

FY 2023–2026 Strategic Plan

August 2021

**Wyoming State
Geological Survey**

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AGENCY

Wyoming State Geological Survey (WSGS)

DIRECTOR

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REPORT PERIOD

2023–2025 (July 1, 2022 through June 30, 2025)

STATUTORY AUTHORITY

W.S. 9-2-801 Definitions (amended by Chap. 170, Session Laws of Wyoming 1997)
W.S. 9-2-803 State Geologist, duties and powers
W.S. 9-2-804 Geological Survey, location and headquarters
W.S. 9-2-805 Geological Survey, duties and disposition of materials and specimens
W.S. 9-2-806 State Geologist as chief administrative officer; appointment of employees
W.S. 9-2-807 Geological Survey Board and operation
W.S. 9-2-808 Authority to cooperate and exchange information
W.S. 9-2-809 Use of University of Wyoming students
W.S. 9-2-810 Cooperation with the United States Geological Survey
W.S. 30-5-103 State Geologist participation on the Oil and Gas Commission
W.S. 33-41-107 State Geologist participation on the Board of Professional Geologists (as amended by Chap. 170, Session Laws of Wyoming)
W.S. 36-6-102 Submission, custody and confidentiality of subsurface log reports
W.S. 36-6-105 Inspection reports for State Lands

MISSION

The mission of the Wyoming State Geological Survey (WSGS), in accordance with Wyoming statutes, is to promote the beneficial and environmentally sound use of Wyoming's vast geologic, mineral, and energy resources while helping to inform and protect the public from geologic hazards. The WSGS works to study, examine, and understand the geology, energy and mineral resources, hazards, water, fossils, and physical features of the state. The WSGS prepares, publishes, and distributes reports and maps on these topics, as well as provides information, interpretation, and services to the public, governmental agencies, and industry.

OVERVIEW

The WSGS is a non-regulatory scientific agency dedicated to protecting the interests of the residents of Wyoming in all geologic matters, including energy and mineral resources, geologic hazards, fossils, water, and geologic tourism. This is accomplished through vigilant monitoring and collection of data, rigorous investigations, and broad dissemination of information. By providing accurate information and expanding geologic knowledge, the WSGS contributes to the economic growth of the state and improves the quality of life of Wyoming's residents. The information and analysis provided by the WSGS supports billions of dollars in commercial activity and thousands of jobs in the state.

The clients and collaborators of the WSGS include state and federal government agencies, the Wyoming Legislature, industry, non-governmental organizations, the public, news media, and the educational community. Within state government, the WSGS works with the Office of State Lands, Department of Environmental Quality, Wyoming Oil and Gas Conservation Commission, Wyoming State Engineers Office, Wyoming Office of Homeland Security, Wyoming Water Development Office, Wyoming Division of State Parks and Historic Sites, Wyoming State Museum, Wyoming Department of Transportation, Consensus Revenue Estimating Group, and the University of Wyoming.

