

Geospatial Excellence and Innovation Subcommittee Update



National Geospatial Advisory Committee Meeting
April 12, 2023

Geospatial Excellence and Innovation Subcommittee

Membership:

- Vasit Sagan (Chair), Siva Ravada (Vice-Chair), Clio Andris, Byron Bluehorse, Jack Dangermond, Bill Haneberg, Tony LaVoi, Kathleen Stewart

Subcommittee Role:

The subcommittee will assess and identify approaches and opportunities for the U.S. geospatial community to enhance key geospatial capabilities and initiatives.

Objectives

1. Identify and examine issues critical to U.S. geospatial competitiveness, excellence and innovation.
2. Host NGAC sessions and workshops to explore key issues and engage with thought leaders.
3. Document NGAC findings with case studies on the topic
4. Develop recommendations for the U.S. geospatial community to enhance key geospatial capabilities and initiatives.

Deliverables

- Workshops and sessions with thought leaders from the proposed topics of study
- Summaries of discussions from workshops
- Case studies to showcase challenges and suggestions
- Summary report on emerging trends, opportunities, challenges, and initial findings by end of 2023
- Recommendations to FGDC agencies

Subcommittee Sessions to Date

Datum Modernization (September 2022)

- Presentation and facilitated discussion on U.S. datum modernization – Dr. Dru Smith (NOAA National Geodetic Survey)

Geodesy (September 2022)

- Presentation and facilitated discussion on U.S. geodesy challenges – Dr. Michael Bevis (Ohio State University)

Integrated Geospatial Information Framework (December 2022)

- Presentation and facilitated discussion on the IGIF and the next generation of the National Spatial Data Infrastructure – Deirdre Bishop (Census Bureau)

Datum Modernization Discussion Summary

- The NSRS used today is based on pre-space-age geodetic technology
 - The existing NAD 83 coordinates may change by 2–4 meters and the orthometric heights may change by up to 2 meters (or more) when compared to the measurements using the new datums (<https://geodesy.noaa.gov/datums/newdatums/WhatToExpect.shtml>)
- The NSRS modernization effort embraces globally used *International Terrestrial Reference Frame* (ITRF) and provides “USA specific” frames only as an after-the-fact derivative product.
 - This will lead the way toward a purely ITRF-based surveying and mapping reference system for US.

How to prepare for the modernized NSRS

- Many systems that currently use the NAD 83 coordinates can continue to operate, but agencies and software companies should be prepared to support the new NSRS
- Educating relevant departments in the various federal agencies about the upcoming NSRS changes should be of high priority
- All the agencies should be preparing their transition plans to adopt the new NSRS
- Agencies should also be talking to their software vendors about the vendors plans to support the new NSRS
- NGS will provide tools and documentation required to make this transition to go smoothly, so agencies should engage with NGS while preparing their transition plans

Geodesy Discussion Summary

- The geodesy crisis is a multi-layer, multi-faceted issue involving academia, industry, and government agencies.
 - For academia, there are almost no geodesy programs in higher education throughout the US.
 - The decline in people trained in geodesy for decades, and the retirement of existing geodesists have threatened many disciplines and business that directly or indirectly rely on geodesy
 - The number of geodesists at federal government agencies like NGA is approaching zero.
- Dr. Michael Bevis and his colleagues outlined several corrective actions that the US should take in order to reverse this ever-growing crisis.
 - Research and development funding for basic and applied geodesy should be increased; this can start with increased funding to academia.
 - The US should ensure that multiple research groups are funded to perform parallel research and development in all mission-critical areas.
 - Training throughout the geodesy field should be expanded by removing the barrier to entry in education, ensuring in-house training for existing employees of geospatial agencies, and training researchers at the Ph.D. level in geodetic research groups.

NGAC Resolution on Geodesy

“The decline of geodetic academic programs in the United States and the resulting shortage of practicing geodesists threatens our international technological competitiveness in Earth and space science, affecting our economic health and security. The National Geospatial Advisory Committee (NGAC) supports the findings, which include challenges, threats, and opportunities, outlined in the “Geodesy Crisis” white paper* authored by Dr. Michael Bevis et al. and discussed with NGAC members.

