



How Long Until All the Arctic Ice Is Gone?

A new study predicts full Arctic melt by the 2050s

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JULY 24, 2013

Ice is such a fundamental part of the Arctic Ocean that we once had no idea what lay beneath it: Early cartographers were as likely to depict the Arctic as a landmass as they were to draw water. But we've known for some time that our warming climate will eventually mean the transformation of the ice-locked Arctic into an open expanse of blue water. The question has long been not if, but when.

A new study published in *Proceedings of the National Academy of Sciences* projects an ice-free summer sometime between 2054 and 2058. Previous models have predicted full Arctic melt as early as 2011 and as late as 2098; the authors of the paper, titled "Reducing spread of climate model projections of a September ice-free Arctic," looked at the historical models whose predictions have most closely tracked with observed changes in ice cover. They also created a simulation that extrapolates sea ice trends into the future. Both methods placed the date of complete melt (minus some residual ice) within a few years of each other: ice-free Arctic waters by midcentury. (Some scientists call this prediction unduly conservative; in April, for example, two NOAA scientists **predicted a nearly ice-free Arctic as early as 2020.**)

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Full ice loss is a scary milestone, but we're already seeing the impacts of retreating ice. Companies are racing to drill for oil and gas in the Arctic, and the U.S. Coast Guard, citing the impacts of climate change, released a plan for increased Arctic operations in May. Already, more and more ships are braving the region. In 2010, just four vessels traveled the Northern Sea Route from Europe to Asia; in 2012, 46 did. As of last Friday, **204 ships have been approved** to transit the route this summer.

Ice-free summers signify not just a radically changed Arctic, but an altered planet – disruptions in ocean currents, changes in global weather patterns. Even current levels of Arctic melt may already be redirecting the jet stream, **according to a paper published in 2012.**

The predicted midcentury melt date is based on a "high-emission scenario," under the expectation that we'll continue pumping greenhouse gases into the atmosphere with abandon. The authors also included a scenario in which we moderately mitigate our emissions. In that case, ice recedes somewhat more slowly – disappearing in the summer perhaps a decade later – and ice extent eventually levels out. How we draw the Arctic map, in other words, still depends on us.

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