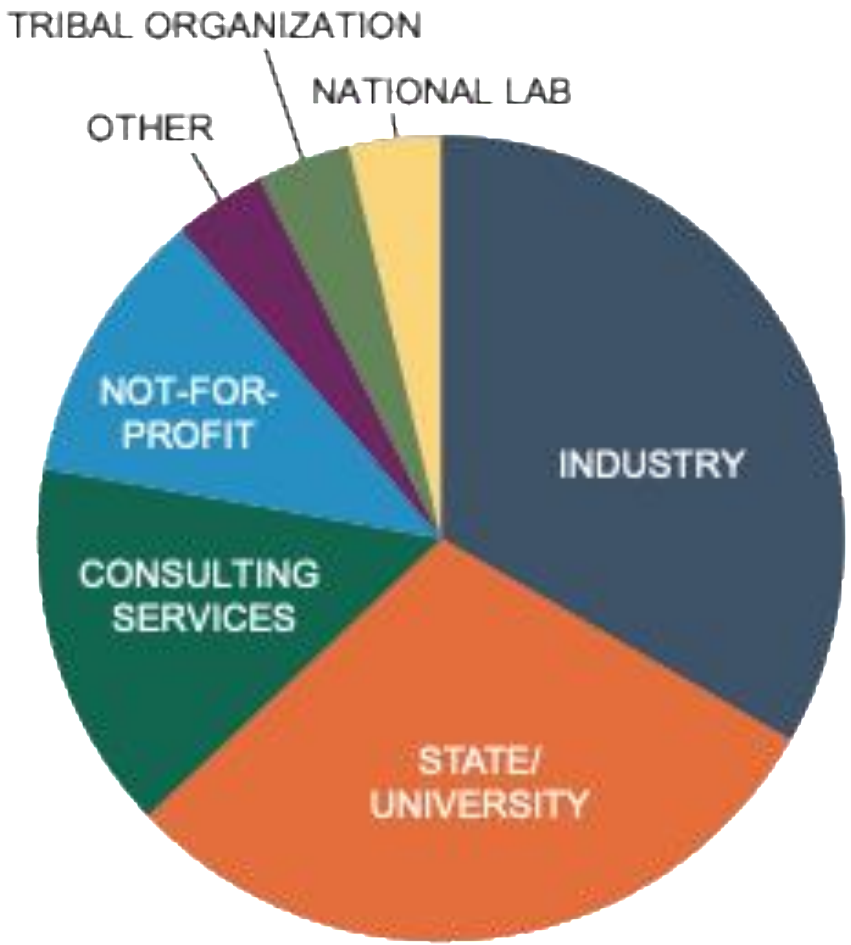
Study Background

- **National Petroleum Council:** The NPC is a federally chartered advisory committee of ~200 members that provides advice on any matter relating to oil and natural gas industries.
- **Request:** The NPC was asked to articulate the potential value of a national resource assessment program.
- **Team:** The study team included >50 subject-matter experts from diverse backgrounds.
- **Scope:** The scope included nearly all subsurface industries - oil and gas, geothermal, mining, storage, and emerging resources, such as geologic hydrogen.
- **Engagement:** The team consulted various state and federal agency representatives, including DOE, USGS, MMA (previously BOEM and BSEE), IOGCC, and AASG

