SBI WINTER 2003 CRUISE
Nutrients and Sea Water $^{18}O/^{16}O$ Contents from Water Collections.
1 - 15 April 2003

By:

P.I.: John P. Christensen Bigelow Laboratory
180 McKown Point
West Boothbay Harbor ME 04575
207-633-9600
jchristensen @ bigelow.org

Co.P.I. Humfrey Melling Institute of Ocean Sciences
P.O. Box 6000
Sidney BC V8L 4B2 Canada

Grant #: NSF (OPP) 0125313

SAMPLING. As part of the Shelf-Basin Interactions (SBI) project, early spring sampling was performed in the eastern area of the SBI study area using aircraft. Flights began on 1 April 2003 and finished on 15 April. During this time, we sampled 42 sites (49 CTD casts) on a series of 5 transect lines which bracketed and were parallel to the SBI current meter mooring line located at 152^{o}W longitude (Fig. 1). Stations were about 10 km apart along each transect line. Transect lines B, C, and D were at the same spacing; while, lines A and E were 20 km from the nearest transect line. A map of the achieved sampling sites is available (file: SW3LOC4A.pdf) and station locations, sampling dates and times are found in the file, SW3VIT-4.pdf.

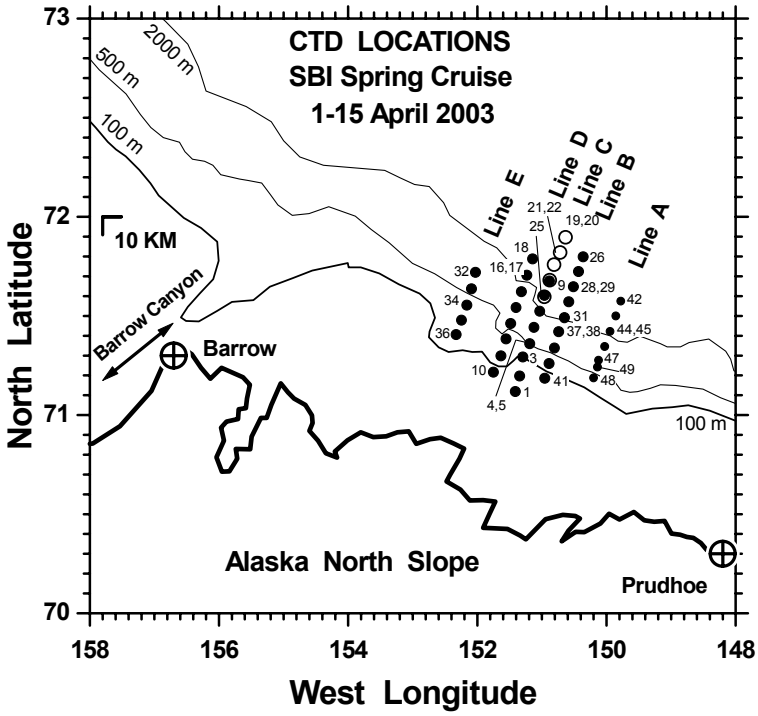

Figure 1. Station locations during the expedition, SBI Winter 2003. CTD numbers are adjacent to the location. The SBI current meter mooring line is between transect lines D and E.

At each site, a Seabird CTD (either a SBE-19 or an SBE-25) and Satlantic ISUS nitrate analyzer with a water sampling bottle was deployed through an 8 inch hole augured through the pack-ice. Continuous profiles of pressure, temperature, salinity, and nitrate concentrations (not reported here) were made from the ice hole to either the sediment surface or to about 390 m and were binned into 0.5 dbar bins. Data from the vertical profiles of temperature, salinity, and density are listed in this EOL/SBI data directory. Approximately 60 of seawater were collected from up to 8 sampling depths. Waters were subdivided into 30 ml for dissolved nutrient analyses and 20 ml for determination of the isotopic ratio of $^{18}O/^{16}O$ in the sea water. Samples were frozen for return to Maine. Nutrients (nitrate, nitrite, ammonium, inorganic phosphate, and dissolved silica) were determined by autoanalyzer at the Scripps Institute of Oceanography Nutrient Chemistry Laboratory according to WOCE protocols. The oxygen isotope samples were determined at the University of Maine's Stable Isotope Laboratory with standard mean ocean water as standard.

The data are reported in the comma-separated-value ASCII file, SW3BOTLE.CSV, which consists of a header of 17 rows followed by the data portion of the table. The data portion consists of 17 columns of 181 rows where each row represents a sample from a separate Niskin bottle. Column 1 is the CTD number. Column 2 is the center depth of the pressure bins (dbar). Column 3 is the average depth of all data within the bin (meters). Column 4 is the average temperature within the bin (degrees C). Column 5 is the average potential temperature within the bin (degrees C). Column 6 is the average salinity in the bin. Column 7 is the sigma-t in the bin (kg/m^3). Column 8 is the nitrate (NO_3^-) concentration (μmol/L). Column 9 is the nitrite (NO_2^-) concentration (μmol/L). Column 10 is the sum of nitrate and nitrite concentrations found in the previous two columns. Column 11 is the ammonium (NH_4^+) concentration (μmol/L). Column 12 is the total inorganic nitrogen concentration which is the sum of nitrate, nitrite, and ammonium concentrations. Column 13 is the inorganic phosphate (PO_4^{-3}) concentration (μmol/L). Column 14 is the dissolved reactive silicate concentration (μmol/L). Column 15 - 17 are the ^{18}O isotopic contents (per mil relative to SMOW). Columns 15 and 16 are the results of first and a repeat measurement (if made) of the same isotopic sample bottle. Column 17 is the average of these measurements. Dummy values are -9, -99 or -999 and represent no measurement.

This report is file SW3BOTLE.PDF.