

Geologic Hazards in Wyoming

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Summary Report

Wyoming State
Geological Survey
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Intrepreting the past,
providing for the future

Geologic hazards in Wyoming:

- *landslides*
- *earthquakes*
- *expansive soils*
- *windblown deposits*
- *radon*
- *karst and sinkholes*
- *volcanic eruptions*

More information is
available at:

www.wsgs.wyo.gov/hazards/hazards



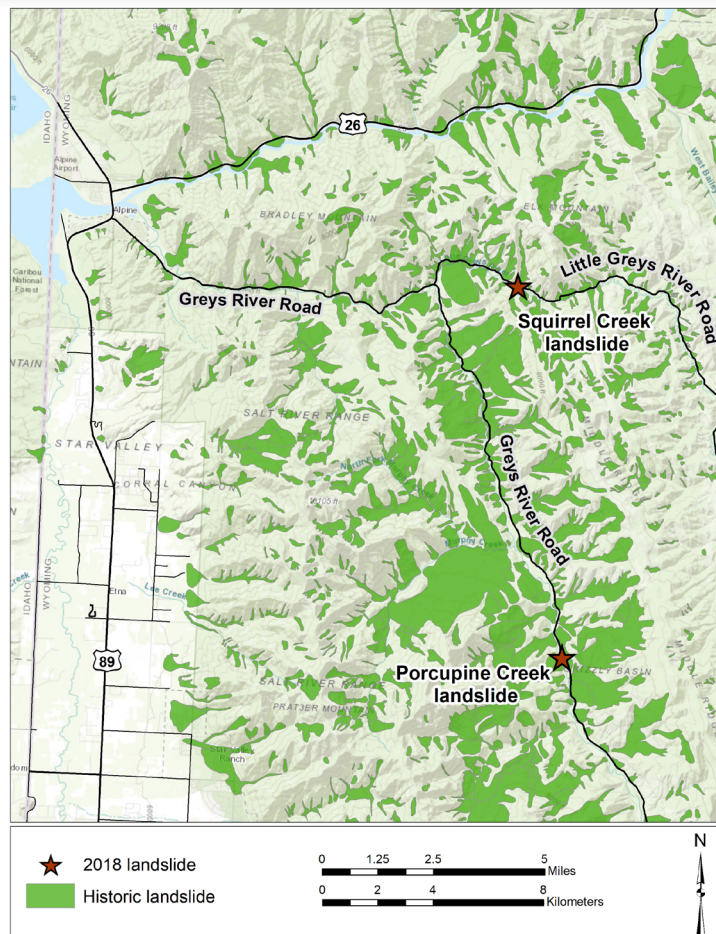
Geologic conditions that represent a risk to people, property, and infrastructure are known as geologic hazards. Because of the rural nature of Wyoming, many geologic hazards occur without endangering the public. However, when they occur near people or infrastructure—homes, buildings, roads, railways, and pipelines—they can cause injuries and damage. Geologists at the Wyoming State Geological Survey (WSGS) study geologic hazards in an effort to mitigate risk and protect the public.

The WSGS is conducting investigations related to landslide susceptibility and occurrences, earthquake activity, modern faults, and surficial geologic deposits. The agency also maintains databases on earthquakes, landslides, and other geologic hazards that are available to governmental agencies, land use planners, and the public. The WSGS works with the Wyoming Office of Homeland Security (WOHS) and county emergency mitigation officers to study and mitigate hazards within at-risk communities.

Landslides

Landslides are the downward movement of rock, soil, or earth caused by gravity, and occur when a slope becomes unstable. Although numerous landslides occurred in Wyoming during 2018, three notable landslides are the Porcupine Creek, Squirrel Creek, and Crandall landslides.

The Porcupine Creek landslide occurred



Northern Greys and Little Greys rivers corridors showing locations of recent landslides at Squirrel and Porcupine creeks in Lincoln County, Wyoming.

on April 17, 2018, when slope failure temporarily dammed the Greys River and destroyed a portion of the Greys River Road in Lincoln County. It limited access to a large portion of the Wyoming range and affected tourism in Alpine, Wyoming. A smaller event occurred near Squirrel Creek that temporarily blocked the Little Greys River Road, stranding a number of campers. By gathering data, creating maps (see map above), and providing input and geologic interpretation, the WSGS contributed to a multi-agency group (including WOHS, Wyoming Department of Transportation, Wyoming Office of Tourism, and Lincoln County officials and emergency managers) to assess and respond to the events.

The landslide in Park County near Crandall, Wyoming, occurred in June 2018 (see photo at top of cover page). The slide encroached on a number of homes and cabins, and destroyed two properties. The WSGS worked with the WOHs in evaluating the surrounding areas to identify landslide history and potential.