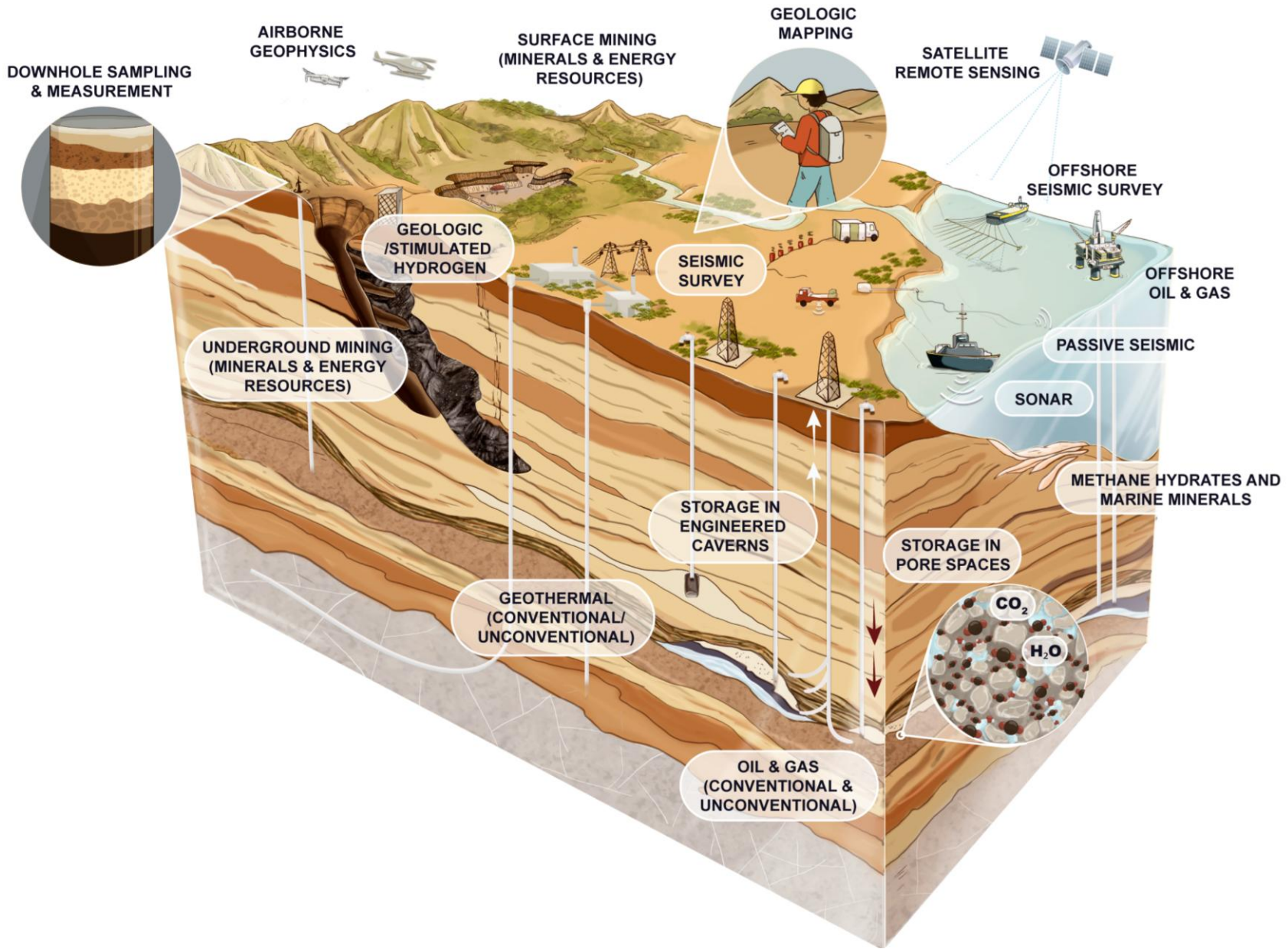


Study Committee and Coordinating Subcommittee Composition

The Subsurface as a National Asset

America's energy future—geothermal, nuclear, wind, solar, hydroelectric, and fossil fuels—is fundamentally tied to the subsurface as demand is rising for secure, domestic energy and mineral resources.

Core Message: The nation needs renewed investment in subsurface resource assessments to identify and de-risk new opportunities.

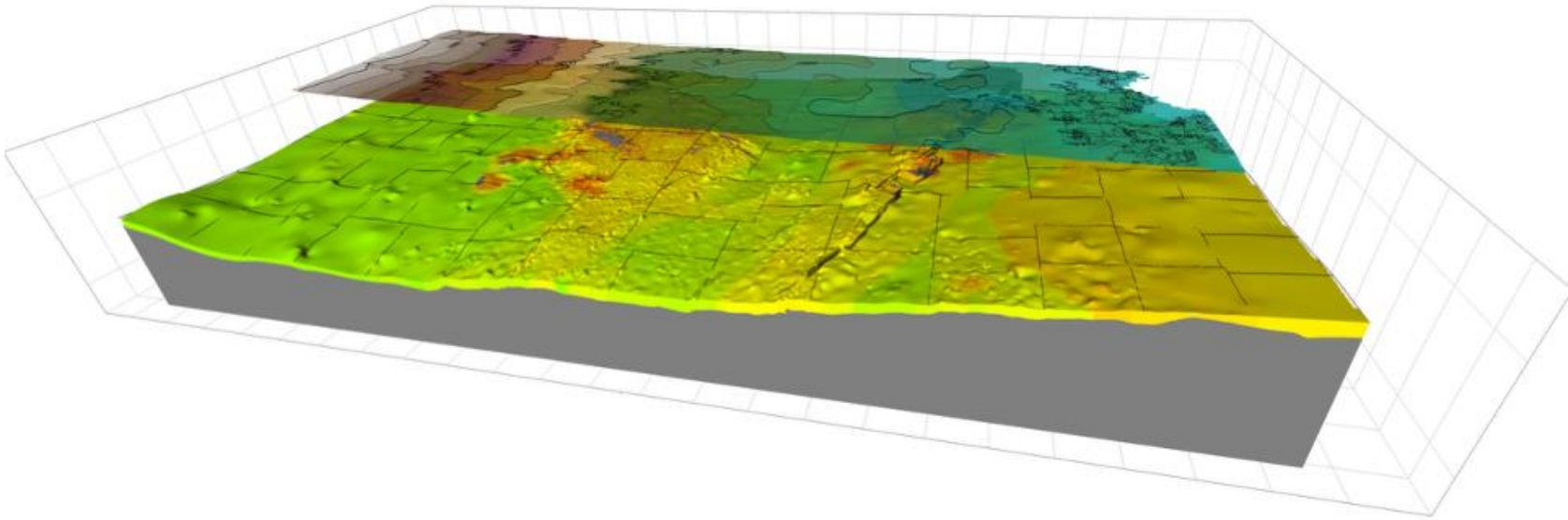


Definition and Value of Assessments

Subsurface assessments: the systematic integration of one or more datasets to produce quantitative estimates of the distribution of a geological resource.

FINDING: Public assessments provide foundational value across a wide range of stakeholders by reducing uncertainty, enabling informed decision-making, and supporting safe and efficient resource development.

- Industry assessments: optimized to support decisions on specific assets or specific areas.
- Public assessments: often regional and conducted without direct commercial incentives to provide neutral, objective benchmarks.



