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Arctic thaw significantly worsens global warming risk

By Jeff Hecht

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More water, more warming
(Image: Norbert Rosing/National Geographic Creative)

Melting ice is cooking the planet. Shrinking Arctic sea ice means the ocean is absorbing more energy from the sun, and it's now clear the effect is twice as big as thought – adding significantly to heating from greenhouse gases.

Arctic temperatures have risen 2 °C since the 1970s, leading to a 40 per cent dip in the minimum summer ice coverage in the Arctic Ocean. Open water soaks up more sunlight than ice, so as the ice retreats the ocean absorbs more energy, warming it and causing even more melting.

To measure the effect, Ian Eisenman of the Scripps Institute of Oceanography in La Jolla, California, and colleagues turned to data from NASA's CERES satellite. They found that the Arctic Ocean's albedo – the fraction of sunlight it reflects back into space – dropped from 52 per cent in 1979 to 48 per cent in 2011. That may not seem like much, but it means a big rise in energy absorbed – equal to 25 per cent of that trapped by the rise in atmospheric

“That is big – unexpectedly big,” says Eisenman. “Arctic sea ice retreat has been an important player in the global warming that we’ve observed during recent decades.”

“It reaffirms that albedo feedback is a powerful amplifier of climate change, maybe even more so than is simulated by the current crop of climate models,” says Mark Flanner of the University of Michigan in Ann Arbor.

The extra energy absorbed goes into the ocean, particularly on the side of the Arctic near Alaska and Siberia, which is losing the most ice. “I don’t know where it’s going from there,” says Eisenman. “I think this is an important piece in the climate change story, but there are lots of other pieces we need.”

The future of Arctic sea ice itself is also uncertain. Arctic summers will probably be ice-free later this century, but nobody knows how soon. “Right now we have very little ability to predict Arctic ice two months or 30 years out,” says Eisenman.

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Topics: Climate Change