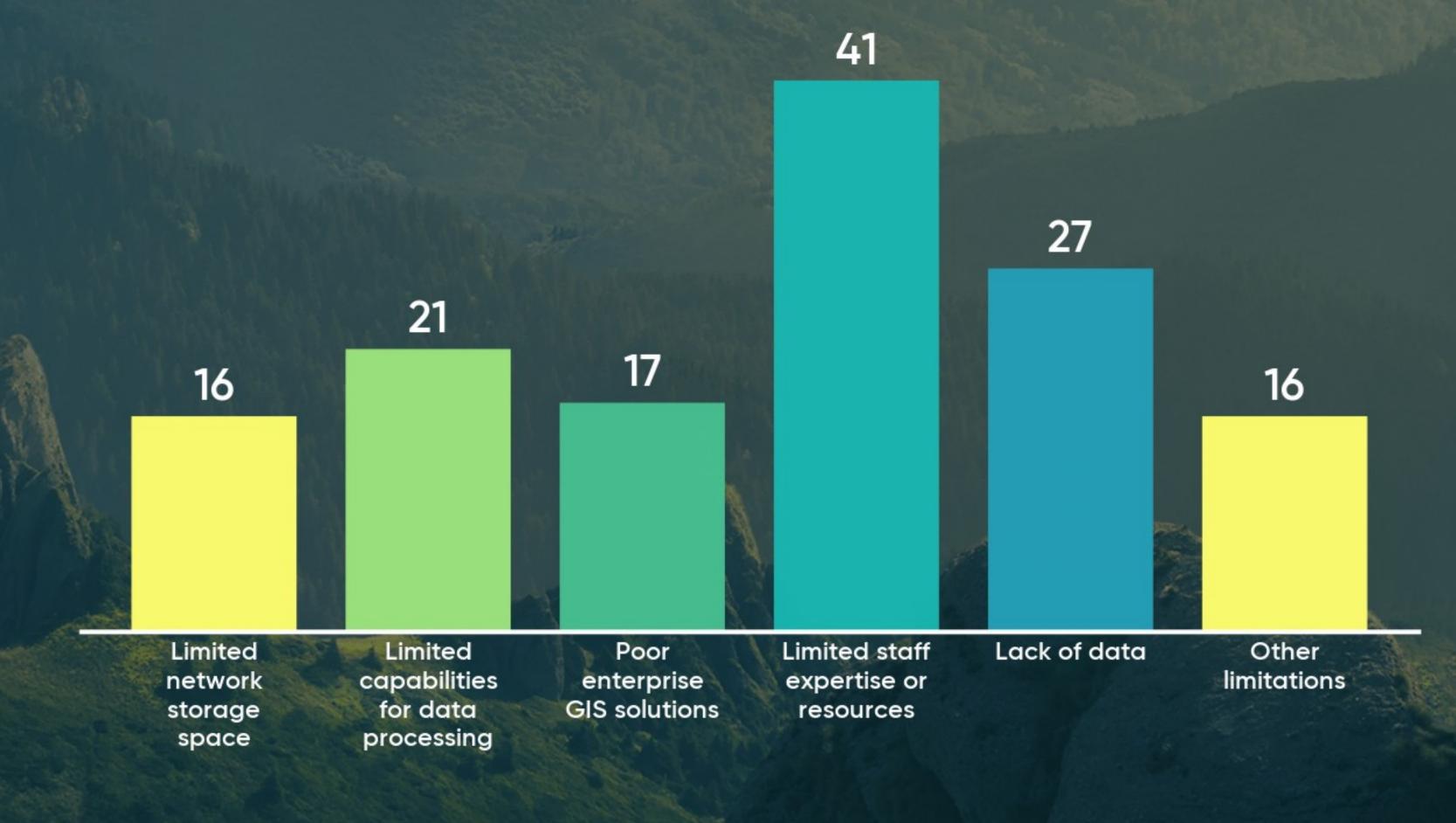
We don't have subsurface data compiled

Our subsurface data has quality issues or is poorly located

We have a dataset that can accommodate statewide data

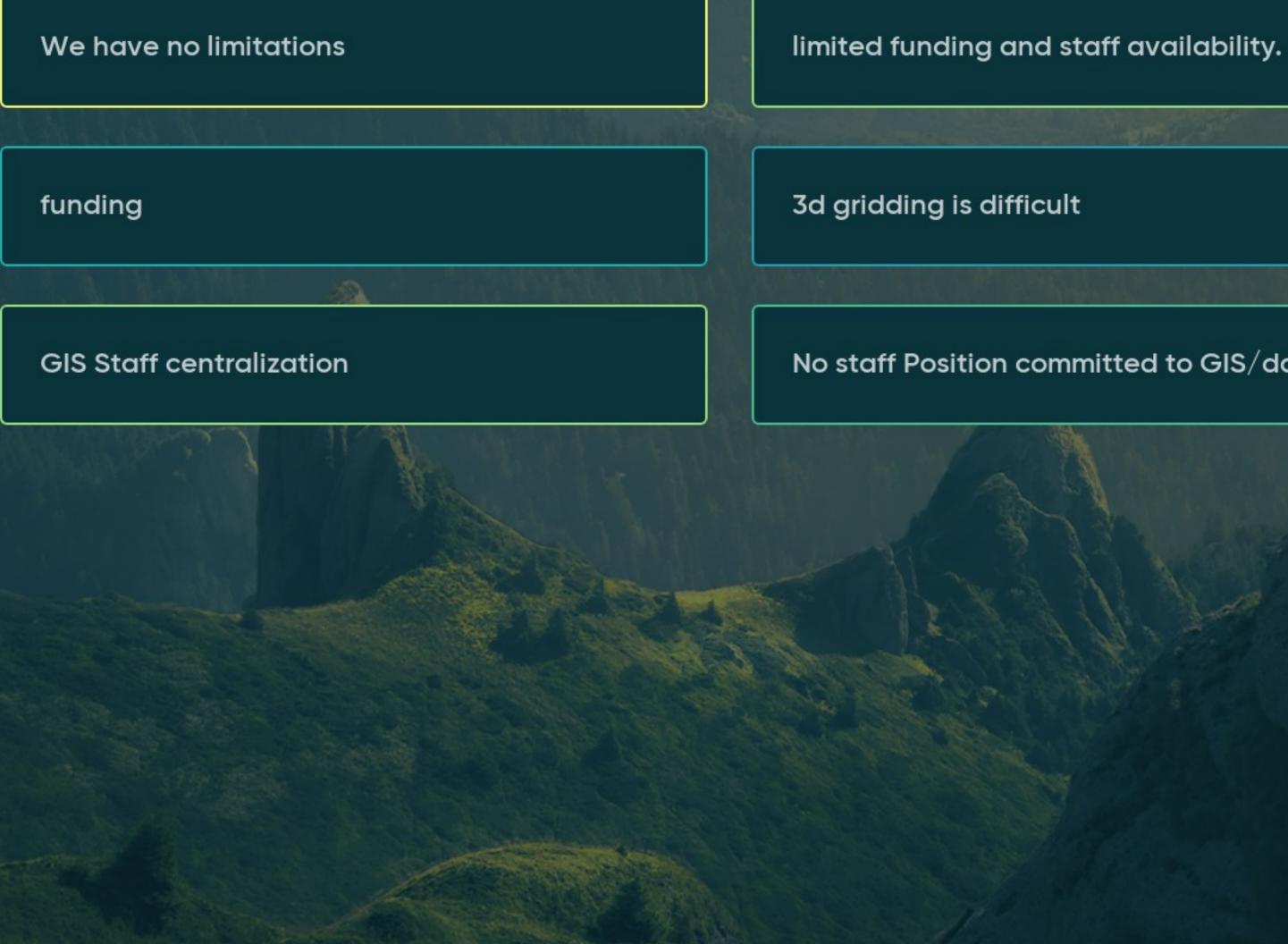


States: What are some of the limitations your survey faces with respect to the technicalities of going 3D? (Check all that apply)





For those that checked 'Other', please briefly describe what the challenges are

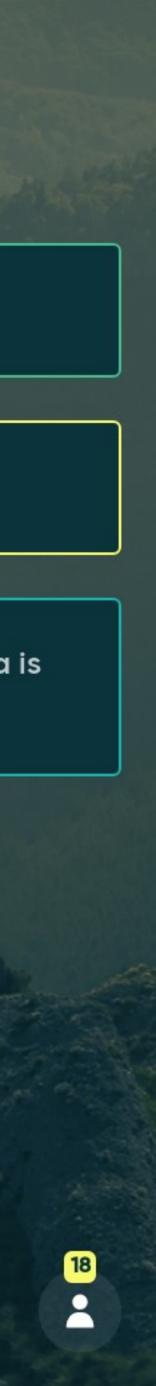


software options and funding

Difficulty getting software approved.