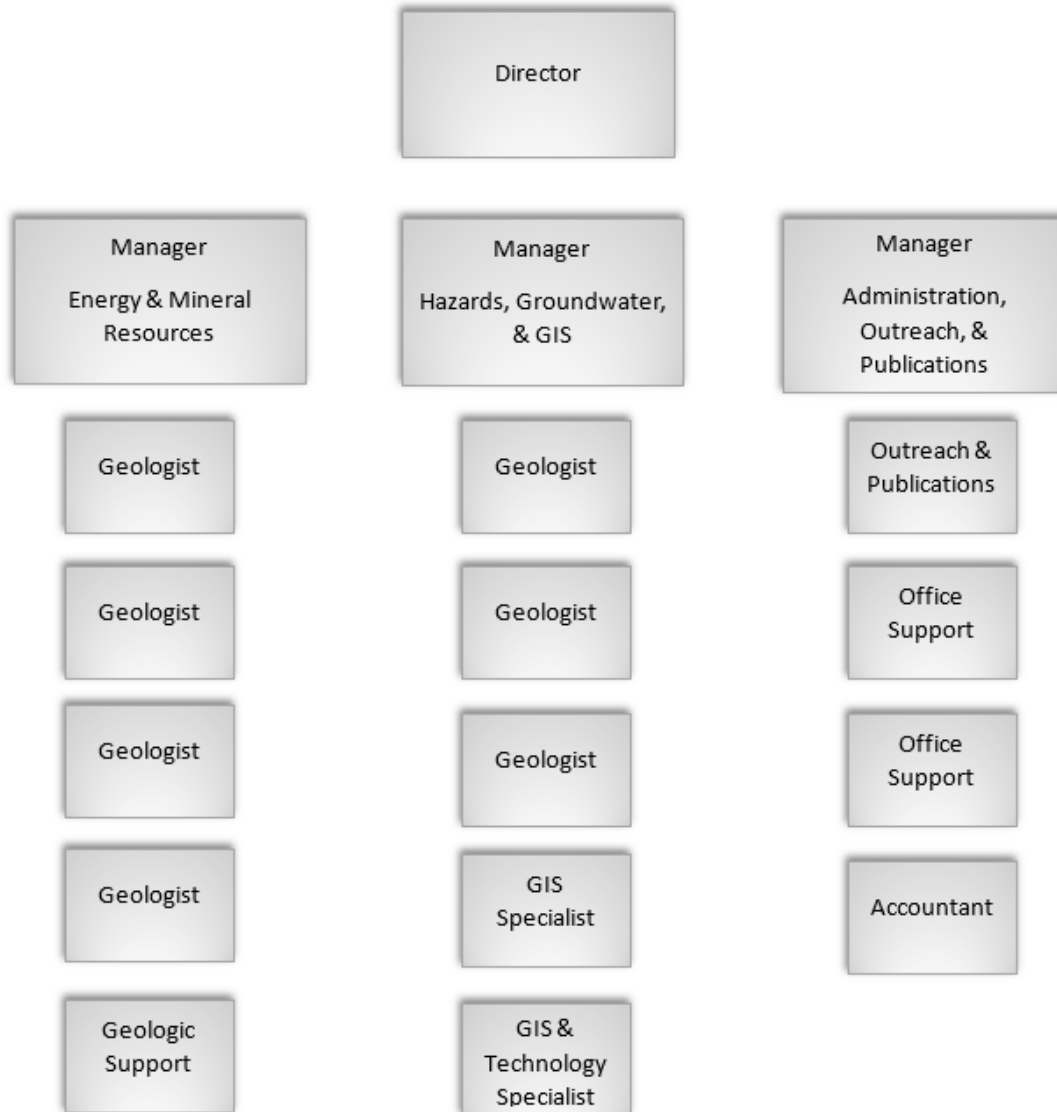
AGENCY STRUCTURE

The WSGS has 18 legislatively approved positions and operates with a biennium budget of \$4,147,648 (biennium FY2021–2022), not including exception requests or adjustments. Funding sources for the WSGS include general funds as well as minor contributions from state and federal grants. In FY2021, after the statewide budget cuts, the WSGS reorganized to comply with the state span of control requirements. The WSGS now has three balanced divisions: 1) Energy and Mineral Resources; 2) Hazards, Groundwater and GIS; and 3) Administration, Outreach, and Publications. Strong collaboration occurs between all divisions.

The WSGS has an Advisory Board consisting of the Governor, a University of Wyoming member, the Wyoming Oil and Gas Conservation Commission Supervisor, and five members appointed by the Governor.

The Director of the WSGS, as State Geologist, serves as a commissioner on the Wyoming Oil and Gas Conservation Commission and Enhanced Oil Recovery Commission, as a member of the Wyoming Consensus Revenue Estimating Group and the State Groundwater Coordination Committee, and as a board member of the Wyoming Board of Professional Geologists.

WSGS Organizational Chart



WYOMING QUALITY OF LIFE

The work performed by the WSGS directly contributes to the goal of managing the state's natural resources for the economic and social benefit of its residents while protecting the public and environment. Effective dissemination of geologic information and public outreach provides residents, decision makers, educators, students, and visitors with key information for a thorough understanding and appreciation of the geologic uniqueness of Wyoming.

The WSGS uses applied science to provide policymakers, the public, and industry with significant geologic information and analysis on energy and mineral resources, groundwater, geologic features, and geologic hazards. This information allows for informed decision-making on important issues. The WSGS strives to provide all stakeholders with the best science possible to ensure that responsible resource development occurs to benefit Wyoming residents, promote economic prosperity, and protect state resources, while ensuring public safety.