State-wide 3D subsurface assessment of deep formation adequacy for carbon waste sequestration. (Kansas Geological Survey Subsurface Dynamics Laboratory)

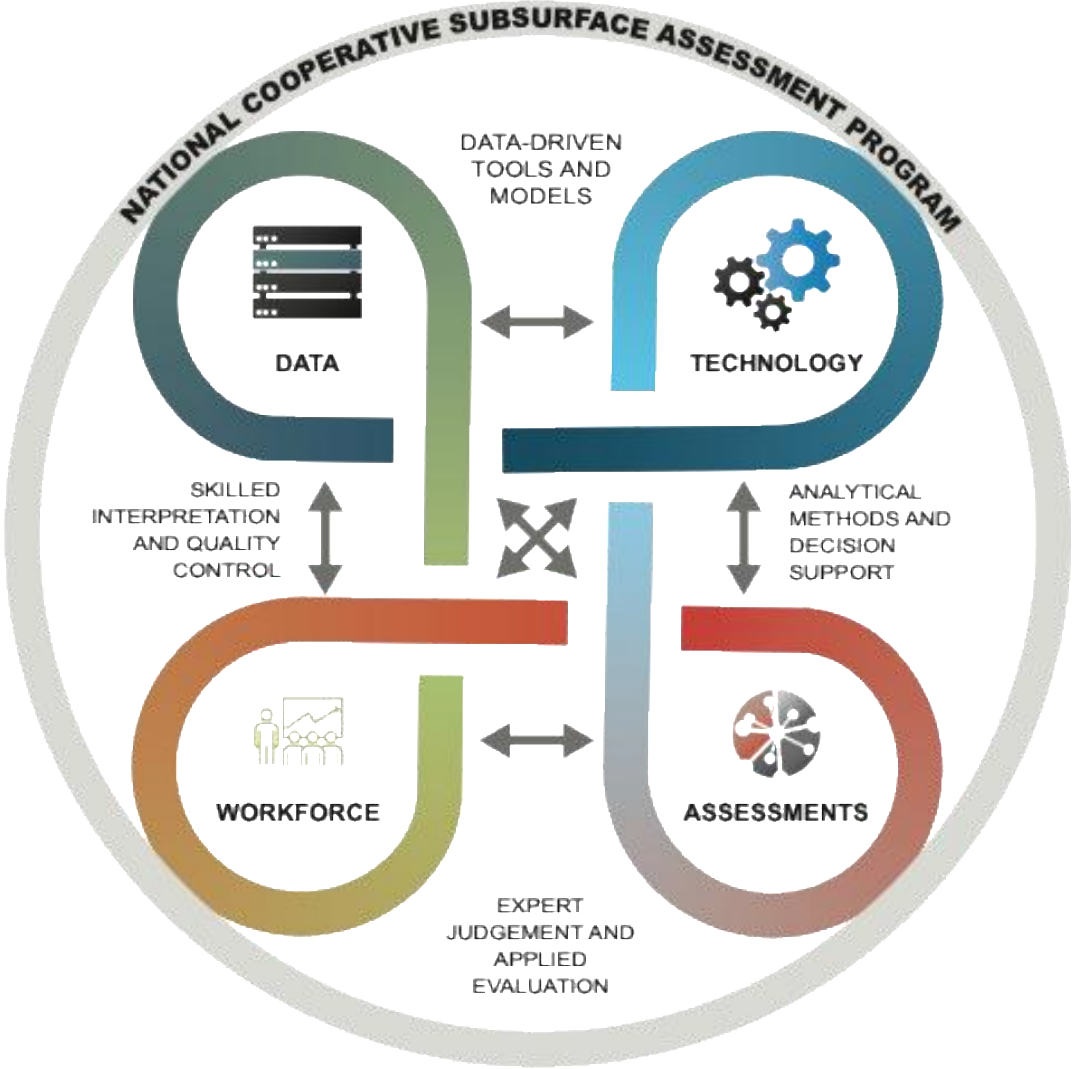
Pillars of a Subsurface Assessment Program

Data: High-quality subsurface datasets are essential for assessments. Preserving and expanding these valuable datasets improves assessment accuracy, resolution, and efficiency.

Technology: Advancement and deployment of technologies can significantly improve the predictive capability of subsurface assessments, while expanding the resources that can be recovered.

