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Beaufort Gyre Exploration Project: Overview

We ask that the following acknowledgment be given when Beaufort Gyre Project data are used: "The data were collected and made available by the Beaufort Gyre Exploration Program based at the Woods Hole Oceanographic Institution (http://www.whoi.edu/beaufortgyre) in collaboration with researchers from Fisheries and Oceans Canada at the Institute of Ocean Sciences." If you are using Beaufort Gyre Program data, please provide us with a citation to include in our compilation of publications that utilize Beaufort Gyre data and send this to Andrey Proshutinsky aproshutinsky@whoi.edu and Rick Krishfield rkrishfield@whoi.edu.

In order to explore our hypothesis concerning the accumulation and release of freshwater in the Beaufort Gyre (see Overview-Background), our investigation consists of a combination of three approaches: observations, historical data analysis and synthesis, and modeling.

The major goal of the observational program is to determine the variability of different components of the BG fresh water (ocean and sea ice) system and to assess the partial concentrations of fresh water of different origin (rivers, Pacific Ocean, precipitation, ice/snow melt, etc). Using moorings, drifting buoys, shipboard, and remote sensing measurements we have been measuring time series of temperature, salinity, currents, geochemical tracers, sea ice draft, and sea level since August 2003, to determine freshwater content and freshwater fluxes in the BG during a complete seasonal cycle and beyond.

The moorings precisely measure the variations of the freshwater and heat content and sea ice draft at representative locations (see Methods - Instruments). The repeat hydrographic and geochemistry ocean sections examine variability of ocean and ice characteristics in the region in time and space. The remote sensing program goal is to characterize the variability of the sea ice thickness and sea surface height horizontal structure.

Hydrographic timeseries plots from drifting ice beacons deployed in August 2003 are available at: Buoy data.

Pre-processed and calibrated data from the moorings available at Mooring data.

Calibrated data from the hydrographic surveys (CTDs) are available at Hydrographic surveys.

The major objective of the historical data analysis is to synthesize and to integrate all available observations with modeling studies to reveal processes, linkages and causes of variability of freshwater content and fluxes in the Western Arctic. Some compiled and re-processed oceanic data sets collected over the last 60 years have been used to calculate freshwater content and steric heights in the BG region. Differences between decades indicate pronounced changes have occurred in the state of the Beaufort Gyre system. Results from upper ocean models are compared to the observational databases, but do not adequately describe the changes in freshwater content.

A description and plots of these analyzed historical data are available at: Historical and model data. More than 40 papers have been published based on the BG data collected since 2003 (see Publications).

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