U.S. Department of the Interior
Office of the Chief Information Officer

Department of Interior
Geospatial Strategic Plan
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Executive Summary

Geospatial information is critical to many of the decisions made at the U.S. Department of the Interior (DOI). Geospatial information are not only maps but the underlying data used for operations, conservation, policy, and science. DOI geospatial work spans from satellites orbiting the earth to studies of the ocean floor. Our interactions with the public include everything from physical maps at the entrance of one of our National Parks, disaster response, and energy development.

This Strategic Plan is a shared product, representing the collaborative efforts of all bureaus and offices of DOI. The goals outlined in this plan are designed to be high level and applicable to the geospatial work done across DOI. This document is one of the first steps to changing how our work is accomplished in the future. By analyzing current policy in relation to the geospatial needs of the Department and identifying the resulting gaps, we have identified four strategic goals.

- Goal 1: Enrich and Mature geospatial data management and stewardship to meet mission needs and inform better data driven decision making.
- Goal 2: Enhance and Maximize integration and shared services / technologies to facilitate geospatial data interoperability, data discovery, trust, and use.
- Goal 3: Strengthen and Promote data governance policies and reporting of geospatial data assets.
- Goal 4: Cultivate and Foster and dynamic and innovative geospatial environment which enhances workforce data literacy, cross bureau initiatives, and collaborative partnerships in support of the DOI mission.

The achievement of these strategic goals will be accomplished through a series of implementation plans. Organizing around the strategic themes of **Collaboration + Data + Technology + Analysis = Trusted Performance** informs the direction and implementation of this strategy as well as our responsibilities to DOI.

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Background

One of the four strategic goals outlined in the Department of Interior (DOI) Strategic Plan (2022-2026) is to serve and honor the public trust by "producing and delivering credible, applicable, and unbiased information to inform critical decisions related to ecosystems, land use, environmental health, natural hazards, and water resources, and the effects of climate change to the American public".

Data, science, and reliable information are key inputs of this goal and DOI's mission. The DOI Strategic Plan describes the importance of using science and sound management principles to "leverage data and information as strategic assets and harness emerging technologies to expand the use of principles of data management making data findable, accessible, interoperable, and reusable (FAIR principles) for staff, collaborators, and the public."

Geospatial data are key components to fulfilling these goals and objectives. Geospatial data helps improve evidence-based policy making by enriching context with location intelligence, enabling the linkage and integration of disparate information from many sources. Geospatial data, science and technologies are critical components of our Nation's digital infrastructure. The organization, collection, and standardization of these assets leading to the passage of the Geospatial Data Act of 2018 (GDA) which codified many of the committees, process and tools used to develop, drive, and manage the National Spatial Data Infrastructure (NSDI).

Additionally, policies and initiatives such as the Evidence Act of 2018 (Open Data Act) and the Federal Data Strategy Action Plans are tightening the relationship between the government open data community and geospatial practitioners across the government. The current administration's focus on equity and inclusiveness are also driving factors in advancing federal mission areas to which DOI is entrusted to upholding, including:

- Promoting well-being, equity and justice for Tribes, American Indians, Alaska Natives, Native Hawaiians, and insular communities
- Conserving migratory bird, fish, wildlife, and endangered species; preserving historic and cultural sites and resources
- Informing access to outdoor recreation opportunities to ensure all Americans can enjoy our public lands
- Enhancing resilience and respond to natural disasters and environmental change
- Managing energy and mineral development on public lands, the outer continental shelf and inland waters
- Leading scientific spatial analysis, mapping and geological, hydrological, and biological science for the Nation

Vision

Unify the DOI community to ensure geospatial access and governance to conserve, protect, and manage the natural and cultural resources of the Nation.

Mission

To ensure integrated geospatial data and technologies for DOI that facilitates collaboration, data sharing, data management, and innovation to support the mission execution of DOI and its bureaus.

The DOI primarily works toward fulfilling its mission through the DOI bureaus and offices. The DOI's Geospatial Strategic Plan provides strategic direction for DOI's bureaus and offices for compliance with important DOI and Federal Geographic Data Committee (FGDC) strategy documents. The DOI seeks to enhance collaboration and sharing of geospatial information and resources among bureaus, programs, and our partners to promote a department-wide management approach to inform and enhance priority initiatives, natural and cultural resource management decisions, and related policy formulation. Improvement in each bureau-level management of geospatial skills, data and technology is required to address local and mission oriented strategic policy development and implementation as well as efficient use of DOI resources.

