

Outlook for the polar regions in a 2-degrees-warmer world

December 4 2019



The Greenland Ice Sheet (GIS) in 2008. The GIS appears highly sensitive to warming beyond 1 to 4 degrees Celsius beyond pre-Industrial levels. Its loss would contribute substantially to global sea level rise. In the decade since this photo was taken, the Arctic has already warmed by 0.75 degrees C. Credit: Eric Post, UC Davis

With 2019 on pace as one of the warmest years on record, a major new study from the University of California, Davis, reveals how rapidly the Arctic is warming and examines global consequences of continued polar warming.

The study, published today in the journal *Science Advances* reports that the Arctic has warmed by 0.75 degrees C in the last decade alone. By comparison, the Earth as a whole has warmed by nearly the same amount, 0.8 degrees C, over the past 137 years.

"Many of the changes over the past decade are so dramatic they make you wonder what the next decade of [warming](#) will bring," said lead author Eric Post, a UC Davis professor of climate change ecology. "'If we haven't already entered a new Arctic, we are certainly on the threshold."

What 2 degrees means for the poles

The comprehensive report represents the efforts of an international team of 15 authors specializing in an array of disciplines, including the life, Earth, social, and political sciences. They documented widespread effects of warming in the Arctic and Antarctic on wildlife, traditional human livelihoods, tundra vegetation, methane release, and loss of sea- and land ice. They also examined consequences for the [polar regions](#) as the Earth inches toward 2 degrees C warming, a commonly discussed milestone.



The Greenland Ice Sheet (GIS) in 2008. The GIS appears highly sensitive to warming beyond 1 to 4 degrees Celsius beyond pre-Industrial levels. Its loss would contribute substantially to global sea level rise. In the decade since this photo was taken, the Arctic has already warmed by 0.75 degrees C. Credit: Eric Post, UC Davis

"Under a business-as-usual scenario, the Earth as a whole may reach that milestone in about 40 years," said Post. "But the Arctic is already there during some months of the year, and it could reach 2 degrees C warming on an annual mean basis as soon as 25 years before the rest of the planet."

The study illustrates what 2 degrees C of global warming could mean for the [high latitudes](#): up to 7 degrees C warming for the Arctic and 3 C

warming for the Antarctic during some months of the year.

The authors say that active, near-term measures to reduce [carbon emissions](#) are crucial to slowing high latitude warming, especially in the Arctic.



An Arctic fox in Greenland. Credit: Eric Post, UC Davis

Beyond the polar regions

Post emphasizes that major consequences of projected warming in the absence of carbon mitigation are expected to reach beyond the polar

regions. Among these are sea level rise resulting from rapid melting of land ice in the Arctic and Antarctic, as well as increased risk of extreme weather, deadly heat waves, and wildfire in parts of the Northern Hemisphere.

"What happens in the Arctic doesn't stay in the Arctic," said co-author Michael Mann, a distinguished professor of atmospheric sciences at Penn State. "The dramatic warming and melting of Arctic ice is impacting the jet stream in a way that gives us more persistent and damaging weather extremes."

More information: "The polar regions in a 2°C warmer world" *Science Advances* (2019). advances.sciencemag.org/content/5/12/eaaw9883

Provided by UC Davis

Citation: Outlook for the polar regions in a 2-degrees-warmer world (2019, December 4) retrieved 25 April 2024 from <https://phys.org/news/2019-12-outlook-polar-regions-degrees-warmer-world.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.