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Russian Arctic losing billions of tons of ice as climate warms

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Source: University of Edinburgh

Summary: Glaciers and ice caps in two archipelagos in the Russian Arctic are losing enough meltwater to fill nearly five million Olympic-size swimming pools each year, research shows.

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FULL STORY

Glaciers and ice caps in two archipelagos in the Russian Arctic are losing enough meltwater to fill nearly five million Olympic-size swimming pools each year, research shows.

Satellite data suggests that the amount of ice lost between 2010 and 2018 would put an area the size of the Netherlands under seven feet of water.

Warming of the Arctic Ocean appears to play a key role in accelerating ice loss from two large groups of islands that border the Kara Sea, researchers say.

The University of Edinburgh team mapped data collected by the European Space Agency's CryoSat-2 research satellite to monitor changes to the surface height and mass of ice caps and glaciers.

Comparing these with climate data for the same period revealed a clear link between rising atmospheric and ocean temperatures and increased ice loss from two archipelagos.

The team's analysis shows that the Novaya Zemlya and Severnaya Zemlya archipelagos -- which cover a combined area of around 50,000 square miles -- lost 11.4 billion tonnes of ice each year between 2010 and 2018.

Thinning of the ice has already had a major impact on the stability of some of the region's glaciers and ice caps, which could further increase ice loss in the future, the team says.

Compared to the relatively small size of glaciers, ice caps are large bodies of ice several hundred meters thick that cover areas of up to around 8,000 square miles in the region. Some of these store ice up to 12,000 years old, which provides scientists with valuable long-term records of the Arctic climate.

Findings from the study add to a body of research suggesting that conditions in the Arctic Ocean are becoming more like those in the North Atlantic, which is much warmer.

The study could help predict future ice loss in regions experiencing similar patterns of atmospheric and ocean temperature change, and improve global sea level predictions, the team says.

The research, published in the *Journal of Geophysical Research: Earth Surface*, was supported by the European Space Agency.

Lead author Dr Paul Tepes, of the University of Edinburgh's School of GeoSciences, said: "The Russian Arctic is largely inaccessible, but satellite data has enabled us to monitor changes to its ice caps and glaciers. As has been observed elsewhere in the world, ice loss in the region is accelerating. As the climate continues to warm, significant ice loss in the Russian Arctic will have clear impacts for sea level rise."

Story Source:

Materials provided by **University of Edinburgh**. *Note: Content may be edited for style and length.*

Journal Reference:

1. Paul Tepes, Peter Nienow, Noel Gourmelen. **Accelerating Ice Mass Loss Across Arctic Russia in Response to Atmospheric Warming, Sea Ice Decline, and Atlantification of the Eurasian Arctic Shelf Seas.** *Journal of Geophysical Research: Earth Surface*, 2021; 126 (7) DOI: 10.1029/2021JF006068

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