



Climate Change Adaptation

*Perspectives at the Nexus of Science, Society, and Resource
Management*

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What does science tell us?

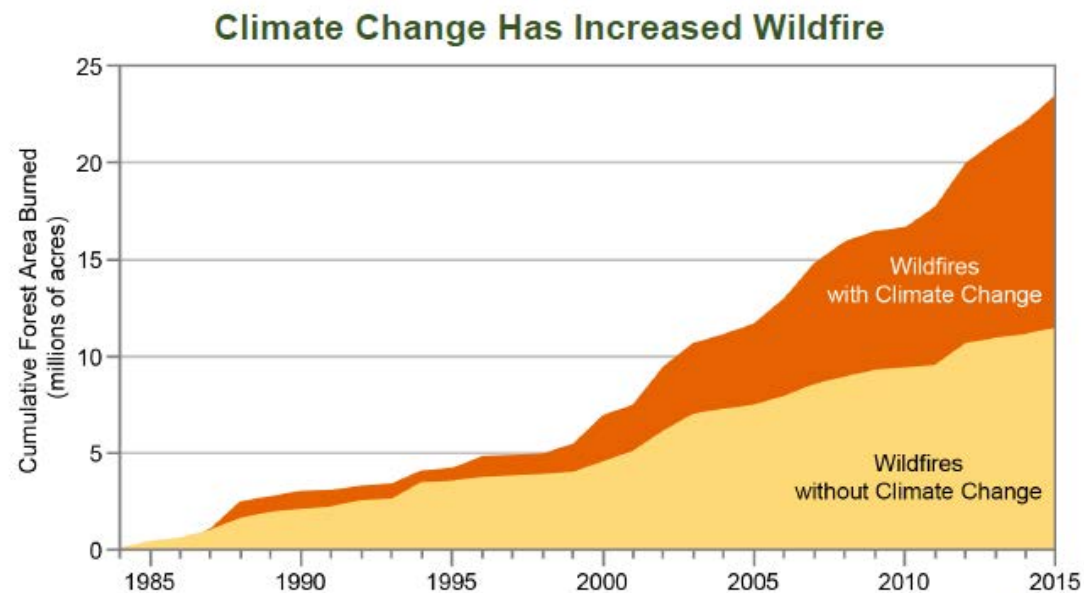
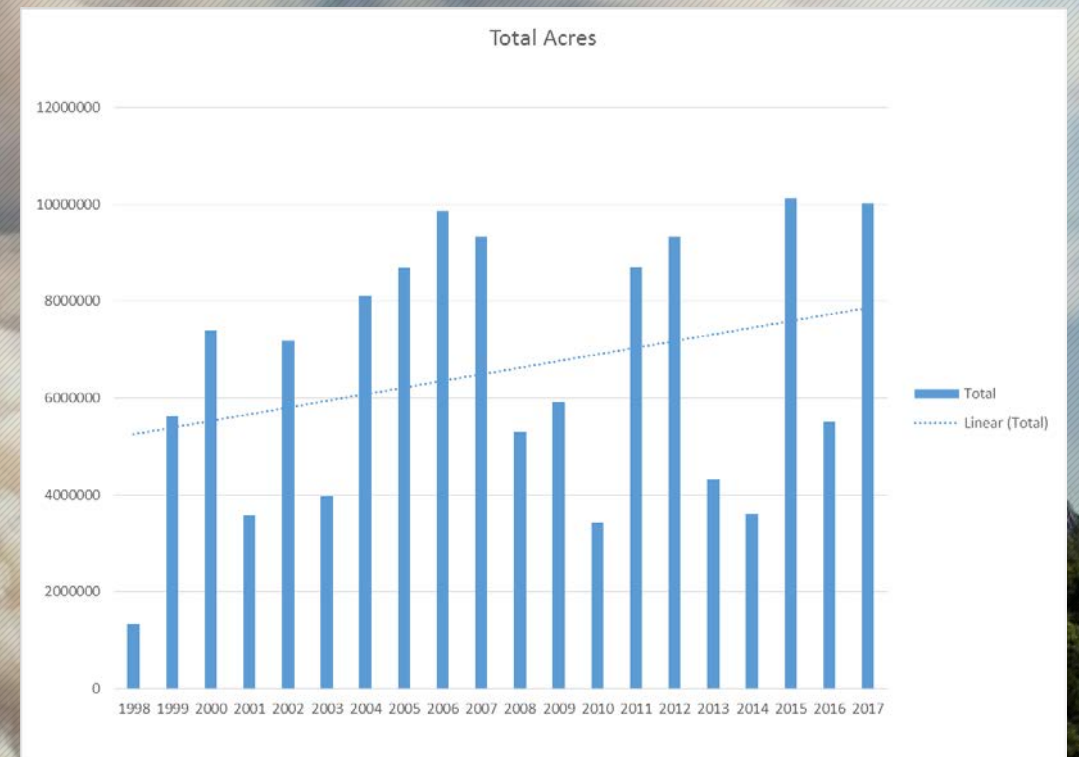
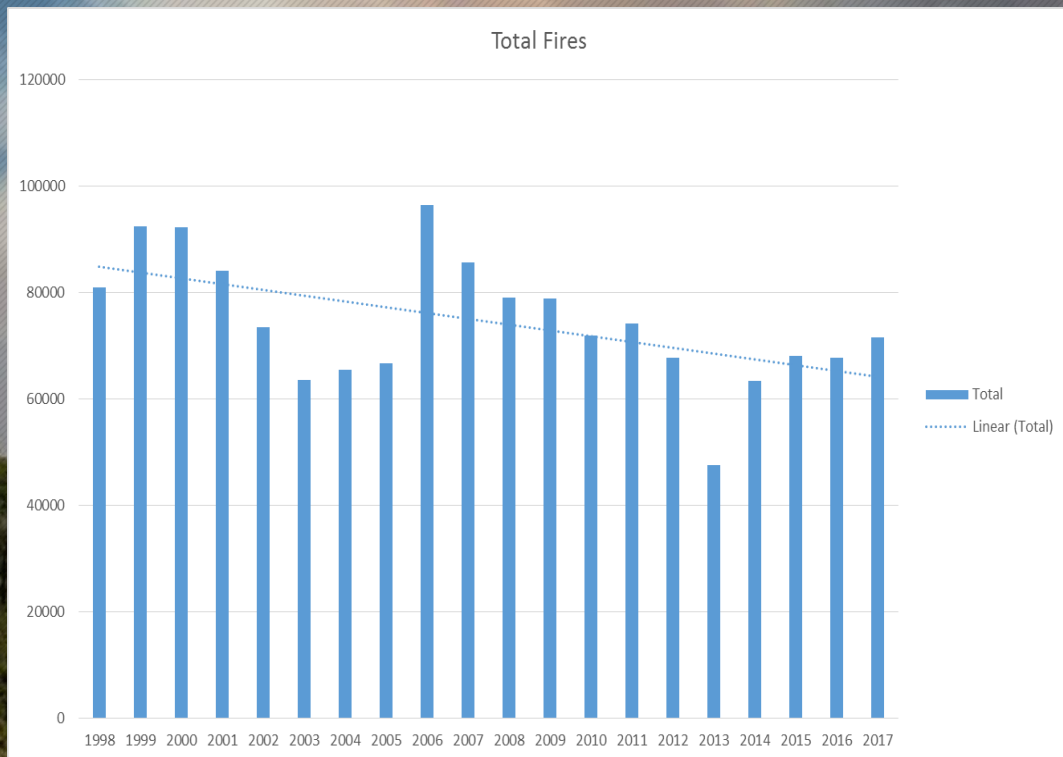


