

Glaciers will melt faster than ever and loss could be irreversible, warn scientists

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Canada's Arctic Archipelago glaciers will melt faster than ever in the next few centuries. Research by European funded scientists has shown that 20 per cent of the Canadian Arctic glaciers may have disappeared by the end of this century which would amount to an additional sea level rise of 3.5cm

The results of the research will be published in [Geophysical Research Letters](#) this week, and the paper is now available online.

The researchers developed a climate model for the island group of the north of Canada in which they simulated the shrinking and growing of glaciers in this area.

The researchers show that the model correctly "predicted" the ice [mass loss](#) measured over the last ten years and then used the same model to project the effect of future [climate change](#) on Canada's [Arctic Archipelago](#) glaciers.

The most important result of the research is it shows the probable [irreversibility](#) of the melting process, according to lead author Dr Jan Lenaerts of Utrecht University who says, "Even if we assume that global warming is not happening quite so fast, it is still highly likely that the ice is going to melt at an alarming rate. The chances of it growing back are very slim."

One of the main reasons for the irreversibility lies in the fact that snow

melting on tundra, and sea ice loss from around the glaciers, actually reinforce regional warming, with significant consequences on the glaciers of Northern Canada. Snow and sea ice reflect the sunlight, and when the snow and [sea ice](#) have disappeared, a large part of the sunlight will be absorbed by the land and the sea, which will significantly increase the local temperature.

In one scenario 20 per cent of volume of the glaciers disappears by the end of this century. In this scenario the average [global temperature](#) increases by 3 degrees Centigrade but the rise in temperature around Canadian ice caps is 8 degrees Centigrade. Dr Lenaerts emphasises this is not an extreme scenario.

Canada's Arctic Archipelago glaciers represent the third largest ice body in the world after Greenland and the Antarctic. Should the Canadian ice caps melt completely, the global average sea level will rise by 20 centimetres. Since the year 2000 the temperature in this area has risen by 1 to 2 degrees Centigrade and the ice volume has already significantly decreased. If a fifth of the Canadian ice caps have melted by the end of this century, this leads to an additional sea rise of 3.5cm.

Co-author Professor Michiel van den Broeke of Utrecht University says , "Most attention goes out to Greenland and Antarctica which is understandable because they are the two largest ice bodies in the world. However, with this research we want to show that the Canadian ice caps should be included in the calculations."

Professor David Vaughan programme leader of ice2sea, who is based at the British Antarctic Survey in Cambridge, says, "The Canadian archipelago is an area where climate is changing rapidly, and the glaciers here contain enough ice that we should not ignore their contribution to sea-level rise. Added to [glaciers](#) in Alaska, the Russian Arctic and Patagonia, these apparently small contributions add up to significant [sea-](#)

[level rise](#). A key success of this study was in showing that the model performed well in reproducing recently observed changes. That success gives us confidence in how the model predicts future changes".

More information: Irreversible mass loss of Canadian Arctic Archipelago glaciers will be officially published by *Geophysical Research Letters* this week, but is already available for download on its website.

Provided by British Antarctic Survey

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