

The future of the Devon Ice cap: results from climate and ice dynamics modelling

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The Devon Ice Cap is an example of a relatively well monitored small ice cap in the Canadian Arctic. Close to Greenland, it shows a similar surface mass balance signal to glaciers in western Greenland. Here we use high resolution (5km) simulations from HIRHAM5 to drive the PISM glacier model in order to model the present day and future prospects of this small Arctic ice cap.

Observational data from the Devon Ice Cap in Arctic Canada is used to evaluate the surface mass balance (SMB) data output from the HIRHAM5 model for simulations forced with the ERA-Interim climate reanalysis data and the historical emissions scenario run by the EC-Earth global climate model. The RCP8.5 scenario simulated by EC-Earth is also downscaled by HIRHAM5 and this output is used to force the PISM model to simulate the likely future evolution of the Devon Ice Cap under a warming climate. We find that the Devon Ice Cap is likely to continue its present day retreat, though in the future increased precipitation partly offsets the enhanced melt rates caused by climate change.