

Seismic observations in Greenland by a joint USA and Japanese GLISN team (2011-2015)

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Global climate change is currently causing melting of the Greenland ice sheet. Recently, a new type of seismic event, referred to as a "glacial earthquake", has been recognized. Such earthquakes are generated by the movements of large masses of ice within the terminal regions of glacier, and represent a new approach for monitoring ice sheet dynamics. In 2009, the Greenland Ice Sheet monitoring Network (GLISN) was initiated as international project to monitor changes in ice sheet by constructing a large broad-band seismological network in and around Greenland.

Japan is a partner country from when the GLISN project was launched, and has been sending an expedition team every year since 2011. In 2011, the joint USA and Japanese GLISN team installed the dual seismic-GPS station ICESG-GLS2 in the middle of the Greenland ice sheet. During 2012-2015, we conducted maintenance of the three stations on ice (ICESG-GLS2, DY2G-GLS1, and NEEM-GLS3), and three stations on bedrock in coastal region (NUUK, DBG, and SOEG).

Especially, in 2014, we had succeeded in real-time transmission of broad-band continuous seismic waveform data from the three ice stations. It was the first time in the world that the seismic data with such a high sampling rate is transferred from the ice sheet. The data is now open to the public and available from the IRIS Data Management Center (<http://www.iris.edu/ds/nodes/dmc/>). Also in 2015, we relocated a seismic sensor at the station ICESG, which had been covered by snow of 5 m depth due to accumulation for four years. All of the excavation and reinstallation processes were achieved within two days by human labor of only three workers.

This presentation will summarize our field activities, and introduce the future plans. The Japanese GLISN team has been supported by JSPS KAKENHI 24403006.

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