

Warming behind big increase in tree mortality in B.C., western U.S.: study

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Warmer temperatures have dramatically increased the rate at which trees in old-growth forests are dying in parts of British Columbia and the western United States, a study says.



A fallen western red cedar is shown in the Coquitlam River watershed near one of the study's research sites, outside Coquitlam, B.C. (Photo courtesy of Amanda Stan)

The study, to be published in Friday's edition of the journal *Science*, found that mortality rates for trees in the old-growth plots in the Pacific Northwest — including parts of southern British Columbia — had doubled in 17 years. Forests in California and other states had less dramatic numbers.

The interior states — like Arizona, Colorado and Idaho — had tree mortality rates that doubled every 29 years. The mortality rates change incrementally every year, the researchers say.

"We may only be talking about an annual tree mortality rate changing from 1 per cent a year to 2 per cent a year, an extra tree here and there," study author Mark Harmon, professor of forest ecology at Oregon State University, said in a statement.

"But over time, a lot of small numbers can add up. The ultimate implications for our forests and environment are huge."

The increases in mortality rates are replicated across all trees at every elevation, regardless of species or size.

The study, which the researchers said is the first of its kind on temperate forests, gathered data on 76 long-term forest plots over a 50-year period for analysis. All of the forest areas studied were at least 200 years old, although individual trees varied in age and size.

Drought stress on trees increased

The researchers analyzed their data for other variables that could influence mortality rates — insect

infestations, forest fires, and increased competition among trees for resources. But based on the way in which the forests were growing, the study found that those factors were unlikely causes of increased mortality rates.

Rather, the researchers isolated an approximately one-degree Celsius increase in temperature in the western United States over the last 30 years as one of the major causal factors.

Increased regional warming has led to less snow, less water content in snow and earlier melting. All these factors contribute to a lengthened summer, the study says, and less water is available to the trees, increasing drought stress on the trees. Increased drought stress also makes trees more susceptible to attacks from insects and pathogens, the study says.

"One degree warmer may not seem like a lot, but the effects can be cumulative and put many more trees under stress, and cause a few more trees to die than used to," Harmon said. "Over long periods of time that can change the whole composition of the forest."

The study cautions that changes in mortality could lead to "substantial" changes in forest composition, structure and function as younger, smaller and less robust trees make up a larger percentage of forest areas.

The study was conducted by researchers from the University of British Columbia, Oregon State University, the University of Washington, the U.S. Forest Service, Pennsylvania State University, Northern Arizona University, University of Colorado and the U.S. Geological Survey.

CBC Radio's *Quirks and Quarks* will have an interview with one of the study's authors on Jan. 24.

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GaretS wrote: Posted 2009/01/23

at 8:15 AM ET We're all gonna die anyways. 2012 anyone?

Well, it's true we're all going to die. But not because some old calander turns over in 2012. Do you think the world is going to end every December when your calander ends?

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jrhather wrote: Posted 2009/01/23

at 4:46 AM ET We're all gonna die anyways. 2012 anyone?

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Idlewild52 wrote: Posted 2009/01/23

at 2:50 AM ET Every move we make has a negative impact on our environment. Times that by billions of us and we have a BIG problem folks!

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Avicenna wrote: Posted 2009/01/23

at 1:09 AM ET The seriousness of the findings of this study is perhaps best exemplified by Jared Diamond's book - *Collapse: How Societies Choose to Fail or Succeed*.

It came out in 2005, and it does an incredible job of integrating societal factors that interrelate with environmental factors that have been shown to bring the collapse of society. Interestingly, deforestation topped his list of the 8 main factors he goes over that have shown historically to bring the demise of society:

- 1) Deforestation and habitat destruction
- 2) Soil problems (erosion, salinization, and soil fertility losses)
- 3) Water management problems
- 4) Overhunting
- 5) Overfishing
- 6) Effects of introduced species on native species
- 7) Population growth
- 8) Increased per-capita impact of people

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farnorth2 wrote:Posted 2009/01/23

at 12:53 AM ETCome on Flintstone. If you have lived in Edmonton for long you know about the chinook! It has been happening for hundreds of years (maybe thousands)' temps may change by 60 degrees in hours. It's nothing new global warming has nothing to do with it.

Climate change has been taking place for millions of years don't sweat the last 200 years they are a time too miniscule to make realistic determinations of future changes.

Chill out

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