Much More Than a Weatherman

U of I's John Abatzoglou Investigates Climate Change Impacts across Disciplines

For most children, the highlight of their 7th birthday may be a new two-wheel bike, a crazy cake or maybe a special birthday party. But when John Abatzoglou reminisces about his 7th birthday, he grins while describing the barometer, thermometer and rain gauge he received.

"As far back as I can remember, I was enthralled by weather. I wanted to be a meteorologist," said Abatzoglou, now an associate professor in the University of Idaho's Department of Geography. "What's bonkers is that I grew up in Southern California — not a place renown for exciting weather. But I do recall staying up late into the night to watch thunderstorms light up the sky — and I was hooked."

Abatzoglou never did become a weather forecaster. During his undergraduate years at University of California, Davis, he studied atmospheric sciences and admits he was a terrible forecaster. Instead, Abatzoglou found himself drawn to climate research, including the ins and outs of atmospheric circulation and climate variability.

"I was really interested in trying to understand how the atmosphere was connected to other facets of Earth's systems, which brings me a bit closer to what I do today," he said. Now, Abatzoglou's inquiries include how climate influences natural resource availability, and he works to communicate his findings to scientists, policy makers and the public.

Related Links

Climate Change in Idaho

Abatzoglou's Tools and Datasets

Climate Impacts Research Consortium

Climate Is Everywhere

Abatzoglou earned his doctorate at University of California, Irvine, where he investigated how global wind patterns influence climate. Then, during a postdoctoral fellowship at the Desert Research Institute in Nevada, Abatzoglou found his niche studying climate in the Western United States.

Uninterested in dedicating himself to just one aspect of climate science, Abatzoglou has danced between a variety of climate issues, bebopping among studies on everything from wildfire and agriculture to water availability, cloud cover and mountain pine beetles. For each interdisciplinary collaboration, he provides the climate aspect of the story.

"I find myself working with ecologists, hydrologists and economists," Abatzoglou said. "I can start to see how weather and climate are important to each of these different fields and individual research questions."

And his desire to seek out interdisciplinary projects has rubbed off on his students.

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“I’ve realized that John’s willingness to work across disciplines is a huge strength,” said Lauren Parker, a postdoctoral researcher in Abatzoglou’s lab. “A lot of scientists build their little box and stay inside of it and that is not how John operates. He sees the bigger picture and wants to engage with it.”

A number of Abatzoglou’s projects have resulted in datasets that he shares with the public. University scientists, companies and water resource boards have all used his datasets.

Earth, Air, Fire and Water

Abatzoglou’s research has hit on all the elements since he joined U of I’s faculty in 2009. For example, a 2013 study indicated a decline in westerly winter winds from 1950-2012 likely led to less high-elevation precipitation and contributed to reductions in Pacific Northwest stream flows.

And much of his research has focused on wildfire, including how climate drives and enables fire, especially the amount of area burned.

“We have found that year-to-year fluctuations in the burned area is primarily linked to climate variability in the Western United States,” Abatzoglou said. “That might be because we have more fuel or what we are seeing is extremely dry fuel conditions where fire suppression efforts are being less effective.”

In 2016, Abatzoglou and his colleagues demonstrated that human-driven climate change, which has resulted in a warmer and drier climate, has been responsible for about half the dryness in wildfire fuels since the 1970s. They estimate this increase in vegetation dryness has led to a doubling of forest area burned since 1984.

His current work includes taking lessons learned about climate and fire in the American West and asking how such relationships are additionally influenced by vegetation types and human land-use at global scales.

John Abatzoglou

The Coldest Nights Are Warming

Some of Abatzoglou's studies focus solely on climate change in the Pacific Northwest. He and his colleagues found temperatures in Washington, Oregon, Idaho and parts of Wyoming and Montana have increased by 0.6-0.8 degrees Celsius from 1901-2012. In this case, there was no way to explain the warming in the Northwest without incorporating human-caused climate change into the equation, Abatzoglou said.

The team also found regional temperatures on the coldest nights of the year have warmed by 3-5 degrees Celsius since 1970. The temperature during the coldest night of the year can dictate where crops can be grown and whether bark beetles survive the winter.

In a follow-up study on agricultural crops, Abatzoglou and Parker – who earned her doctorate under Abatzoglou in 2017 – explored how future climate change will affect where certain perennial crops, like fruit and nut trees, can grow sustainably. Specifically, they learned warmer winters will change where almonds, kiwis and oranges can survive the coldest months of the year.

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— John Abatzoglou, geography associate professor

"In climatically cooler locations, there are opportunities for crop expansion, and in climatically warmer locations, like Southern California, you might see a contraction," Parker said.

For example, temperatures in the Willamette Valley of Oregon will likely be warm enough over the next half century to successfully produce almonds. They are continuing their work by looking into other crops — cherries, blueberries and hazelnuts — that Northwest growers are interested in producing.

A Voice for Climate Change

For Abatzoglou, research doesn't end after he publishes a journal article. He said that scientists are not serving the public well if they don't communicate the value of science, especially if federal grants fund their research.

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Article by Leigh Cooper, University Communications and Marketing.

Finding Abatzoglou Online

- Interviews with journalists (Examples: L.A. Times, Washington Post and Spokesman Review)
- Writes climate and weather articles for the National Oceanic and Atmospheric Administration's Pacific Northwest Climate Impact Research Consortium
- Indulges in his weather and climate fascination on Twitter as @climate_guy