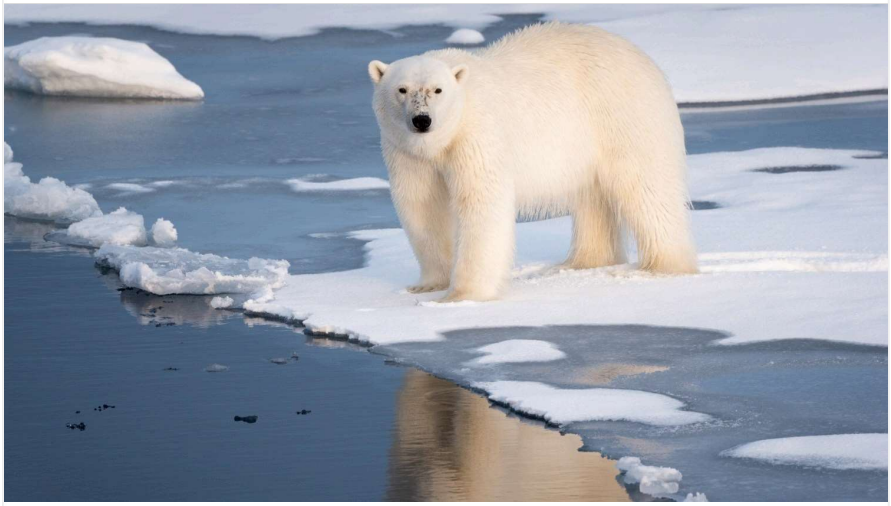

Shrinking sea ice is accelerating global warming and threatens local wildlife, forcing polar bears to swim far greater distances.

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How British scientists plan to 'refreeze' Arctic sea ice

Cambridge researchers will pump seawater on top in a bid to stop it shrinking

Adam Vaughan, Environment Editor

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British scientists are heading to the Arctic for an audacious attempt to discover whether engineering can help to save the region's fast-vanishing sea ice.

A rapidly warming Earth means the extent of the ice is millions of square kilometres less today than it was decades ago. The phenomenon is accelerating climate change because white ice

reflects much of the sun's energy to space while dark water absorbs it. It also threatens local wildlife, forcing polar bears, for example, to swim greater distances.

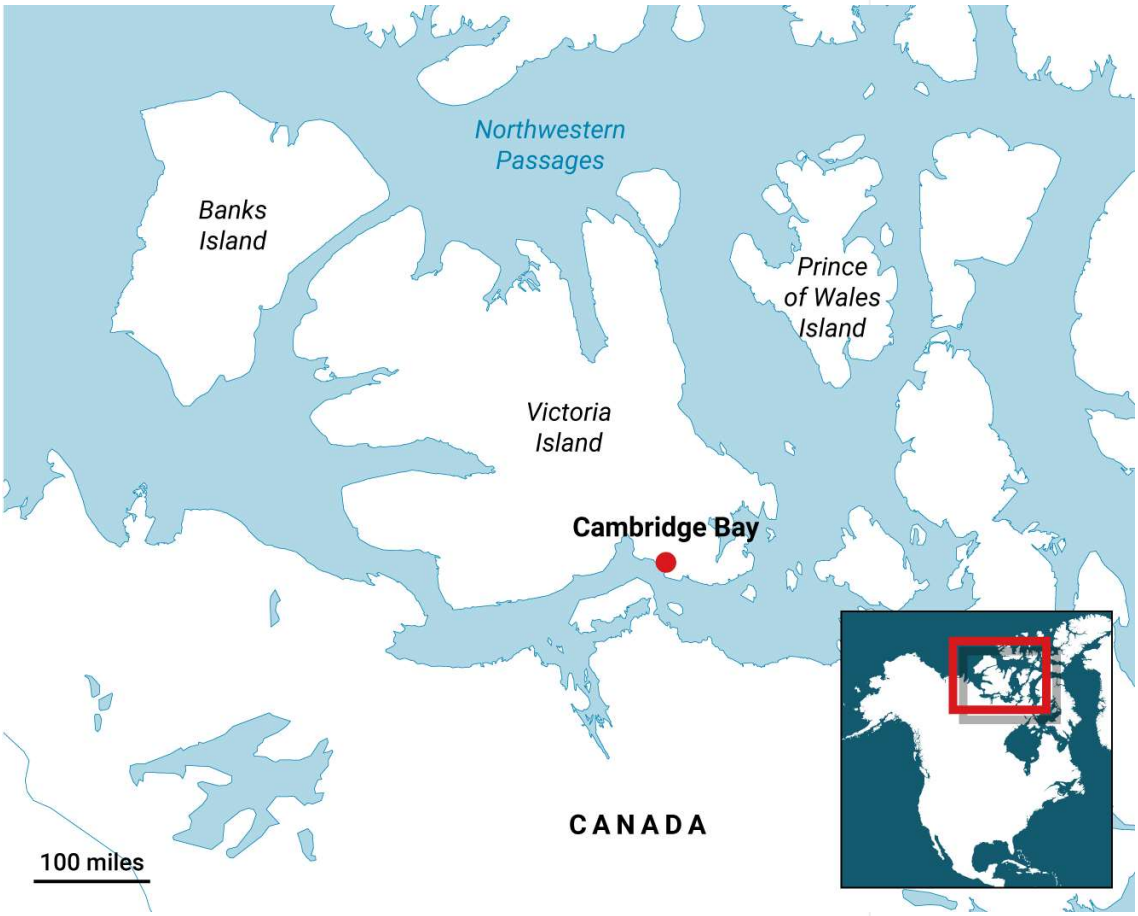
The great melt is why some engineers are looking to "refreeze" the Arctic. Jacob Pantling of the University of Cambridge will join an international team next week in the Canadian high Arctic to test pumping seawater on top of the ice to make it thicker and longer-lasting.

