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FEDERAL GEOGRAPHIC DATA COMMITTEE

NGAC FAIR Data Subcommittee

OCT 11, 2023

NGAC Subcommittee Membership – August 2023

	Landsat Advisory Group	3DEP Subcommittee	GDA Subcommittee	NSDI Subcommittee	FAIR Data Subcommittee
Chair	Frank Avila	Gary Thompson	Chad Baker	Bert Granberg	Clio Andris
Vice Chair	Vasit Sagan	Gale Blackmer*	Mark Meade	Curtis Pulford	Holli Howard
Members	Mariel Borowitz* Holli Howard Keith Masback* Anne Miglarese* Devaki Raj *Non-NGAC Members	Garet Couch* Lynn Dupont Karen Gaffney* David Maidment* Mark Reichardt* Jim Van Rens* Breece Robertson Steve Steinberg* Stewart Walker* *Non-NGAC Members	Maggie Cawley Leslie Jones Phil Thiel Gary Thompson	Jack Dangermond Leslie Jones Ryan Mattke Siva Ravada Vasit Sagan Kathleen Stewart Tim Trainor	Nadine Alameh Byron Bluehorse Tony LaVoi Siva Ravada Breece Robertson Kathleen Stewart Phil Thiel
Member Total	7	11	6	9	9
Federal Contact(s)	Tim Newman/ Tim Stryker	Mike Tischler/ Vicki Lukas	John Mahoney/ Libby Duban	Josh Delmonico/ John Mahoney	FGDC Executive Committee Members

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NGAC Subcommittees – August 2023

Subcommittee	Tasks*	FGDC Partner Org.
Landsat Advisory Group Subcommittee	Provide ongoing advice & recommendations on Landsat & National Land Imaging (NLI) Program. For 2023, complete LAG Task 1 (Recommendations for National Land Imaging 'Next' Products), and Task 2 (Interagency Coordination and Efficiencies).	USGS/National Land Imaging Program
3DEP Subcommittee	Meet NGAC requirements under National Landslide Preparedness Act, including program assessments of 3DEP, and additional topics related to the future direction of 3DEP.	USGS/National Geospatial Program
GDA Subcommittee	Coordinate NGAC reporting requirements under the Geospatial Data Act; follow up on the recommendations in the April 2023 NGAC GDA Implementation paper.	FGDC Office of Secretariat (OS)
NSDI Subcommittee	Provide advice and recommendations on development & implementation of the NSDI Strategic Plan; complete Geospatial competitiveness paper initiated by NGAC Geospatial Excellence & Innovation Subcommittee.	Census/ FGDC OS
FAIR Data Subcommittee	"Umbrella" subcommittee to address multiple data-related topics, which may include advice and recommendations on: GeoPlatform Geo AI Standards	FGDC ExCom/ FGDC OS

NGAC FAIR Data Subcommittee – Potential Study Topics

- **GeoPlatform:**
  - Role of the GeoPlatform in the NSDI & value to stakeholders
  - Examples of best practices in other Platforms
  - Models in other organizations (States, International)

- **Standards:**
  - Recommendations on the role of the FGDC standards process (considering resource constraints)
  - How do FGDC standards impact other organizations?
  - Role of FGDC standards in the NSDI?

- **Geo AI:**
  - Forum to share information on best practices, issues, concerns
  - What needs to be done to data/metadata to prepare for AI applications?

NGAC FAIR Data Subcommittee – Potential Study Topics

- **F**indable

- **A**ccessible

- **I**nteroperable

- **R**eusable

NGAC FAIR Data Subcommittee - Timeline

August Committees established

September First virtual meeting goal:
Brainstorming on the committee goals
Begin to form research questions for the committee based on the topics

October goal:
Distill into Research Topics and come up with a deliverable/next step goal for the December meeting

+1 pins

Topics

A Standards Data Catalog that points to relevant standards by feature and regionally

5 What are the benefits/drawbacks of allowing users to 'like' or 'star/rate' a dataset?

15 Would we see more interaction/ease of use if we included a screenshot of the data before a user downloads? (etc…they can see file size now)

8 What does the national geospatial community need from the Federal Geospatial Platform? The GDA language is very vague and doesn't speak to end user requirements

9 Do we have handle on GeoPlatform is being used, what are the issues and opportunities for evolution? Add looking into data interoperability among platforms.

11 Do we have a sense of who and how many use GeoPlatform - has their been a product UX study and what did it tell us?

0 In light of the newest Federal funding opportunities requiring geodata to support proposals, discussion on how this committee is engaged or could be.

3 For the Geo AI topic - is it within our purview to create recommended standards of use, QAQC processes and addressing ethical issues?

10 data sets for specific applications: how do I find data sets that are used in solving a problem similar to what I am trying to solve?

14 What % of tabular datasets / which, etc. are "analysis-ready", meaning they are a flat file w/ appropriate column headings, etc? How do we signal to users whether a dataset is 'ready to go'?

