

# Past evidence supports complete loss of Arctic sea ice by 2035

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Arctic Sea Ice, MOSAiC Expedition. Credit: Markus Frey, British Antarctic Survey

A new study, published this week in the journal *Nature Climate Change*, supports predictions that the Arctic could be free of sea ice by 2035.

High temperatures in the Arctic during the last interglacial—the warm period around 127,000 years ago—have puzzled scientists for decades. Now the UK Met Office's Hadley Centre [climate](#) model has enabled an international team of researchers to compare Arctic sea ice conditions during the last interglacial with present day. Their findings are important for improving predictions of future sea ice change.

During spring and [early summer](#), shallow pools of water form on the surface of Arctic sea-ice. These 'melt ponds' are important for how much sunlight is absorbed by the ice and how much is reflected back into space. The new Hadley Centre model is the UK's most advanced physical representation of the Earth's climate and a critical tool for climate research and incorporates sea-ice and melt ponds.

Using the model to look at Arctic sea ice during the last interglacial, the team concludes that the impact of intense springtime sunshine created many melt ponds, which played a crucial role in sea-ice melt. A simulation of the future using the same model indicates that the Arctic may become sea ice-free by 2035.

Joint lead author Dr. Maria Vittoria Guarino, Earth System Modeller at British Antarctic Survey (BAS), says, "High temperatures in the Arctic have puzzled scientists for decades. Unraveling this mystery was technically and scientifically challenging. For the first time, we can begin to see how the Arctic became sea ice-free during the last interglacial. The advances made in climate modeling means that we can create a more accurate simulation of the Earth's past climate, which, in turn gives us greater confidence in model predictions for the future."

Dr. Louise Sime, the group head of the Palaeoclimate group and joint lead author at BAS, says, "We know the Arctic is undergoing significant changes as our planet warms. By understanding what happened during Earth's last warm period we are in a better position to understand what will happen in the future. The prospect of loss of sea-ice by 2035 should really be focussing all our minds on achieving a low-carbon world as soon as humanly feasible."

Dr. David Schroeder and Prof Danny Feltham from the University of Reading, who developed and co-led the implementation of the melt pond scheme in the climate [model](#), say, "This shows just how important sea-

ice processes like [melt ponds](#) are in the Arctic, and why it is crucial that they are incorporated into climate models."

**More information:** Guarino, M., Sime, L.C., Schröder, D. et al. Sea-ice-free Arctic during the Last Interglacial supports fast future loss. *Nat. Clim. Chang.* (2020). [doi.org/10.1038/s41558-020-0865-2](https://doi.org/10.1038/s41558-020-0865-2)

Provided by British Antarctic Survey

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