

# Record-breaking temperatures 'have robbed the Arctic of its winter'

Fort Yukon has recorded Alaska's coldest ever temperatures but this winter temperatures have been much warmer than usual, leading to dangerously thin ice



A lack of snow in south central Alaska forced race organisers to move the Iditarod dog sled race north. Photograph: Loren Holmes/AP Suzanne Goldenberg in Fort Yukon, Alaska

@suzyji

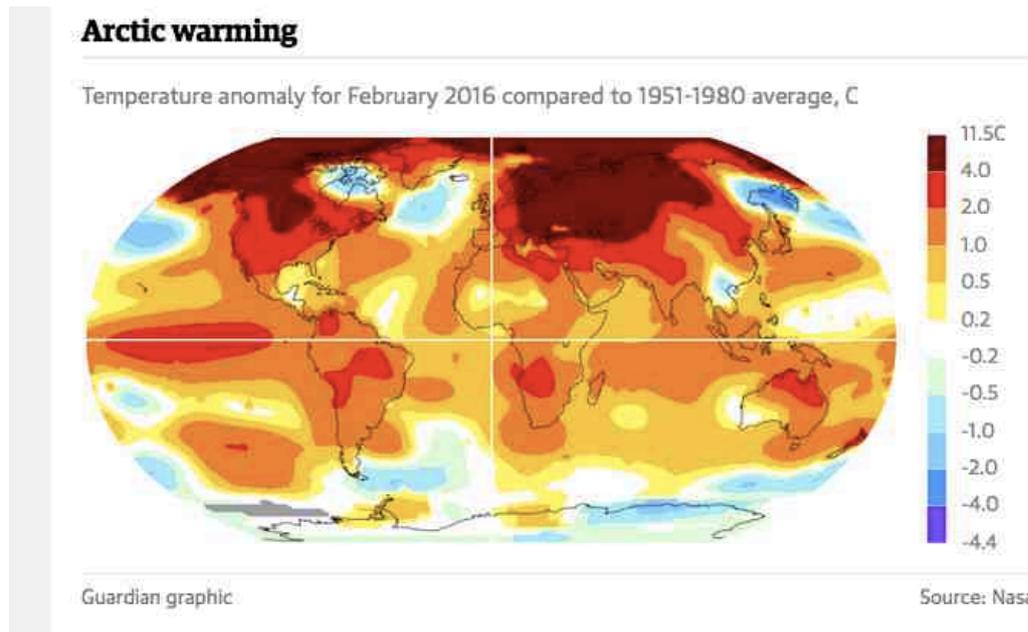
Tuesday 15 March 2016 17.48 GMT Last modified on Tuesday 15 March 2016 19.16 GMT Guardian

This year's [record-breaking temperatures](#) have robbed the Arctic of its winter, sending snowmobilers plunging through thin ice into freezing rivers and forcing deliveries of snow to the starting line of Alaska's legendary Iditarod dogsledding race.

Last month's high temperatures – up to 16C (29F) above normal in some parts of the Arctic – flummoxed scientists, and are redefining life in the Arctic, especially for the indigenous people who live close to the land.

In Fort Yukon, an indigenous Gwich'in community eight miles inside the Arctic Circle, the freakishly warm weather is forcing people off the rivers that are their main transport corridors in the winter time.

"You can't trust the ice," said Ed Alexander, Yukon Flats centre coordinator for the University of [Alaska](#) at Fairbanks. "This is the warmest winter that we have ever seen up here. We have had less snow. We have had real thin ice. We have had an explosion of growth in the brush clogging up trails and that kind of thing. It makes everything dangerous."



Guardian graphic

Source: Nasa

Other communities downriver lost a number of people this winter when their snowmobiles fell through soft ice – and these were experienced hunters and trappers, he said.

Alexander said he and his wife had a narrow escape when they went out for a Sunday drive on their snowmobile. "I noticed there was water all the way across the river and I went to stop my snow machine and say: 'Oh maybe we should turn around and go back a different way'."

By the time he turned around to his wife, Alexander saw the back of the snowmobile was already sinking into snow and soft ice. "We just took off and there was as rooster tail of water coming out 30ft behind us," he said. "We made it back to shore but that will wake you up."

Warm is a relative term in Fort Yukon. The community nestled between the Yukon and Porcupine rivers lays claim to the coldest – and hottest – temperatures ever recorded in Alaska.



Persistent above-freezing temperatures have melted much of the local snow in Anchorage, leading to snow being sent in by train for the start of the famous Iditarod dog sled race. Photograph: Rachel D'Oro/AP

Temperatures at the start of this week were well within the boundaries of what most of the world would describe as very cold at  $-6\text{C}$  ( $20\text{F}$ ), but that was still up to  $10\text{C}$  ( $18\text{F}$ ) warmer than expected for this time of year.

“When I was growing up it would warm up from 60 below to 20 below and we would be walking around with T-shirts on,” said Craig Fleener, a Fort Yukon native who advises the governor on climate change. “It’s all a matter of perspective.”

This year, the backwaters were already slushy by early March – so much so that Fort Yukon had to start their dog sled races in the middle of town rather than on the ice. The smell of sap was already coming off the willows, and some plants were budding up, Alexander said.