The Geospatial Approach at Department of Interior

The fourth industrial revolution and related geospatial technologies, such as big data, artificial intelligence, 5G, Global Positioning System (GPS), Light Detection and Ranging (LiDAR), earth observation satellites, miniaturized robotics, autonomous undersea vehicles (AUVs) and other Internet of Things (IoT) sensors are transforming how the Department executes its mission, and more generally, how society understands and manages our planet. Geospatial technology is driving new behaviors, collaborations, policies, and public-private partnerships that are turning data about our world into an ecosystem of digital knowledge that can solve complex real-world challenges in near-real time. Strategically provisioning these geospatial technologies while also aligning DOI's geospatial data management practices, information sharing patterns, and its people will result in a more unified 'geospatial approach' to further enrich, enhance, and enable critical DOI mission areas. DOI's critical mission areas are displayed in *Figure 1 – DOI Critical Mission Areas*.

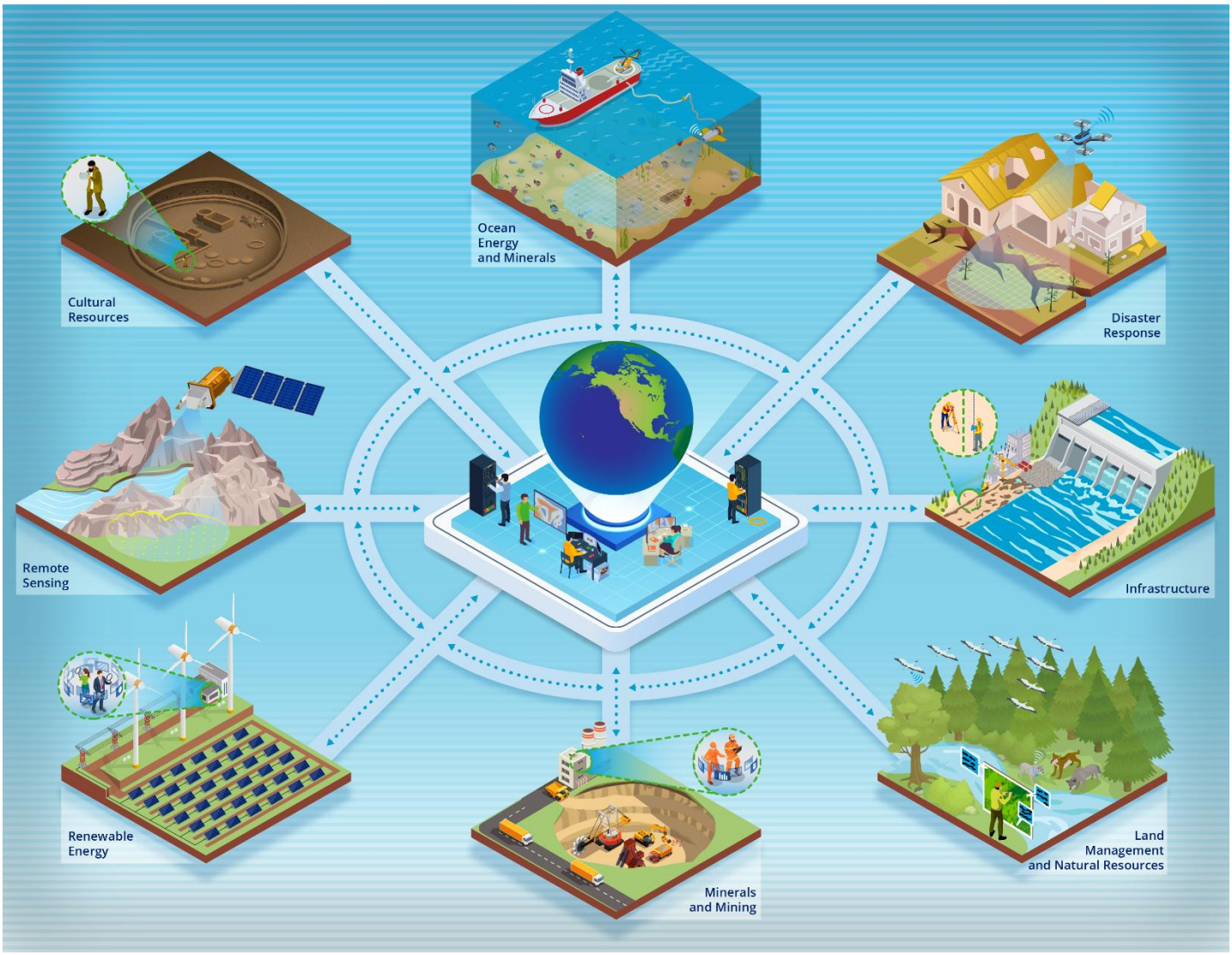

Figure 1 – DOI Critical Mission Areas

DOI's geospatial activities are distributed throughout DOI evidenced by the various geospatial programs, systems, and staff contained within its bureaus. Together, they steward multiple critical National Geospatial Data Assets (NGDAs), lead numerous geospatial standards initiatives, and provide key geospatial capabilities for a diverse set of end users. Elements within the critical DOI mission areas that depend on geospatial data, technology, and practitioners include, but are not limited to:

- Making decisions and directing resources when responding to disasters
- Monitoring and tracking habitat information in support of endangered species

- Promoting the sovereignty, health, and welfare of tribal communities
- Managing and protecting lands, oceans, and other critical natural resources
- Monitoring natural and cultural resources
- Modeling lahars (volcanic mudflows) and their affects to nearby populated areas
- Completing emergency management planning for dam-break and other critical infrastructure scenarios
- Locating, documenting, and protecting cultural resources and historic properties, such as archeological sites and historic structures
- Generating location-based analysis and maps
- Locating sediment resources that are suitable to fulfill coastal nourishment and protection projects
- Administrating the official offshore marine cadastral data, which includes lease grids and various offshore boundaries for jurisdictional enforcement and offshore resource management
- Site characterization for offshore energy development and supply of marine critical minerals
- Providing national topographic and geologic mapping for the Nation.

Across the DOI geospatial spectrum there are a number of unifying precepts that bind together the DOI geospatial data environment and help define the consistent geospatial approach. Implementation of these core precepts will enable the realization of a simple but highly effective formula: **Collaboration + Data + Technology + Analysis = Trusted Performance**

