STATEMENT OF
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BEFORE THE
UNITED STATES SENATE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
CONCERNING
Oversight of Natural Hazards

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Madame Chairman and members of the Committee, thank you for the opportunity to present the views of the U.S. Department of Agriculture (USDA) regarding natural hazards on National Forest System lands, specifically around our efforts to monitor, mitigate, and forecast avalanches along with our use of mapping and monitoring systems.

USDA Forest Service Avalanche Safety Program

The USDA Forest Service is deeply committed to our avalanche safety program, which was founded 80 years ago. Unfortunately, avalanches kill more people on National Forests than any other natural hazard. Each winter an average of 25 to 30 people are killed by avalanches in the United States, and nearly all of these deaths involve recreation on National Forests. This is why the Forest Service has traditionally been, and continues to be, the lead agency for avalanche safety.

The Forest Service aims to provide reasonably safe recreational opportunities for the public, and to warn the public about imminent danger on our lands. As such, our goal is to provide information, education, and planning tools designed to reduce avalanche risk and improve backcountry and ski area safety.

The Forest Service avalanche program consists of two primary parts. First, we operate a military artillery for avalanche control program in close cooperation with several ski areas. Second, we maintain a network of 13 backcountry avalanche forecasting operations. I will discuss each program in more detail.

The military artillery for avalanche control program protects the skiing public by utilizing U.S. Army surplus 105 mm howitzers to trigger avalanches. Nationally, this program involves close cooperation between the Department of the Army, the Forest Service, several Departments of Transportation (including Alaska, Washington and Colorado), the Alaska Railroad, Alyeska Ski Resort, Alaska Department of Natural Resources, and Forest Service permitted ski areas in Colorado, Utah, Nevada, California, and Oregon. A 2017 Interagency Agreement between the Department of the Army and the Forest Service guides the program's operation. This program – and the Forest Service's role in it – is essential for mitigating avalanche danger and maintaining public safety at ski areas that host more than 2 million skier visits each winter. The program is highly valued by the participating ski areas; as such, these ski areas cover its entire operating cost which is approximately $750,000 per year.

The second Forest Service avalanche safety program provides avalanche information and education to the public. This is one of the most visible public safety programs run by our agency, and is an excellent example of a robust and successful public/private partnership, with more than half of program dollars coming from non-federal sources, including grants, donations, and non-profit partners or friends groups. Nationally, partners contribute about $1.7 million annually to the program while the Forest Service appropriated dollars contributes $1.5 million. The program is comprised of 13 Forest Service Avalanche Centers, as well as our partners at the Colorado Avalanche Information Center, the American Avalanche Association, and several non-profit avalanche centers. Each operation is managed locally and is partially supported financially by affiliated non-profit 'friends' groups.

Avalanche centers cover terrain in the western United States (Alaska, Washington, Oregon, California, Nevada, Idaho, Montana, Utah, Wyoming, Colorado, Arizona, and New Mexico), as

well as one avalanche center in New Hampshire. These operations gather current information about snowpack and weather conditions in order to provide accurate and timely avalanche advisories and warnings to the public. Advisories are augmented with photos, videos and near-real time observations from the field. These public safety products are accessed more than 10 million times each winter by more than 1 million people who work, recreate, and travel in the mountains. The program also distributes hazard and risk messaging through a robust social media presence and via a strong partnership with the National Weather Service and associated emergency alert systems.

In addition to avalanche advisories, our avalanche centers provide high quality avalanche education to tens of thousands of people each winter. These courses are geared toward the local audience and designed not to compete with guiding and outfitting operations who teach avalanche courses as part of their livelihood. A particularly successful initiative has been the "Know Before You Go" avalanche awareness program (www.kbyg.org) led by the Utah Avalanche Center. Focused on youth, this program includes many cooperators from across the country as well as Canada and reaches close to 30,000 teens each winter. The video developed for this program is posted online and has received close to 1 million views in the past 18 months.

In order to better communicate all available information to the public, the Forest Service has partnered with the American Avalanche Association to develop and maintain Avalanche.org (www.avalanche.org). Avalanche.org connects the public to backcountry avalanche information and education in the United States and represents a series of collaborations and partnerships that span more than 25 independent operations and 12 states. This initiative also provides a home for the development of technologies which improve our ability to both forecast and communicate avalanche hazard.

We have strong evidence that our approach successfully mitigates avalanche danger faced by the public. The Forest Service recently published a peer-reviewed article in the journal Wilderness and Environmental Medicine that rigorously analyzed avalanche fatality data over the past 20 years. This statistical analysis demonstrated that, while the number of backcountry users has increased by at least a factor of 8, the number of avalanche fatalities during that time has

remained unchanged, with about 25 to 30 fatalities per year. Thus, the avalanche fatality rate (number of fatalities divided by the number of users) has dropped significantly. If our fatality rate had remained constant, we would be seeing more than 200 avalanche fatalities annually. While we will not be satisfied until we can further reduce the avalanche fatality rate, this represents success both for our Forest Service avalanche programs, and also for avalanche safety gear manufacturers and all avalanche educators.

USDA Forest Service Support of Public Safety from Other Hazards

The Forest Service also actively manages public and employee vulnerabilities associated with natural hazards such as; unstable soils, floodplains, debris flows, naturally occurring asbestos, landslides and other geologic hazards. The Forest Service relies on geospatial technology in Geographic Information Systems, Remote Sensing, Unmanned Aerial Systems, and real time sensors such a stream gauges, weather stations, lightning detection, infrared heat detection systems, aerial imaging, and of course, our experienced cadre of field technicians, professionals, and partners.

The Forest Service began using geospatial data in strategic decision making to actively plan for natural hazards and events following a 500-year flood which occurred in low lying Forest Service lands along the Little Missouri River in Arkansas on June 11, 2010. This catastrophic event took the lives of 20 people who were asleep in a Forest Service campground facility and drove the review of campground locations, signage, early warning systems, evacuation plans, and other communications to improve visitor safety throughout the national forests.

The Forest Service shares our internal data with other agencies such as Federal Emergency Management Agency, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, along with, State and local governments, industry and the public. Standardized "open" data is kept in our Enterprise Data Warehouse and is available on Data.gov. We also rely on partnerships and collaboration with other agencies to collect and supply data such as 3D elevation lidar (light detection and ranging), national hydrography dataset, Alaska interferometric synthetic aperture radar, along with mapping efforts such as nationwide Forest Service Topo 7 ½ inch scale map products, and the US Geological Survey-led

Alaska Mapping Initiative. The Forest Service and US Geological Survey routinely share base data to reduce duplication and generate value under the "Collect Once, Use Many" principles.

Our Geospatial Technology and Applications Center in Salt Lake City is partnering with US Geological Survey and others in the Interior Department to build a Hazards Vulnerability Assessment tool. This assessment tool provides us with a map view of potential hazards and the risks posed to public, employees, assets, natural resources, and our infrastructure. Recent events such as the west coast Tsunami warnings, hurricanes, volcanic and earthquake activity potential across the country, floodplains, drought, insect and disease damage, and other information can be shown using an on-line map viewer.

Optical and thermal imagery and aerial views greatly influence our agency's ability to respond to emergencies and events, as well as recovery and restoration of Forest Service lands and watershed condition. We use these internal and external data sets to drive predictive modelling and mapping techniques to inform our planning and decision making.

Conclusion

The USDA Forest Service is committed to public safety and partnering to ensure resources and evolving technologies are available and used to enhance planning, forecasting and protecting lives. Thank you for the opportunity to testify and I look forward to answering your questions.