

# Future increases in snowfall will not prevent retreat of glaciers on the Antarctic Peninsula

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(Phys.org) —Dr Nicholas Golledge, a senior research fellow at Victoria's Antarctic Research Centre, is part of an international team of researchers studying a small glacier on James Ross Island, near the northern Antarctic Peninsula.

The team, led by Dr Bethan Davies, from Royal Holloway, University of London, found that surface melt in this region will increase greatly under even a slight warming, offsetting any gains from increased snowfall.

The currently observed glacier recession in this region is therefore likely to continue, and even accelerate, under the presently warming climate.

Published online in the scientific journal *Nature Climate Change*, the study used a combination of glacial geology, ice-core data and numerical glacier and climate modelling. Dr Golledge developed the glacier [model](#) used in the study.

The model uses a series of equations to simulate ice flow, and allows changes in climate to be translated into advance or retreat of the glacier depending on the balance between the accumulation of snow in higher areas, and the melting of ice at the glacier front.

Using this model, Dr Davies simulated the present-day extent and flow speed of the glacier, based on climatic conditions interpreted from the nearby Mt. Haddington ice-core record. The model was then applied to the last ten thousand years, guided by geological data, and then into the future using outputs from a regional [climate](#) model.

Dr Golledge says this is important research because it helps reduce some of the uncertainties about how these small glaciers will react to changing temperature and precipitation over the next two centuries.

"This glacier, though small, is typical of many of the smaller land-terminating glaciers around the Antarctic Peninsula. It is these small, peripheral [glaciers](#) that are likely to contribute most to sea-level rise over coming decades," he says.

**More information:** "Modelled glacier response to centennial temperature and precipitation trends on the Antarctic Peninsula." Bethan J. Davies, et al. *Nature Climate Change* (2014) [DOI: 10.1038/nclimate2369](https://doi.org/10.1038/nclimate2369)

Provided by Victoria University of Wellington

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