Collaboration facilitates the exchange of data and knowledge between and across DOI bureaus, other federal, state, local, and tribal partners, academia and the private sector, as well as citizens. Collaboration creates a dynamic and innovative community built upon data sharing and the exchange of knowledge. As new data streams are growing in diversity and size, advances in technology have brought about an unprecedented opportunity to fundamentally collaborate on how that data is collected, accessed, valued, utilized, analyzed, and visualized. A unified geospatial approach for DOI provides the necessary framework to document, govern, and implement a collaborative ecosystem.

Data is collected using various methodologies (field surveys, remote sensing, data harvesting from operational systems of record, crowdsourcing, etc.) and in various formats (raster, vector, three-dimensional, unstructured text). It should be readily accessible and wherever possible be maintained by established data lifecycles and related geospatial data development, management, and dissemination regimes. Additionally, geospatial data must be service enabled to approved Open Geospatial Consortium (OGC) specifications and service endpoints registered within the GeoPlatform.gov to promote the seamless connection to and sharing of data. This will necessitate the continued development of data governance policies, standards and

practices including, but not limited to: metadata standards, microservices, and related common data/information sharing protocols.

Technology is essential to facilitating knowledge exchange, accessibility, use, interpretation, and analyses across bureau boundaries. This will necessitate the strategic implementation and federation of interoperable technology platforms and the development of a common repository of geospatial tools and apps that can functionally enhance the capabilities supporting DOI missions in a timely manner. The DOI geospatial data and tools environment is long established in valuable foundational systems. As these systems evolve, big data, artificial intelligence and machine learning will become an ever-increasing core part of DOI science and evidence-based information to guide decisions. To maximize the impact of automation, DOI must focus on identifying and addressing the most critical hard problem areas and build effective coalitions that span Federal, Tribal, State, and local government entities, academia, and industry. New and advanced technologies will serve to complement current systems and capabilities to provide a robust and flexible technology environment for the 21st century.

Analysis is transforming or fusing data to generate new knowledge that can be acted upon, or combined with other knowledge to model potential future outcomes. Emerging technologies and the world of big data have generated new opportunities for innovation within DOI. DOI exploits a wide range of data including remote sensing and commercial satellite data, ground-based sensor systems, ocean and marine data, topographic data from multiple sources, land surveying data, GPS (both satellite-based and mobile), wildlife and ecosystem data and much more. As this data increases exponentially this will necessitate the continued development of shared geospatial processing models, interoperable Application Programming Interfaces (APIs), and common analytical processes.

