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Biogeochemical Mooring North of Svalbard: CO₂ System Measurements

The objective is to identify and monitor changes in the Arctic marine carbon cycle by using a suite of biogeochemical measurements on a mooring. The ocean has absorbed ~30% of atmospheric CO₂ emissions causing ocean acidification. These changes and their impacts on ecosystems, are poorly understood in the Arctic due to sparse observations of key biogeochemical measurements. The observations from this mooring will provide the first year-long, high-resolution observations of the marine carbon cycle in the high Arctic.

The mooring was deployed from the Norwegian Coast Guard's ice breaker, KV Svalbard, on 12 August 2018 and recovered 13 months later by the Norwegian research vessel FF Kronprins Haakon. Data collection included 5 x CO₂ sensors at three different depths, along with 2 x nitrate sensors, 2 x oxygen sensors, 2 x temperature and salinity sensors, and one current meter, successfully logged data at 3 hour intervals for a year. The data will be included in the ICOS Norway network (<https://no.icos-cp.eu/>).

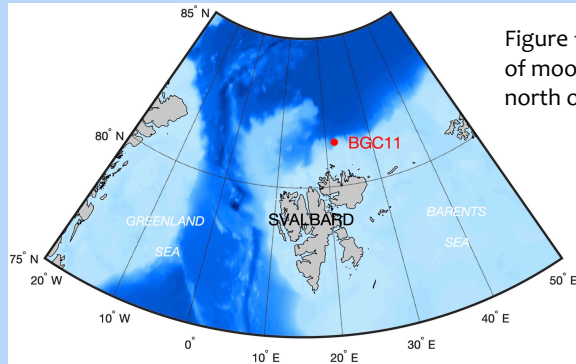


Figure 1. Location of mooring BGC 11 north of Svalbard



Figure 2. KV Svalbard during the 2018 expedition

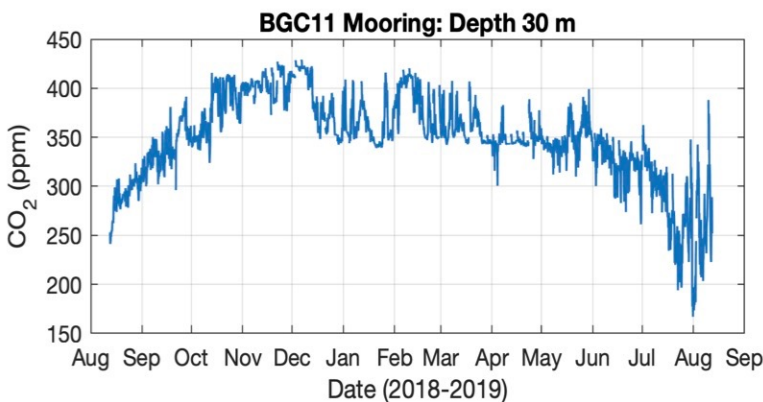


Figure 3. Time series of CO₂ at 30 m depth

The climate and ecosystem modelling community is the main user group. The data will contribute to the global carbon budget estimates, and to aid in our understanding of how ocean acidification will impact ecosystems in the Arctic. The data will help improve future forecasts of ecosystem changes.



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