

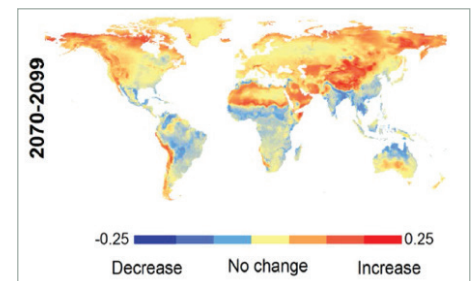
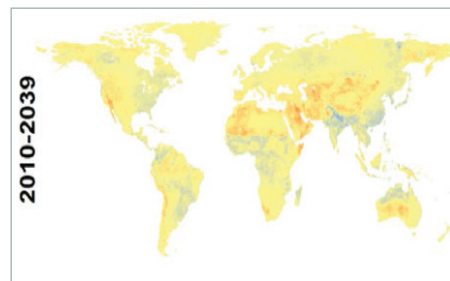
# Wildland Fire Prevention and Commercial Operations

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Extreme weather and drought events are being experienced on a global scale. The effects of climate change on increasing temperatures, decreased precipitation levels, and decreased soil moisture have increased the fire season and acres at risk. Recent studies predict that the number of large, high-intensity fire events will increase globally, in part due to a 20 to 50 percent increase in the number of days when conditions are conducive to fires. “Forests in the western United States, southeastern Australia, Europe, and the eastern Mediterranean region that extends from Greece to Lebanon and Syria are among those areas at highest risk.”<sup>1</sup> Combined with increasing development along the wildland-urban interface, these dynamics present an increased potential for wildfire events, as well as increased exposure to people and property from these events.

Whether termed bushfire, forest fire, grass fire, or brush fire, wildfires occur throughout the world with devastating effects. Some areas around the globe including southern Australia, the western US, Portugal, Spain, Greece, and the south of France are known for severe wildland fire. In North America, most wild fires occur during the months of April through late October. During these months with prolonged periods without rain, grass and other organic matter are very dry and easily ignited. Months of the most extreme fire behavior vary based on regional specifics of low vegetation moisture content, humidity levels in the single digits, and strong winds approaching hurricane force.



Mean change in global wildfire. The greatest increases are expected for parts of western & southern US, south-west Canada, parts of the Mediterranean basin, eastern Siberia, south-central Australia, western South America and the drier regions in Asia <sup>2</sup>

According to a recent study published by the Insurance Information Institute, North American wildfires are increasing in both frequency and severity. A study by the National Park Service reports U.S. Forest lands have been experiencing an escalating number of catastrophic-scale forest fires during the past 20 years. The Insurance Information Institute reports that 90% of these fires were initiated by human activity, as opposed to lightning and other natural causes. The threat of wildland fire is clear and present when a building is surrounded by brush, forest, grass, or crops, especially during dry seasons and periods of drought.

Common causes of wildland fires include unattended campfires, illegible outdoor cooking, recreational open fires, hot exhaust systems from automobiles and equipment, burning of debris, negligently discarded cigarettes, arson, and downed electrical utilities sparking and igniting nearby dried vegetation.

An on-coming wildland fire can spread to commercial buildings as flying embers and firebrands carried through the air land on the structure and ignite combustible building elements, exterior combustible storage, vegetation surrounding the building, or enter the building through vents or openings. As a wildfire approaches, radiant heat can break windows and combustible building materials may reach autoignition temperature. Finally, a wildfire burning up to structures can have direct flame impingement for fire involvement to the building.

Wildfires are important to the ecosystem, as the burning of native fuels allow for the regeneration of plant life; however, the building of structures on the fringes of these areas presents a significant danger to life and property

and the ongoing encroachment and development of the urban/woodland interface places more property at risk. The following are some best practice prevention tips to increase the chance of your facility surviving a wildfire:

