

NYT Op-Ed Asks the Wrong Questions On Climate Change and the CA Drought

A [new opinion piece](#) in the New York Times downplays the many lines of scientific evidence connecting climate change to the ongoing drought in California. The op-ed by NOAA's Dr. Martin Hoerling addresses only the question of direct causation, and fails to address the fact that climate change is already making droughts worse, including the California drought. Dr. Hoerling employs a standard that requires certainty and blocks the consideration of science that points to, but does not prove, causation. This "wait and see" standard of attributing severe drought and other extreme weather to climate change is out of touch with the climate decisions facing the U.S. We cannot wait for, nor is it scientifically possible to achieve, 100% certainty in attribution. The clearly documented effect of climate change on heat is influencing the California drought and there is significant evidence that it may have influenced the lack of precipitation as well. Our decisions about how to deal with climate change must take into account the very real risks of drastically higher food prices and local water shortages brought on by drought.

- We know with high certainty that warming global temperatures are contributing to [increased soil evaporation](#), [reduced snowpack](#), and [concentrated precipitation extremes](#). We also know that these factors affect the intensity and duration of droughts in general, including the current one gripping the Golden State.
- We also know that altered storm tracks are playing a significant role in the drought. A growing body of evidence suggests that a warming Arctic – one of the hallmarks of climate change – is affecting the changing patterns of the jet stream.
- This drought is occurring in the context of the IPCC's projections that climate change will intensify drought in dry areas, and studies have shown that other droughts have been worsened by climate change. Dr. Hoerling himself [authored a study](#) finding that drought in Syria was worsened by climate change.
- All these connections provide a common-sense basis to say that it's likely that global warming made the California drought worse than it would have been otherwise, and the economic harm that is already happening is a harbinger for future risks.

In a court of law, the evidence connecting the impacts of global warming and the current drought would be considered somewhat circumstantial. There is a vast body of direct evidence showing the impacts of climate change around the world – from rising sea levels to melting glaciers and ice caps – and many of these impacts are influencing extreme weather events. But this distinction between direct and indirect impacts does not mean that their connection to climate change is irrelevant. In fact, the connection becomes extremely relevant as part of a risk assessment approach. Members of the [military](#), the [World Bank](#), and others make decisions based on assessments of risk, and they take these common-sense circumstantial connections into account.

In the U.S., we should carefully weigh the risks of worsened drought in California, which could have severe economic consequences. California produces [nearly half of the nation's fruits, nuts and vegetables](#). According to the California Department of Food and Agriculture, the state holds 80,500 farms and ranches, which together generate more than [\\$100 billion in economic activity](#). According to industry group California Farm Water Coalition, [lost revenue for farming and associated businesses like trucking and processing could reach \\$5 billion in 2014 alone](#).

The Facts:

- Higher global average temperatures are [likely to increase the length and intensity of droughts](#). Average temperatures in [California have been increasing](#).
- Much of California (especially Northern California) relies on [snowpack in the Sierra Nevada Mountains](#) to store water during the winter and slowly release it over the course of the spring and summer. Snowpack makes up [about a third](#) of California's water supply overall. Late December 2013 snowpack levels were just [20% of normal](#), tying the 2012 readings for [the driest on record](#) for the same date. [Reductions in snowpack have been connected to climate change](#).
- The current high-pressure ridge that blocked many Pacific storms from reaching California is unprecedented in modern weather records: it remained in place for [13 months](#), held by a large, static bend in the jet stream. A [2005 study](#) predicted the impact of Arctic warming on Californian precipitation using climate models, which produced a similar high-pressure ridge to the one that remained in place throughout 2013.
- Scientists are beginning to detect a connection between these abnormal jet stream waves, and the [warming of the Arctic](#). The Arctic is warming faster than the rest of the globe, reducing the temperature differential on each side of the jet stream. This may cause the [jet stream to slow down](#), which in turn allows it to deviate from its straight path and cause these "stuck in place" weather patterns.

From the Scientists:

[Peter Gleick](#), Environmental Scientist, Pacific Institute:

"Is the California drought, no matter the cause, being *influenced or affected* by climate changes already occurring? This question is much more interesting than the first one about causality. And I think the answer to this is unambiguously 'yes'... I'm not saying the *net* influence of climate change on the current California drought is unambiguously for the worse or better, just that the influence is real, and the most definitive and well-understood effect (higher temperatures) has decreased current water availability."

[James Hansen](#), Climatologist, Columbia University:

“Increasingly intense droughts in California, all of the Southwest, and even into the Midwest have everything to do with human-made climate change.”

[Jennifer Francis](#), Marine and Coastal Sciences Professor at NOAA and Rutgers University:

“The highly amplified pattern that the jet stream has been in since early December is certainly playing a role in the California drought. The extremely strong ridge over Alaska has been very persistent and has caused record warmth and unprecedented winter rains in parts of Alaska while preventing Pacific storms from delivering rain to California. But is this pattern a result of human-caused climate change, or more specifically, to rapid Arctic warming and the dramatic losses of sea ice? It’s very difficult to pin any specific weather event on climate change, but this extremely distorted and persistent jet stream pattern is an excellent example of what we expect to occur more frequently as Arctic ice continues to melt.”