

A week after heat waves [toppled records across Europe](#) late last month, scientists were ready to declare that climate change almost certainly drove the deadly hot stretch.

On August 2, while the same heatwave was [turning Greenland's ice sheets into slush](#), World Weather Attribution reported that decades of greenhouse-gas emissions had raised the odds of such extreme weather by a factor of as much as 100 in some regions.

“Over France and the Netherlands, such temperatures would have had extremely little chance to occur without human influence on climate,” concluded the group, a kind of international rapid-response team set up to assess the potential role of climate change in extreme weather events that have recently occurred.

Just a few years ago, climate scientists' standard response to questions about the cause of specific storms, floods, and droughts was, as the [National Academies of Sciences noted](#) in a 2016 paper, basically a shrug: “We cannot attribute any single event to climate change.”

Read: [Sustainable Fashion: An Ethical Future Ahead?](#)

But thanks to better climate models, swelling libraries of earlier analyses, and our improving understanding of these systems, researchers can now often say with virtual certainty that climate change made a particular event more likely or more severe.

These studies are giving researchers, policymakers, and the public a clearer sense of how far we've already diverged from the 100-year droughts and 1,000-year floods of the recent past and, in turn, what sorts of steps may be required to combat the rising threats.

“With this kind of science, we're starting to understand what climate change really means,” says Friederike Otto, acting director of the University of Oxford's Environmental Change Institute and co-investigator at World Weather Attribution.

Crucially, she says, the work also helps researchers test and refine climate models, in part by underscoring when, as with the European heat waves, climate change is accelerating faster than projections would indicate.

Detecting the climate signal

A growing number of regions are exploring or actively setting up efforts to quickly assess the role of climate change in unfolding events, including the European Union’s Copernicus Climate Change Service and the Australian, French, and German meteorological agencies.

World Weather Attribution is a loosely-organized international collaboration of researchers at the University of Oxford’s Environmental Change Institute, the Red Cross Red Crescent Climate Centre, and the Royal Netherlands Meteorological Institute. In the wake of a severe weather event, they begin by attempting to determine its characteristics and the conditions in which it formed. The researchers look at measures such as atmospheric pressure patterns and levels of water vapour by analyzing observational data from satellites, weather stations, and other sources.

But to determine cause and effect, you need to run controlled experiments that isolate the possible variables, says Noah Diffenbaugh, a Stanford climate scientist. Since researchers can’t do that on the climate itself, they often rely on powerful computer models.

Researchers run the models with and without the effects of rising greenhouse gases in the atmosphere to determine how frequently comparable events would have occurred in the past and, in turn, the odds that the recent event would have happened without the human influence on the climate.

Because improving computing power enables many, many runs of high-resolution simulations, scientists can turn around the results faster than ever and make determinations they wouldn’t have been able to reach in the past. Teams around the world have produced petabyte-scale databases exploring the ripple effects through the climate from incremental tweaks of various variables across a huge range of scenarios. The work has helped researchers understand more about the degree of uncertainty in the models, as well as the level of variability in the actual climate system.

And any researcher can now tap into those vast libraries to run new analyses. If the set of conditions that drove a particular drought, storm, or heatwave is well understood and well represented in these earlier models, attribution researchers, like those working with World Weather Attribution, can often draw on those archives to perform “fast-track assessments” of the potential role of climate change.

Will it change minds?

Some hope that by highlighting connections to climate change while a disaster is still unfolding and the world is watching, this research could also help the public and politicians recognize the dangers of climate change and take steps to prevent them from getting worse.

Well, maybe.

Some research, including a study earlier this year in [Climatic Change](#), has found that living through extreme weather events can shift opinions about climate change, and those beliefs are stronger in communities that suffered more wide-scale damage. But the effects generally don't last long or carry over when the disaster is a town away, much less on the other side of an ocean. The overwhelming force that [drives views](#) over the long term is [partisan identity](#), at least in the US, other studies find.

Rapid attribution research may deepen opinions among those who already support climate policies, says Elizabeth Albright, an assistant professor at Duke who studies how extreme events alter policies and decisions.

But for climate deniers?

"I am not as confident that such reporting will influence beliefs of the sector of the public who deny that human-caused climate change exists or do not see it as a problem that needs to be addressed," she says.

This piece was originally published at [Technology Review](#)

**CERTIFICATE COURSE IN
INTERNATIONAL RELATIONS**

SIX-WEEK ONLINE COURSE IN INTERNATIONAL RELATIONS
BY THE KOOTNEETI

JOIN TODAY!

team@thekootneeti.com
courses.thekootneeti.in
(+91) 120 4565994

The views and opinions expressed in this article are those of the author and do not necessarily reflect the views of The Kootneeti Team

Climate change or just crazy weather? How improving tools make it easier to tell

Facebook Comments