1 New potential topic on data that is available for equity and environmental and other justice issues.

7 Do we have a good understanding of all the current geo standards?

6 Review of FGDC Standards process with recommendation for improvements

Could we inventory all the water data standards (example) to see just how many such standards currently exist and look for opportunities to collaborate on building a single

15 What are some common "data journeys" that people have as they try to find data online?

2 How do we know what organizations are using which geospatial standards and which are most relevant to US gov and partners?

4 Do Federal geospatial standards matter? Or does the geospatial community look to other sources (e.g. OGC, international standards bodies) for guidance and support?

13 Guidance on GEO AI standards and or best practices

12 Are there using numerical measurements to define 'sparse' data; 'noisy' data; 'incomplete' data?

16 What are three recommendations we could provide to all Federal agencies to improve the democratization of data and tools?

How do we improve data equity in our communities, especially those that are not likely to have the supporting resources to take advantage of geospatial technologies?

17 AI/L the con FAIR

NGAC FAIR Data Subcommittee Working/Brainstorming Doc

1. Using geospatial data and tools to access funding opportunities

Background: In light of the newest Federal funding opportunities requiring geodata to support proposals, discussion on how this committee is engaged or could be?

- Require use of tools to use these tools to show they are working in underserved communities but it is unclear how they can get to the tools, create a map or data
- EJScreen good example to understand impact

2. User-focused studies

a. Would we see more interaction/ease of use if we included a screenshot of the data before a user downloads? (etc…they can see file size now)

b. What are some common "data journeys" that people have as they try to find data online?
   i. When, specifically, do users experience disappointment or frustration?
   ii. Census Bureau has different FIPS codes than shapefile (extra zero).

c. Social
   i. How do I find data sets that are used in solving a problem similar to what I am trying to solve?
   ii. What are the benefits/drawbacks of allowing users to 'like' or 'star/rate' a dataset?
      1. Help the user to understand if this data is useful and has all the components of a quality dataset

d. What are the tools, data, standards needed to run your analysis (NSGIC and GeoGov Summit)

3. Standards

a. Do we have a good understanding of all the current geo standards?

b. Review of FGDC Standards process with recommendation for improvements

c. Do Federal geospatial standards matter? Or does the geospatial community look to

NGAC FAIR Data Subcommittee – Major Themes

- Standards

- GeoAI

- GeoPlatform

- Fair Principles

- Equity and Justice

- Funding

- Data Usability and Characteristics

- User focused studies

NGAC FAIR Data Subcommittee - November discussion

Ideas to help build our deliverable to discuss in Nov:

- **Organize the Barriers and Challenges of FAIR data principles**
  - Within or separately from Standards, GeoAI, GeoPlatform
  - User Journeys or "workflow" - MAPLands example and USFS example
  - Regionally - states, by agency, federally, internationally
- **Scope paper for FGDC ExCom/ FGDC OS**
  - Do we need to get more feedback on ideas?
  - Who is this for? An Agency or partners or all?
- **Write a faux press release to help guide our research solutioning on some of the challenges and barriers**

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NGAC FAIR Data Subcommittee – Barriers by Bard

- **Cost:** Geospatial data can be expensive to collect and maintain. This can make it difficult for researchers and other users to access the data they need.
- **Access:** Geospatial data is often not freely available. It may be held by private companies, government agencies, or other organizations that charge for access.
- **Format:** Geospatial data can be available in a variety of formats, which can make it difficult to use and share.
- **Metadata:** Geospatial data should be accompanied by metadata, which describes the data and how it was collected. However, metadata is often missing or incomplete.
- **Quality:** Geospatial data can vary in quality. Some data may be inaccurate, outdated, or incomplete.
- **Interoperability**: Geospatial data from different sources may not be interoperable, meaning that it cannot be easily combined or used together.

NGAC FAIR Data Subcommittee – FAIR Barriers by Bard

- **Lack of awareness:** Many researchers and other users are not aware of the FAIR principles or how to make their data FAIR.
- **Lack of resources:** Researchers and other users may not have the time or resources to make their data FAIR.
- **Lack of tools:** There is a lack of user-friendly tools to help researchers and other users make their data FAIR.
- **Lack of incentives:** There are few incentives for researchers and other users to make their data FAIR.

NGAC FAIR Data Subcommittee – FAIR Barriers by Bard

Solution Space from BARD

- Create a standards resource to find data formats and metadata.
- Create tools to help users discover and access geospatial data.
- Develop tools to help users convert and integrate geospatial data from different sources.
- Develop guidelines for the use of GeoAI in decision-making.
- Develop standards for the collection and use of geospatial data for AI training.
- Develop tools to help users assess the fairness and reliability of GeoAI models.
- Develop resources to help underserved communities access and use geospatial data and tools.
- Work with federal agencies to ensure that their geospatial data and tools are equitable and accessible.

