U.S. DEPARTMENT of ENERGY

U.S. Department of Energy

FY26-30 Geospatial Data Management Strategy

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Introduction

The U.S. Department of Energy (DOE or Department) is committed to advancing America's security and prosperity by addressing critical energy, environmental, and nuclear challenges through transformative science and technology solutions. Geospatial data, a transformative resource intrinsically linked to precise locations on Earth, has direct and profound impacts across the Department's core science, energy, and national security missions, carried out by Headquarters Offices and Programs, National Laboratories, Power Marketing Administrations, Field Sites, and Plants.

Across these entities, DOE harnesses geospatial data and technologies to underpin critical functions. This includes supporting the analysis, optimization, and modernization of the nation's energy infrastructure, enhancing its reliability and resilience through applications such as optimal siting, infrastructure planning, resilience modeling, and asset management. For national security, geospatial data is crucial for safeguarding the U.S. nuclear stockpile, supporting non-proliferation efforts, enhancing emergency response capabilities, and optimizing transportation routing for sensitive materials. Geospatial applications are equally vital for environmental remediation at legacy nuclear weapons production and energy research sites, encompassing site monitoring, contamination cleanup, and waste management. The Department also drives scientific and technological innovation through advanced geospatial modeling, artificial intelligence integration, and data sharing across various sectors.

This FY26-30 DOE Geospatial Data Management Strategy aims to maximize the impact of geospatial data across the Department's missions, building upon existing progress and aligning with the Geospatial Data Act of 2018 (GDA), the 2025-2035 National Spatial Data Infrastructure (NSDI) Strategic Plan, and other relevant federal mandates. By establishing robust mechanisms for geospatial governance, refining lifecycle management, enhancing discoverability, and fostering a culture of collaboration, this strategy demonstrates DOE's commitment to unlocking the full potential of its geospatial data holdings, thereby contributing to national energy security, environmental stewardship, scientific leadership, and the prosperity of the nation.

Vision and Guiding Principles

Vision

This vision articulates the aspirational future state that DOE strives to achieve through the strategic management and utilization of its geospatial data holdings:

> *To harness the full potential of location-based intelligence across the Department, transforming how we solve the nation's energy, environmental, and security challenges while setting new benchmarks for data-driven advancement that elevate national prosperity and reinforce global leadership.*

Guiding Principles

To realize this vision and ensure effective and responsible geospatial data management, DOE will operate under the following interconnected guiding principles that will inform our decisions, actions, and collaborations, aligning our efforts with federal mandates and national geospatial priorities.

- **Compliance, Oversight, and Accountability:** Adhering to GDA and other federal mandates for responsible stewardship of geospatial data.
- **Data Quality and Integrity:** Committing to the accuracy, completeness, consistency, and timeliness of DOE geospatial data.
- **Accessibility and Discoverability:** Ensuring that authorized users can easily find, access, and understand DOE geospatial data.
- **Interoperability and Standardization:** Promoting open standards to ensure efficient data exchange and integration within DOE and with external partners.
- **Security and Privacy:** Protecting sensitive geospatial information and adhering to privacy regulations throughout the data lifecycle.
- **Collaboration and Partnerships:** Fostering internal collaboration among DOE entities and cultivating external partnerships to leverage collective expertise and co-create solutions.

Goals, Objectives, and Actions

To effectively advance the Department’s geospatial capabilities, a comprehensive framework is essential. The following goals, objectives, and actions provide a clear roadmap for both centralized leadership and distributed implementation across the DOE enterprise and support alignment with GDA requirements and the goals outlined in the 2025-2035 NSDI Strategic Plan.

Goal 1: Establish and maintain a robust, federated governance framework for secure and integrated geospatial data management

Objectives	Actions
1.1 Implement geospatial data governance guidelines that promote security, privacy, interoperability, transparency, and conformance with federal data standards	1.1.1 Assess existing DOE guidelines relevant to geospatial data management against the GDA, NSDI, and enterprise data strategy requirements 1.1.2 As needed, update or develop new geospatial data standards and guidelines 1.1.3 Integrate geospatial data governance within broader DOE enterprise data governance frameworks 1.1.4 Comply with the GDA-mandated biennial audit of geospatial data activities, with audited years including FY26, FY28, and FY30
1.2 Foster internal and external collaboration to enhance geospatial data exchange, harmonize best practices, and contribute to national geospatial initiatives	1.2.1 Lead and support internal DOE working groups or committees for cross-program geospatial data coordination and best practice sharing 1.2.2 Actively represent DOE's geospatial interests in external geospatial forums and partnerships, contributing to NSDI efforts 1.2.3 Disseminate shared best practices and frameworks for geospatial data management and exchange across DOE
1.3 Promote adoption of common technical standards and shared services to improve the findability, accessibility, interoperability, and reusability of DOE's geospatial data assets	1.3.1 Promote shared services and integration patterns to reduce duplication and enhance data exchange 1.3.2 Embed standards adoption into data governance processes 1.3.3 Facilitate coordination and collaboration across DOE components to share successes, challenges, and lessons learned

