The Arctic is in trouble. The consequences will be felt around the world

By Laura Paddison, CNN
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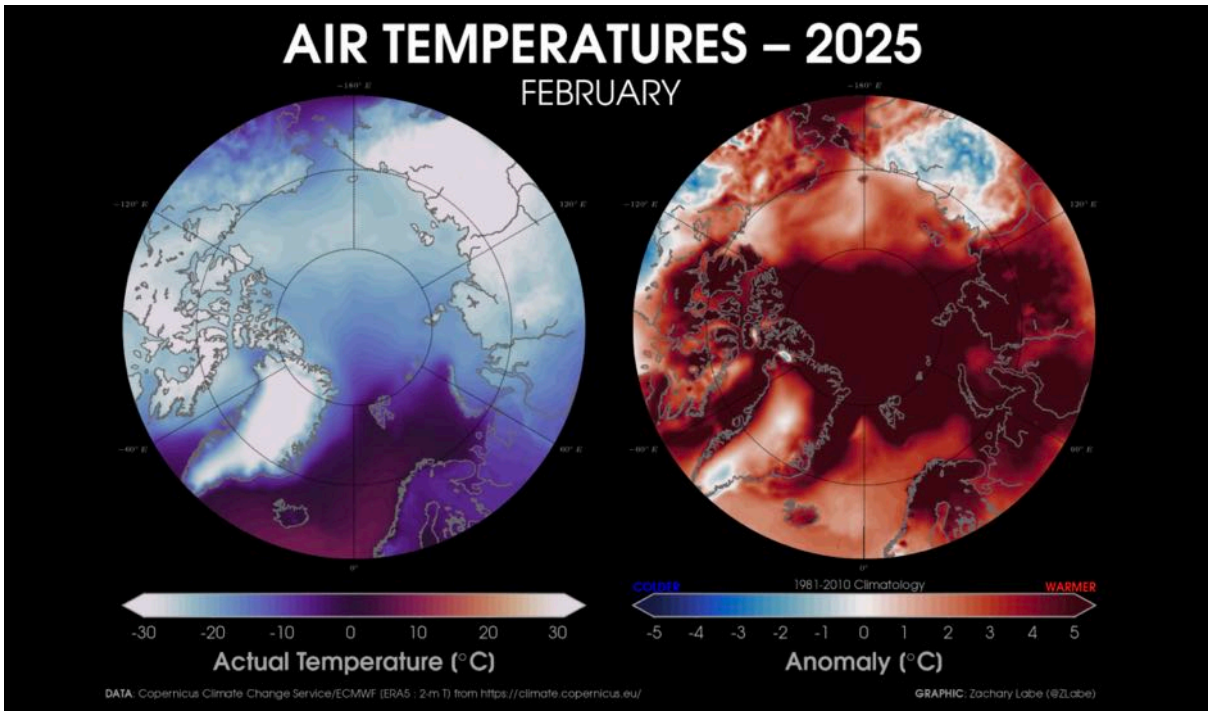
Rivulets of meltwater snake across the surface of the melting Isunnguata Sermia glacier of the Greenland ice sheet near Kangerlussuaq, Greenland, on July 11, 2024. Sean Gallup/Getty Images

CNN —
The Arctic has long filled humans with awe, but there are now profoundly worrying signals coming from the frozen landscape at the top of our planet, and scientists are deeply concerned about its future as the Trump administration pulls the US out of global climate strategy and guts its science agencies.
Last month was extreme: Temperatures in parts of the Arctic spiked 36 degrees Fahrenheit, or 20 Celsius, above normal. By the end of the month, sea ice was at its lowest level ever recorded for February, marking the third straight month of record lows.
This follows a year of concerning signs from the region, including intense wildfires and thawing permafrost pumping out planet-heating pollution.
It paints a grim picture of a region that's been in rapid decline for the last two decades as humans continue to burn fossil fuels. The Arctic now exists within a "new regime," where signals such as sea ice loss and ocean temperatures may not always break records, but are consistently more extreme compared to the past, the National Oceanic and Atmospheric Administration said in its annual health check of the region published in December.
It's a problem with global consequences. The Arctic plays a vital role in global temperatures and weather systems. It's "sort of like our planetary air conditioning system," said Twila Moon, deputy lead scientist at the National Snow and Ice Data Center. Its decline accelerates global warming, increases sea level rise and helps to drive more extreme weather.