The NGAC strongly recommends that these serious national challenges be addressed immediately through an ambitious program of educational support, research funding, and government agency action including:

- Address the challenges and opportunities for augmenting geodesy capabilities in support of the National Spatial Reference System and within relevant Federal Geographic Data Committee (FGDC) agencies.
- Promote understanding within FGDC agencies and across the geospatial community about how geodesy expertise advances socio-economic, environmental, ecological, intelligence, and military programs to advance national security and economic growth.
- Augment budgets to sponsor academic training and research work in geodesy and allied geospatial fields (the NGAC commends National Geospatial-Intelligence Agency for making its leadership and financial commitment to this effort).
- Act expeditiously.

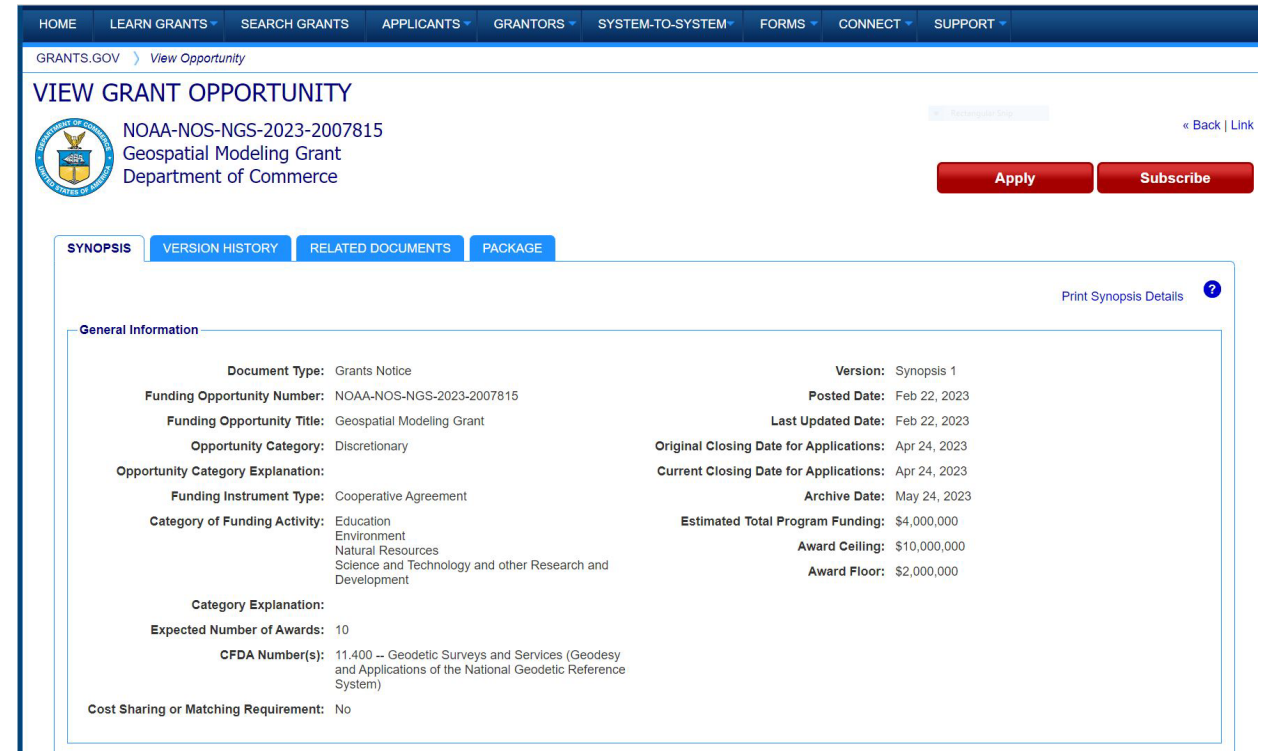
(Adopted by the NGAC on December 7, 2022)

* The white paper titled “America’s loss of capacity and international competitiveness in geodesy, the economic and military implications, and some modes of corrective action” can be found at https://aagsmo.org/wp-content/uploads/2022/02/TheGeodesyCrisis_Final.pdf



Subcommittee's early impact on federal grant funding opportunities

“The secondary objective of this funding opportunity is to support a Geodesy Community of Practice in collaboration with federal and nonfederal stakeholders to address the nationwide deficiency of geodesists and improve the coordination and use of geospatial data. Applicants are encouraged to partner and collaborate across organizations and stakeholder groups, including students, to maximize public awareness and education. This funding opportunity solicits projects that will address challenges and opportunities recognized by the National Geospatial Advisory Committee (NGAC) Resolution on Geodesy.”