Goal 2: Modernize and optimize DOE's geospatial data architecture and infrastructure foundations to support advanced scientific and operational needs

Objectives	Actions
2.1 Enhance DOE's geospatial data infrastructure by prioritizing scalable, cloud-based solutions to efficiently process, store, and analyze large, complex datasets	2.1.1 Implement and expand scalable, cloud-based geospatial platforms capable of handling large datasets and complex analytical workloads 2.1.2 Promote shared data reference architectures and services that ensure interoperability and reusability across geospatial systems

Objectives	Actions
2.2 Integrate advanced geospatial analytical capabilities, including artificial intelligence (AI), machine learning (ML), and spatial data science, into DOE research and operational workflows	2.2.1 Prioritize the development or acquisition of tools and platforms that enable the application of AI/ML and spatial data science techniques to geospatial data 2.2.2 Communicate guidelines and best practices for the responsible, transparent, and secure use of AI/ML in geospatial applications, particularly with sensitive data
2.3 Improve data accessibility, discoverability, and interoperability through modern data access methods and metadata standards	2.3.1 Promote adoption of Application Programming Interface-first approaches across DOE to enable system interoperability, automation, and seamless data sharing 2.3.2 Encourage the utilization of standard geospatial web services, such as Web Map Service, Web Feature Service, and Web Coverage Processing Service, and widely used data formats, such as GeoJSON and Keyhole Markup Language, to enhance data discoverability, accessibility, and interoperability in alignment with FAIR (Findable, Accessible, Interoperable, Reusable) principles 2.3.3 Provide guidance for implementing robust metadata standards to optimize geospatial data utility for analysis and integration 2.3.4 Maintain DOE's Open Energy Data website as a centralized access point and publishing platform for public geospatial data assets

Goal 3: Leverage geospatial technologies and data to drive innovation and decision-making across DOE's mission areas and the energy sector

Objectives	Actions
3.1 Enable the identification, evaluation, and responsible adoption of advanced geospatial technologies that enhance analysis, insights, and predictive capabilities	3.1.1 Communicate the benefits and potential challenges of emerging geospatial technologies and best practices across DOE 3.1.2 Provide high-level guidance for the responsible and interoperable use of advanced geospatial tools 3.1.3 Facilitate cross-DOE connections between offices, labs, sites, and technology experts to share use cases, successes, and lessons learned

Objectives	Actions
3.2 Enable the development and application of innovative geospatial solutions to accelerate outcomes within DOE's core mission areas and the broader energy sector	3.2.1 Identify and prioritize challenges within DOE's missions and the energy sector where geospatial technologies can yield significant breakthroughs 3.2.2 Promote collaborative research and projects that apply geospatial innovations to mission-critical areas and energy sector needs 3.2.3 Facilitate the sharing of geospatial solutions and technical expertise across DOE components and energy sector stakeholders for wider adoption and impact
3.3 Facilitate the secure and appropriate sharing of DOE geospatial data and expertise with external partners to support broader initiatives	3.3.1 Develop data sharing agreements, as appropriate, with external partners to facilitate geospatial data exchange and collaborative projects 3.3.2 Participate in interagency forums, including the Federal Geographic Data Committee and its Working Groups, to coordinate activities, share best practices, and strategically integrate high-value DOE geospatial datasets into national efforts such as the GeoPlatform, thereby ensuring alignment with national geospatial data infrastructure goals 3.3.3 Promote and support the publication of unclassified, high-value public geospatial data assets

Goal 4: Cultivate a skilled and adaptable geospatial workforce and foster a culture of geospatial literacy across DOE