No staff Position committed to GIS/database

The quality of some of the subsurface data is not good enough for 3D usage



For those that checked 'Other', please briefly describe what the challenges are

limited time money and staff and so far 3-D work has been specific to projects

software/computing

Verification of borehole locations. Wildly variable skill level for geologic picks through the years (students with minimal exp to PGs with decades exp)

GIS staff/time

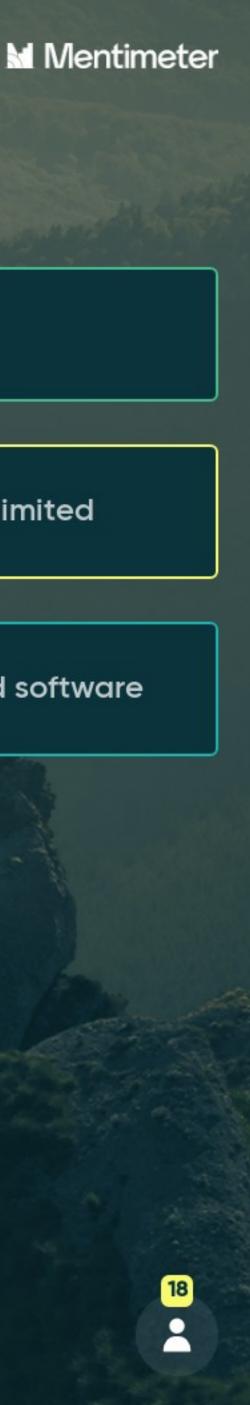
For mappers, lack of 3d product need. 3d data and products are more in the realm of water and oli and gas geos

Funding

Funding

limited budget, access to software limited

Need to invest more in GIS staff and software



States: Does your state have a current software solution in place for modeling in 3D? (Check all that apply)

3

Open Source

30

Esri



13

Other proprietary solution

Solutions tried thus far have been unsatisfactory

7

Unsure



FedMappers: Does your Fedmap project involve a partnership with a state survey Mento get the work done?

Yes

7

3

No

Unsure

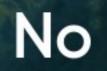


FedMappers: Does your Fedmap project involve modeling in 3D?



Yes

5



Maybe



FedMappers: If your project creates 3D models, are they site specific or regional?

Site specific

2

5

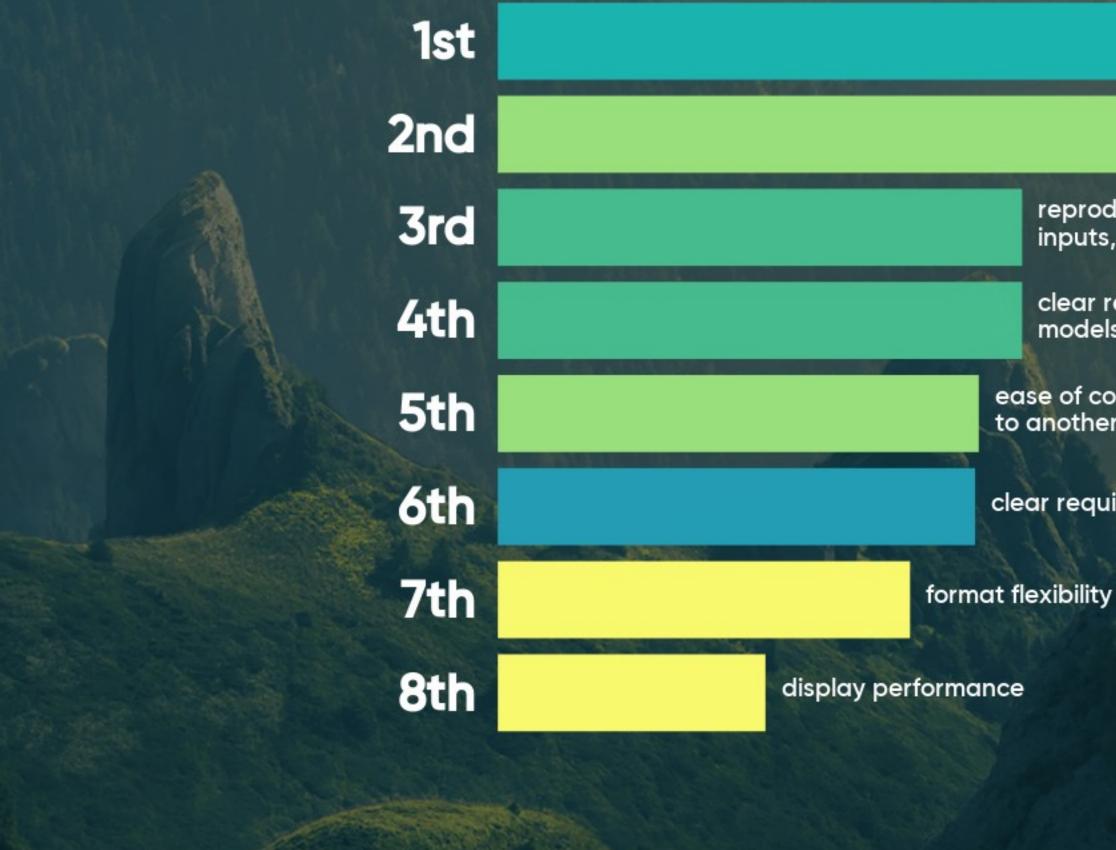


Regional





Everyone: Please rank the importance to your state for each factor with respect to the GeoFramework Initiative **3D** output standards



clear requirements to create models

ease of access to modeling

reproducibility of models (access to inputs, frameworks, and outputs)

clear requirements to distribute models to users

ease of conversion from one format to another

clear requirements to display models



States: What scale of 3D map data will best meet the needs of the stakeholders in your state?





