

Course introduction

Welcome to the course of the Greenland ice sheet, its climate, its processes, and its changes. I have been here in Greenland for the last 25 years annually to make measurements together with my grad students. And through this camp here, a large number of students have been educated to do exactly what we will do in our course. We want to see why is Greenland changing, what are the processes we need to understand, to look for the changes, and how can we use these observations in our models for the prediction of the future.

Greenland is an important part of the climate system. It changes when the planet gets warmer and cooler, and it also makes a contribution to global sea levels. And so people are concerned to know what's happening there today.

We learned most of what we know about Greenland thanks to satellite measurements from space. We now know that the glaciers in Greenland are flowing faster than they were 10 or 20 years ago. We know in fact that the glaciers flow faster in summer than they do in winter, and that's because of the amount of water that's around on the surface of the ice sheet. And we know that the ice is thinning really rapidly at the coast where it flows into the oceans. All of these things tell us that the ice sheet is out of balance with the environment around it. We wouldn't have learned these things without satellite measurements.

We need spaceborne sensors like Cryosat like laser instruments, like radars to extrapolate from one point to a larger area. And this is the whole scope of our research here on the Greenland ice sheet. And in calibrating sensors that then can be used to assess the change in the mass in Greenland, and that will be used in the models to predict the future. How does Greenland change in 50 years, in the 100 years, or maybe in 2000 years?