

## Wyoming State Geological Survey FY2021 Annual Report

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### Statutory References

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 U.S. 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

### Clients Served

Local, state, and federal government agencies, the Wyoming Legislature, industry, non-governmental organizations, the public, news media, and education community.

<b>Budget Information (FY2021)</b>	
General Funds (Expenditures)	2,179,723.15
Federal Grant Funds	295,516.10
State Grant Funds	0.00
Other Funds*	12,794.42
	<b>\$2,488,033.67</b>
*Sales Reverted to State General Fund	

### **Basic Facts**

The Wyoming State Geological Survey (WSGS) had 21 legislatively approved positions and operated with a biennium budget of \$4,592,225 (biennium FY2021), not including exception requests or adjustments. Funding sources for the WSGS includes general funds as well as state and federal grants. Research programs and divisions included the following:

- Energy and Mineral Resources
- Hazards, Water Resources, and Fossils
- Technical Analysis and Data Management
- Publications and Communications
- Administration
- Human Resources

### **Organizational Structure**

The WSGS had 21 full-time benefited staff positions in FY2021 (see chart on last page for details). The WSGS has an Advisory Board consisting of the Governor, a University of Wyoming member appointed by the university president, the State Oil and Gas Supervisor, the State Geologist, and five appointed members.

In addition, the State Geologist serves as a commissioner on the Wyoming Oil and Gas Conservation Commission (W.S. 30-5-103), as a board member of the Wyoming Board of Professional Geologists (W.S. 33-41-107), as a commissioner for the Enhanced Oil Recovery Institute (W.S. 30-8-101), and as a member of the Wyoming Consensus Revenue Estimating Group (CREG).

### **Mission**

The mission of the WSGS is to promote the beneficial and environmentally sound use of Wyoming's vast geologic, mineral, and energy resources while helping to protect the public from geologic hazards. By providing accurate information and expanding knowledge through the application of geologic principles, the WSGS contributes to the economic growth of the state and improves the quality of life of Wyoming's residents.

The WSGS works to (1) study, examine, and understand the geology, mineral resources, and physical features of the state; (2) prepare, publish, and distribute (free or for sale) reports and maps of the state's geology, mineral resources, and physical features; and (3) provide information, advice, and services related to the geology, energy and mineral resources, hazards, and physical features of the state.

### **Wyoming Quality of Life Result**

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

- 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.

### **Contribution to Wyoming Quality of Life**

The WSGS strives to provide decision makers with the best science possible to ensure that responsible resource development occurs to benefit Wyoming residents, promote economic prosperity and protect state resources. In addition to ensuring that Wyoming has the geologic and geohydrologic information necessary to solve existing problems and anticipate future challenges, the WSGS collaborates closely with other state and federal agencies, various organizations, and stakeholders to solve multidisciplinary problems. The WSGS also supplies the geologic knowledge necessary for the beneficial and responsible development of Wyoming's unconventional energy resources and mineral resources.

While working to increase public awareness, the WSGS endeavors to provide Wyoming residents with the most accurate, up-to-date information on geologic hazards, natural resource and energy issues, water issues, and other geology-related topics so they can make informed decisions about issues that affect them. The WSGS aims to reduce risks associated with geologic hazards such as landslides, volcanism, earthquakes, avalanches, and floods, and also works in collaboration with the Yellowstone Volcano Observatory.

### **Report Narrative – FY2021 Projects Completed**

(Reporting Period: July 1, 2020–June 30, 2021; all reports are available on the agency’s website.)

#### *Upper Cretaceous Stratigraphy of the Powder River Basin*

The WSGS published a study (August 2020) of the Upper Cretaceous Stratigraphy of the Powder River Basin, which contains some of the state’s most prolific oil and gas reservoirs as well as significant petroleum-generating source rocks. The new study aims to better understand the Upper Cretaceous stratigraphy of the basin’s unconventional tight oil and gas reservoirs, their source rocks, and intervening formations.

#### *Update Made to Online Groundwater Atlas of Wyoming*

The WSGS completed an update (October 2020) to its online Groundwater Atlas of Wyoming, which provides a wide range of information about the state’s groundwater. The WSGS launched the atlas in 2017, making it easier for users to explore basic Wyoming groundwater data quickly.

#### *Geology of Wyoming Postcard*

The WSGS published a new postcard (November 2020) showing the general geology of Wyoming. The postcard includes a colorful map of rock formations, faults, basins, mountain ranges, and other geologic features in Wyoming.

#### *Greater Green River Basin Groundwater Salinity Report*

The WSGS published a study (December 2020) on groundwater salinity in the Greater Green River Basin in southwestern Wyoming. The new report is part of an ongoing series that examines water quality in selected Wyoming energy-producing basins.

#### *Annual Summary Report*

The WSGS published its annual summary report about the state’s oil and natural gas industry (January 2021). The report outlines the significant events that occurred in the industry during 2020.

#### *Boysen State Park Geology Pamphlet*

The WSGS published a pamphlet about the geology of Boysen State Park (January 2021). The pamphlet is part of a series focused on geology of Wyoming’s various state parks, thus enhancing park visitors’ experience.

#### *Hot Springs State Park Geology Pamphlet*

The WSGS published a pamphlet about the geology of Hot Springs State Park (March 2021). The pamphlet is part of a series focused on geology of Wyoming’s various state parks, thus enhancing park visitors’ experience.

#### *Oil and Natural Gas Study of the Greater Green River Basin’s Subsurface Geology*

The WSGS published a new study (April 2021) about the Greater Green River Basin’s subsurface geology. The study establishes a baseline dataset for the stratigraphy and geometry of potential unconventional reservoirs, including the Lewis Shale, Baxter-Hilliard shales, Niobrara Formation, Mowry Shale, and Phosphoria Formation.

#### *New Geologic Maps*

The WSGS, under its STATEMAP program, published new preliminary geologic maps (June 2021). Some of the maps are accompanied by written technical reports with additional detail about each quadrangle’s unique geology, structure, and economics as well as geochemical and geochronological analyses.

- 1:24,000-scale bedrock geologic map of the Richards Gap quadrangle, Sweetwater County, Wyoming, and Daggett County, Utah
- 1:24,000-scale bedrock geologic map of the Goat Mountain quadrangle, Albany and Laramie counties
- 1:100,000-scale surficial geologic map of west half of the Jackson Lake quadrangle, Teton County
- 1:100,000-scale bedrock geologic map of the Rock River quadrangle, Albany, Laramie, and Platte counties

See next page for WSGS Organizational Chart.

