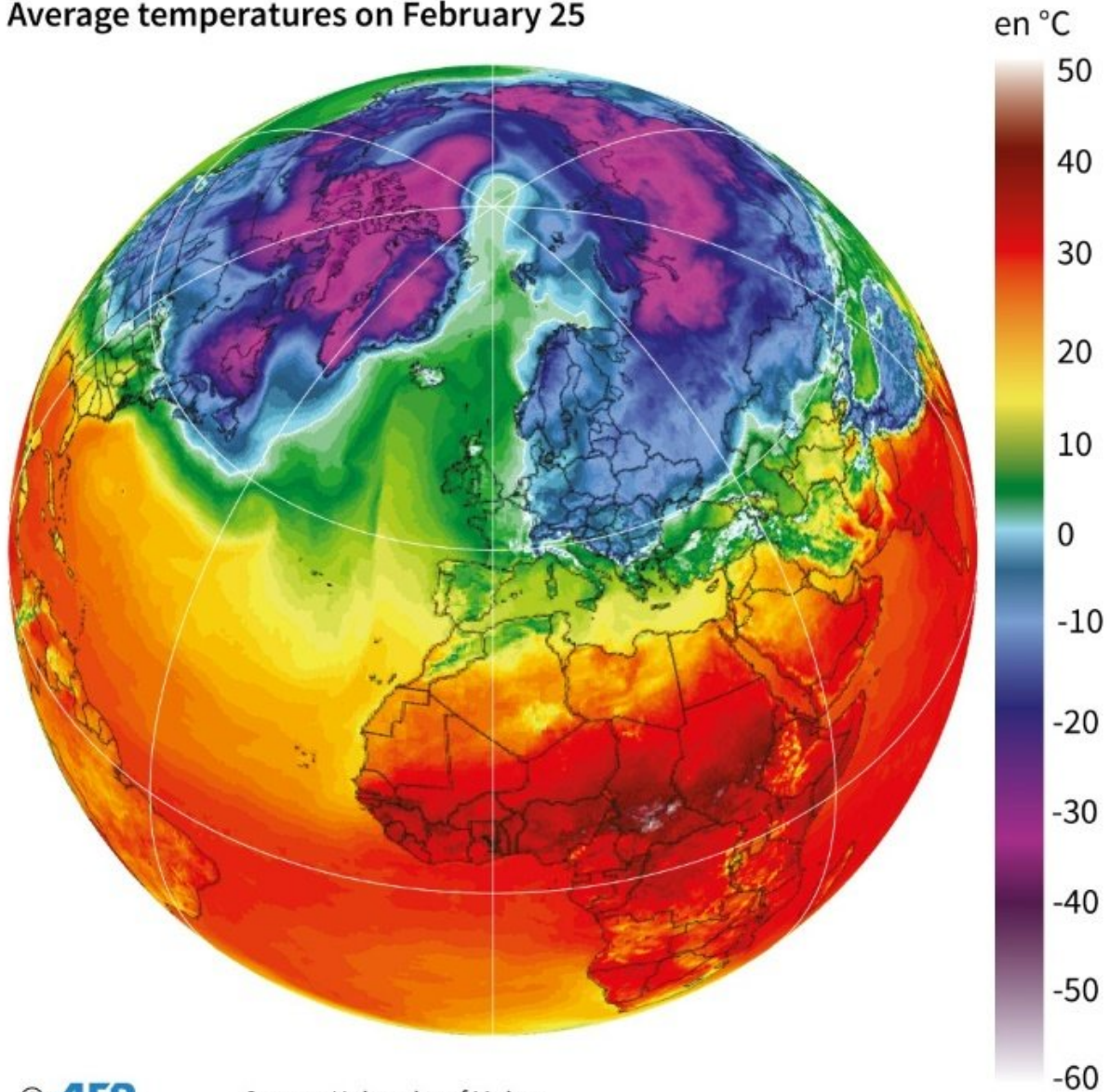


Icy Europe, balmy North Pole: the world upside down

February 28 2018, by Marlowe Hood

Balmy weather at the North Pole

Average temperatures on February 25



© AFP

Source: University of Maine

Temperatures at the earth's surface on February 25 at 1200 GMT.

