Half-a-degree of warming boosted extreme weather

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Credit: public domain

Half a degree Celsius of global warming has been enough to increase heat waves and heavy rains in many regions of the planet, researchers reported Friday.

Comparing two 20-year periods—1960-79 and 1991-2010—between which average global temperatures jumped 0.5 C (0.9 F), scientists found that several kinds of extreme weather gained in duration and intensity.

The hottest summer temperatures increased by more than 1 C (1.8 F) across a quarter of Earth's land areas, while the coldest winter temperatures warmed by more then 2.5 C (4.5 F).

The intensity of extreme precipitation grew nearly 10 percent across a quarter of all land masses, and the duration of hot spells—which can fuel devastating forest fires—lengthened by a week in half of land areas.

These changes were well outside the bounds of natural variability, according to the study, published in the journal *Nature Climate Change*.

"We have to rely on climate models to predict the future," said lead author Carl-Friedrich Schleussner, a researcher at the Potsdam Institute of Climate Impact Research.

"But given that we now have observational evidence of around 1 C warming, we can also look at the real-life impacts this warming has brought," he said in a statement.

In science, observed trends are generally seen as more reliable than projections, which can vary sharply depending on the assumptions made.

Changes in climate—sometimes defined as "average weather"—can only be detected across time periods measured in decades or longer.

0.5 C does matter

Global warming caused mostly by the burning of fossil fuels began

slowly in the early 19th century with the onset of industrialisation, but has accelerated rapidly over the last 50 or 60 years.

The 196-nation Paris Agreement, inked in the French capital in 2015, vowed to cap the rise of the planet's average surface temperature at "well under" 2 C (3.6 F), and to "pursue efforts" to block it at 1.5 C (2.7 C).

To inform that effort, the Intergovernmental Panel on Climate Change (IPCC)—the UN's top science advisory group—will issue a report for policy makers in September 2018 on the feasibility of the 1.5 C target, and what impacts might be avoided if it is met.

The new study—one of thousands that will be reviewed by the IPCC—suggests even a half degree rise is significant.

"With the warming the world has already experienced, we can see very clearly that a difference of 0.5 C really does matter," said co-author Erich Fischer, a scientist at ETH Zurich in Switzerland.

Earlier research based on computer models, also led by Schleussner, concluded that 2 C of warming would—compared to 1.5 C—double the severity of crop failures, water shortages and heatwaves in many regions of the world.

It also found that holding the rise in temperature to 1.5 C would give coral reefs—the cornerstone of ecosystems that sustain half-a-billion people and a quarter of marine wildlife—a fighting chance of adapting to warmer and more acidic seas.

An extra half-a-degree on top, however, would expose most reefs to possible extinction by century's end.

More information: Carl-Friedrich Schleussner et al. In the

observational record half a degree matters, *Nature Climate Change* (2017). DOI: 10.1038/nclimate3320