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## Arctic sea ice extent hits record low for winter

By Helen Briggs BBC Environment correspondent



The maximum ice extent marks the beginning of the melt season for Arctic sea ice

Sea ice in the Arctic Ocean has fallen to the lowest recorded level for the winter season, according to US scientists.

The maximum this year was 14.5 million sq km, said the National Snow and Ice Data Center at the University of Colorado in Boulder.

This is the lowest since 1979, when satellite records began.

A recent [study](#) found that Arctic sea ice had thinned by 65% between 1975 and 2012.

Bob Ward of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics said: "The gradual disappearance of ice is having profound consequences for people, animals and plants in the polar regions, as well as around the world, through sea level rise."

The National Snow and Ice Data Center (NSIDC) said the maximum level of sea ice for winter was reached this year on 25 February and the ice was now beginning to melt as the Arctic moved into spring.

The amount measured at the end of February is 130,000 sq km below the previous record winter low, measured in 2011.

An unusually warm February in parts of Alaska and Russia may have contributed to the dwindling sea ice, scientists believe.

Researchers will provide the monthly average data for March in early April, which is viewed as a better indicator of climate effects.

NSIDC scientist Walt Meier said: "The amount of ice at the maximum is a function of not only the state of the climate but also ephemeral and often local weather conditions.

"The monthly value smoothes out these weather effects and so is a better reflection of climate effects."

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### Analysis by David Shukman, Science editor, BBC News

The Arctic Ocean freezes every winter and much of the sea-ice then thaws every summer, and that process will continue whatever happens with climate change. Even if the Arctic continues to be one of the fastest-warming regions of the world, it will always be

plunged into bitterly cold polar dark every winter. And year-by-year, for all kinds of natural reasons, there's huge variety of the state of the ice.

So what does this new record for the lowest level of winter ice actually mean?

For a start, it does not automatically follow that a record amount of ice will melt this summer. More important for determining the size of the annual thaw is the state of the weather as the midnight sun approaches and temperatures rise. But over the more than 30 years of satellite records, scientists have observed a clear pattern of decline, decade-by-decade.

So at some point this century the summers are on course to be clear of ice, opening up new shipping lanes, making it easier to access the region's oil and gas and possibly also altering the path of the jet stream that drives our weather. So the matter of when all this might happen is the subject of intense research.

Meanwhile, at the other end of the world, researchers are puzzling over the growth of sea-ice around parts of Antarctica. Overall, there is a fall in the global total of sea-ice but with lots of questions about its pace.

Commenting on the data, Alexander Shestakov, director of the WWF Global Arctic Programme, said: "This is not a record to be proud of.

"Low sea ice can create a series of reactions that further threaten the Arctic and the rest of the globe."

# Antarctic ice shelf thinning speeds up

By Jonathan Amos  
Science Correspondent

9 hours ago

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**Scientists have their best view yet of the status of Antarctica's floating ice shelves and they find them to be thinning at an accelerating rate.**

Fernando Paolo and colleagues used 18 years of data from European radar satellites to compile their assessment.

In the first half of that period, the total losses from these tongues of ice that jut out from the continent amounted to 25 cubic km per year.

But by the second half, this had jumped to 310 cubic km per annum.

"For the decade before 2003, ice-shelf volume for all Antarctica did not change much," said Mr Paolo from the Scripps Institution of Oceanography in San Diego, US.

"Since then, volume loss has been significant. The western ice shelves have been persistently thinning for two decades, and earlier gains in the eastern ice shelves ceased in the most recent decade," he told BBC News.

The satellite research is **published in Science Magazine**. It is a step up from previous studies, which provided only short snapshots of behaviour. Here, the team has combined the data from three successive orbiting altimeter missions operated by the European Space Agency (Esa).

### **Faster flow**

The findings demonstrate the value of continuous, long-term, cross-calibrated time series of information.

Many of Antarctica's ice shelves are huge. The one protruding into the Ross Sea is the size of France.

They form where glacier ice running off the continent protrudes across water. At a certain point, the ice lifts off the seabed and floats.

Eventually, as these shelves continue to push outwards, their fronts will calve, forming icebergs.

If the losses to the ocean balance the gains on land through precipitation of snows, this entirely natural process contributes nothing to sea level rise. But if thinning weakens the shelves so that land ice can flow faster towards the sea, this will kick the system out of kilter. Repeat observations now show this to be the case across much of West Antarctica.

"If this thinning continues at the rates we report, some of the ice shelves in West Antarctica that we've observed will disappear by the end of this century," said Scripps co-author Helen Amanda Fricker.

"A number of these ice shelves are holding back 1m to 3m of sea level rise in the grounded ice. And that means that ultimately this ice will be delivered into the oceans and we will see global sea-level rise on that order."

Prof Fricker was speaking on **this week's Science In Action programme** for the BBC World Service.

### **Modelling capability**

Various studies have now confirmed that the land, or grounded, ice in

Antarctica is losing mass.

Esa's current polar observing spacecraft, known as Cryosat, recently reported that the continent's ice sheet was diminishing **at a rate of 160 billion tonnes a year**. Cryosat found the average elevation of the full ice sheet to be falling annually by almost 2cm.

It is thought that all this thinning is predominantly the consequence of warm water getting under the floating ice at the continent's margins to melt it from below.

This warmer water appears to be being drawn towards Antarctica by stronger westerly winds in the Southern Ocean.

But the precise drivers at work and their scale are poorly understood. And until scientists get a better grasp of some of these issues, their ability to project future change will be limited.

Prof David Vaughan is the director of science at the **British Antarctic Survey (BAS)**, and was not involved in the Paolo paper.

He commented: "We need three components: we need to understand the changes in the grounded ice; how the floating ice is behaving; and finally how the oceanographic conditions under the floating ice have changed. With those three things, we have the basis for building really good models. Ten years ago, we didn't have any one of those elements. Today, we've made good progress on two, but on the oceanographic side we're only just beginning."

BAS recently placed moorings in the Amundsen Sea in West Antarctica **to gather data on ocean conditions**. In the same sector, BAS also sent a sub under the floating shelf ahead of Pine Island Glacier to better understand how water moves under the ice.



A sub was recently sent under the floating extent of Pine Island Glacier to map the seafloor

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