Not for the first time in recent years, Europe has descended into a deep freeze while the Arctic experiences record high temperatures, leaving

scientists to ponder the role global warming may play in turning winter weather upside down.

The reversal has been dramatic.

A Siberian cold front has spread sub-zero temperatures across Europe, carpeting southern cities and palm-lined Mediterranean beaches with snow.

On Sunday, meanwhile, air temperatures at the North Pole—which won't see the Sun until March—rose above freezing.

"In relative terms, that's a 30 C (54 degrees Fahrenheit) temperature anomaly," Robert Rohde, lead scientist at Berkeley Earth in Washington, tweeted.

At the Longyearbyen weather station on the Island of Svalbard in the Arctic Ocean, temperatures were 10 C above average over the last 30 days, according to Zack Labe, a climate modeller at the University of California Irvine.

At the same time, sea ice is covering the smallest area in the dead of [winter](#) since records began more than half a century ago.

In one region, around Svalbard, the area covered by sea ice—205,727 square kilometres—on Monday was less than half the average for the period 1981-2010, the Norway Ice Service reported.

"Positive temperatures near the North Pole in winter are thought to have occurred during four winters between 1980 and 2010," Robert Graham, a [climate scientist](#) at the Norwegian Polar Institute, told AFP.



A couple sit on a bench overlooking the snow-covered fields of Thirsk in the North Yorks Moors National Park in North Yorkshire, on February 27, 2018

They have now occurred in four out of the last five winters."

This acceleration, experts said, circumstantially points to climate change, which has—over the same period—warmed the Arctic region twice as fast as the global average.

Transform the planet

Another clue may be the Arctic thaw/European [deep freeze](#) pairing.

"The surge of mild weather at the North Pole and the cold front in Europe are directly linked," Etienne Kapikian, a scientist at Meteo France, the national weather service, told AFP.

"Just how hot is the Arctic now?" tweeted Peter Gleick, president emeritus of the Pacific Institute and a member of the US National Academy of Science.

"Hotter than ever measured in winter. Human-caused climate change is beginning to radically transform our planet."

Gleick's larger assertion is no longer seriously contested, but the link between the "warm Arctic, cold continent" phenomenon and [global warming](#) has yet to be proven, other scientists say.



The shore of the bay of Ajaccio covered with snow, on the French Mediterranean island of Corsica

If the connection with global warming remains speculative, the mechanics of what scientists call "sudden stratospheric warming"—the weird winter weather's immediate cause—is well understood.

Strong winds in the stratosphere circulate west-to-east over the Arctic some 30 kilometres above Earth's surface. This is the polar vortex.

The jet stream, meanwhile, races in the same direction at bullet-train speed 10 kilometres overhead at the upper boundary of the troposphere, the lowest layer of the atmosphere.

Sometimes the vortex dramatically warms and weakens, with winds slowing down and even reversing, explained Marlene Kretschmer, a climate scientist at the Potsdam Institute for Climate Impact Research.

A cooling tendency

"When this happens, it can affect the jet stream where our weather is made," she told AFP. "That is exactly what has happened now."

Freezing Arctic air that is normally "locked" in the [polar vortex](#) breaks out, creating the Siberian cold front that has blanketed Europe.

Sudden stratospheric warming occurs, on average, every other year, so it is not a rare phenomenon.



The Forum in Rome on February 26, 2017. Not for the first time in recent years, Europe has descended into a deep freeze while the Arctic experiences record high temperatures

But over the last two decades, the vortex's breakdowns have become deeper and more persistent.

"Overall, the global warming trend is clear," said Kretschmer. Earth's average surface temperature has gone up by one degree Celsius since the mid-19th century—enough to unleash deadly drought, heatwaves, and storms engorged by rising seas.

"But if you just look at winter temperatures since 1990, you see a cooling tendency in winter over northern Eurasia."

Still, the question remains: What drives changes in the intensity and

duration of sudden stratospheric warming?

One theory holds that newly ice-free ocean surface—which absorbs the Sun's rays rather than bouncing them back into space like snow—releases warmth into the air that eventually disrupts the stratosphere.

"It is hard to say that any one event is linked to global warming," said Kretschmer.

"But there are a lot of studies now suggesting this pattern—warm Arctic, cold continent—could be linked to climate change."

"This much is certain—there is overwhelming evidence that changes in the Arctic will affect our weather," she added.

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