[Winter](#) was almost over – without ever getting cold enough to create the conditions Arctic villagers rely on for their way of life.

In Fort Yukon, many people depend on wood for heating in the winter months.

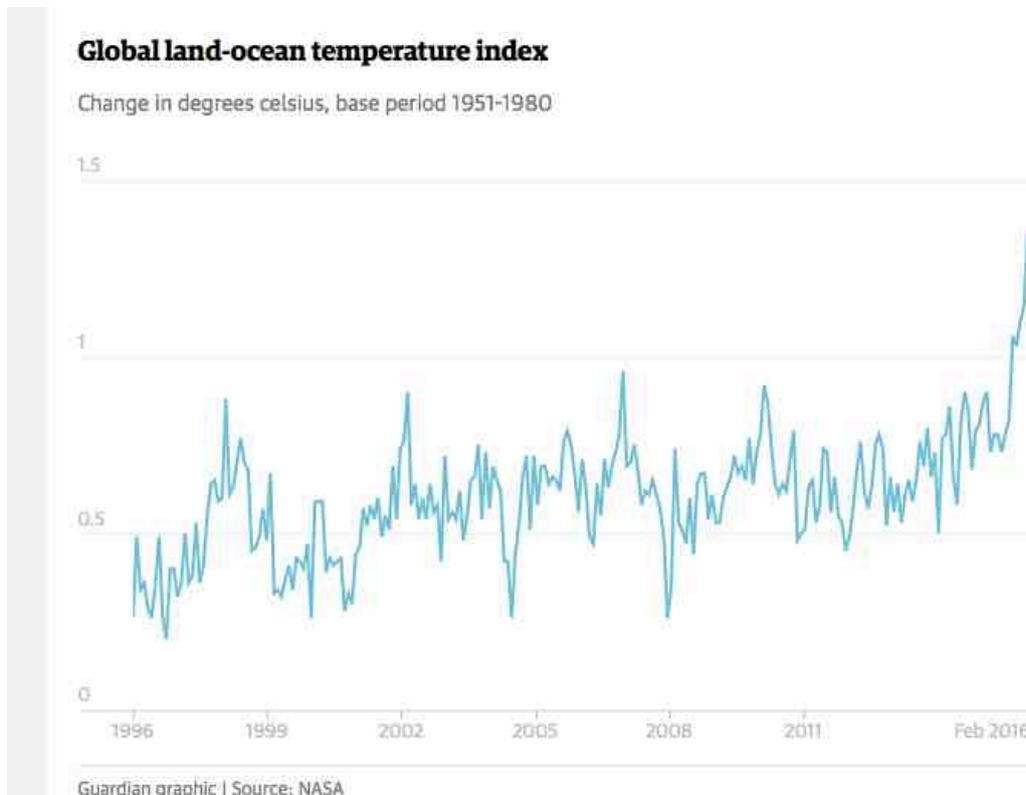
Come freeze-up, they are out with heavy equipment on the river hauling timber. But without a consistent run of extremely cold days – about two weeks of temperatures approaching  $-51\text{C}$  ( $-60\text{F}$ ) – the snow never gets hard enough to pack into ramps or roads.

The ice over the river never gets thick enough for heavy equipment, said Dacho Alexander, a local magistrate and Ed’s brother.

“I normally like to have an ice thickness of between 24 and 36 inches and generally up here we have about 34 to 36 inches,” Dacho Alexander said. The ice this year never made it beyond 20 inches, at the points where he drew core samples.

“We really need 50-60 below in order for the ice to thicken up. Even if it is a week or two weeks that gives us really good ice thickness. It’s not the same to have two months of 10 below. The ice doesn’t get any thicker.”

[January and February obliterated global temperature records](#) – and nowhere more so than in the Arctic which saw some locations  $16\text{C}$  ( $29\text{F}$ ) warmer than normal.



Feb 2016

Guardian graphic | Source: NASA

In late December, temperatures at the North Pole rose to a balmy  $0\text{C}$  – about  $30\text{C}$  ( $54\text{F}$ ) above average.

“You can’t overestimate how big the changes in warming we saw in January and February in the Arctic,” James Overland, an Arctic and climate change researcher at the National Oceanic and Atmospheric Administration, told reporters covering the Arctic science summit in Fairbanks.

“Not only have we beaten the record, we have beaten it by an unbelievably large amount, when you think of it in relation to how Arctic temperatures changed in the

past.”

The Arctic had already been warming twice as fast as anywhere else over the last 30 years but scientists were still taken aback by the February records.