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NGAC FAIR Data Subcommittee - Timeline

August Committees established

September First virtual meeting goal:
Brainstorming on the committee goals
Begin to form research questions for the committee based on the topics

October Quarterly meeting goal:
Distill into Research Topics and come up with a deliverable/next step goal for the December meeting

November Virtual meeting goal: Focus on a short term deliverable by December

December - First milestone

- Challenge: Federal funding opportunities increasingly require geospatial data and tools to support proposals.
- Solution: Create user-focused studies and resources to help users find, access, and use geospatial data and tools effectively.

Geospatial Standards

- Challenge: There is a complex and fragmented landscape of geospatial standards.
- Solution: Develop and promote a common understanding of geospatial standards based on FAIR principles

Here is a step-by-step guide for a researcher to understand the barriers to FAIR geospatial data:

Step 1: Understand the FAIR principles

Step 2: Identify the user journeys for each FAIR principle

Step 3: Identify the challenges to each FAIR principle

Step 4: Assess the current state of FAIR geospatial data

Step 5: Identify the root causes of the barriers

Step 6: Develop solutions to the barriers

Step 7: Evaluate the solutions

Step 8: Implement the solutions

Step 9: Measure the impact

Step 10: Share the results

It is important to share the results of your work with the geospatial community. This can be done by publishing papers, giving presentations, and developing resources for other researchers.

By following these steps, researchers can help to understand and overcome the barriers to FAIR geospatial data.

Here is a step-by-step guide for a researcher to understand the barriers to FAIR geospatial data:

Step 1: Understand the FAIR principles

Step 2: Identify the user journeys for each FAIR principle

Step 3: Identify the challenges to each FAIR principle - For example, a challenge to the Findable principle might be that a dataset is not well-documented or that it is not listed in a public catalog.

Step 4: Assess the current state of FAIR geospatial data

To understand the barriers to FAIR geospatial data, you need to assess the current state of FAIR geospatial data. This can be done by on the following:

- Metadata: How much geospatial data has metadata? What is the quality of the metadata?
- Data quality: How much geospatial data is high quality? What are the common data quality issues?
- Interoperability: How much geospatial data is interoperable with other datasets? What are the common interoperability challen

Step 5: Identify the root causes of the barriers

Here is a step-by-step guide for a researcher to understand the barriers to FAIR geospatial data:

Step 6: Develop solutions to the barriers

Once you have identified the root causes of the barriers, you can start to develop solutions. For example, a solution to the lack of met be to create a template for metadata or to develop a tool that automatically generates metadata.

Step 7: Evaluate the solutions

Once you have developed solutions, you need to evaluate them to see if they are effective. This can be done by piloting the solutions group of users and collecting feedback.

Step 8: Implement the solutions

Once you have evaluated the solutions and found that they are effective, you can start to implement them on a larger scale. This may working with other researchers, data publishers, and software developers.

Step 9: Measure the impact

Once you have implemented the solutions, you need to measure the impact to see if they are making a difference. This can be done data on the same metrics that you used to assess the current state of FAIR geospatial data.

Step 10: Share the results

It is important to share the results of your work with the geospatial community. This can be done by publishing papers, giving present

Research Questions

- What are the most important geospatial standards for the US government and its partners?
- How can we improve the adoption and implementation of geospatial standards?
- How can we improve geospatial standards to make data more FAIR?
- What are the challenges and opportunities for using geospatial standards in GeoAI?
- How can we promote equity and justice in the use of geospatial standards?
- How can we develop geospatial data and standards that are more accessible to those with less resources?
- How can we make geospatial standards more accessible and affordable for everyone?
- How can we develop geospatial standards that are more flexible and adaptable to new technologies?
- How can we develop geospatial standards that are more aligned with international standards?
- How can we develop geospatial standards that are more easily understood and implemented by users?
- How can we improve the FGDC standards process?
- How can we better understand which geospatial standards are being used by different organizations?
- What are the barriers to using geospatial standards in underserved communities?
- How can we develop guidelines for the use of GeoAI in decision-making?
- How can we develop standards for the collection and use of geospatial data for AI training?
- How can we develop tools to help users assess the fairness and reliability of GeoAI models?

IDEAS for Research:

<u>Catalog the Barriers</u> **to FAIR through User Journeys for each principle**
- **3 - 5 challenges to each principle**
  - **Is there metadata in each data set?**
  - **How do you know the data quality of a data set?**
- **Outcome working to be more FAIR (broken out)**
- **Deliverable**
- **Demonstrate a success story**

Can we make FAIR cohesive and have them all be together

Cool document - https://force11.org/info/the-fair-data-principles/

How do we make this FAIR

HOW

- **Organize User Journeys through personas**
  - Come up with a template for the user journey
- **Organize the Challenges of the journey of each in FAIR**
- **FAIR challenges**
  - **Document challenges in each principle**
- **Next Steps:**
- December meeting deliverable:
  - 3 - 5 User Journeys
- Deliverable of a Blog Post