

# Wildfire in a Warming World

## PART II: FUTURE OUTLOOK & RESOURCES

SYNOPSIS / NOVEMBER 30, 2016 / BY JENNIFER HUSHAW

Climate change will continue to alter wildfire risk, with implications for forestlands throughout North America and the global climate system (via increased carbon emissions). Severe disturbance from novel fire regimes may also hasten the species shifts expected with climate change, making fire an important driver of on-going ecosystem change.

### Overview of Changing Fire Risk

**FIRE POTENTIAL & SEASONALITY:** In many regions, fire potential and the length of the fire season will increase. Fuel moisture is highly sensitive to temperature and research suggests we will have drier fuels even in places where precipitation levels go up because the additional moisture cannot compensate for drying caused by higher temperatures.

**A CHANGING LANDSCAPE DRIVES FIRE ACTIVITY:**

Climate-induced changes in vegetation and forest pests will also influence fire risk by changing fuel loads, e.g. mountain pine beetle affects fire probability by altering the quantity and characteristics of live and dead fuels.

Changing fire regimes may also flip some vegetation communities from moisture- to fuel-limited, e.g. the fire return interval in the greater Yellowstone ecosystem is predicted to decrease to the point that some forested areas will no longer regenerate by mid-century, instead they will convert to a new dominant vegetation type and a fuel-limited fire regime.

### Modelling Future Wildfire

**THE GLOBAL PICTURE:** Fire probability is expected to increase in the mid- to high-latitudes and decrease in the tropics. Lengthening of fire season is expected to continue in temperate and boreal regions.

**THE NORTH AMERICAN OUTLOOK:**

Evidence suggests increased potential for very large fires in historically fire-prone regions of the U.S. and a

general increase in fire potential in the Southwest, Rocky Mountains, northern Great Plains, Southeast, and Pacific coast. In the southern U.S., the fire season will likely begin earlier, while northern regions will see an overall extension of the season. Research also suggests increases in fire potential across high-latitude regions, e.g. the annual number of fire spread days in Canada is expected to increase anywhere from 35–400% by 2050.

The combination of high fuel loads and exceptional drought conditions is a recipe for severe fire (as we have seen in the western U.S.), but future increases in fire frequency and water deficits may actually *decrease* fire severity in some regions because reduced vegetation productivity, regeneration, and biomass accumulation will lower fuel loads.

### Management Considerations

**MANAGING FOR EXTREMES** – Planning for extreme fire events can determine the necessary capacity of fire management organizations and guard against the most serious fire-related impacts.

**ACTIVE FUELS REDUCTION** – Fuels reduction via pre-commercial or commercial thinning and prescribed fire is a good approach for reducing fire potential, but it will be more effective in fuel-limited (rather than moisture-limited) ecosystems.

**PASSIVE APPROACH** – A passive approach allows the fire regime and dominant vegetation type to change and come into equilibrium with the novel climate. This may be more cost-effective than fire suppression in places that expect increased aridity and fire frequency. It is appropriate for lands with a management focus on maintaining transitional habitat for wildlife in a changing climate.

**Note:** See the [full bulletin](#) for details, maps of future fire risk, “Things to Do,” and a list of resources.