Earthquakes

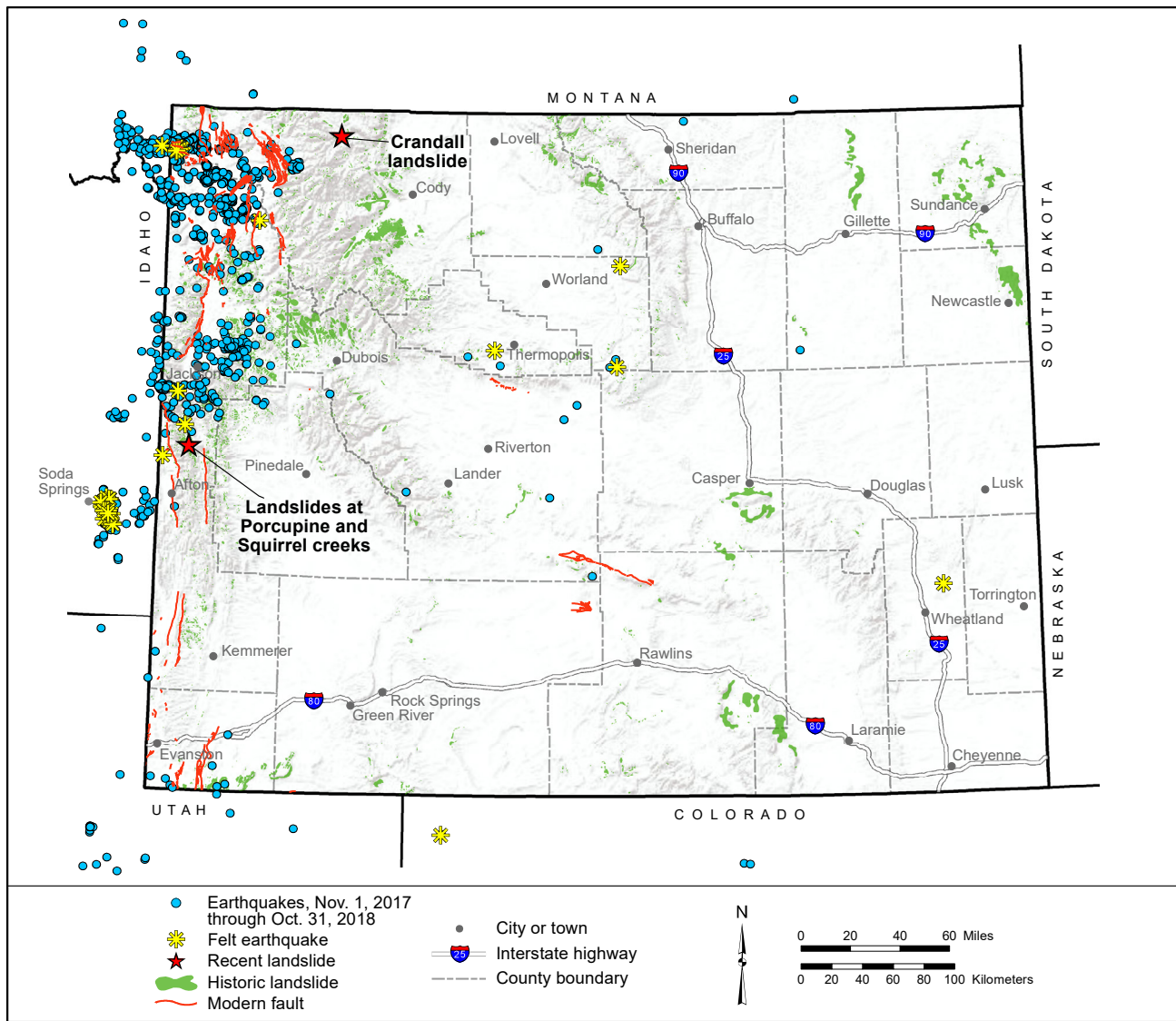
Earthquakes occur nearly every day in Wyoming (see map below), with the majority occurring in the north-western corner, including Yellowstone National Park. In most cases, earthquakes go unnoticed due to their small magnitude. However, when large enough, earthquakes that occur inside and outside of Wyoming can be felt in the state. For example, a magnitude 4.4 earthquake with an epicenter near Soda

2,558 earthquakes occurred in and near Wyoming from November 1, 2017, to October 31, 2018

Springs, Idaho, occurred in January 2018. It and many of its aftershocks were felt within the state, primarily in Star Valley. Of the 36 earthquakes felt in Wyoming in the past year, fewer than half had epicenters within the state.

Modern faults, those that have ruptured in the last 1.6 million years, are considered potential earthquake sources. Wyoming hosts more than 30 of these modern faults (see map below). Studying these faults can provide valuable information about previous earthquakes and clues to potential future events. The WSGS has recently collaborated with geologists from the U.S. Geological Survey, Bureau of Reclamation, and multiple universities to study modern faults in Jackson Hole, the Washakie Basin, and near the Seminoe Mountains. Data gathered from these projects are redefining seismic hazards for those portions of the state.

The WSGS continues to be the primary state agency that provides information related to all geologic hazards throughout Wyoming.



Earthquakes in and near Wyoming from November 1, 2017, through October 31, 2018, as well as historic and recent landslides, and modern faults.

Caption for cover photo: Oblique aerial photograph of a recent landslide near Crandall, Wyoming. (Photo provided by Park County)