Antarctic temperatures rise 10C above average in near record heatwave

Reported temperatures on continent in midwinter reach 28C above expectations on some days in July

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Climate scientists say the recent Antarctic temperature rises bear out what models predict. Photograph: Anadolu/Getty Images

Ground temperatures across great swathes of the ice sheets of Antarctica have soared an average of 10C above normal over the past month, in what has been described as a near record heatwave.

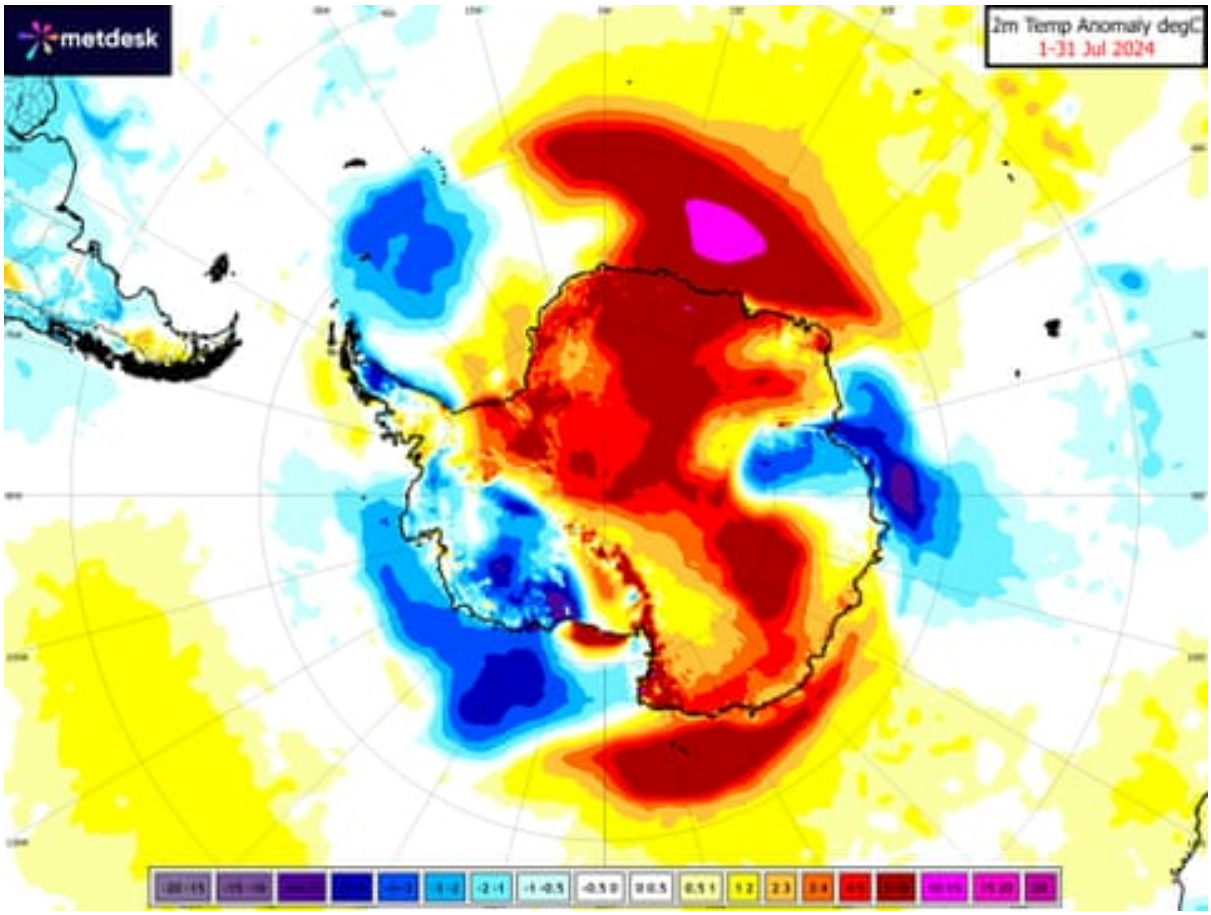
While temperatures remain below zero on the polar land mass, which is shrouded in darkness at this time of year, the depths of southern hemisphere winter, temperatures have reportedly reached 28C above expectations on some days.

