

# DROUGHT IMPACTS ON WILDFIRE:

## AN UNCERTAIN FUTURE



In order to better understand the relationship between drought and wildfire in the Western United States and meet stakeholder needs at the state and regional level the Desert Research Institute (DRI), Western Regional Climate Center (WRCC) and NOAA's National Integrated Drought Information System (NIDIS) have partnered to form the NIDIS Drought and Wildfire Nexus (NDAWN) to identify priorities and actions to improve products and communication in the drought and fire communities. In addition to exploring drought impacts on wildfire planning, behavior and effects in the western U.S., NDAWN will also explore how drought information is used and could be improved across fire management agencies.

The NDAWN initiative kicked off at a workshop held in Boise, ID in October 2015, where fire managers and planners emphasized a need for increased engagement across agencies and the public on the topic of drought and wildfire. Many of the impacts identified at the workshop are already present in the absence of drought. However, drought amplifies these impacts and some can transmute into entirely new impacts, both in intensity and consequences. Impacts where drought was implicated as detrimental to fire planning, fire behavior, and post-fire restoration include the following:

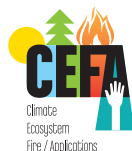
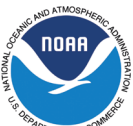
- Current planning processes are not flexible enough to manage drought impacts. For example, these processes prevent carrying over restoration funding until ecological conditions are favorable, or the ability to optimize narrow burn windows for fuel treatments.
- Drought conditions can alter where and how fire burns, and amplify safety concerns by increasing hazardous conditions for fire fighters and nearby communities during fire events.
- Drought can increase the likelihood that vegetation types will shift post-fire, allowing opportunities for invasive species to establish.
- Public and agency awareness of drought and wildfires is expanding as large fires become more common, but acceptance of smoke from fuel treatments such as prescribed fire (Rx fire) still lags.
- Extensive drought increases the potential for large wildfires, which produce considerable smoke impacting local and regional public health.
- Drought amplifies firefighting resource demands and increases costs.
- Drought reduces barriers to fire (natural and human-made) by reducing fuel greenness, snow pack and moisture, thus increasing availability to burn.
- Overall, drought increases wildfire management uncertainty and worsens treatment effectiveness in fuel management and restoration efforts, decreasing ecological resilience.



## OBJECTIVES OF THE NIDIS DROUGHT AND WILDFIRE NEXUS

- 1) To involve the fire community in the Drought Early Warning Systems (DEWS) and drought information networks supported by NIDIS, National Drought Mitigation Center (NDMC), the Western Governors' Association (WGA), state, and local agencies to successfully utilize drought information in fire management programs.
- 2) To provide a baseline of how drought information is currently used in the wildfire community and primary sources, establishing a longitudinal survey mechanism to understand drought information use in the fire management community, enabling NIDIS to identify changes in use and priority issues over time.
- 3) Identify gaps and needs related to drought information in the wildfire community.
- 4) Initiate the development of a network that successfully disseminates and utilizes drought information in fire management planning, behavior, and effects decision contexts at state and regional levels.

To achieve these objectives, NIDIS, DRI, WRCC and their partners will be holding a series of workshops in the National Interagency Fire Center's (NIFC) Geographic Area Coordination Center regions to better identify and address drought impacts by looking at the role of fuel types, fire regimes, topography, climatic conditions and cultural and societal settings in sub-regional contexts.





# IMPACTS FROM DROUGHT ON WILDFIRE PLANNING, BEHAVIOR, AND EFFECTS

## NO DROUGHT

- Suppression tactics take place normally
- Fuels management teams meet their objectives
- Firefighting expenditures are normal

## SHORT-TERM DROUGHT (< 6 MONTHS)

- Fire behavior changes
- Risk of large fires increases
- Ability to manage fires becomes more uncertain under changing conditions
- Prescribed burn windows contract
- Fuel for burning becomes increasingly available
- Restrictions may be imposed on public recreation

## LONG-TERM DROUGHT (> 6 MONTHS)

- Fire behavior can become more extreme
- Ability to manage fires becomes more uncertain
- Fire season lengthens
- Cost of suppression increases
- Reduced water availability for suppression
- Wildfire smoke increases, with subsequent health impacts
- Resources for firefighting may become more scarce
- Ecological resilience decreases
- Vegetation mortality increases
- Burn impacts may cause increased runoff
- Ecosystem restoration becomes more uncertain
- Response may tend to “throw money at the problem” rather than taking a more measured approach
- Burnout: Complexity of managing the situation may cause “crisis fatigue”, tendency to disengage
- Complex challenges can inspire interagency engagement
- More extreme conditions may require increased policy flexibility
- Intensity of managing the situation may spur better planning
- Communication needs require expanded public awareness of conditions and actions for safety, information and engagement
- Opportunities for engagement with sophisticated climate forecast user groups increase

## IS DROUGHT THE NEW NORMAL?

Drought is a common occurrence in the western U.S., although the frequency and intensity vary through time. The recent four-year drought in parts of the West is not unusual in length, but has been unusual in terms of intensity, associated with temperatures which have been greatly above average. The 2014–15 winter in the California Sierra region was the driest in perhaps the last several centuries. Tree rings from the past 2000 years show that there can be decades of overall drought. It is difficult to predict if the current drought will end soon, or if we are in an extended dry period. Model projections of future climate suggest that drought may become more common given warmer temperatures and increased depletion of soil and vegetation moisture.

FOR MORE INFORMATION PLEASE CONTACT:

[tamara.wall@dri.edu](mailto:tamara.wall@dri.edu)

[tim.brown@dri.edu](mailto:tim.brown@dri.edu)

[alicia.marrs@noaa.gov](mailto:alicia.marrs@noaa.gov)