

CLIMAS

Southwest Climate Outlook

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Southwest faces high fire risk despite recent rains

BY MELANIE LENART

Although recent rains have effectively delayed the start of the fire season in parts of Arizona, fire experts predict the entrenched drought will push southwestern forests to "critical" levels in a condensed fire season in May and June.

About 20 climate and weather experts and 30 forest fire specialists from western regions pooled their expertise in Phoenix during a weeklong National Seasonal Assessment Workshop in late March. A full report from the workshop will be issued in early May.

The workshop was organized in part by Gregg Garfin, a climatologist with the University of Arizona's Institute for the Study of Planet Earth and program manager of ISPE's Climate Assessment for the Southwest (CLIMAS). Garfin also co-chairs the Arizona Governor's Drought Task Force drought monitoring committee.

"The ongoing drought undoubtedly exacerbates fire danger in parts of our region," Garfin explained to members of the media at an April 2 briefing outlining the prognosis. Multi-year drought affects moisture in heavy fuels, i.e., the logs and branches sitting on the forest floor.

The length and severity of the southwestern fire season will depend largely on April rains and dying trees, reported the workshop's southwestern team, led by Chuck Maxwell, Fire Weather Program manager for the Southwest Coordination Center based in Albuquerque. Fire potential

is expected to reach the "critical" stage, with fire danger in the top 10 percent, by early May, he explained.

"I would say April is the pivotal month for us. We've had years completely knocked down by one or two storms in April," Maxwell said of the southwestern fire season. "It's also one of the toughest times of year to forecast climate."

Garfin noted that most of northern Arizona is running a five-year precipitation average that is 10 to 30 inches short of normal despite recent rainfall. An early April storm that coincided with the press briefing dropped more than an inch of rain on Tucson and 7/10th of an inch on Phoenix, then headed further north for the weekend.

Decent snowpack at the beginning of March raised some hopes that the Southwest might see some short-term relief from drought this year. But hopes were dashed when sky-rocketing temperatures melted much of the snowpack by the end of March.

"The record-breaking temperatures of the past month will probably counteract the effects of a relatively moist early 2004 in southern Arizona," Garfin explained. "Most of our high mountain snow has either directly evaporated, or runoff rapidly. What's left will be wick-ed up by thirsty soils, as happened in New Mexico last year."

Most of western New Mexico was bereft of snow by April 13, with below-average snowpack values throughout the rest of the state except the Pecos River basin, according to a report

based on SNOTEL data. Similarly, the report showed Arizona's snowpack at less than 25 percent of average by mid-April.

Below-average precipitation has plagued much of Arizona since the water year began on Oct. 1, including Gila, Yavapai, and Coconino counties, Garfin reminded. Although most of New Mexico has received average precipitation or better since October, the State of Enchantment faces long-term precipitation deficits similar to Arizona's.

Even as long-term drought makes it difficult for "heavy fuels" like logs to retain enough moisture to repel fire, short-term rainfall events can encourage the growth of grasses that soon become "fine fuels" during the dry spring. Fine fuels, which can allow fire to spread more easily throughout the landscape, are expected to stay within the normal range for the fire season.

However, current climate conditions are setting the stage for simultaneous outbreak of fire across Arizona, probably sometime between late April and mid-May, Maxwell and his team said. That's because recent rainfall in the southern portions of Arizona is delaying the usual start of the southern fire season, while unusually dry conditions in northern areas could prematurely kick-start the fire season further north.

Longer-range climate forecasts vary at this point in time, hampered by a neutral El Niño signal. El Niño tends to bring higher than average precipi-

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Fire, continued

tation to the Southwest, which could potentially dampen the ability of wild-fires to consume large areas of forest.

Climate forecasters at the workshop had difficulty agreeing whether rainfall would be above or below average this spring. Forecasts using methods based on past trends expected continued high temperatures and low precipitation, while some forecasts based on climate model analyses of ocean and atmospheric conditions predicted cooler temperatures and a relatively wet spring for much of the West, including the Southwest.