The screenshot displays the 'VIEW GRANT OPPORTUNITY' page on Grants.gov. The navigation bar includes links for HOME, LEARN GRANTS, SEARCH GRANTS, APPLICANTS, GRANTORS, SYSTEM-TO-SYSTEM, FORMS, CONNECT, and SUPPORT. The breadcrumb trail shows 'GRANTS.GOV > View Opportunity'. The main heading is 'VIEW GRANT OPPORTUNITY' with a 'Back | Link' option. The grant details are as follows:

- Document Type:** Grants Notice
- Funding Opportunity Number:** NOAA-NOS-NGS-2023-2007815
- Funding Opportunity Title:** Geospatial Modeling Grant
- Opportunity Category:** Discretionary
- Opportunity Category Explanation:** Cooperative Agreement
- Funding Instrument Type:** Education
- Category of Funding Activity:** Environment, Natural Resources, Science and Technology and other Research and Development
- Category Explanation:** Expected Number of Awards: 10
- CFDA Number(s):** 11.400 -- Geodetic Surveys and Services (Geodesy and Applications of the National Geodetic Reference System)
- Cost Sharing or Matching Requirement:** No
- Version:** Synopsis 1
- Posted Date:** Feb 22, 2023
- Last Updated Date:** Feb 22, 2023
- Original Closing Date for Applications:** Apr 24, 2023
- Current Closing Date for Applications:** Apr 24, 2023
- Archive Date:** May 24, 2023
- Estimated Total Program Funding:** \$4,000,000
- Award Ceiling:** \$10,000,000
- Award Floor:** \$2,000,000

https://www.grants.gov/web/grants/view-opportunity.html?oppId=346302&utm_medium=email&utm_source=GovDelivery

IGIF Discussion Summary

The United Nations Integrated Geospatial Information Framework (UN-IGIF) is a UN charter that focuses on providing guidance for developing a global framework for geospatial information management. The IGIF has three components including Overarching Strategic Framework, an Implementation Guide, and a Country-level Action Plans. These three independent but connected parts comprise a comprehensive Integrated Geospatial Information Framework that serve a country's needs in addressing economic, social and environmental factors that depend on location data. As of 2022, two dozens of countries have begun advancing IGIF with UN-GGIM Secretariat.

Lessons learned:

- The IGIF is a framework of concepts that not only provides additional structure, reasoning, and evidence as to why NSDI's are important, but also provides the guidance, options and actions to plan for, develop, and implement an integrated national geospatial information management program, aligned to national strategic priorities and circumstances within a country.
- NGAC can provide the guidance in identifying the strategic geo-spatial priorities for the country and to help plan and develop the country level action plan. Implementation of the IGIF is outside the scope of NGAC.

Next Steps

1. Additional NGAC sessions to explore key geospatial competitiveness issues
 - **AI/ML issues impacting geospatial programs & technologies**
 - **Other issues?**
2. Develop subcommittee summary paper that: 1) highlights key geospatial competitiveness issues, and 2) provides findings and recommendations that can be utilized in the development of the new strategic plan for the National Spatial Data Infrastructure.
 - **Target completion date: December 2023**

Proposed study topics & discussion

- UNGGIM Integrated Geospatial Information Framework (IGIF)
- Geodesy and other basic geospatial science capabilities
- Datum modernization
- **Emerging technologies (AI/ML, 3D AR/VR, Big Data)+**
 - Invited talk by experts from Academia and/or industry in our June meeting.
 - Collaborate with National AI Advisory Committee on their efforts in this area.
- Risks to U.S. geospatial competitiveness
- The feasibility and need for creating a national center for geospatial sciences
- A dedicated, federal funding program to support geospatial R&D