Trusted Performance Trusted Performance established and delivered through secure, robust, scalable and dependable location enabled technologies that facilitate impactful outcomes for DOI mission areas is the goal. Inherent in trusted performance is the protection of sensitive cultural and natural resource location data. Trusted performance enhances collaboration and the management of geospatial data by bringing together people, data and technology to enhance insights, decision-making and operational excellence. Exposure of data to promote data sharing and re-use is critical to avoid duplication in data purchasing and exploitation. Therefore, the use of Data.gov and the GeoPlatform.gov as a “common denominator” for data findability, accessibility, interoperability, and reusability is a priority for all DOI bureaus.

Guiding Principles

Thirteen overarching guiding principles emerged based upon an analysis of the key federal policies and initiatives and are displayed in *Figure 2 – Guiding Principles*. These have served as the basis for cross-walking policy to help understand how these legislations, policies, related documents, and FGDC and DOI actions can be used to inform the geospatial strategy.

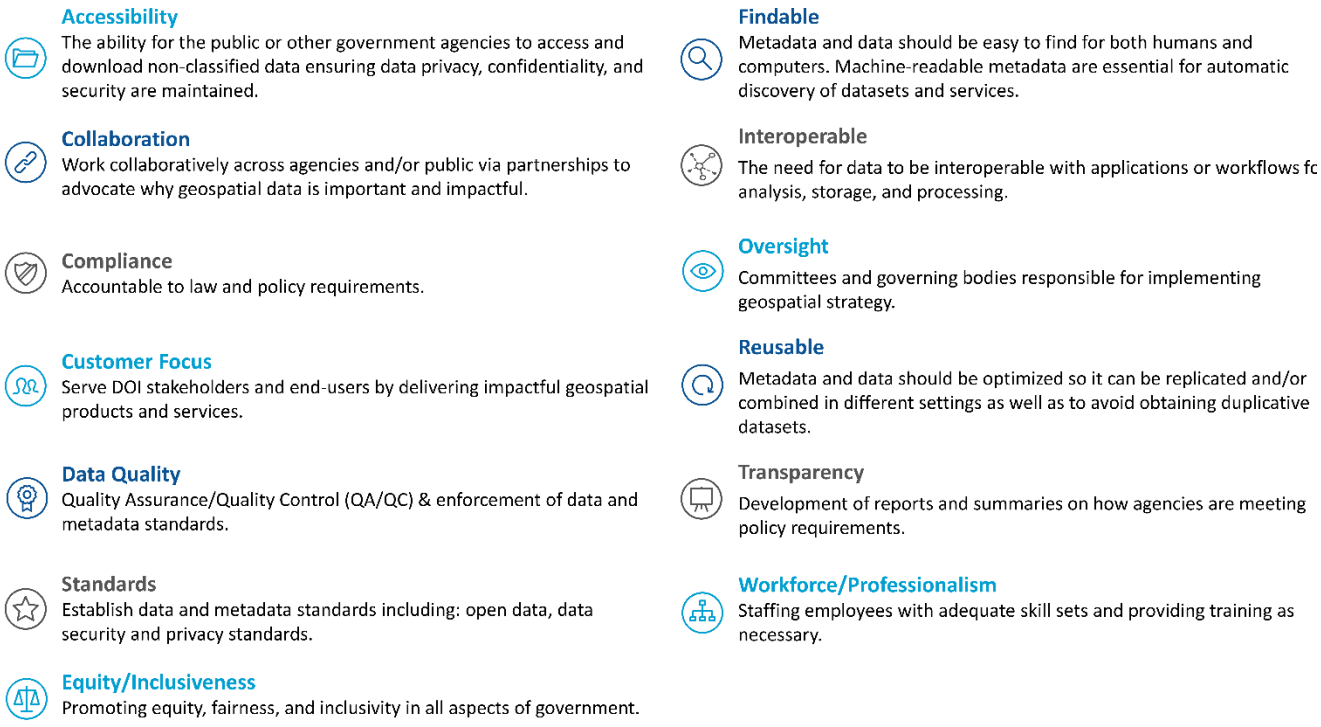

Figure 2 – Guiding Principles

Goals and Objectives

Location inextricably links to everything we do with increasingly high accuracy. Geospatial data provides enriched context to support and advance the strategic goals and objectives of DOI. Geospatial data helps facilitate the move from raw data to actionable knowledge to enhance operations, business process optimization and prediction.