State Surveys: Which stakeholder group in your state are likely users of geologic 3D map data? (check all that apply)

14

emergency man

researd

40

42

21

-use managers

hydrologists/water ma

surance co

34

35

oil and gas or geothermal reg industry

anies/real estate

homeov

23

education



37

ng or other industry

States: Who do you envision/wish to perform the actual 3D modeling of your state?

9%

USGS will incorporate the data for my state into a regional or national model

We hope to other team

partner with states/fedmap to accomplish modeling as a

48%

43%

We will likely perform the 3D modeling ourselves for later synthesis into national model



FedMappers: Will national-scale 3D geologic model data address the research objectives of Fedmap at large?

6



1

Somewhat

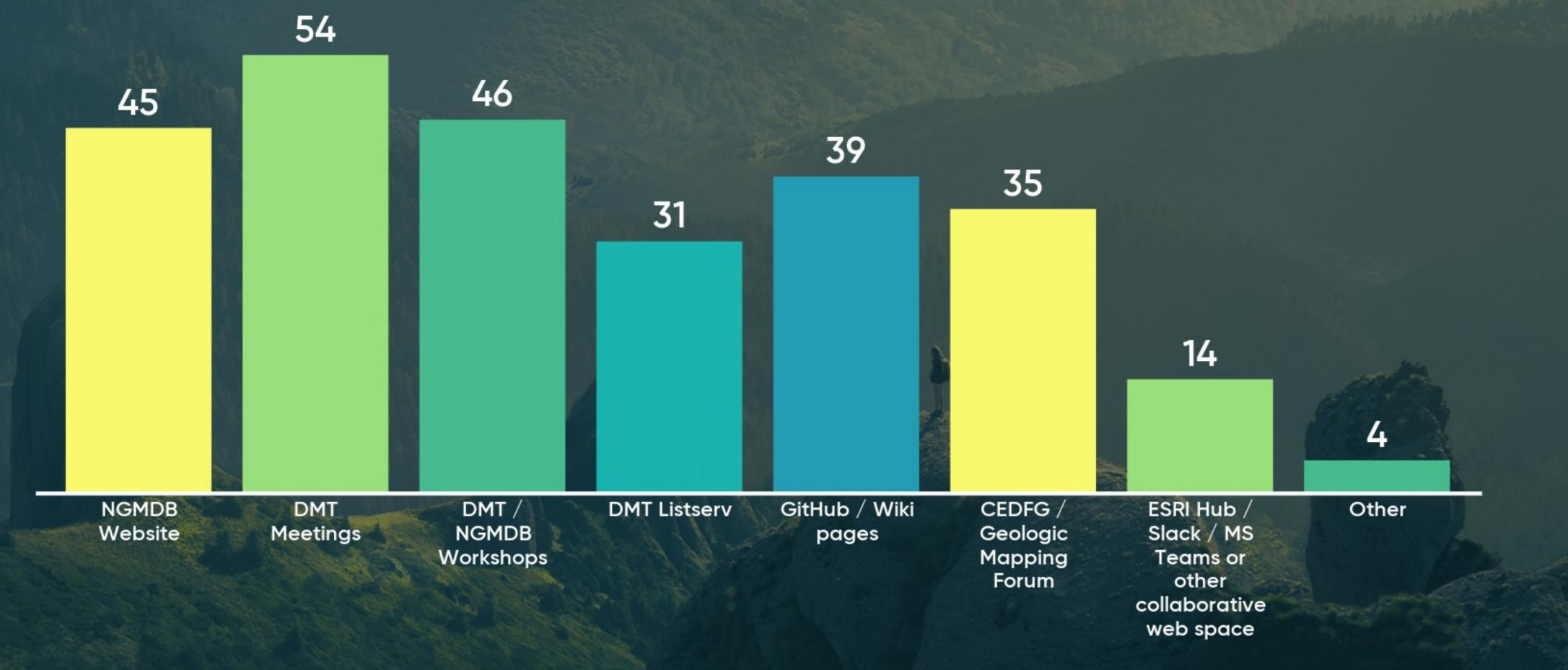


4

Unsure



Check all that apply: What collaboration tools for GIS, GeMS, and mapping information do you currently use or want to use





If you said other, what is it?

https://gitter.im/gemsschema/community

Monthly lunch bag gatherings

interacting-cooperating with adjacent states to resolve issues

GMAC meetings

CDEFG Meetings

Attending seminars - see what is going on outside of my group

USGS Community for Data Integration

Gitter