Figure 25.4: The cumulative forest area burned by wildfires has greatly increased between 1984 and 2015, with analyses estimating that the area burned by wildfire across the western United States over that period was twice what would have burned had climate change not occurred. Source: adapted from Abatzoglou and Williams 2016.⁷

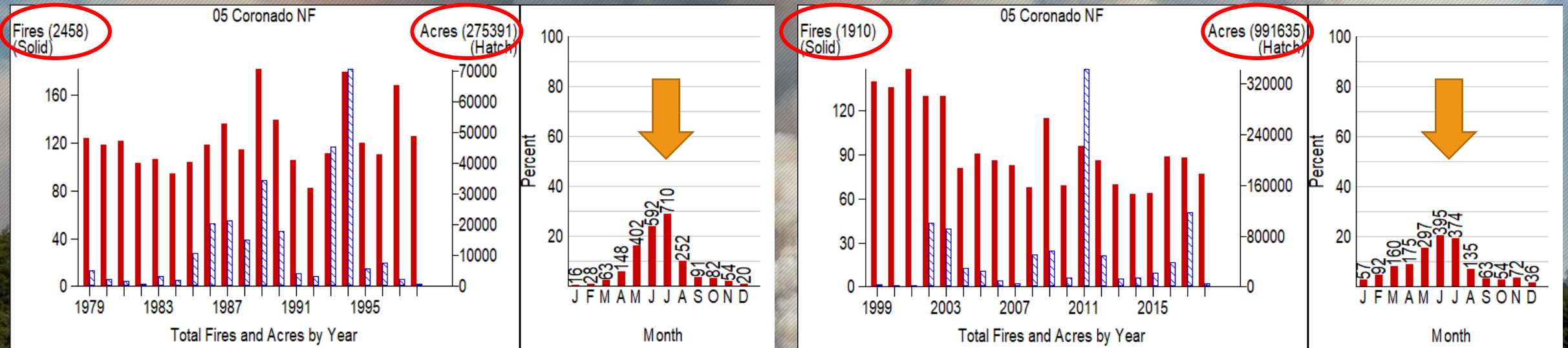
What do we know on the ground?

Total Wildland Fires and Acres (1998 - 2017).



What do we know on the ground?

Coronado NF Fire Occurrence Statistics - 1979-1998 and 1999 - 2018



What do we know on the ground?

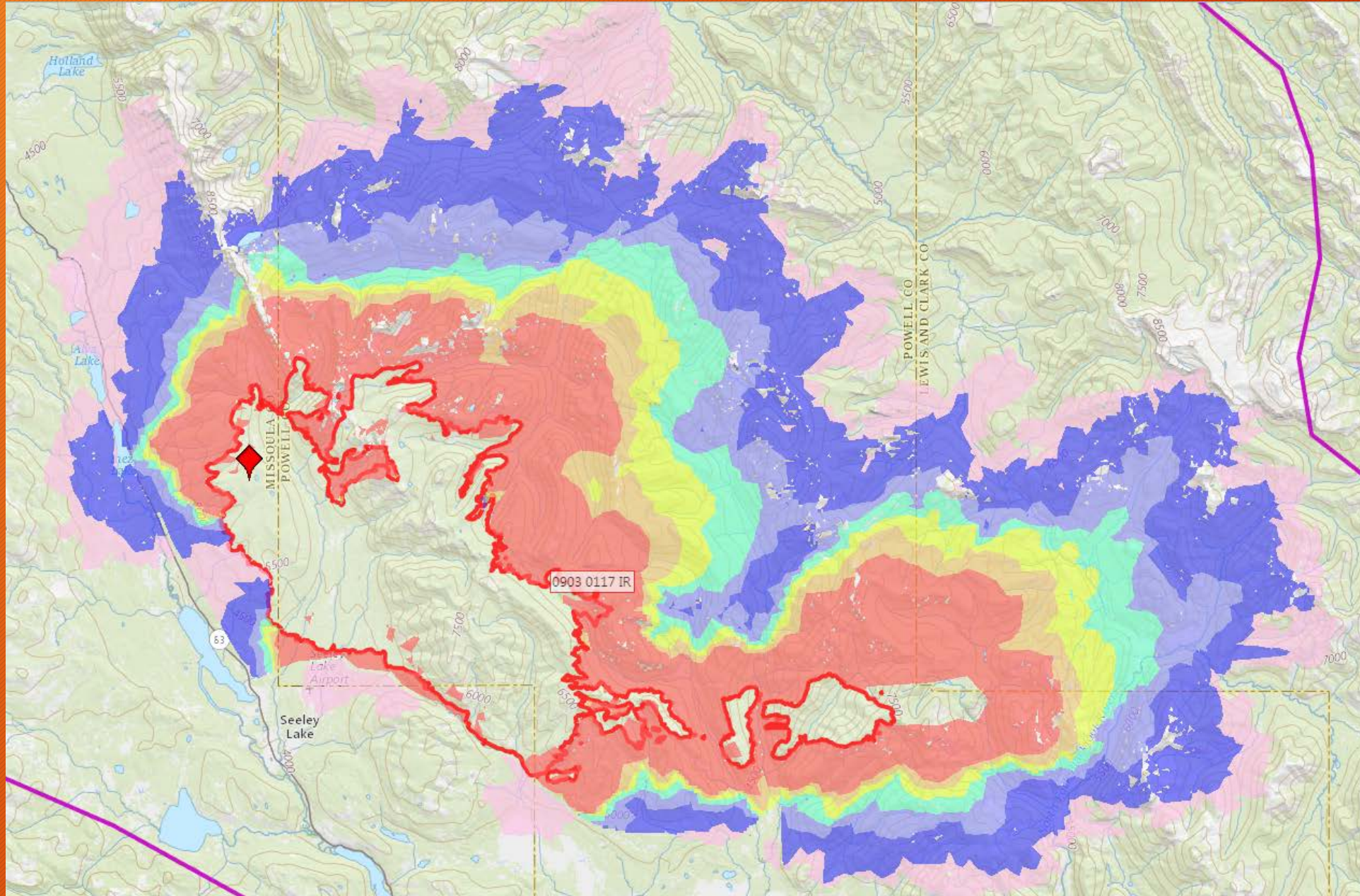
High-intensity (uncharacteristic) fire is the new normal.