Objectives	Actions
4.1 Provide access to training and professional development opportunities that equip DOE staff with geospatial skills relevant to their roles	4.1.1 Engage DOE geospatial professionals to identify skill gaps and training/learning needs 4.1.2 Develop and promote internal training and education opportunities 4.1.3 Identify and promote external trainings, certifications, conferences, and other opportunities

Objectives	Actions
4.2 Support internal forums, groups, and shared platforms that foster continuous learning, knowledge transfer, and collaboration	4.2.1 Support and encourage staff participation in DOE's Geospatial User Group 4.2.2 Leverage DOE's Geospatial Science Steering Committee to foster technical excellence and communication across the enterprise 4.2.3 Develop and maintain centralized online resources for geospatial best practices, technical guidance, and engagement opportunities
4.3 Elevate leadership awareness and secure commitment for continued investment in geospatial capabilities across DOE's missions	4.3.1 Deliver executive briefings at established governance board meetings to highlight the strategic value of geospatial technologies and capabilities 4.3.2 Provide executive leadership with regular updates on geospatial progress, challenges, and opportunities 4.3.3 Promote the inclusion of geospatial topics in the agendas of relevant executive-level meetings and strategic planning sessions

Comparison of NSDI and DOE goals

NSDI Goals	DOE Goals
Governance: Implement National Governance Increase multisector nationwide participation and accountability in NSDI governance and implementation and establish and execute national oversight and management mechanisms for the NSDI	**Goal 1:** Establish and maintain a robust, federated governance framework for secure and integrated geospatial data management
Data and Technology: Modernize the Infrastructure and Leverage Advanced Technology Leverage technological innovations (for example, AI; the broader use of space-based positioning, navigation, and timing [PNT]; and alternative PNT technologies both in space and on the ground) to reduce the level of effort required to acquire, develop, manage, maintain, access, distribute, and use geospatial data through the NSDI	**Goal 2:** Modernize and optimize DOE's geospatial data architecture and infrastructure foundations to support advanced scientific and operational needs **Goal 3:** Leverage geospatial technologies and data to drive innovation and decision-making across DOE's mission areas and the energy sector.

NSDI Goals	DOE Goals
People: Building a Skilled Geospatial Workforce for a Sustainable Future Build a skilled and engaged geospatial workforce that is equipped to advance and leverage the full potential of the NSDI to address complex challenges, drive innovation, and promote societal advancement	**Goal 4:** Cultivate a skilled and adaptable geospatial workforce and foster a culture of geospatial literacy across DOE

Implementation Framework

DOE's Office of the Chief Information Officer (OCIO), through its Senior Agency Official for Geospatial Information and Geospatial Information Officer, is central to guiding the implementation of this FY26-30 Geospatial Data Management Strategy. OCIO is responsible for overseeing, coordinating, and facilitating Department-wide geospatial initiatives, engaging both the Department's geospatial science community and external partners.

To support successful implementation of the strategy and GDA compliance, OCIO developed the FY26 Geospatial Communications Plan. This plan outlines communications pillars and activities designed to strengthen collaboration and engagement with DOE stakeholders, interagency partners, and the public. OCIO will review and update the plan annually to ensure sustained engagement and alignment with evolving geospatial priorities.

OCIO will also work closely with DOE's Geospatial Science Steering Committee (GSSC), which serves in an advisory capacity and promotes the effective utilization of geospatial data and technology across DOE. Comprised of leaders or senior technical representatives from Headquarters Offices and Programs, National Laboratories, Power Marketing Administrations, Field Site, and Plants, the GSSC aims to foster technical excellence, advocate for best business practices, provide policy and standards recommendations, and coordinate geospatial matters with other federal and state agencies. The GSSC convenes monthly to discuss strategic initiatives and is instrumental in integrating the strategy's goals and objectives throughout the DOE enterprise.

Conclusion

The FY26-30 DOE Geospatial Data Management Strategy represents a key step in harnessing the full power of location-based intelligence to advance the Department's critical missions. By embracing robust governance, modernizing infrastructure, driving innovation, and cultivating a skilled workforce, DOE is poised to unlock significant insights and efficiencies. The successful implementation of this strategy will strengthen national energy security, enhance environmental stewardship, elevate scientific leadership, and contribute significantly to the nation's prosperity. This endeavor is a collective commitment, underscoring DOE's dedication to leveraging geospatial data as a cornerstone for future-ready solutions and long-term national impact.

Contact

For inquiries regarding this strategy or DOE's geospatial efforts, please contact geospatial@hq.doe.gov.

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For more information, visit: energy.gov/data