Understanding, characterization, and the prudent development of Wyoming's natural resources are vital to the economy of Wyoming. The development and extraction of natural resources produces billions of dollars each year for the Wyoming treasury and has created thousands of high-paying jobs. It also provides critical commodities to the United States and other countries, with these commodities supporting a wide variety of industries, technologies, and communities.

The WSGS ensures that Wyoming has the most up-to-date geologic information necessary to solve existing problems and anticipate future challenges. Geologic hazards such as sink holes, earthquakes, volcanism, landslides, and unstable soils can present a safety concern for many people across the state. Understanding and locating these potential hazards helps protect property, infrastructure, and the health of Wyoming's residents and its many visitors.

From mountain ranges to basins, and from fossils to rocks and minerals, information provided by the WSGS helps residents and visitors to gain a clear understanding, comprehension, and admiration of their surroundings. This information also supports a vibrant and growing geotourism industry that brings revenue to Wyoming.

All work at the WSGS is oriented toward improving the quality of life of Wyoming citizens, through contributions to the following categories, as outlined by Governor Gordon:

- Result: Wyoming families and individuals live in a stable, safe, supportive, nurturing, healthy environment.
- Result: Wyoming has a diverse economy that provides a livable income and ensures wage equality.

- Result: Wyoming state government is a responsible steward of State assets and effectively responds to the needs of residents and guests.
- Result: Wyoming natural resources are managed to maximize the economic, environmental, and social prosperity of current and future organizations.

PROGRAMS AND PRIORITIES

The WSGS has one program: Geologic Program. Within that program, the WSGS conducts work on energy and mineral resources, geologic hazards, groundwater, geologic mapping, and outreach. The WSGS is the repository for state fossils.

Priorities:

- Research energy and mineral resources to ensure maximum benefit to Wyoming
- Identify possible geologic hazards to increase safety of residents
- Interpret data on groundwater resources to anticipate and mitigate problems
- Conduct geologic mapping to understand distribution of resources and geologic hazards
- Manage Wyoming geologic data so that they are usable and accessible
- Disseminate information to all stakeholders
- Safely house state fossils and oversee fossil loans

GOALS AND CHALLENGES

Wyoming is a large state with complex yet significant geologic resources. Energy and mineral resources, as well as tourism, provide a large portion of state revenue. Understanding Wyoming’s vast geologic resources requires well-trained geologists with specializations (oil and gas, coal, fossils, hazards, minerals, groundwater) and the ability to transfer their knowledge to many different audiences (decision makers, general public, scientists, educators).

WSGS goals—designed to meet statutory requirements—are aligned with divisions:

Energy and Mineral Resources

Goals

The WSGS develops and publishes research reports and maps on oil and gas resources (conventional and unconventional), coal, and minerals. The WSGS is focusing additional staff on the study of rare earth elements and other critical minerals, and will continue to track industry activity and provide crucial geologic information and analysis to the public and industries important to Wyoming (oil and gas, coal, trona, industrial minerals, etc.). This critical information is provided to the Consensus Revenue Estimating Group (CREG) and used in various reports.

Unconventional oil and gas hydrocarbon plays are found throughout the state and have the potential to have a significant impact on the state for many years to come. The WSGS is actively involved in analyzing the geology related to these developing plays and in understanding where additional economic plays may exist.

Critical, economic, and industrial mineral extraction contributes to the state's economy with significant potential for increased extraction in the future. The WSGS researches mineral systems and produces maps and reports containing extensive geologic analytical results.

Challenges

The WSGS works with surface and subsurface geologic data that are publicly available. Extensive geophysical data are necessary to fully understand energy and mineral systems, but acquiring and interpreting these data are cost prohibitive. Additional staff would also allow the WSGS to accelerate the work in this division.

Applied research, analytics, and statistics are applied to complex geologic problems and production and price forecasting of energy and mineral resources. Data management, data analysis, and data models require extensive effort to remain organized and current.

The WSGS lab requires direction, planning, maintenance, design, development and implementation to remain productive and up-to-date. Lab facilities include a rock saw, rock crusher, microscopes, XRD system, handheld XRF analyzer, and 3D visualization equipment.