- Consult local wildland fire maps and consult with your local planning, fire, and forest authority to determine if your facility is in a wildland fire prone zone.
- Construct buildings of fire resistive materials. Masonry, brick, or reinforced concrete walls limit heat transfer and have preference. Metal noncombustible buildings will allow for the transmission of heat from the external source to the interior of the building and walls and roofs should be properly insulated to provide at least one hour of fire resistive rating using noncombustible insulation products. Roofing materials should be tight fitting without gaps.
- Skylights should be avoided or if necessary constructed of wire reinforced glass.
- Window glass can melt or shatter under heat loading. Noncombustible shutters can provide a level of protection. Tempered and double paned insulated glass windows provide another layer of protection.
- Avoid building construction with changes in elevations, under floor spaces, open eaves, edges, etc., as they are areas where burning firebrands can accumulate and will ignite before flat smooth surfaces. Such building features should be kept minimum or boxed in with noncombustible materials.
- Vents, gaps, and louvers are opportunities for fire ember penetration into buildings. Vents, drains, and weep holes in exterior walls should be kept clean and screened with a fine gauge steel wire mesh having a maximum aperture of 1/8 inch (3.2 mm).
- Ensure exterior doors and frames are tight and constructed to stop sparks and embers from being blown in through gaps, especially in the gap underneath the door.
- Protect external combustible materials by using flame retardant intumescent paint.
- Avoid combustible yard storage which can ignite and expose the building. Use noncombustible shipping containers to store combustible outdoor storage. If unavoidable, separate yard storage as far as possible, but at least 50 ft (15 m) from any building, and on the lesser exposed side of the building.
- Maximize defensible space by creating a clearance zone around buildings, outdoor structures, and yard storage by removing trees and shrubs so there is no continuous canopy of line of vegetation around the site and ensure regular clearing of vegetation around the site. It may not be necessary to remove all trees within the clearance zone.
- Maintain a minimum of 100 ft (30 m) clearance zone from a shrub / grassland exposures and 330 ft (100 m) from a woodland or forest exposures. Depending upon fuel types and sloping topography, these distances may need to be increased. Additionally, separation distances may vary by law or ordinance.
- Grass around the facility should remain trimmed and irrigated. Trim dead tree limbs, tree limbs lower than 6 ft (1.8 m), and any overhanging buildings or structures.
- Keep the fuel load around the facility to a minimum, including propane tanks and other fuel storage.
- Develop a formal written pre-fire plan with the public fire service to establish access and egress paths, update contact information and communication protocols, and fire service needs.

## **Preventing Wildland Fires with Wildland Fire Prevention Plans**

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There are a number of industries that present an increased exposure towards igniting wildland fires. Electric Power Transmission & Distribution, Oil & Gas, and Timber related industry sectors (along with their associated contractors and subcontracts) are several examples which may have increased wildland fire liability. Entities performing prescribed burns also present an increased exposure and should implement detailed wildland fire prevention plans per local regulatory agency.

Companies should determine their scope of operations, contractual, and risk transfer controls in addition to fire prevention practices to limit their potential for starting wildland fire. Real-time monitoring of wildfire conditions, understanding the threat, and efficiently communicating information are the key components to an effective industrial wildland fire prevention plan. The below basic hazard analysis helps any commercial entity in the prevention of industry-caused wildland fire:

### **Basic hazard analysis for commercial operations within wildland operating sites:**

1. Identify the risks (ignition risk assessment)
2. Identify the hazards (wildland fuels that are susceptible to ignition)
3. Identify the values at risk (things all parties wouldn't want a wildfire to burn, such as equipment & facilities assessment, park and forest lands)

#### **Then:**

- Identify actions that will reduce or eliminate the risks. Examples might be:
  - Inspections of equipment
  - Training for employees
  - Cutting, welding and grinding (hot work) management
  - Spark arrester requirements
  - Smoking restrictions
  - Debris burning protocols
- Identify actions that will reduce the fuels to ignition (reduce the hazards). Examples include:
  - Mowing
  - Raking leaves and pine litter
  - Periodically watering vegetation
  - Cooking and warming fire protocols
  - Clearing vegetation from cutting, grinding and welding Designated refueling areas
- Assign responsibilities and timelines for the actions.

Companies operating within the wildlands should have a formal Wildlands Fire Prevention Plan (WFPP). Wildfire predictive maps are free, prevalent and must be integral to monitor and understand the wildfire threat.<sup>3</sup> Best practice approaches today utilize GIS-based wildfire monitoring & threat analysis services which directly integrate with above noted target industries, as well as the property & casualty insurance industry, to help prevent wildfire loss.

#### Sources:

1. South Dakota State University. "Large, high-intensity forest fires will increase." ScienceDaily. ScienceDaily, 10 April 2017. <[www.sciencedaily.com/releases/2017/04/170410085510.htm](http://www.sciencedaily.com/releases/2017/04/170410085510.htm)>.
2. Moritz M.A., Parisien M-A., Batllori E., Krawchuk M.A., Van Dorn J., Ganz D.J. and Hayhoe K. (2012) "Climate change and disruptions to global fire activity" Ecosphere 3: Article 49.
3. Predictive Maps: <https://www.predictiveservices.nifc.gov/predictive.htm>

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