

## **Heat and Drought Kills Trees in Southwest**

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Study sheds light on how quickly vegetation may respond to climate change

Washington, D.C. - *infoZine* - According to newly published research, a massive die off of pinyon trees throughout the Southwest was caused by higher atmospheric temperatures combined with drought and lowered pest resistance.

While the trees ultimately succumbed to infestations of bark beetles, "it was the drought," said research team leader David Breshears, a biologist at the University of Arizona. "Beetles don't get trees unless the trees are really water-stressed" and unable to make enough pinesap to defend themselves against the insects, he said.

Breshears, Neil Cobb, director of the Merriam-Powell Center for Environmental Research at Northern Arizona University in Flagstaff, Paul Rich, research scientist at Los Alamos National Laboratory (LANL) in N.M. and their colleagues reported their findings this week in the online Early Edition of the Proceedings of the National Academy of Sciences.

In 1987, researchers established a study site in the pinyon-juniper woodland zone at LANL in northern N.M. They measured moisture and temperature of the location and used satellites to determine the extent of tree cover, according to Alan Tessier, program director in the National Science Foundation's division of environmental biology, which co-funded the research with several federal agencies.

The region's 60,000 square miles (about 155,000 square km) of pinyon-juniper woodlands became a lot less green starting in 2002, the team found. By the end of 2003, more than 90 percent of the pinyons in the study plot were dead.

Breshears says such higher temperatures and drought are of the type predicted by climate-change models.

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