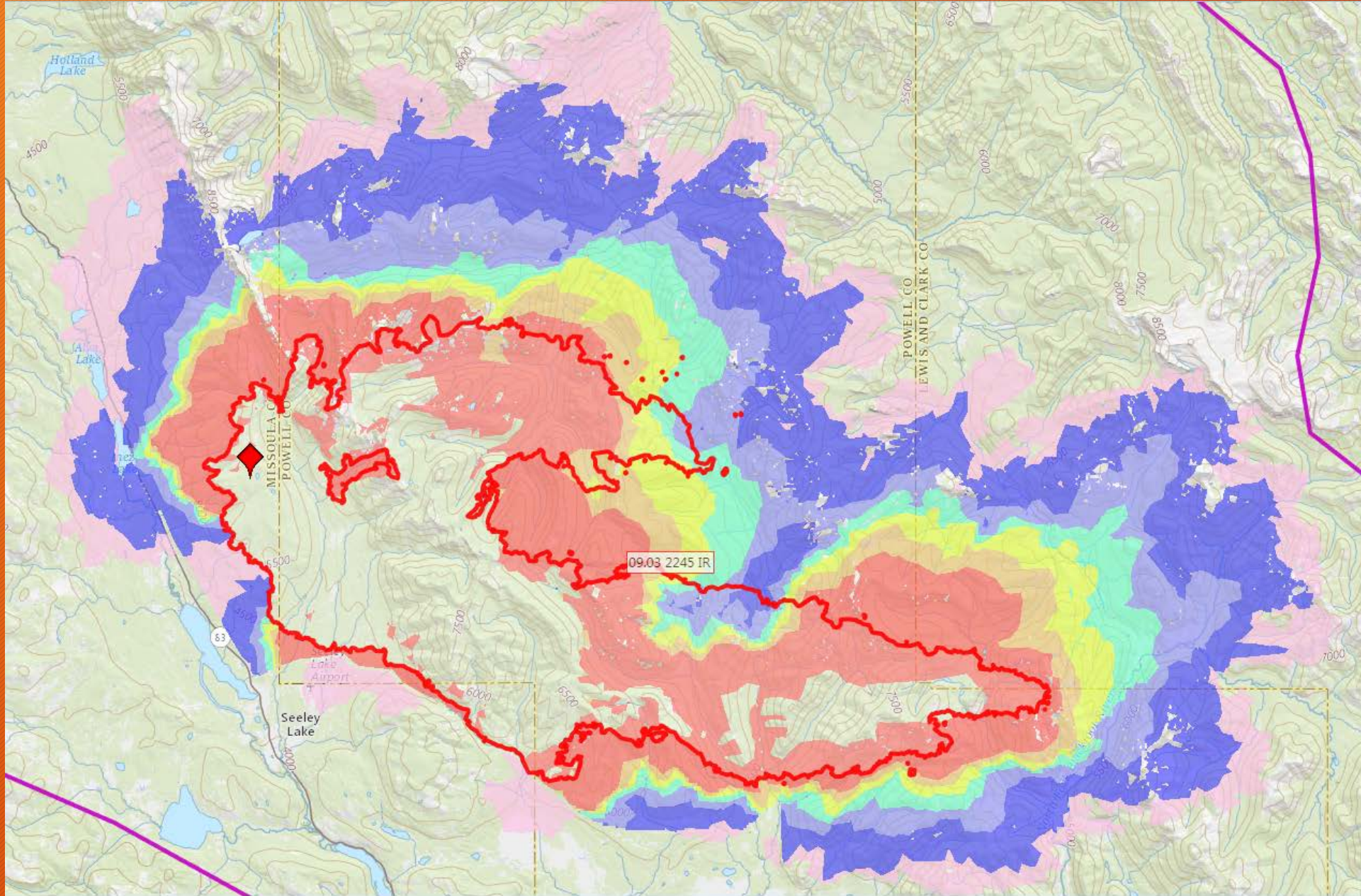
What do we know on the ground?