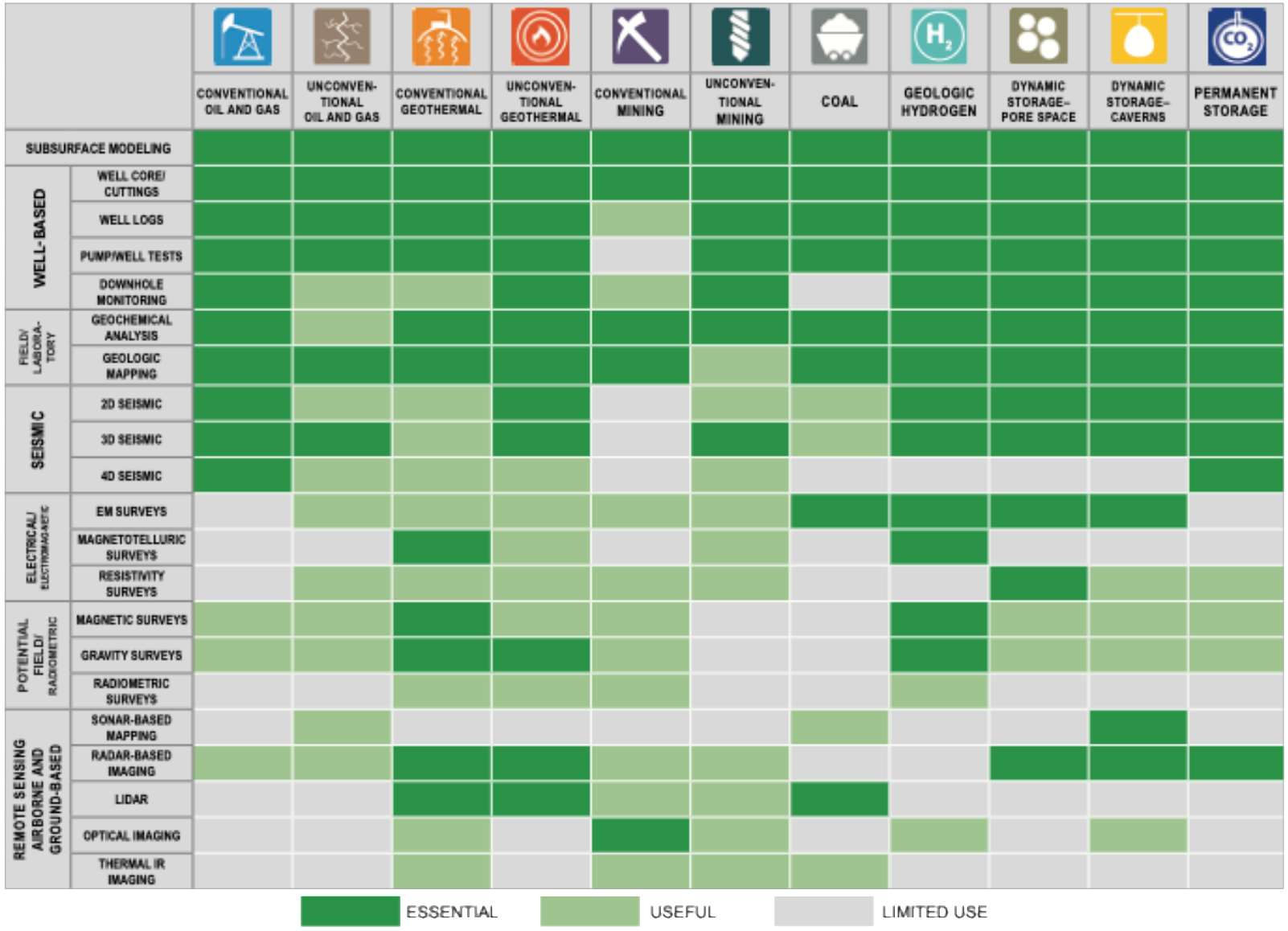
Workforce: Subsurface evaluation, data management, and modeling skills are essential to interpret data, integrate large datasets, evaluate uncertainty and risk, and translate technical results.

Assessment: Methodologies must keep pace with emerging technologies and resources.



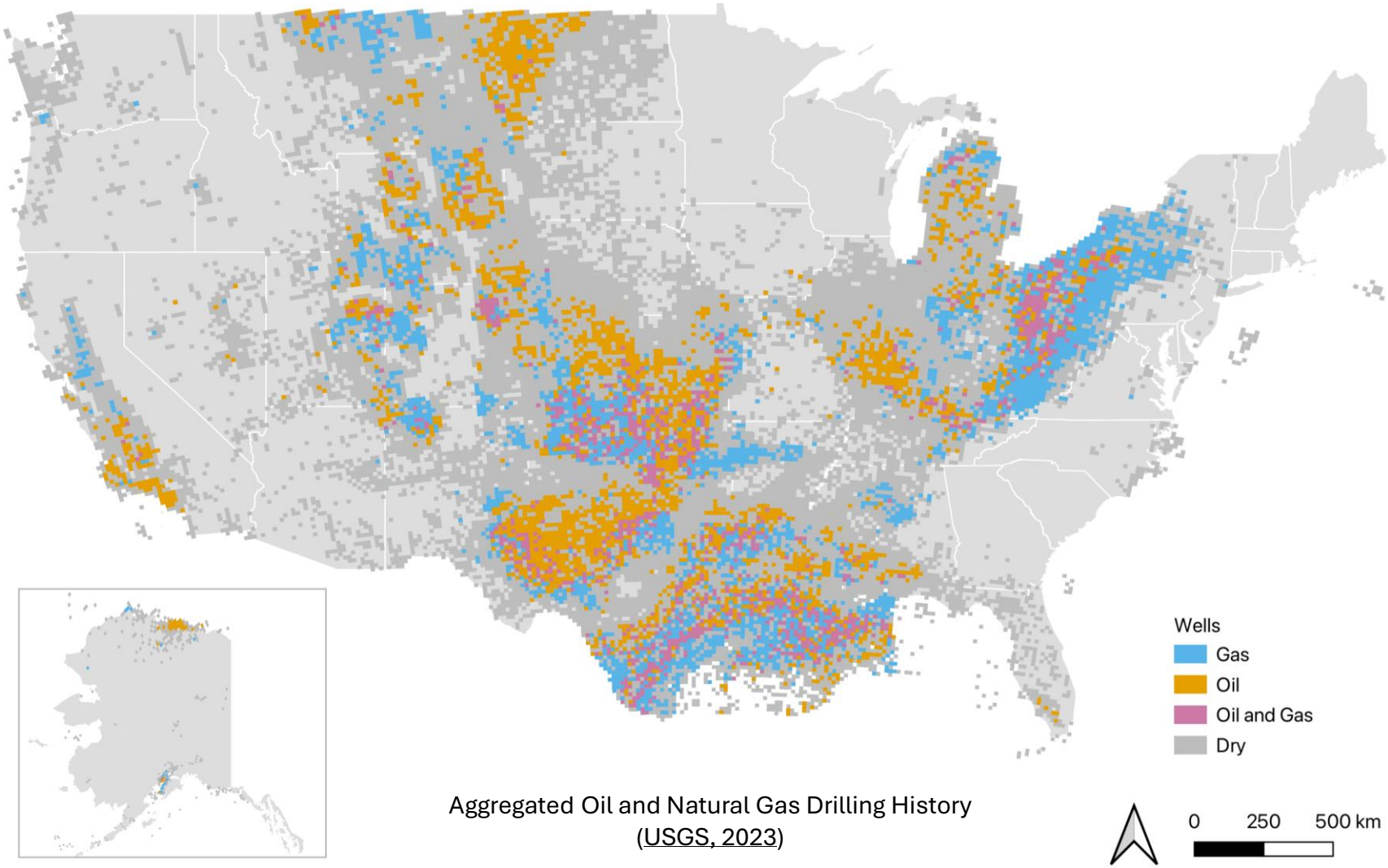
Data: Subsurface Characterization Benefits All Industries