But in the end, the team adapted much of their forecasts from Climate Prediction Center trends, predicting higher temperatures and lower precipitation for parts of the Southwest through June. These climate forecasts and input from forest fire specialists allowed the group to produce a National Wildland Fire Outlook (Figure 1).

A wet late February, early March, and early April currently buffers much of the Southwest, Maxwell said. Although southern New Mexico was identified as at risk for increased wildfire potential according to interpretations presented by two other participants, Maxwell was less concerned about that from a resource standpoint because of the general lack of forests in that region.

The risk factor from heavy fuels is significantly above average in southwestern forests, but well below the values for this time of year in 2002, Maxwell said. Drought-inspired fires raged throughout the Southwest in 2002, which burned nearly as many acres as in the record-breaking 2000 fire year. This season is expected to fall somewhere between the season of 2002 and 2003.

Even in a best-case scenario, fire potential is expected to reach critical conditions for several weeks in June because of the long-term drought. May

and June are typically the Southwest's driest months, and biggest fire months, of the year. Current soil moisture remains seriously below average because of the ongoing drought.

Another factor relates to the danger posed by the millions of trees killed off by beetles, throughout the Southwest. Many species of beetles appear to thrive on drought, which weakens a tree's ability to defend itself by oozing sap when an attack starts. Foresters worry most about "the trees that don't know they're dead," as one workshop participant described the stressed trees making one last effort to ward off beetles by producing a variety of volatile compounds.

Dead trees that retain their needles are more volatile than bare-branched ones, goes the general thinking, although this fire season may help test the theory that trees that died several years previously are less likely to become torches. When the standing dead trees eventually hit the ground, which may take decades, they again become more hazardous as they join the existing heavy fuel load that concerns forest firefighters.

Mortality from drought and bugs soared in 2002 and 2003, so the landscape is filled with graveyards of standing-dead trees. And newly dead "red trees" continued to succumb to the double-whammy of drought and beetles in patches all over the West, according to regional reports at the workshop.

The workshop was organized by CLIMAS, the National Interagency Fire

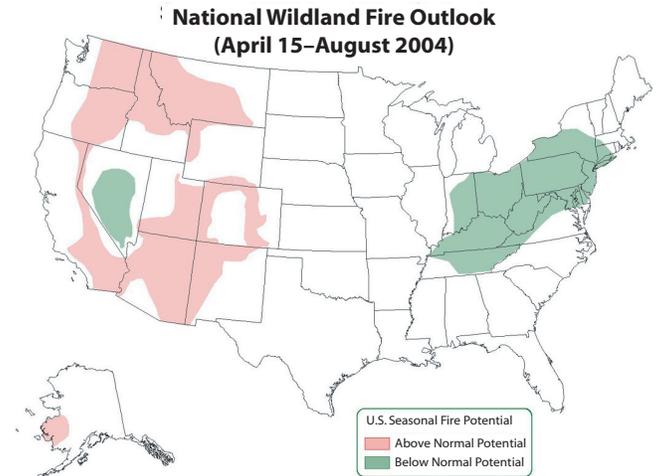


Figure 1. Climate and weather experts worked with forest fire specialists to consider how the climate forecasts are likely to affect this year's fire season. They concurred that the potential for large fires (greater than 100 acres) would be above average in most of the West, including Arizona and northwestern New Mexico. However, it's expected to be slightly lower in Nevada because the ongoing drought is limiting the production of grasses that would spread fire.

Center, and the Program for Climate, Ecosystem, and Fire Applications at the Desert Research Institute, with funding from the National Oceanic and Atmospheric Administration and the National Interagency Fire Center.

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Related Links

The final National Seasonal Assessment Workshop report is planned for release in mid-May and will be available on the CLIMAS website:

<http://www.ispe.arizona.edu/climas/>

The Southwest Coordination Center report issued by Maxwell, Richard Naden, Jay Ellington and Ron Melcher on April 5 is available at:

<http://www.fs.fed.us/r3/fire/swapredictive/swaoutlooks/seasonal/2004/swa2004-fire-season-outlook.htm>