The idea is one of several being explored by researchers. Another is to sprinkle a layer of reflective glass powder over the ice.

"We are currently seeing annual reductions in the extent of summer sea ice. If we can halt this pattern, or even reverse it, then more sunlight can be reflected back to space in the Arctic summer rather than be absorbed by the exposed dark blue ocean and that will help a lot," said Dr Shaun Fitzgerald, who

leads the Centre for Climate Repair at the University of Cambridge.

Pantling and his scheme, in partnership with two groups of scientists called Real Ice and Arctic Reflections, will send researchers to Cambridge Bay, in Canada's northernmost territory, Nunavut. Once they arrive around January 14, the team will cut a hole in the ice and install a pump to flood seawater on top of it.

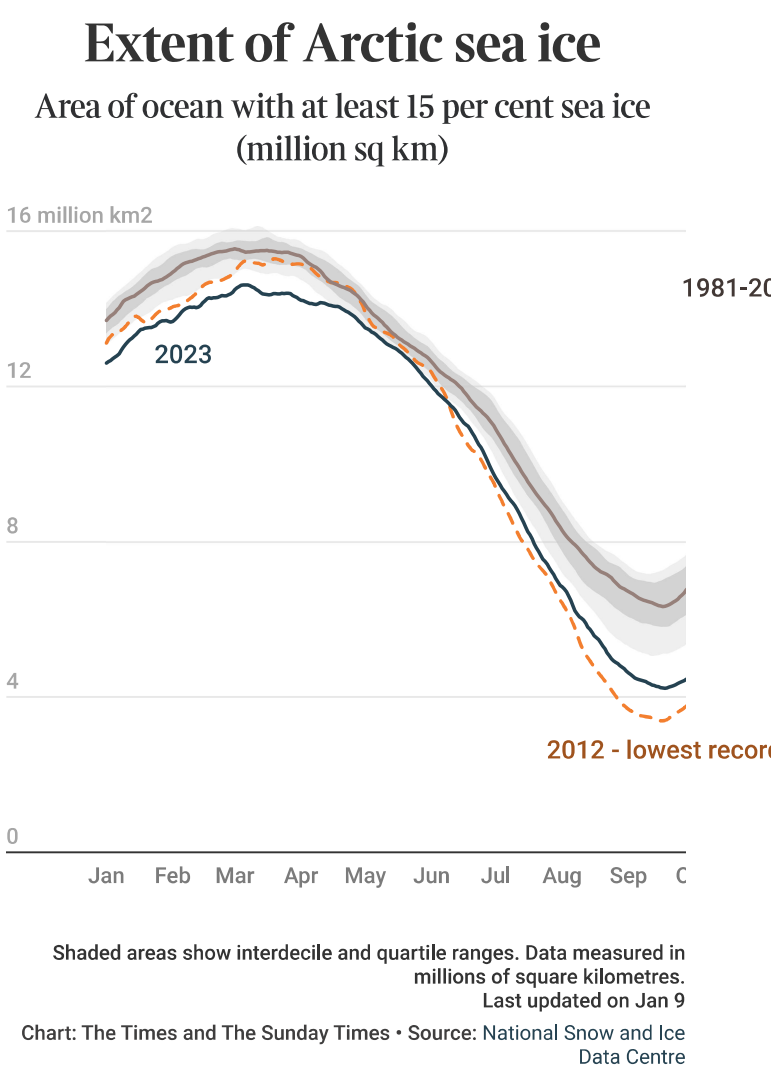


The hope is that as the flooded water freezes during the rest of the Arctic winter it will create more ice, speeding up the natural

freezing process underneath the ice. For the first time, the pumps will be powered by a green source: a fuel cell running on hydrogen produced using renewable electricity.

Over about ten days, the researchers will flood an area several tens of metres in radius. Local people will then take readings in the coming weeks to measure the difference in ice thickness. Ideally, Fitzgerald hopes the intervention will create ice that is about a metre thicker, meaning it should be robust enough to survive the summer melt season.

A pilot scheme was run at Nome in Alaska last February and further projects to explore seawater pumping will take place in Sweden later this year. The problem of Arctic sea ice loss is urgent. The extent of the ice last year was the sixth-lowest in 45 years of satellite records, while scientists think the first ice-free summer could come anytime between the 2030s and 2050s.



However, there are big questions over whether the refreezing concept can be employed at a large enough scale to have an impact, and whether it could backfire.

One study suggested that deploying pumps across a tenth of the Arctic could reverse present trends of ice loss. However, it would require about 10 million pumps, which could be powered by wind turbines or fuel cells.

“That’s a lot of pumps. Yes, it’s a big engineering challenge. But it’s not absolutely out of this world,” said Fitzgerald. Nonetheless, he conceded that pumps and turbines would face “very harsh” winter conditions, and there might also be concerns over the effect on local wildlife.

The other issue is that pumping seawater on to the ice could inadvertently make things worse. The artificially created ice will be salty, which means a lower melting temperature. “Is it a bad idea or a good idea? It might actually last as long doing nothing at all,” admitted Fitzgerald.

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