- Geologic mapping, geochemical analysis, geophysical imaging, and targeted drilling are high-value inputs across essentially all subsurface resource types.
- Many resources overlap within the same subsurface regions so that data collected for one resource may be useful to another.
- Integrated assessments focused on characterizing a volume of Earth, rather than a single resource, can support multiple resource sectors.



Data: Hidden Value in Legacy Assets

- Significant subsurface data has already been collected, including well logs and well core and samples.
- Much of these data remain in legacy format, unavailable to the public, or at risk of being lost due to inadequate funding for preservation.
- Data preservation is a high-return, low-cost investment that can accelerate exploration and innovation, particularly as AI-driven analysis expands.



Aggregated Oil and Natural Gas Drilling History (USGS, 2023)

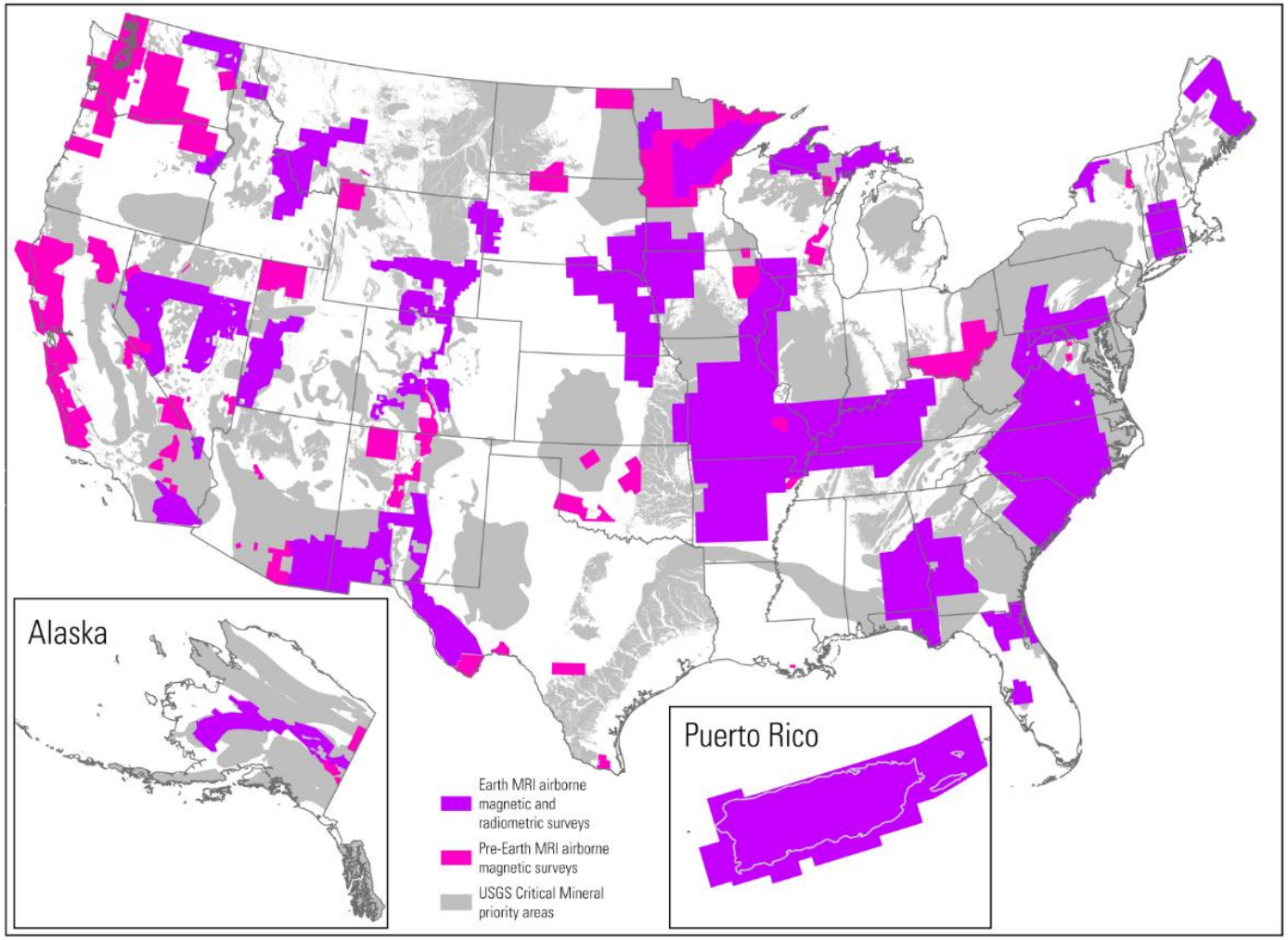
Data: Current Initiatives & Gaps

Select federal / state initiatives:

