グリーンランド北西部ボードウィンフィヨルドにおける係留観測

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Mooring measurement in Bowdoin Fjord in northwestern Greenland

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The Greenland ice sheet has been losing its mass rapidly in recent years. Calving events of marine-terminating outlet glaciers are considered important for this mass loss due to warming oceanic temperature. In the frameworks of GRENE and ArCS projects, Bowdoin Glacier and Fjord in the northwestern Greenland has been intensively observed since 2009 (e.g. Sugiyama et al., 2015). However, oceanographic observations had been limited during summer until 2016. To reveal seasonal variability of ocean current, temperature and salinity within the fjord, a mooring was deployed in this fjord from August 2016 to July 2017 for the first time. The mooring was deployed near the Inglefield Bredning, which is an outer, wider fjord connected to Baffin Bay to examine the inflow of warm Atlantic Water. The upper part of the mooring equipped with thermistors came loose likely due to a fishery survey in September 2016, but a current meter and a conductivity-temperature recorder near the bottom yielded valid data over the entire mooring period. Both the current velocity and temperature data show larger variability from August to January and smaller variability afterwards possibly due to sea-ice cover (Fig. 1). Prevailing current directions are north-northeast and south-southwest roughly along the fjord orientation. The conductivity-temperature recorder data show the existence of warm and saline (> 34) Atlantic Water throughout the year. The relationship between current velocity and water temperature/salinity, and possible causes of the variability will be examined.

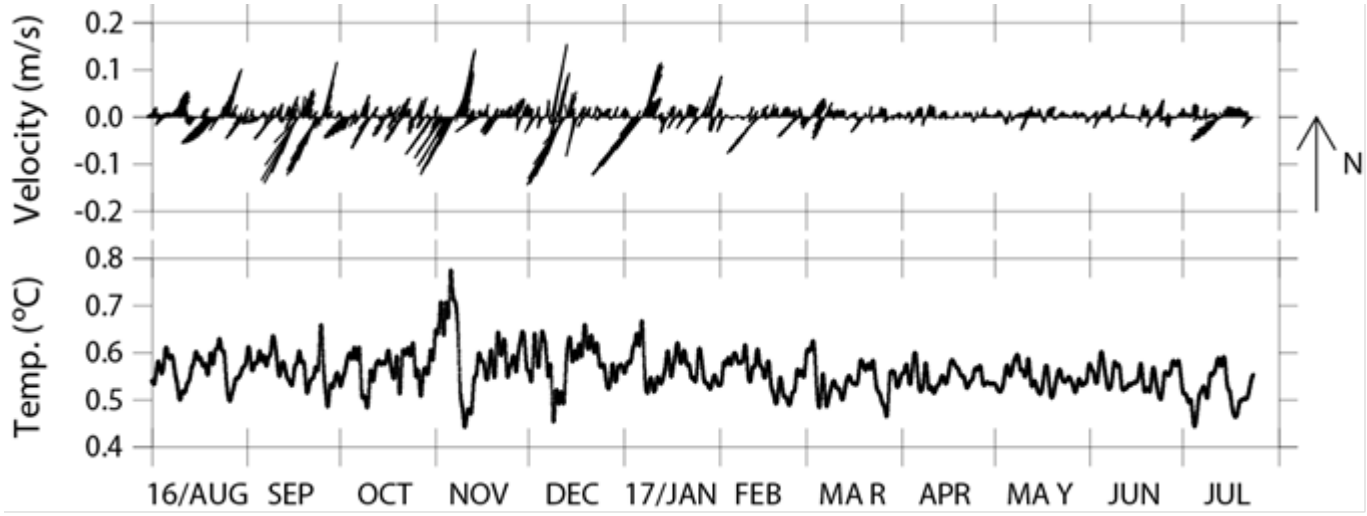

Figure 1. Time series data from the mooring deployed in Bowdoin Fjord at (77º31’46.6”N, 68º 26’41.8”W). The bottom depth of the mooring site was ~545 m. (a) Velocity data obtained by a Nortek DW-Aquadopp at the depth of ~527 m. (b) In situ temperature data obtained by a SeaBird Scientific SBE-37 at the depth of ~530 m. Tidal components are removed.

References

Sugiyama S., D. Sakakibara, S. Tsutaki, M. Maruyama and T. Sawagaki, Glacier dynamics near the calving front of Bowdoin Glacier, northwestern Greenland, Journal of Glaciology, **61**(226), 223-232.