Mass loss of outlet glaciers and ice caps in the Qaanaaq region, northwestern Greenland

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The Greenland ice sheet and peripheral ice caps are rapidly losing mass. Recently, ice mass loss is increasing particularly in northwestern Greenland (e.g. Enderlin and others, 2014). It is urgently important to understand the ongoing changes in this region, but observational data are sparse in northern Greenland. To quantify current ice mass loss in northwestern Greenland and better understand processes driving the mass loss, we studied outlet glaciers and ice caps in the Qaanaaq region as a part of GRENE Arctic Climate Change Research Project. Field and satellite observations were performed to quantify ice surface elevation change of outlet glaciers and ice caps (Saito et al., 2016; Tsutaki et al., 2016). Frontal position and ice speed of outlet glaciers were mapped by satellite data. We also studied processes occurring near the front of outlet glaciers to investigate interaction of the glaciers and the ocean (Ohashi et al., 2016). Our field activities include mass balance monitoring on Qaanaaq Ice Cap since 2012 (Sugiyama et al., 2014), integrated field observations near the calving front of Bowdoin Glacier since 2013 (Sugiyama et al., 2015; Podolskiy et al., 2016), and ocean measurements in front of the glaciers. In this contribution, we present the overview of the results obtained in the GRENE project, and introduce a new project established under the framework of ArCS (Arctic Challenge for Sustainability Project). Our presentation aims to stimulate community discussion on research plan in Greenlnad for Master Plan 2020 called by Science Council of Japan.

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