TITLE: **SWL2002_Chem-Merged_README.docx**

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ORIGINAL AWARD TITLE: Pacific Marine Arctic Regional Synthesis (PacMARS)

DATA ARCHIVE: PacMARS data archive data link http://pacmars.eol.ucar.edu

DATASET OVERVIEW:
This dataset includes measurements of water samples collected at hydrographic stations from the annual Canadian Coast Guard Service Sir Wilfrid Laurier cruise during July 2002. Data includes by column, Cruise #, Event #, Station Number (#), Station Name (Stn. Name), Station Water Depth (m), Date (yy/mm/dd), time (hh:mm), latitude (°N), and longitude (°W), nominal depth (w), Rosette Bottle #, Sample Number, bottle trip location, raw CTD data (pressure, temperature (°C), Salinity, dissolved Oxygen concentration, Chlorophyll a concentration, nutrients (Phosphate, Silica, Nitrite+Nitrate, Ammonium) and delta-O18 (stable oxygen isotope) values. Additional parameters in the columns from sensors and data descriptors are provided in this file and defined below.

INSTRUMENT DESCRIPTION:
Water samples were collected from rosette bottles attached to a Seabird Model SBE19 CTD for nutrients, chlorophyll and oxygen-18/16 ratios. Water temperature, salinity, and other data that were electronically measured with sensors on the CTD are also provided for the depths where each bottle was closed.

DATA COLLECTION AND PROCESSING
Water column collections included water sampling for inorganic nutrients, dissolved oxygen, oxygen-18/16 ratios of seawater, and chlorophyll *a* at up to 6 depths at each station from the rosette bottles. Sensor data for temperature and salinity are also included. Subsamples for inorganic nutrients were collected from the CTD rosette, filtered shipboard, and frozen for post cruise analyses. Nutrient samples were processed by technical support at the Institute of Ocean Sciences, Department of Fisheries and Oceans Canada as part of a collaborative study. Samples were processed for all 4 nutrients: phosphate, nitrite + nitrate, silica, and to a limited extent, ammonia, as well as dissolved oxygen. Water samples for $^{18}O/^{16}O$ ratios were collected in small vials, sealed to prevent evaporation and returned to the lab for analysis. These samples were analyzed at the University of Tennessee using a Thermo DeltaPlus Stable Isotope Mass Spectrometer. The water column chlorophyll was analyzed shipboard using a Turner Designs AU-20 fluorometer (non-acidfication or Welschmeyer method) following a 24-hour in the dark incubation with 90% acetone at 4°C method (see Cooper et al. 2012, 2013 for further details).

There are 11 tabs within this file:

Tab 1 “2002-20 chem” is the data file with the parameters listed in more detail in the data format below.
Tab 2 “Cast Notes”-self explanatory
Tab 3 “Data Notes”-self explanatory
Tab 4 “Electronic log” provides a listing of events at each station, date time, and inventory of components for the full Canadian-US cruise.
Tab 5 “Bottle-rawCTDvalues”
Tab 6 “Sample List”
Tab 7 “HCH Analysis”
Tab 8 “Arctic200220nutrients”
Tab 9 “Nuts sorted”
Tab 10 “salinity 2002-20”
Tab 11 “Salinity 2002-20_Feb4_edited”

DATA FORMAT

Data File Structure:
File Names (Formats): **2002_SWL_Chem-Merged.xls**

Files Data Parameters by Column:

A	(empty)
B	Event number
C	Station name - based on transect names, see cruise report
D	Date (mmddyyyy)
E	Time (UTC) (hh:mm)
F-G	Columns to convert lat to decimal degrees
H	Latitude hemisphere (N)
I	Latitude in decimal degrees
J-K	Longitude degrees (W)
L	Longitude hemisphere (W)
M	Longitude in decimal degrees
N	Water depth (m)
O	Cast depth (db)
P	Sample Number
Q	Activity
R	Raw CTD sensor pressure depth
S	Bottle number-discrete bottle number on rosette; typically lower numbered bottles were in deeper water
T	Assigned sample number
U	Bottle integrity
V	Tripping direction (downcast or upcast)
W	Raw date July
X	Raw CTD sensor bottle number
Y	Raw CTD sensor nominal targeted depth in water column (m)
Z	Raw CTD sensor pressure (dbar)
AA	Raw CTD sensor temperature (C)
AB	Raw CTD sensor salinity (psu)
AC	Raw CTD sensor oxygen (ml/L)
AD	Raw CTD sensor fluorescence
AE	Raw CTD transmission (%)
AF	Raw CTD sensor StdDev temperature-standard deviation for temperature

AG Raw CTD sensor StdDev conductivity- standard deviation for conductivity
AH Station (Bottom water salinity)
AI Salinity bottle value (psu)
AJ Sample number salinity bottle
AK Salinity comments.
AL Station nutrients
AM Nutrient sample number
AN Nitrate replicate 1(µM) - AN-BI are nutrient samples measured at IOS
AO Baseline correction (µM)
AP Nitrate replicate 1-corr (µM)
AQ Nitrate replicate 2 (µM)
AR Baseline Correction (µM)
AS Nitrate replicate 2-corr (µM)
AT Nitrate replicate 1-corr-avg (µM)
AU Dilution
AV Nitrate replicate 1 diff bet dups
AW Nitrate+Nitrite (µM) (corrected for dilution)
AX Silicate replicate 1(µM)
AY Silicate replicate 2 (µM)
AZ Silicate replicate avg (µM)
BA Dilution factor
BB Silicate (µM) diff bet dups
BC Silicate (µM) (corrected for dilution)
BD Phosphate replicate 1 (µM)
BE Phosphate replicate 2 (µM)
BF Phosphate avg (µM)
BG Dilution
BH Phosphate (µM) diff bet dups
BI Phosphate (µM) (corrected for dilution)
BJ Chlorophyll (µg/L) - Run at sea using Turner Designs fluorometer - BJ-BN are nutrient samples measured at Marine Science Institute, UC Santa Barbara
BK Phosphate (µM)
BL Silica (µM)
BM Nitrate+Nitrite (µM)
BN Ammonia (µM)
BO Delta O-18 (per mil) - Samples measured at the University of Tennessee

Data Version Number and Date: Version 1, 05/07/14

Software Compatibility: This dataset will be posted in Microsoft Excel for Mac 2011, Version 14.4.1

REFERENCES

Cooper, L.W., M.A. Janout, K.E. Frey, R. Pirtle-Levy, M.L. Guarinello, J.M. Grebmeier, and J.R. Lovvorn. 2012. The relationship between sea ice break-up, water mass variation, chlorophyll biomass, and sedimentation in the northern Bering Sea. Deep Sea Research Part II 65, 141-162; doi:10.1016/j.dsr2.2012.02.002.

Cooper, L.W, M.G. Sexson, J.M. Grebmeier, R. Gradinger, C.W. Mordy, J.R. Lovvorn. 2013. Linkages Between Sea Ice Coverage, Pelagic-Benthic Coupling and the Distribution of

Spectacled Eiders: Observations in March 2008, 2009 and 2010 from the Northern Bering Sea, Deep Sea Research Part II, Topical Studies in Oceanography, 94, 31-43.