The globe has experienced 12 months of record warmth, with temperatures consistently exceeding the 1.5C rise above preindustrial levels that has been touted as the limit to avoiding the worst of climate breakdown.

Michael Dukes, the director of forecasting at MetDesk, said that while individual daily high temperatures were surprising, far more significant was the average rise over the month.

Climate scientists' models have long predicted that the most significant effects of anthropogenic climate change would be on polar regions, "and this is a great example of that", he said.

"Usually you can't just look at one month for a climate trend but it is right in line with what models predict," Dukes added. "In Antarctica generally that kind of warming in the winter and continuing in to summer months can lead to collapsing of the ice sheets."



A map provided shows provisional heat data over Antarctica for July. Many parts of the continent were 5-10C above the 1991-2020 climate mean. Photograph: metdesk

Last month was the first in 14 months that temperature records were not broken, but that followed an exceptionally warm July 2023, and it remained 0.3C above any July before that.

Zeke Hausfather, a research scientist at Berkeley Earth, said Antarctica's heatwave had "definitely been one of the bigger drivers in the spike of global temperatures in recent weeks".

"Antarctica as a whole has warmed along with the world over the past 50 years, and for that matter 150 years, so any heatwave is starting off from that elevated baseline," he said. "But it's safe to say that the majority of the spike in the last month was driven by the heatwave."

The heatwave is the second to hit the region in the past two years, with the last, in March 2022, leading to a spike of 39C and causing a portion of the ice sheet the size of Rome to collapse.

Antarctica's increased July temperatures follow a particularly strong El Niño, the climate phenomenon that leads to warming around the world, and was likely also a lag effect of that, in combination with the general increase in temperatures caused by climate breakdown, Dukes said.

Scientists said the proximate cause of the heatwave was a weakened polar vortex, a band of cold air and low pressure that spins in the stratosphere around each pole. Interference from atmospheric waves had weakened the vortex and led to rising high-altitude temperatures this year, Amy Butler, an atmospheric scientist at the National Oceanic and Atmospheric Administration, told the Washington Post.

Jamin Greenbaum, a geophysicist at the University of California San Diego's Scripps Institution of Oceanography, said he was "certainly worried about what's in store for this region in the years to come".

"The majority of my field expeditions have been to East Antarctica where I have seen increasing melt through the years," he said. "Although I'm of course alarmed to see these reports of the weakened polar vortex causing the tremendous heatwave there, I'm also not surprised considering this is sadly an expected outcome of climate change."

Jonathan Overpeck, a climate scientist at the University of Michigan School for Environment and Sustainability, said on X that the heatwave was an "eye-opening sign that climate change is starting to really transform the planet".

Edward Blanchard, an atmospheric scientist at the University of Washington, told the Post it was a near-record event. “It is likely that having less sea ice and a warmer Southern Ocean around the Antarctic continent ‘loads the dice’ for warmer winter weather over Antarctica,” Blanchard said.

“From this perspective, it might be a bit ‘less surprising’ to see large heatwaves in Antarctica this year compared [with] a ‘normal’ year with average sea ice conditions.”

Jonathan Wille, a researcher studying climate science at ETH Zürich, a public research university in Zürich, Switzerland, said the heatwave was attributable to a weeks-long “southern stratospheric warming event” over the region.

“Those are really rare over Antarctica, so it wasn’t really quite clear how that would affect surface conditions on the continent,” he said. “It’s been interesting to see how widespread the effects have been.”

Though he said there “seem to be more and more frequent heatwaves over the continent”, he said it was not yet clear how much of a factor the climate crisis had been in creating this particular event.

“We’ll have to wait for the attribution studies to find out,” he said. “It’s a ‘wait and see’ scenario.”