

West withers, wonders about warming

Is mankind contributing to drought and beetles?

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FLAGSTAFF, Ariz. - Just outside this mountain town, where the acres of ponderosa pine turn into a Christmas green blur, Tom Whitham eyes the weary, struggling forest.

Death is everywhere. Their limbs bare and bark brittle, the trees quickly turn this forest into an aching reminder of the devastation of drought and a massive bark beetle infestation.

Whitham pulls his pickup truck over and gestures to the dead trees — 75 percent in this area alone.

Forget talk of global warming and speculation of what it might do in 50 years, or 100. Here and across the West, climate change already is happening. Temperatures are warmer, ocean levels are rising, the snowpack is dwindling and melting earlier, flowers bloom earlier, mountain glaciers are disappearing and a six-year drought is killing trees by the millions.

Most scientists agree humans are to blame for at least part of that warming trend, but to what degree?

"That's the \$64,000 question," said Whitham, a regents' professor of biology at Northern Arizona University. "If we aren't causing it, we're certainly contributing to it. Humans can take a drought and make it even worse."

Snow's role in West

The West is unique in that it depends so heavily on snowpack — melting snow provides three-fourths of the water in streams. Over the past 35 years, temperatures across the region have inched up 1 to 3 degrees, causing the snow to melt as much as three weeks earlier, said Kelly Redmond, regional climatologist for the Western Regional Climate Center in Reno, Nev.

Lilac and honeysuckle bloom up to 10 days earlier. Warmer temperatures lead to a huge surge in woody plants that thrive in warm, wet conditions. Glaciers are retreating, roads are buckling in Alaska and shifting some supports on the 800-mile trans-Alaska oil pipeline. Already-low reservoirs are called upon to water fields and quench thirst for longer and longer periods after the seasonal snowpack is gone.

"The West has become habitated because of the ability to store and have a reliable water supply," said Martin Hoerling, a research meteorologist who studies climate for the National Oceanic and Atmospheric Administration. "Simply the temperature effect is going to put a much greater strain on water availability."

Bennie Hodges of the Pershing County Water Conservation District in rural Nevada, said the drought has forced him to allot farmers such a meager amount of water that they can only farm a fraction of their land. The county's only reservoir is at 17 percent capacity.

"We're in tough shape here. Is it global warming? I don't know," Hodges said. "When you're in the desert, the wet and dry cycles come and go. I ask myself many times, 'Are we having global warming?' What do we do? We just try to get through."

Many scientists blame greenhouse gases such as carbon dioxide and ozone for causing global warming because the pollutants tend to trap the sun's heat in the atmosphere. But some contend the warming is just natural climate variability and humans have nothing to do with it.

Environmentalists preach conservation, especially with an uncertain snowpack and peak runoff occurring earlier. If that continues, "you would have a real problem that the current reservoir systems aren't designed to deal with," said Daniel Lashof of the Natural Resources Defense Council's Climate Center.

"It's sort of like a cancer," he said. "We still have an opportunity to avoid the most severe consequences, but we have to act now."

Beetles enter equation

Mike Wagner saw it coming. He predicted a beetle outbreak years ago in northern Arizona when he saw how abundant older trees were in overcrowded forests. When the drought began, the beetles were ready. By 2002, trees weakened by drought were unable to fend off the beetles, and they were soon overcome. Tens of millions of trees across the West have been killed at a rate never seen before.

"Absolutely unprecedented," said Wagner, a regents' professor of forest entomology at Northern Arizona. "We've never had these conditions before, never had that combination."

Scientists expect another devastating beetle outbreak this year.

Warmer temperatures only help the beetles reproduce more quickly, leading to more lost trees. Some types of beetles that used to propagate two generations in a year now can produce three.

"This is all due to temperature," said Barbara Bentz, a research entomologist with the U.S. Forest Service who is studying bark beetles. "Two or three degrees is enough to do it."

Outside Cody, Wyo., an entire forest has been killed by the drought and beetles.

"It used to be a nice spruce forest," said Kurt Allen, a Forest Service entomologist. "It's gone now. You're not going to get those conditions back for 200 or 300 years. We're really not going to have what a lot of people would consider a forest."

Already, warmer temperatures have allowed the mountain pine beetle to be more successful in attacking high elevation pines, Bentz said.

"What we're seeing is consistent with what we expect to happen under global warming," said Evan Mills, scientist at the Energy Department's Lawrence Berkeley National Laboratory. "We will expect more beetle infestation, more drought, more wildfires."

Global warming skeptics

Not everyone subscribes to the global warming theory. Frontiers of Freedom, a Washington, D.C. public policy group, doesn't believe humans have anything to do with the gradual warming of the Earth.

"These things happen. That's just the way nature has always been," said George Landrith, president of Frontiers of Freedom. "Variability has always existed. There's nothing new about that."

Landrith dismisses global warming as politically motivated.

"It's about making energy scarce and expensive," he said.

Jeff Kueter, executive director of the George C. Marshall Institute, another public policy group,

said more research needs to be done because there is too much uncertainty about global warming and the role humans play in it.

"We don't buy into alarmists' speculation of what's going to happen in the future," he said. "There's so much we don't know about how the climate system operates."

Experimenting the future

In a meadow near Crested Butte, Colo., wildflowers of purple, red, white and blue pop out under three electric heaters. Tourists flock to these lush meadows — dubbed the wildflower capital of Colorado — but John Harte is looking at the world 50 years from now, when it could be 4 degrees warmer.

For 14 years, Harte, an environmental science professor at the University of California-Berkeley, has artificially heated wildflowers and documented what warmer temperatures can do to them.

He has seen firsthand the Rocky Mountain snow melt earlier, felt the temperature warm, the soil dry and watched his wildflowers bloom earlier.

"We're projecting, from these experiments, there's going to be a tremendous decline in the abundance of the flowers," he said. "You think of meadows strewn with gorgeous flowers. Many of those flowering plants are going to be decimated."

Scientists say continued warming across the West will mean a smaller snowpack that could affect ecosystems that depend on stream flows and water temperature. Soils and vegetation will be drier, increasing fire risk and prolonging the fire season. Plants and trees will be able to grow at higher elevations, threatening ski resorts. Sea levels will continue to rise, putting beaches and cities at risk.

In Flagstaff, home to the world's largest contiguous ponderosa pine forest, Tom Whitham wonders how much more devastation the drought and beetles will cause, and to what extent humans will contribute to it.

"The thing that would make me really sad is if this were human caused," he said, glancing at the bare trees towering over his pickup truck. "If you lose a 200-year-old forest, you can't get it back."

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