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News Notes

Natural Hazards

Pyro babies

This image was captured late in the afternoon on Aug. 6, 2000, from a bridge over the East
Fork of the Bitterroot River just north of Sula, Mont. These elk sought refuge in the river bottom during what may have been the most extreme day of fire activity near the Bitterroot in more than 70 years. Photo by John McColgan, BLM Alaska Fire Service.

Discussions over the causes of this year's fire season have mostly centered on the need for earlier and more frequent prescribed burns. To help establish the best times for burning, scientists from the University of Arizona are looking to climate: El Niño and La Niña.

With two consecutive years of La Niña, more than 6.9 million acres of American forests went up in flames this summer. Over the past five years, the El Niño Southern Oscillation (ENSO) has primed western forests to ignite, says dendrochronologist Thomas Swetnam of

the University of Arizona. Similar weather phenomena may have contributed to the Yellowstone Park fires of 1988, he says.

"In both the tree-ring record and during the 20th century we're seeing synchronized forest fires at regional to continental scales," Swetnam says. He believes the driving factors creating these fire catastrophes are fire suppression over the past century and ENSO climate effects. He has been working on linking seasonal disasters with longer climate cycles for over a decade, but, he says, "climate relationships with fire are just now being recognized."

Still, it may be some time before fire managers turn to the climate phenomena for strategy advice. Don Smurthwaite of the National Interagency Fire Center says that while long-range forecasting is interesting, the "long-range" for fire managers is 24 hours to a week. General trend forecasting, however, does help Smurthwaite to pre-position fire fighters in regions where fires are expected to be the worst.

But, Swetnam says, it is easy now to look online and use the forecasts to help fire managers prepare for high-risk seasons at least a year in advance. Scientists at the National Oceanic and Atmospheric Administration (NOAA) can detect the onset of an extreme summer El Niño event, such as in 1997, as early as January or February. Years of extreme El Niño generally bring about wet conditions to the Southwest, perfect for prescribed burns, Swetnam says. Although it is hit or miss if a desiccating La Niña event follows the next summer, the preparation can't hurt, he says. Should a strong La Niña follow closely after an extreme El Niño — be prepared, he says.

Using tree-ring records going back 300 years, Swetnam studied fire scars in several thousand pines and giant sequoias. He compared those records with the climate history told in the ring width patterns of pines and Douglas firs. He found that fire damage correlated strongly with extreme conditions of a wet El Niño followed within three years by a dry La Niña. In the Pacific Northwest, where El Niño and La Niña tend to have opposite precipitation and temperature effects than in the Southwest, Swetnam warns that fire risks are higher during the dry El Niño years following a La Niña. In average years of mild climate flux, the relationship to fire scars is weak.

U.S. Geological Survey research biologist Dave Peterson agrees that climatic data in tree-ring records and the sedimentary record clearly connect weather patterns with fires, but adds that on a local level it is difficult to place the blame on ENSO. He contends that the fires were a

result of many different factors, including ENSO and fire exclusion.

Agricultural activity, road-building and clear-cutting have also made the forests more susceptible to fires, he says.

While using climate forecasts, forest restoration and prescription burns might help, "we just need some decisions," Peterson says. "We need to develop an integrated plan with federal, regional, and state agencies, municipalities and the public and then enact it. Our initial efforts have to be phenomenal."

Meg Rudolph
Geotimes contributing writer

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