Wyoming State Geological Survey FY2017 Annual Report

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Year Established

1933

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

Organizational Structure

The Wyoming State Geological Survey (WSGS) has 21 full-time benefited staff positions (see chart for details). The WSGS has an Advisory Board. The board consists 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, and as a member of the Wyoming Consensus Revenue Estimating Group (CREG).

Clients Served

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

Budget Information (FY2017)	
General Funds (Expenditures)	2,021,569.23
Federal Grant Funds	157,437.60
State Grant Funds	128,002.23
Other Funds*	11,666.13
	$2,318,675.19
*Sales Reverted to State General Fund	

Basic Facts
The WSGS has 21 legislatively approved positions and operated with a biennium budget of $4,576,848 (2017-2018), 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 include the following:

- Energy and Mineral Resources
- Water Resources, Mapping, and Hazards
- Geographic Information Systems and Information Management
- Publications and Communications
- Administration
- Human Resources

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
Wyoming natural resources are managed to maximize the economic, environmental, and social prosperity of current and future generations.

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.

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 – FY2017 Projects Completed
(Reporting Period: July 1, 2016 – June 30, 2017; all reports are available on the agency's website.)

Wyoming Geochronology Map
The WSGS launched a geochronology map (June 2017) that presents Wyoming-specific data compiled from published and unpublished sources, along with data collected specifically for WSGS projects. This map is intended to be a starting point for users interested in age data related to Wyoming.

Codell Sandstone Oil Production Trends, Northern Denver Basin, Laramie County, Wyoming
The WSGS published a study (May 2017) on Codell Sandstone oil production trends in the northern portion of the Denver Basin in Laramie Count. Success appears to depends on geology, but equally if not more important is the proper application of drilling and completion technologies and practices. The goal of the study is to provide a better understanding of operational best practices that in turn can help industry and regulators in optimizing oil production from the Codell Sandstone in the study area.

Preliminary Investigation of Quaternary Faults in Eastern Jackson Hole, Wyoming
The WSGS published a report (March 2017) about Quaternary faults in eastern Jackson Hole, Wyoming. The primary goal of the investigation was to evaluate a system of predominately westward-dipping late quaternary faults that form a distributed system of short, unconnected segments along the eastern edge of the valley.

Groundwater Atlas of Wyoming
The WSGS launched a new Groundwater Atlas of Wyoming (March 2017) that provides a wide range of information and enables users to obtain basic groundwater data quickly, which will be helpful in an arid state where groundwater is used extensively for domestic, agricultural and industrial purposes.

Groundwater Response in the Sandstones of the Wasatch and Fort Union Formations, Powder River Basin, Wyoming
The WSGS published results of a study (March 2017) examining groundwater level responses in sandstone aquifers associated with coalbed natural gas production in the Powder River Basin. The investigation is intended to provide a preliminary evaluation of groundwater level fluctuations following CBNG development and its subsequent decline.

Wyoming State Geological Survey Statewide Groundwater Baseflow Study
The WSGS published results of a statewide groundwater study (December 2016) after developing a new model to estimate baseflow, a significant component of groundwater recharge. The primary objective of the project was to develop a straight-forward model capable of making reasonable large-scale estimates of baseflow for the state of Wyoming using precipitation data, other readily available environmental data and Geographic Information Systems techniques.

New Geologic Maps
The WSGS, under its StateMap program, published three new geologic maps (September 2016) that are focused on the geology and related energy resources and geologic hazards in Wyoming.

- 1:24,000 scale Geologic Map of the Ervay Basin Quadrangle, Open File 16-03, Natrona County
- 1:24,000 scale Geologic Map of the Ervay Basin SW Quadrangle, Open File 16-04, Natrona County
- 1:24,000 scale Geologic Map of the Dixon Quadrangle, Open File 16-05, Carbon County, Wyoming; Moffat County, Colorado
- 1:00,000 scale Geologic Map of the Jackson Quadrangle, Open File 16-06, Sublette, Lincoln, Teton and Fremont counties
- 1:24,000 scale Geologic Map of the Jeffrey City Quadrangle, Open File 16-07, Fremont County

Uranium: Geology and Applications
The WSGS published a public information circular (August 2016) about uranium, a chemical element that has benefited Wyoming where the largest economic reserves in the United States can be found. The publications provides a description of uranium, host rock formations, where it came from, major discoveries in Wyoming and how much are in reserves. There's also information covering historical uses, early research and types of uranium mining.

Oil and Gas Map of Wyoming
The WSGS published the Oil and Gas Map of Wyoming (August 2016), which replaces the 2012 version. The map is one the Survey's most popular publications and is used by industry, policymakers, researchers and the public.

Stratigraphy and Hydrocarbon Potential of the Fort Union and Lance Formations in the Great Divide and Washakie Basins, South-Central Wyoming
The WSGS published a study (August 2016) aimed at establishing the hydrocarbon-generation potential of the Lance and Fort Union petroleum systems. The investigation identified which portions of the formations in the Great Divide and Washakie basins had the potential to generate natural gas and form hydrocarbon-bearing reservoirs.

Wyoming Oil and Gas Map of Wyoming
The WSGS launched its first-ever online oil and gas map (July 2016) that complements and enhances the Survey's traditional paper map (August 2016) by providing additional data and the ability to be updated more frequently as new information is acquired. The online map replaces the same oil and gas layers as the paper map, in addition to more content, details and functionality. The first update to the online map was made in April 2017.

See next page for WSGS Organizational Chart.

Wyoming State Geological Survey
Organizational Chart