

Testimony submitted to the:
House Committee on Natural Resources
Subcommittee on Energy and Mineral Resources
“Volcano Hazards: Exploring the National Preparation and Response Strategy”

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Submitted by:

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Good afternoon Mr. Chairman and Members of the Committee. Thank you for the opportunity to appear before you today in order to discuss this important topic. My name is Thomas Drean and I am the State Geologist and Director of the Wyoming State Geological Survey.

Since 1877, the Wyoming State Geological Survey and its predecessors have been dedicated to facilitating the responsible development of natural resources and identifying and quantifying geologic hazards for the citizens of Wyoming. This includes hazards such as the Yellowstone Supervolcano which underlies Yellowstone National Park in Wyoming.

Wyoming leads the nation in the production of coal, uranium, trona and bentonite and is the 5th largest producer of natural gas and 7th largest producer of crude oil in the United States. It also has additional natural resources, including wind power, helium and a promising deposit of rare earth elements that are in the process of undergoing regulatory review prior to their potential development.

Wyoming produces approximately 10 quadrillion British Thermal Units (BTU's) of energy each year and if it were an independent nation it would be the 10th largest energy producer in the world and the 3rd largest exporter of energy in the world. The responsible production of this energy and other natural resources are vital to Wyoming and the United States and an interruption of it due to a significant geologic hazard event, such as a major volcanic eruption would have substantial impact on humans and the economy.

Nothing is more important to the Wyoming State Geological Survey than the health and safety of the citizens of Wyoming and the United States. Because of this, we dedicate efforts and expertise to working on evaluating and understanding geologic hazards including sink holes, landslides, unstable soils, earthquakes and volcanism. Much of this work is done in collaboration with other state agencies and federal entities such as the United States Geological Survey (USGS).

From a geologic time perspective the volcanism that has taken place in the Yellowstone Plateau volcanic field in Wyoming is relatively recent with exceptionally large explosive eruptions taking place 2.1 million, 1.3 million and approximately 640,000 years ago. These eruptions are noteworthy in that they are some of the largest the Earth has experienced with one of them producing an estimated 2,500 times as much ash as the 1980 Mount St. Helens eruption. The Lava Creek eruption, which was the most recent large explosive eruption of the Yellowstone Supervolcano, ejected an estimated 250 cubic miles of material (rock, dirt and ash) plus untold volumes of gases such as carbon dioxide and sulfur dioxide into the atmosphere. This ejected material covered large portions of the United States (from coast to coast) in ash with it being several feet thick in major portions of the West and up to inches thick east of the Mississippi River. Some material that was ejected into the upper atmosphere from this event likely circled the earth for an extended period of time.

In recorded history, our planet has not experienced an eruption anywhere near the magnitude of these Yellowstone events. It's important to note that a much smaller eruption in Indonesia in the early 1800s produced significant global cooling, crop failures and perhaps the largest global famine of the 19th century. One should also not lose sight of the fact that other severe hazardous events are often associated with volcanism, including earthquakes, significant mud/ash flows, landslides, forest fires, damming of rivers and associated flooding, surface water contamination, steam explosions, tsunamis and ecosystem alteration. All of these are considerable threats to public safety.

Besides the large explosive eruptions, there have also been numerous smaller and less explosive eruptions in the Yellowstone area that resulted in lava flows, the most recent of these being approximately 70,000 years ago. Although significant and more likely to occur than a super eruption, these eruptions impacted much smaller geographic areas (hundreds of square miles).

It is important to recognize that although the magma chamber and hot spot beneath Yellowstone remain active the consensus in the scientific community (including the Wyoming State Geological Survey) is that there is less than a one percent chance that a very large explosive volcanic event will take place this century. This is because there are no strong scientific indicators that a super eruption will take place at Yellowstone in the near future. As things stand now, I would not hesitate to have my grandchildren visit or live at the doorstep of the Yellowstone Supervolcano.

Clearly we cannot stop or control volcanic events, especially ones as large as the Yellowstone Supervolcano. However, that does not mean we should ignore them, or make monitoring and investigating them a low priority. The scientific community can play an important and key roll in informing and warning the public and key decision makers about the threats posed by volcanos

like the Yellowstone Supervolcano. An important component of this is the timeliness of reporting, collaboration and being as factual and accurate as possible.

Key to understanding the Yellowstone Supervolcano and its potential for an eruption is the continuous and proper monitoring of it. The Yellowstone Volcano Observatory (YVO), which is funded and managed by the USGS, has the responsibility of monitoring and studying the Yellowstone volcanic plateau area. The YVO consists of eight member agencies including: The USGS, the University of Utah, the University of Wyoming, Yellowstone National Park, the Montana Bureau of Mines and Geology, the Wyoming State Geological Survey, the Idaho Geological Survey and UNAVCO. The stated purpose of the YVO is to: increase the scientific understanding of the Yellowstone volcanic and hydrothermal system, actively monitor the volcanic system and to disseminate data, interpretations and knowledge to the public.

Providing ample warning of a potential volcanic event in Yellowstone is of paramount importance for local, regional and national awareness and preparedness. I understand that emergency-response readiness is an important responsibility of the USGS Volcano Hazards Program and as part of YVO the Wyoming State Geological Survey, among other agencies, plays a role in providing alerts and information statements on geologic hazard related events in the Yellowstone Plateau.

Although unlikely to occur in the near future, large explosive eruptions of the size that occurred at Yellowstone in the geologic past would be extremely harmful to the United States and global community. This would be a devastating incident unlike anything the modern world has experienced. A volcanic event of this size would no doubt cause numerous deaths and destroy an untold amount of property. It would also disrupt or destroy critical food production and supplies, natural resource production, key infrastructure, communication, transportation, healthcare delivery and likely the global climate for an extended period of time.

Thank you for the opportunity to appear before you today and I would be happy to answer any questions the Committee may have.