- USGS, MMA, and state geological surveys lead data collection and assessments
- EIA provides production, reserves, and outlook data
- DOE supports R&D and demonstration for resource recovery, processing, and storage.
- NSF, national labs, and universities advance technology and workforce skills in subsurface characterization

Opportunities for Improvement:

- Baseline coverage is uneven, legacy datasets are at risk, and high-resolution industry data are not routinely integrated into public assessments.
- Differing mandates, methods, and update cycles limit coordination, while multi-resource assessments remain rare.
- Emerging technologies remain underutilized, while specialized workforce capacity is limited.



Example of federal magnetic and radiometric survey data collection (USGS, 2025)

Data: Recommendations

Acquire Priority Baseline Data to Strengthen Subsurface Assessments: Congress should fund a joint federal-state initiative for subsurface data collection with rapid public access through shared digital repositories.

Develop a National Data Portal to Ease Access to Subsurface Data: Congress should establish a National Data Portal and data standards to enhance public access to interoperable subsurface data.

Recover and Preserve Legacy Subsurface Data: Congress should increase funding to the USGS National Geological and Geophysical Data Preservation Program and establish a National Data Task Force to strengthen data preservation, and develop best practices, recovery strategies, and funding recommendations.

Evaluate Access to Proprietary Data Acquired by Industry: DOI should review existing policies governing the management of proprietary subsurface data and evaluate possible pathways to accelerate access while protecting commercial investments and intellectual property.

Full recommendations available at american-resources.npc.org

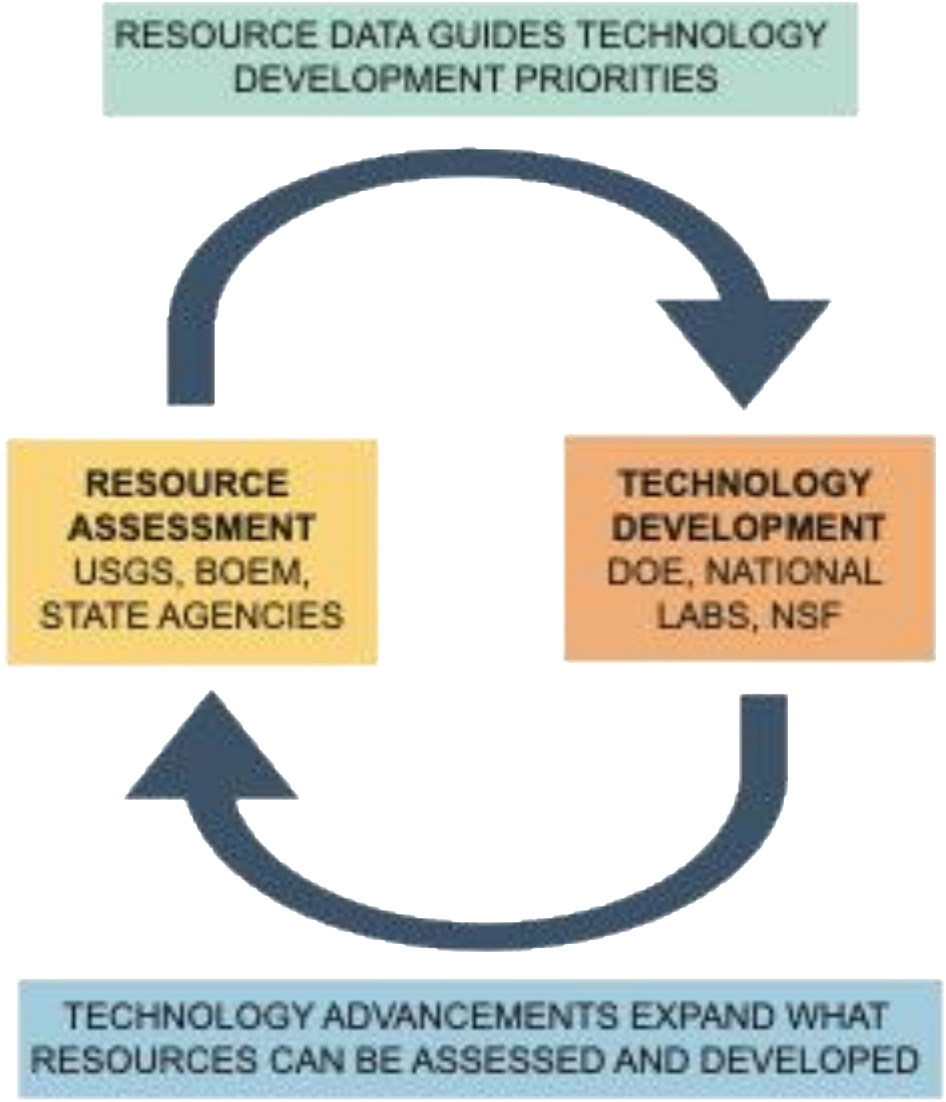
Technology: Current Initiatives & Gaps

Select federal / state initiatives:

- DOE supports R&D and demonstration for resource recovery, processing, and storage.
- NSF, national laboratories, and university partners support early-stage R&D, modeling, and analytical tools that can improve resource discovery, recovery, and management.

