

Ice mass loss in northwestern Greenland **—Results of the GRENE Greenland project and overview of the ArCS Greenland project—**

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The Greenland ice sheet and peripheral ice caps are rapidly losing ice mass (e.g. Khan and others, 2015). The mass loss is driven by two key processes, melt increase due to warming climate and accelerated ice discharge from tidewater glaciers. Overview of the mass change is relatively well understood by satellite remote sensing, but more detailed investigations are needed to understand spatial and temporal variations, and mechanism of mass loss. Recently, mass loss is increasing particularly in northwestern Greenland (e.g. Enderlin and others, 2014). Despite its importance, in-situ data are sparse in the northern area of Greenland. To quantify the current ice mass loss in northwestern Greenland and predict its future, we have been working on the ice sheet and ice caps in the Qaanaaq region (Figure 1), as a part of GRENE Arctic Climate Change Research Project. Field and satellite observations were performed to quantify the ice mass loss of the ice sheet, outlet glaciers and ice caps. We also study detailed processes occurring near the front of outlet glaciers to better understand ice-ocean interaction. These studies include mass balance monitoring on Qaanaaq Ice Cap since 2012, integrated field observations near the front of Bowdoin Glacier since 2013, and ocean measurements in fjord in the region (Figure 1). In this contribution, we present the results of the GRENE Greenland project, and introduce the overview of the next project planned under the framework of ArCS (Arctic Challenge for Sustainability Project).

References

- Enderlin, E. M., I. M. Howat, S. Jeong, M. J. Noh, J. H. van Angelen, and M. R. van den Broeke, An improved mass budget for the Greenland ice sheet. *Geophys. Res. Lett.*, 41, 866–872, 2014.
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Figure 1. Satellite image of the Qaanaaq region in northwestern Greenland.