

Significances of GLISN project in Global Seismology

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The Greenland Ice Sheet Monitoring Network (GLISN) project—a collaboration between Canada, Denmark, France, Germany, Italy, Japan, Norway, Poland, South Korea, Switzerland, and the United States—provides real-time broadband seismological observations to help address critical, poorly understood aspects of the Arctic system. Geodetic observations are also included at selected stations. Seismic data from GLISN record changes at high temporal resolution and reflect deformation and structures internal to the ice and solid Earth. These data complement existing observations from satellite and airborne remote sensing, ice-penetrating radar, and GPS geodesy. Launched in 2009, the GLISN project completed installation of all 33 initially planned seismic stations in August 2013. Most GLISN stations in Greenland are installed on bedrock along the ice-free coast at sparsely populated settlements to take advantage of existing power and communications infrastructure. Four stations are installed in the ice. Additional stations surrounding Greenland—in Canada, Iceland, and on several Norwegian islands—allow scientists to gain a broad view of Greenland's structure and changes in the ice. The GLISN project has already provided valuable data for multiple studies. Data from the network (Figure 1) have been used to improve analysis of glacial earthquakes, which result from calving events of about 1 cubic kilometer each. GLISN stations have also been used in automatic detection of calving events by measurement of tilt associated with seiches (standing waves) in the fjords where many glaciers terminate.

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