- Fire behavior and probability models are routinely underpredicting:
 - Protocol called for 20-30 years of weather data in fire danger/behavior modeling (FSPRO, FSIM, NFDRS).
 - Now we routinely use the last 10 -15 years of data; using a larger data set makes the runs too “cool” or not reflective of current conditions.

7 day FSPRO run - (probability of spread over a 7 day period)



Fire perimeter less than 24 hours later (48,500 growth)



What do we know on the ground?

Increasing exotic/invasive plants:

Buffelgrass in Sonoran Desert providing fuel in a non-fire adapted ecosystem.



Other Factors

Wildland-urban-interface (WUI) is increasing.

The percent of homes in the WUI increased by over five percent between 2000 and 2010 (latest data available). As of 2010, the WUI of the lower 48 states includes about 44 million houses, equivalent to one in every three houses in the country, with the highest concentrations of houses in the WUI in California, Texas and Florida.

(Martinuzzi, Sebastián; Stewart, Susan I.; Helmers, David P.; Mockrin, Miranda H.; Hammer, Roger B.; Radeloff, Volker C. 2015. The 2010 wildland-urban interface of the conterminous United States. Research Map NRS-8. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 124 p.)



What are we doing to adapt?

- Triage everything - Funding, Planning, Implementation priorities, values at risk (what is priority to protect and has high probability of success)
- Increase size of treatments (increase landscape diversity)
- Avoid trying to replicate historical conditions, but continue to learn lessons from historical variation
- Inform/raise awareness - Public, politicians, stakeholders, firefighters
- Risk Assessments - assess values and fire impacts (positive/negative)
- Maintaining completed treatments rather than implement new ones
- Utilize natural ignitions under favorable conditions (right place & time)
- Anticipate big surprises and incorporate these events in planning

Support for Adaptive Management

- Science
 - Abundant research (National Climate Assessments, etc.)
 - Collaboration between scientists and resource managers is ongoing (JFSP)
 - Managers need to know where to find the information and how to interpret the data
 - Asking the right questions (knowing what questions we want help answering)
- Support for implementation of projects
 - Funding - (majority of federal funding going towards impacts of climate change (i.e. wildfires) rather than funding adaptation to climate change (planning, implementation, MONITORING))
 - Social controversy over whether climate change is occurring (public education)
 - Internal/external policies and influences



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