Hazards, Groundwater, and GIS

Goals

The WSGS reviews, characterizes, and maps geologic hazards that affect public safety and property (landslides, unstable soils, earthquakes, sinkholes, etc.). The agency reports on these to the public and other potentially affected parties. The WSGS is also an active member of the Yellowstone Volcano Observatory. From tourism to the potential impact of geologic hazards, Yellowstone is of major significance to the state.

The WSGS plays an important role in characterizing and understanding Wyoming's groundwater resources. WSGS reports are widely used by government agencies, the public, and industry. Water has and will continue to be a critically important resource to Wyoming, and the WSGS believes that water-related issues will likely increase in importance over the coming years. The WSGS will continue to serve the state in understanding, reporting, and advising on geology-related groundwater issues.

The WSGS has the responsibility of constructing geologic maps of the state as well as housing large amounts of geologic data. Geologic maps are used by many entities (industry, public,

communities, counties, government agencies, universities, etc.) and are also included in the U.S. Geological Survey's national database. The WSGS is also the steward and repository for vast amounts of data, specimens, and state fossils. The WSGS will continue to generate accurate and applicable maps, and make all non-confidential data available to its stakeholders.

Challenges

In terms of geologic hazards and groundwater, challenges include obtaining up-to-date information from public and governmental agencies, maintaining databases, and conducting investigations at a statewide level with limited dedicated staff.

GIS is widely used throughout the WSGS, and the survey must follow templates and standards, ensuring compliant products are produced in accordance with evolving national standards.

Budget considerations have caused the fossil focus area to remain a low priority for the WSGS. Statute W.S. 9-2-805 states the WSGS shall "seek a comprehensive understanding of the geology of and fossils in the state," so the WSGS relies on a committee of fossil experts from around the state. This committee meets on an as-needed basis and helps the staff and director of the WSGS with fossil-related issues and questions. Currently, the WSGS performs no independent scientific work on Wyoming fossils.

Administration, Outreach, and Publications

Goals

The WSGS administration team serves as the support system to the agency's scientists and their geologic work. The team also facilitates the relationship between the WSGS and the public by being the first point of contact. They handle map, report and other publication inquiries and purchases. Their tasks directly link WSGS work to the public, government agencies, industries, and more.

The WSGS provides information to a wide array of audiences, including residents and non-residents, industry, resource managers, and policymakers. This sharing of information is done through outreach events and the distribution of publications created by the WSGS scientists. This supports and helps spur economic growth and development, and facilitates important education and understanding of Wyoming's geologic resources.

Over the past fiscal year the WSGS has had more than 105,327 page views and 67,073 unique users of its website; 63,565 views of downloadable maps and reports; 1,242 GIS data downloads; 5,016 followers on Facebook, 2,246 on Twitter, 1,277 on Instagram, and more than 114,104 total views of WSGS videos on YouTube. The WSGS aims to continue the upward trajectory of its data distribution and social media program.

Geologic tourism is significant in Wyoming. The WSGS provides information to residents, nonresidents, visitors, and groups who travel to Wyoming to view and study its geology, which significantly impacts Wyoming's economy. Additionally, the WSGS gives presentations on natural resources and geologic history of Wyoming to elected officials, communities, industry, clubs, organizations, schools, and youth groups. Improved outreach continues to be a goal.

Challenges

As the agency moves forward, it hopes to ensure that sufficient funding and resources are dedicated toward these outreach efforts. The WSGS strives to find a reasonable balance between the time spent by technical staff on research and outreach.

PERFORMANCE MEASURES

By tracking and understanding the agency's performance, the WSGS obtains an accurate and timely depiction of its contribution to Wyoming. It also ensures studies most beneficial to citizens are managed efficiently and effectively, with the agency delivering the desired products and services to its state and federal partners, as well as to residents and investors in the state.

WSGS Performance Measures are:

- Performance Measure #1: Completion of initiatives and grants on schedule and on/or under budget, documented through the statewide Saba TalentSpace system.
- Performance Measure #2: Feedback and guidance from the WSGS Advisory Board.
- Performance Measure #3: Feedback from customers and collaborators, including input on planning products, services, data, and analyses; feedback from public meetings.
- Performance Measure #4: Outside peer reviews of projects, initiatives, and publications.
- Performance Measure #5: Tracking downloads and sales of reports and maps; monitoring use of the WSGS website by outside parties.