Opportunities for advancement:

- Emerging technologies offer significant potential to improve resource characterization and recovery, but their adoption in federal and state assessment programs remains limited.



Technology: Recommendation



Increase Development of Emerging Technology for Subsurface Mapping and Modeling: DOE, in collaboration with USGS, should increase investment in advanced extraction, subsurface mapping, and modeling technologies through direct R&D funding and public-private partnerships.

Full recommendations available at american-resources.npc.org

Assessments: Current Initiatives & Gaps

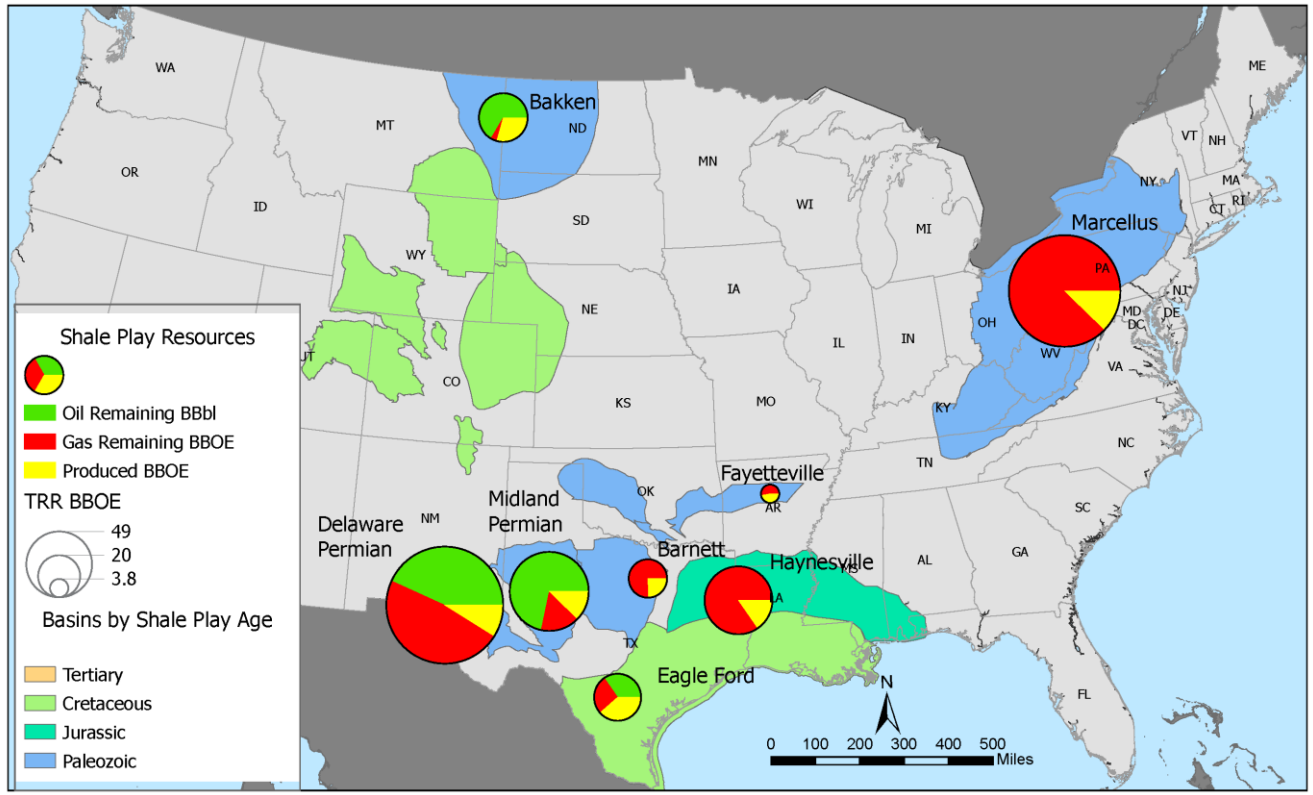
Select federal and state initiatives:

- USGS, MMA, and state geological surveys assess offshore and onshore resource potential.
- EIA provides production, reserves, and outlook data that complement geology-based assessments.

Opportunities for improvement:

- Assessments are produced under distinct mandates, methods, and update cycles, limiting integration into a unified, decision-relevant framework.
- Multi-resource assessments of co-located resources remain rare.

FINDING: Static assessments of in-place resources are the foundation of publicly available resource data. When conducted rigorously, these assessments can remain valuable for generations, enabling diverse industries to explore the subsurface as technologies evolve and new pathways emerge for technical and economic recovery.



https://www.sciencedirect.com/science/article/pii/S1876380424605161?via%3Dihub

Assessments: Recommendations

Accelerate holistic assessments of the Nation's Subsurface Resources: USGS and MMA, in collaboration with state geological surveys, should accelerate the multi-resource assessments using DOE-supported technologies, advanced 3D subsurface modeling, AI, and integrated sensors.

