United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Office of the Director
Reston, Virginia 20192

Memorandum

To: Jeff Rupert
Director, Office of Wildland Fire

Through: Timothy R. Petty, Ph.D.
Assistant Secretary for Water and Science FEB 15 2018

From: William H. Werkheiser FEB 13 2018
Deputy Director
Exercising the Authority of the Director of the U.S. Geological Survey

Subject: U.S. Geological Survey Support for Active Management of Wildland Fire Risk

The U.S. Geological Survey (USGS) wildland fire priority is to deliver information, data, and tools that support active management to reduce wildland fire risk on lands administered by agencies in the Department of the Interior (DOI), as identified in the Secretary's Wildland Fire Directive (September 12, 2017).

The USGS works closely with DOI agencies to help managers meet their management goals in forests, woodlands, shrublands, grasslands, tundra, and deserts across the United States. USGS products are used by national and State foresters, tribes and local communities. Key focal areas of USGS science to inform active management include prescribed fire and fuels management; characterization of risk resulting from fire; means to reduce risks; and data and tools to support decision-making by fire and land managers.

Before Wildland Fires

The USGS and the U.S. Forest Service (USFS) develop the LANDFIRE suite of data and tools. LANDFIRE provides maps and information about fuel types and loading, forest canopy characteristics, fire regimes and fire return intervals, topography (slope, aspect, elevation), and annual/seasonal changes of vegetation. Efforts are actively underway to improve spatial resolution and structural characteristics of fuels, frequency of updates, and provide detail on specific fuel types (e.g., cheatgrass). LANDFIRE is also used during and after wildfires, and is discussed briefly in those sections below.

USGS research on the effects and the effectiveness of prescribed fire, mechanical treatment, fuel breaks and other kinds of fuel treatments help land managers design fuel treatments to reduce the damaging effects of wildfires, increase firefighter access and safety, and meet land management objectives.

USGS studies on the effects of wildfire on a broad range of resource values help characterize the wildfire risk to those values and methods to reduce that risk through active management. Examples of values examined include fish and wildlife habitat; hunting, fishing, forest management and grazing activities; and water supply.

Recognizing the inextricable link between fire and invasive species, USGS is actively assessing the potential for use of bio-pesticides to control nonnative annual grasses in sagebrush rangelands. These research results are expected to help inform managers of application methods and the effectiveness of these agents.

USGS science, developed in collaboration with other federal and state partners, is providing information on effectiveness of conifer removal activities to reduce fuel loads and enhance ecosystem function (e.g., reduce water loss). One of these efforts, known as SageSTEP, has provided insights for improving the design and techniques used to implement treatments to remove conifers and the long-term effectiveness (10-year) of these actions.

During Wildland Fires

USGS provides data to the Wildland Fire Decision Support System (WFDSS) that assists fire managers and analysts making strategic and tactical decisions for fire incidents. WFDSS integrates fire modeling and decision support in one system. LANDFIRE and its models are a primary component of WFDSS and help reduce risks to firefighters, communities and resource values at risk.

Wildfire occurrence and perimeters are updated daily and shared with the fire management community, agency personnel and the public through the Geospatial Multi-Agency Coordination Tool (GeoMAC). The wildfire response coordination by the National Interagency Fire Center (NIFC) is further supported with early wildland fire detection information and commercial satellite imagery through the USGS-led interagency Civil Applications Committee working with the Intelligence and Defense Communities.

The USGS has developed maps to quantify the amount of cheatgrass in sagebrush rangelands at the start of the fire season to inform fire managers of fuel load, improve targeting of active fuels management, and identify priority areas to increase wildfire suppression capabilities.

The USGS studies on trace elements in smoke, ash, and burned soil from wildfires, and their effect on humans, provide critical information on health risks to incident teams.

After Wildland Fires

Monitoring Trends in Burn Severity (MTBS) is a joint USGS/USFS program that maps the burn severity and extent of large fires, 1000 acres or more, across all lands of the United States from 1984 to present. This information is produced after large wildfires and used by BAER Teams (Burned Area Emergency Response) to help develop plans to identify areas that need to be stabilized and outline steps for recovery of the vegetation. MTBS maps are also used to update fuel/vegetation maps in LANDFIRE.

USGS scientists use burn severity, terrain, geological and weather data to produce maps that identify the potential for flooding, debris-flow, or mudslides to affect communities downstream from recent wildfires. This information is used by emergency managers to determine when and if evacuation is needed, and by BAER Teams to identify steps for stabilization and recovery of affected landscapes.

USGS produced a three-part restoration handbook that informs strategic targeting of management actions in sagebrush ecosystems to reduce fuel loads and enhance post-fire recovery success. Strategies for controlling cheatgrass and restoring native plant communities after fire also reduce wildland fire risk. This restoration handbook provides a detailed approach for determining restoration needs.

Finally, after the issuance of the Secretary's Wildland Fire Directive, the USGS compiled 10-years of publications and products and developed a webpage to improve access to its information, data and tools that support active management of wildland fire. The USGS helps land, fire, and emergency managers do their job better, improve people's lives, and increase the cost effectiveness of managing fire and its effects.

Please contact Paul Steblein, USGS Fire Science Coordinator, 703-648-6895; psteblein@usgs.gov, should you have any questions or interest in a briefing.