

Project acronym: ICELYN

Project title: Ice thickness measurements of Lyngmarksbræen, Qeqertarsuaq, west Greenland

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Discipline: Earth Sciences & Environment

Station(s): Arctic Station (Greenland)

Ice thickness measurements of glaciers and ice caps are fundamental for estimating global ice volume changes and global sea level rise. Unfortunately, there are currently no ice thickness data from west Greenland and only very limited data from ice caps. In this study, we will (1) measure the ice thickness and calculate the ice volume of Lyngmarksbræen Ice Cap; (2) measure the snow depth of Lyngmarksbræen and provide the fundamental snow and ice thickness data for a planned mass balance monitoring program established at Arctic Station; and (3) use the snow and ice thickness data to test and improve numerical models of ice thicknesses and ice volume, which are used to estimate ice volume loss on regional scale.

The ICELYN project estimates the 2017 ice volume of Lyngmarksbræen and its outlet glacier Chamberlin Gletsjer. These results will represent the foundation for monitoring glacier change at Arctic Station. In addition, the ICELYN project will provide the first winter glacier mass balance of Lyngmarksbræen. This data will be made available to the Arctic Station monitoring program. c. Use the data to test and improve numerical models of ice thicknesses and ice volume The ICELYN project will implement the ice thickness data and subglacial topography in numerical models on local, regional and global scale. Locally, we will (1) model past, present and future changes of ice volume and ice extent of Chamberlin Gletsjer (1894-2100); and (2) test glacier-scale performance of numerical ice thickness models on Chamberlin Gletsjer and Mittivakkat Gletsjer. Regionally, we will use the results to calibrate a numerical ice thickness model for west Greenland. Globally, we will add the results to the World Glacier Monitoring Service database, so that the data can be used in the next IPCC report.