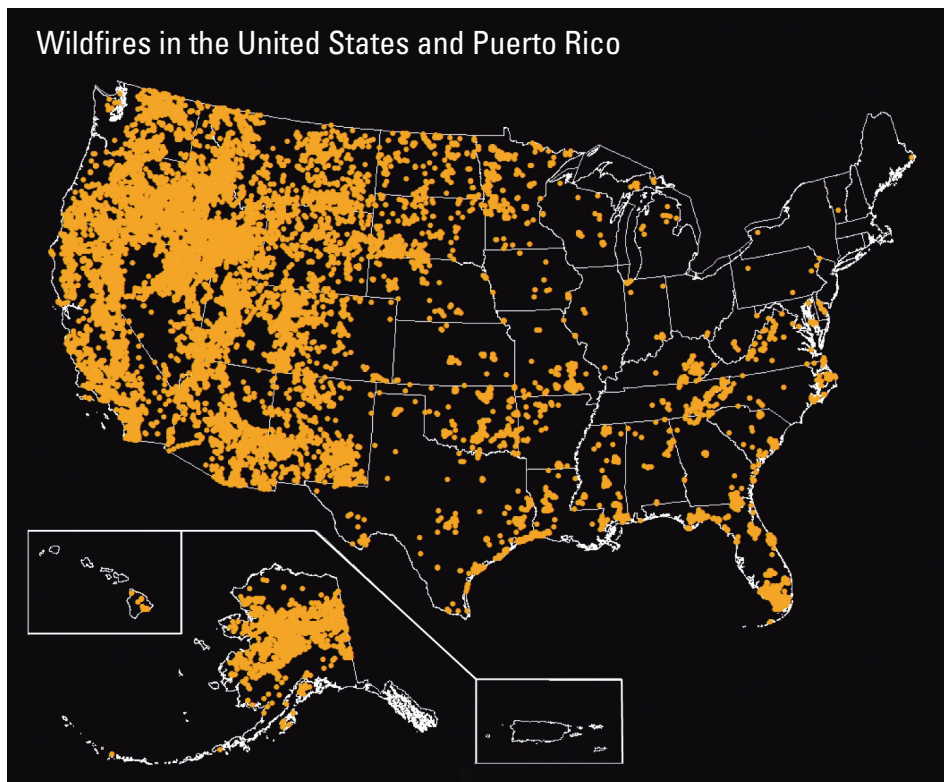


USGS Science Helps Build Safer Communities

Wildfire Hazards—A National Threat



This map shows locations that experienced wildfires greater than 250 acres, from 1980 to 2003. Map not to scale. Sources: Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, and the USGS National Atlas

A Mounting Threat

Wildfires are a growing natural hazard in most regions of the United States, posing a threat to life and property, particularly where native ecosystems meet developed areas.

However, because fire is a natural (and often beneficial) process, fire suppression can lead to more severe fires due to the buildup of vegetation, which creates more fuel.

In addition, the secondary effects of wildfires, including erosion, landslides, introduction of invasive species, and changes in water quality, are often more disastrous than the fire itself.

Science Can Meet the Challenge

The U.S. Geological Survey (USGS) provides tools and information by identifying wildfire risks, ways to reduce wildfire hazards, providing real-time firefighting support, and assessing the aftermath of wildfires. The goal is to build more resilient communities and ecosystems.

The USGS conducts vegetation and fuels mapping to support firefighting readiness, reduce wildfire hazards in the wildland-urban interface, and assess wildfire effects on ecosystems.



Firefighters work to control a wildfire near Springer, Okla., on Monday, January 16, 2006. (FEMA photo/Bob McMillan)

| Wildfire Impacts | USGS Science Priorities |
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| <ul style="list-style-type: none"> • The Federal Government annually spends billions of dollars to suppress wildfires. • Wildfires increase the potential for flooding, debris flows, and landslides. • Smoke and other emissions contain pollutants that can cause significant health problems. • Short-term effects: destruction of timber, forage, wildlife habitats, scenic vistas, and watersheds • Long-term effects: reduced access to recreational areas; destruction of community infrastructure and cultural and economic resources | <ul style="list-style-type: none"> • Conduct research on previous wildfires, including ignition sources, burn severity patterns, season of burning, and fire size • Study the effects of postfire runoff and erosion on aquatic ecosystems and species • Expand the ability to monitor and provide early warnings using new technology, sensor webs, and satellite technology • Develop tools and methods to minimize impacts on human life and property, especially in the wildland-urban interface |

To determine how current conditions differ from natural wildfire circumstances, the USGS studies historical fire patterns—their size, how they started, how hot they burned, and what time of year they occurred.

The USGS is also developing methods to monitor the effectiveness of treatments to reduce fuel buildup, the effects of wildfire on wildlife, and the ecological effects of fuel-reduction measures and postfire rehabilitation treatments.

Land managers use this information to determine fire risk, plan fuel treatments, and develop emergency response plans.

Tools and Teamwork

To aid land managers in developing plans to minimize wildfire threats before they occur or spread, the USGS and the U.S. Forest Service developed the Fire Potential Index (FPI), which depicts the wildfire potential for forests, shrublands, and grasslands.

FPI maps use satellite-derived information to assess the impact of vegetation on fire danger. The FPI is updated daily to reflect changing weather conditions and is used in daily wildfire decisionmaking.

To monitor the risk of actively burning wildfires, the USGS, in cooperation with the National Interagency Fire Center, developed GeoMAC. This is an Internet-based mapping tool that provides a national view of current wildfire situations to fire managers and the public.

GeoMAC aids fire personnel by displaying the most current wildfire information available.

The USGS is also a member of LANDFIRE, a multipartner wildfires, ecosystem, and fuel-mapping project. LANDFIRE data support fuels treatments, incident response, postfire recovery actions, and effective monitoring.

After the Flames, the Risk Remains

The less obvious but equally devastating effects of wildfires occur after the fire is extinguished. These aftereffects include erosion, landslides, debris flows, and altered water quality.

The risk of floods and debris flows increases due to the exposure of bare ground and the loss of vegetation. Sediment, burned debris, and chemicals affect water quality as well.

USGS Rapid-Deployment Data-Collection Networks provide critical information for postfire flood and debris-flow warnings and on the response of eroded, burned areas. This information helps emergency management officials with emergency response, postfire mitigation, and rehabilitation planning.

USGS wildfire science is an integral part of the Federal Government mission to protect life, property, and natural resources before, during, and after wildfires.



A wildfire in Yellowstone National Park, Wyo., approaches a gift shop and lodge on Wednesday, September 7, 1988. (National Park Service photo)



A wildfire left very little of this home near San Bernadino, Calif., in October 2003. (FEMA photo/Kevin Galvin)



The evening sun barely penetrates smoke and ash as evacuees flee Glenwood Springs, Colo., because of spreading wildfires on Saturday, June 8, 2002. (FEMA photo/Bryan Dahlberg)

Wildfire Facts

- More land has been affected by wildfires in recent years than at any time since the 1960s. In 2004, wildfires burned more than 8 million acres in 40 States.
- The greater Yellowstone National Park fire of 1988 burned more than 1.2 million acres.
- Wildfire severity has increased and fire frequency has decreased during the past 200 years.
- Many species depend on wildfires to improve habitat, recycle nutrients, and maintain diverse communities.
- Land management agencies light “prescribed fires” under controlled conditions for specific management objectives.

For More Information

<http://www.usgs.gov/themes/Wildfire/fire.html/>

<http://firescience.cr.usgs.gov/html/sitemap.html>

<http://www.geomac.gov/>

<http://landfire.gov/>

<http://www.usgs.gov/>