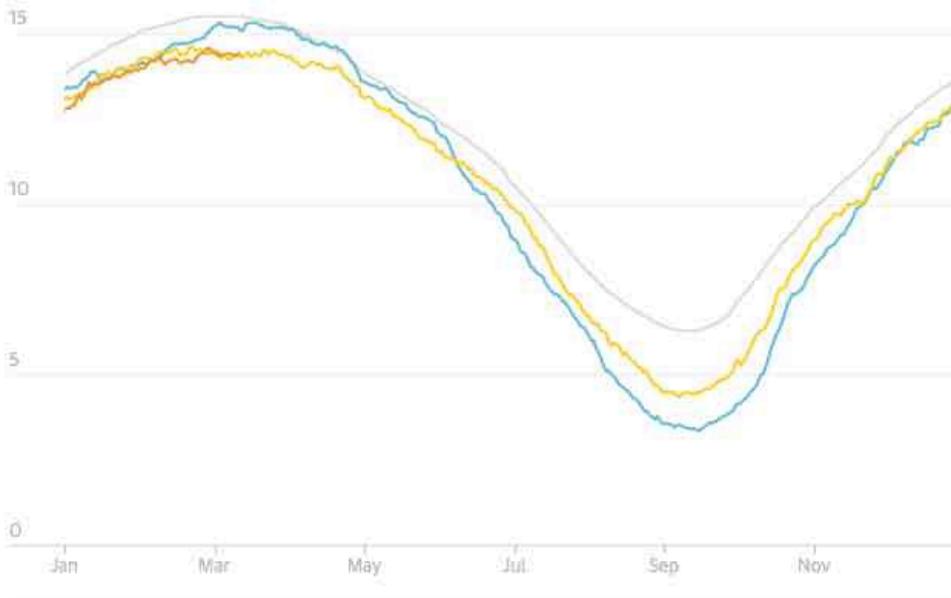
“We would never have expected such a jump in one year,” Overland said. “It sends us into a new temperature place that we have never seen before.”

The record temperatures are already resounding across the Arctic and beyond – melting the sea ice cover, thawing the permafrost and soil, and shaking up the orderly patterns of the jet stream.

## Extent of Arctic sea ice

Area of ocean with at least 15% sea ice, millions of square kilometres

■ 1981-2010 average ■ 2012 ■ 2015 ■ 2016



Guardian graphic | Source: National snow and ice data center

Guardian graphic | Source: National snow and ice data center

Researchers are already beginning to connect such changes in the jet stream to weather effects in mid-latitudes such as the unseasonable blasts of cold Arctic air known as the polar vortex.

From where Ed Alexander sees it, they had better get moving. “To put it in context: I tell people to imagine what if Los Angeles was 60 degrees warmer than it was supposed to be – because Fort Yukon is 60 degrees warmer than it’s supposed to be.

“People think the changes up here are invisible ... but if it only changes half as much down there as it has changed up here you guys are in for a hell of a lot of trouble.”

21 March 2016

## Weather records broken as world faces alarming levels of change



Keeping cool  
Asim Afeez/Bloomberg via Getty Images

Last year broke weather records left, right and centre, according to a new statement by the World Meteorological Organization (WMO) on the status of global climate in 2015.

This included the highest level of ocean warming on record and the most extensive melting of winter sea ice in the Arctic. A billion people in South Asia also suffered an unprecedented killer heat wave.

“The alarming rate of change we are now witnessing in our climate as a result of greenhouse gas emissions is unprecedented in modern records,” said Petteri Taalas, secretary-general at the WMO.

The WMO says that new temperature records are already being set this year, with average global air temperatures in January and February the highest for those months on record. “The startlingly high temperatures so far in 2016 have sent shockwaves around the climate-science community,” said [David Carlson](#), head of the WMO’s World Climate Research Programme.

But while air temperatures fluctuate – with the mercury soaring in 2015 partly because of a major El Niño event – the WMO says the real signifiers of global warming are the oceans.

From more than 3000 ocean temperature sensors established at the start of the century, it says that global ocean heat content reached record levels to a depth of at least 2000 metres in 2015.

More than 90 per cent of the excess heat trapped in the atmosphere by rising concentrations of greenhouse gases finds its way into the oceans, says [Matthew Palmer](#) of the UK Met Office in Exeter.

## Heat imbalance

The steady ocean heating recorded by the sensors, called the Argo array, implies a planetary heat imbalance, in which between 0.65 and 0.8 watts more energy is being absorbed for every square metre of Earth’s surface than is being released, says Palmer, who published his findings last month.

In the Arctic Ocean, a combination of warming ocean waters and rising air temperatures meant that in 2015, winter ice peaked at 14.54 million square kilometres on 25 February – less than at any time since satellite measurements began in 1979. And new record lows were set in the first two months of 2016.

According to the US government's National Oceanic and Atmospheric Administration (NOAA), Arctic air temperatures [began 2016 at 4 °C](#) above the average for the mid-20th century.

The situation in the Arctic records was countered in the southern hemisphere, where the summer minimum extent of sea ice was the fourth-highest ever recorded. The WMO says nobody is quite sure why.

But where people live, the heat has been unrelenting, with rising average temperatures triggering a bout of local record highs.

Last summer, heat waves battered India. Temperatures exceeding 47 °C caused thousands of deaths – a phenomenon that Indian meteorologists dubbed a “heat bomb”.

Meanwhile, temperatures in southern Africa hit a record 48 °C, and across Europe several new temperature records were broken – for example, 40.3 °C in Germany, 42.6 °C in Spain, and 36.7 °C in the UK.

Climatologists are predicting new records highs for 2016.