Prioritize Assessments of Emerging Resources: DOI should prioritize national assessments of emerging resources (e.g. geologic hydrogen, superhot geothermal) and collaborate with DOE to integrate emerging and existing technologies into these assessments.

Establish a Collaborative, Long-Term Planning Process: Congress should establish a long-term planning process within the White House Office of Science and Technology Policy to identify national subsurface resource assessment priorities.

Full recommendations available at american-resources.npc.org

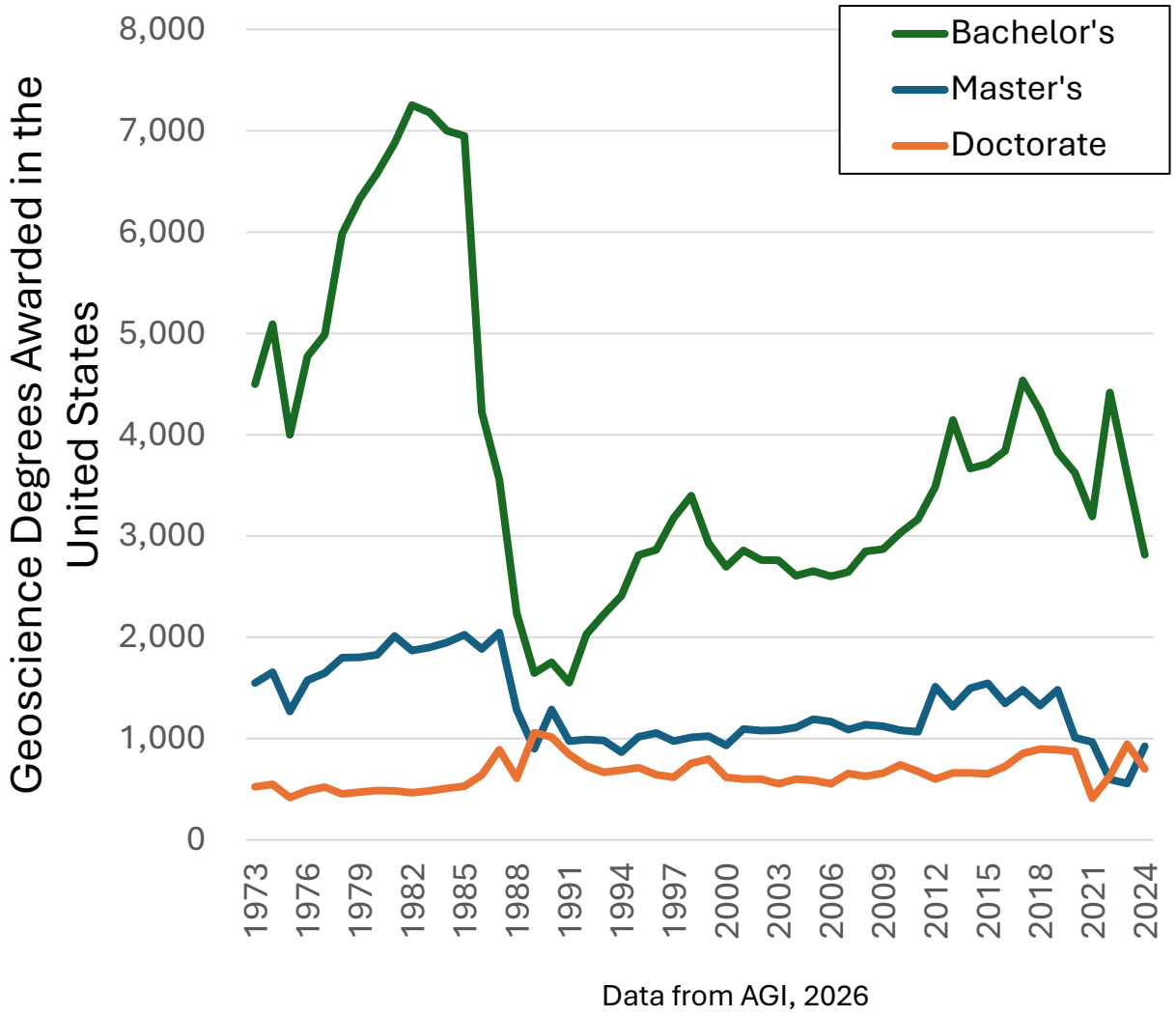
Workforce: Current Initiatives & Gaps

Select federal / state initiatives:

- NSF's INTERN and ORISE can place students with resource-focused agencies.
- NSF-supported university partnerships can build applied skills in mapping, modeling, data integration, resource assessment, and subsurface characterization.

Opportunities for advancement:

- Modern subsurface assessments increasingly depend on a limited workforce that combines subsurface expertise with data science, modeling, geospatial analysis, and uncertainty evaluation.



Data from AGI, 2026

Workforce: Recommendations



Develop a Qualified Workforce for Subsurface Analysis Through Residencies and Partnerships: DOE and DOI should partner with state geological surveys, NSF, universities, and industry to create residency, fellowship, and internship programs that build a pipeline of early-career geologists.

Full recommendations available at american-resources.npc.org

A Vision for a Secure Future

Congress should authorize and appropriate a National Cooperative Subsurface Assessment Program that builds on existing agency authorities for resource assessments, data acquisition and management, technology development, and workforce capacity to strengthen the nation's ability to holistically evaluate subsurface resource potential and support a secure energy and economic future.



Download the report



American-Resources.npc.org