The Arctic is the early warning system for climate change and the loss of sea ice is a clear sign it's in trouble, scientists say. It should be reaching its annual maximum levels of ice at this time of year, but instead it's experiencing record lows.
"I hope that these three months do not act as a precursor to a potential new all-time minimum this summer, because the starting point to the melting season is not good," said Mika Rantanen, a researcher at the Finnish Meteorological Institute.
Arctic sea ice bottoms out at the end of summer in September. The last 18 years have seen the lowest sea ice levels on record, a downward spiral that will continue, scientists say.
The Arctic will be ice-free in the summer at some point by 2050, even if humans stop pumping out climate pollution, according to a report co-authored by Dirk Notz, head of sea ice at the University of Hamburg. "It's basically too late to prevent that," he told CNN.
The first ice-free day could even happen before the end of this decade, according to a separate study published in December.
Sea ice loss is not only damaging to wildlife, plants and the roughly 4 million people who live in the Arctic — it has global consequences. Sea ice acts like a giant mirror, reflecting the sunlight away from the Earth and back into space. As it shrinks, more of the sun's energy is absorbed by the dark ocean, which accelerates global heating.
Part of the reason for the recent run of record-low sea ice is the unusual heat in the Arctic, which has been warming around four times faster than the global average.
Early February's extreme warmth "was one of the strongest ever recorded," said Rantanen, who estimates it was probably in the top three of the most intense warming events in the satellite era since the 1970s.



Monthly mean near-surface air temperatures and the anomaly, or difference from normal, for February 2025 in the Arctic. (The normal temperature is the average from 1981-2010.) Data is from ERA5 reanalysis. Zachary Labe https://zacklabe.com/

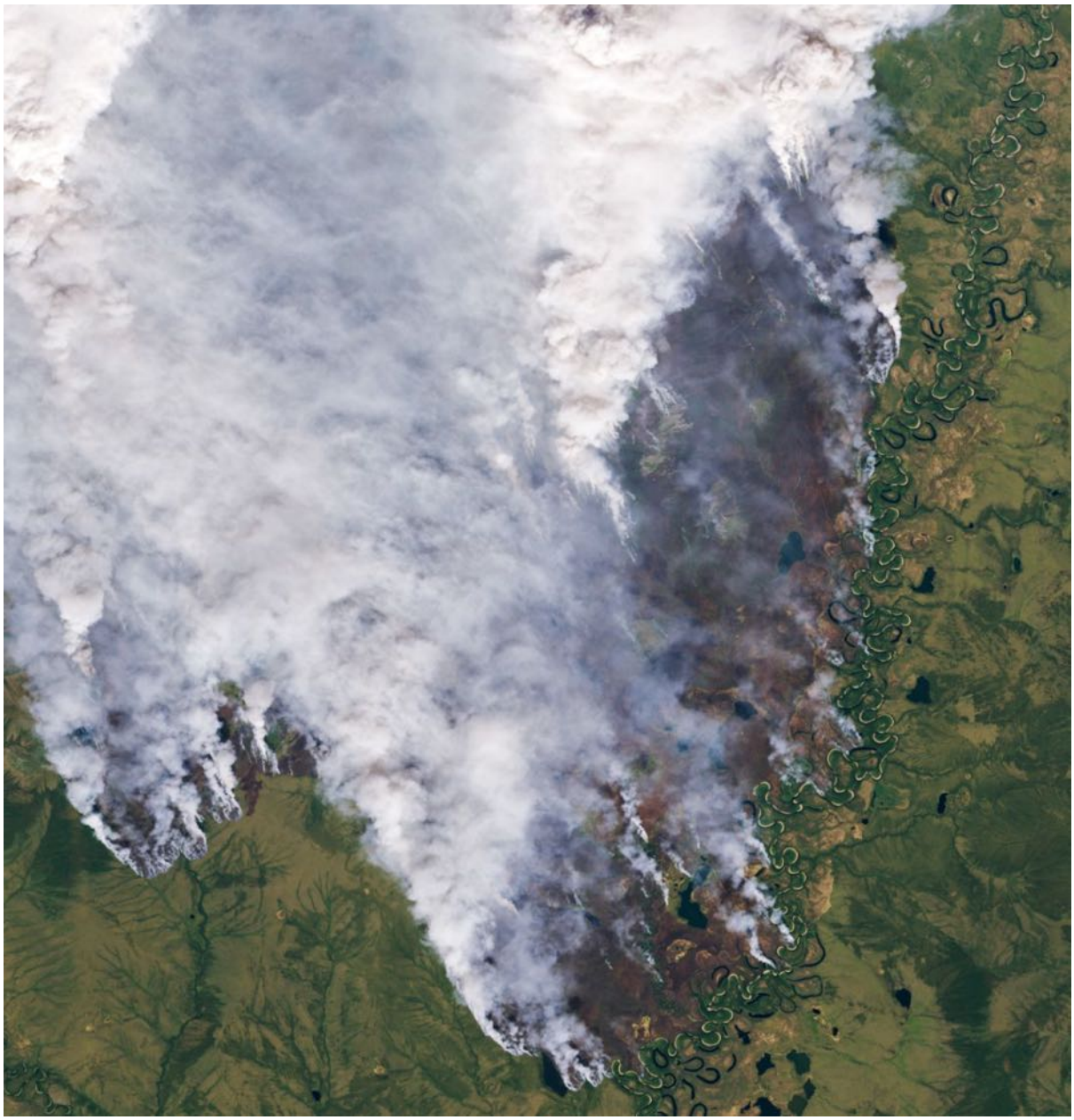
The Arctic landscape is changing too, said the NSIDC's Twila Moon.

