

Annual Summary 2022

The Arctic Observing Network: Renewing Observations at the Davis Strait Gateway

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The Davis Strait observatory is a long-term program, started in 2004, focused on documenting and understanding the exchange of freshwater and heat between the Arctic Ocean and the North Atlantic. Heat carried northward by the ocean can accelerate the melting of Greenland's glaciers, with large impacts on local ecosystems, on the equator-to-pole movement of heat in the global ocean, and on global sea level rise. Freshwater exiting the Arctic has impact on northern ecosystems and on the equator-to-pole movement of heat in the global ocean. Measurements of ocean temperature, salinity and currents, and of the sounds made by marine mammals, are collected by a line of 12 moorings (strings of science instruments suspended from a float that is anchored to the sea floor) at locations spanning Davis Strait. These moorings are serviced every other year using a research ship. During the mooring service cruise, we also collect measurements of temperature, salinity and chemical properties at multiple sites along lines that cross southern Baffin Bay, Davis Strait and the northern Labrador Sea. The original project operated from 2004-2017, while this new effort supports measurements from fall 2020 through at least fall 2024. All data are freely available for download at the US Arctic Observing Network archive (<https://arcticdata.io>) or by request to craiglee@uw.edu. Results from research using this data are published in open scientific journals.

In summer 2022, we used the US research vessel RV Neil Armstrong to service the entire mooring array, recovering moorings deployed in 2020 and 2021, and redeploying new instruments at the same site. This included the moorings BI-2 and BI-4, sited off the coast of Baffin Island, in Nunavut waters, deployed on 4 August, 2021 from the Greenlandic research vessel R/V Sanna. Mooring BI-2 was located at 66° 38.8' N, 61° 13.4' W, and mooring BI-4 at 66° 39.5' N, 61° 10.2' W. These moorings were recovered on 3 October 2022, with new moorings deployed at the same sites on 12 October 2022. These moorings will be recovered in autumn 2024.

In addition to service the moorings, the 2022 Neil Armstrong cruise collected scientific measurements in Baffin Bay and in the northern Labrador Sea. Sites extended west to east across Baffin Bay and included some locations over the Baffin Island shelf, within Nunavut waters. Measurements included physical, chemical (such as nutrients, carbon parameters) and biological (such as chlorophyll concentrations, phytoplankton and zooplankton species, seabird counts) parameters. A detailed account of measurement sites and parameters can be found in the attached cruise report.