Geospatial data helps us understand the future to better navigate today. Geospatial data is empowering citizens and government with data for the digital age to collaborate, innovate, and use to build a sustainable future for generations to come with a foundation in solid science and data, and with openness and transparency. DOI's strategic goals and objectives are displayed in *Figure 3 – Strategic Goals and Objectives*.

Vision:

Unify the DOI community to ensure geospatial access and governance to conserve, protect, and manage the natural resources of the Nation.

Mission:

To ensure integrated geospatial data for DOI that facilitates collaboration, data sharing, data management, and innovation to support the mission execution of DOI and its bureaus.

Strategic Goals

Goal 1	Goal 2	Goal 3	Goal 4
Enrich and Mature geospatial data management and stewardship to meet mission needs and inform better data driven decision making.	**Enhance and Maximize** integration and shared services/technologies to facilitate geospatial data interoperability, data discovery, trust and use.	**Strengthen and Promote** data governance policies and reporting of geospatial data assets.	**Cultivate and Foster** a dynamic and innovative geospatial environment which enhances workforce data literacy, cross bureau initiatives, and collaborative partnerships in support of the DOI mission.

Objectives

1.1 Develop and align towards a common DOI geospatial data management lifecycle framework. 1.2 Develop, adopt, communicate and enforce geospatial data and metadata standards to improve usability and shareability of geospatial data. 1.3 Highlight and communicate efforts within Bureaus that demonstrate maximum compliance with DGB and GAC data policies and adoption of standardized data catalogs. 1.4 Establish policies and practices to ensure geospatial data assets across DOI are findable, accessible, interoperable, and reusable (FAIR).	2.1 Identify and advance DOI best practices and guidelines to ensure geospatial data assets are secure, accessible and can support a wide range of DOI mission needs. 2.2 Develop and maintain a comprehensive data inventory that accounts for geospatial data assets being created, collected, directed or maintained. 2.3 Expand the use of shared IT services/cloud-based platforms for geospatial data assets and data management activities. 2.4 Optimize the use of Department-wide purchase agreements, and/or intergovernmental strategic sourcing vehicles to minimize costs and maximize shared value of data, services, and technology being procured.	3.1 Develop and implement Departmental guidance and policies to conform and comply with applicable Federal policies and reporting requirements. 3.2 Ensure and implement geospatial decisions and guidance from DOI DGB and the GAC. 3.3 Develop and implement metrics to assess bureau level compliance with DGB/GAC guidance to ensure geospatial data assets are of high quality, useful and being used to meet standing and/or emerging strategic goals and objectives.	4.1 Review and update reporting and coordination structure(s) to maximize effectiveness of authorities in place to bolster stewardship of geospatial programs, data, and technology across DOI. 4.2 Review available human resources and funding to meet the needs of geospatial programs across DOI. 4.3 Identify and execute plans to close workforce skill gaps that leads to an innovative and equitable workforce that supports geospatial technology learning and development. 4.4 Promote geospatial innovation throughout cross-bureau initiatives to best leverage geospatial expertise across DOI that address standing and/or emerging needs.

Figure 3 – Strategic Goals and Objectives

Implementation Planning

To achieve the DOI's vision of unifying and advancing a department-wide geospatial community to provide technology, policies, standards, and workforce necessary to improve the accuracy, quality, and availability of geospatial information will require implementing a diverse set of geospatial goals. Organizing around the strategic themes of **Collaboration + Data + Technology + Analysis = Trusted Performance** will inform the direction of the implementation of a geospatial strategy. Trust is earned over time through consistent investment in Collaboration + Data + Technology + Analysis. These themes will incorporate factors to encourage leadership to promote critical support and to and sustain the mainstreaming of geospatial data to department leadership. Driving the change and requirements to geospatial information should come from the leadership within the bureaus and offices that are supporting users of geospatial information within DOI. The Geographic Information Officer (GIO) will work collaboratively with this community to implement the strategic plan. The strategic plan will be a living document that will be revisited each year to ensure the goals and objectives of the Geospatial Advisory Committee's (GAC) program aligns with the DOI bureau and office priorities. The GAC will take regular feedback from stakeholders to track annual priorities and projects via an implementation plan. It will further identify challenges, gaps, and opportunities to make updates and adjust for changing priorities.