The thawing of permafrost — a jumble of soil, rocks and sediment held together by ice — is pervasive, she said, releasing planet-heating carbon dioxide and methane.

Wildfires have become more frequent and intense and wildfire seasons run longer. Last year marked the third time in five years significant, widespread blazes ripped across the Arctic.

These changes are fundamentally altering the ecosystem. For thousands of years, the shrubby landscape of the Arctic tundra stored carbon, but wildfires and thawing permafrost mean that this region is now releasing more carbon than it stores, according to NOAA.

"There's just an overwhelming amount of change happening in the Arctic right now," said Moon.



Satellite image shows a large fire burning in Sakha, a region of northern Russia located along the Arctic Ocean, on July 10, 2024. NASA Earth Observatory

What happens in the Arctic has repercussions across the planet.

A warmer Arctic means land ice — glaciers and ice sheets — melts faster, adding to sea level rise. The Greenland ice sheet already sheds around 280 billion tons of ice a year, enough to cover the whole of Manhattan in a layer of ice roughly 2 miles thick.

Rapid warming in the region also weakens the jet stream, altering weather systems that affect billions of people, said Jennifer Francis, a senior scientist at Woodwell Climate Research Center. A more meandering jet stream “makes weather conditions linger longer, leading to more persistent heat waves, cold spells, drought, and stormy periods,” she told CNN.

Melting icebergs crowd the Ilulissat Icefjord in Greenland, on July 16, 2024. Sean Gallup/Getty Images

Scientists say some of these changes can be reversed if humans stop pumping out planet-heating gases, but on timescales ranging from hundreds of years to many thousands. Many of these changes are considered “relatively irreversible,” Moon said.

There’s another threat, too. Scientists’ ability to keep tabs on the swift-changing Arctic is being jeopardized by geopolitical upheaval.

Russia’s war on Ukraine has meant scientists from the country, the largest Arctic nation, have been excluded from international collaboration. This has already undermined scientists’ ability to track what’s happening in the Arctic, according to a recent study.

In the US, the Trump administration’s sweeping cuts to government climate science jobs is creating serious concern, especially as many measurement systems are maintained by the US. With less US expertise and fewer US scientists, “it would become much, much harder to understand what’s happening” at a vital time for the Arctic, said the University of Hamburg’s Notz.

What’s happening in the Arctic is one of the starkest indications of “how powerful we humans have become in changing the face of our planet,” Notz said. “We are able to wipe out entire landscapes.”