TITLE: **SWL2004_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 2004. 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 6 tabs within this file:

Tab 1 "2004-13_SWL_Chem" is the data file with the parameters listed in more detail in the data format below. Nutrient data are from the University of Tennessee; IOS nutrient data are in tab 5
Tab 2 "Cast Notes"-self explanatory
Tab 3 "Data Notes"-self explanatory
Tab 4 "Electronic Sample Log" provides a listing of events at each station, date time, and inventory of components for the full Canadian-US cruise.
Tab 5 2004_13_ctd-final-chem_May2008- is a listing of the specific CTD file name, station, cast #, date/time, latitude, longitude, and station water depth
Tab 6 "Printout Logsheet"

DATA FORMAT

Data File Structure:
File Names (Formats): **2004_SWL_Chem-Merged.xls**

Files Data Parameters by Column:

A	(empty)
B	Cast #
C	Station name – based on transect names, see cruise report
D	Cast start time (UTC) (dd:mm:yy hh:mm)
E-F	Columns to convert lat to decimal degrees
G-H	Columns to convert long to decimal degrees
I	Bottom depth (m)
J	Cast depth (db)
K	Latitude in decimal degrees
L	Longitude in decimal degrees
M	Sample #
N	Raw nominal pressure
O	Bottle number-discrete bottle number on rosette; typically lower numbered bottles were in deeper water (CTD)
P	Sample #
Q	Bottle integrity
R	Tripping direction (downcast or upcast)
S	Date (July)
T	Trip time (UTC)
U	Raw CTD bottle number
V	Nominal targeted depth in water column (m)
W	Raw CTD sensor pressure depth
X	Raw CTD sensor temperature (C)
Y	Raw CTD sensor salinity (psu)
Z	Raw CTD sensor chla (ug/L)
AA	Raw CTD sensor transmission (%)
AB	Raw CTD sensor stdDev Temp-standard deviation for temperature
AC	Raw CT sensor StdDev Cond – standard deviation for conductivity
AD	Raw CT sensor StdDev Salinity – standard deviation for salinity
AE	Salinity bottle value (psu) – AE-AZ analyzed at IOS
AF	Salinity bottle value (psu) dup
AG	Difference between CTD salinity (raw) and bottom water salinity
AH	Bottom water salinity - data quality & comments
AI	Sample number

AJ Nitrate+Nitrite replicate 1 (µm/L)
AK Nitrate+Nitrite replicate 2 (µm/L)
AL Diff
AM Diff sqr'd
AN Silicate replicate 1 (µm/L)
AO Silicate replicate 2 (µm/L)
AP Diff
AQ Diff sqr'd
AR Phosphate replicate 1 ((µm/L)
AS Phosphate replicate 2 (µm/L)
AT Diff
AU Diff sqr'd
AV Phosphate analyzed from plastic tube
AW Data flag (See notes)
AX Oxygen-18 (per mill) (avg. of 2 samples in a few cases) These samples were analyzed at the University of Tennessee
AY Ba (nM)
AZ Ba (nM) dupl
BA Phosphate (µM) – BA-BG nutrients analyzed at University of California, Santa Barbara
BB Silicate (µM)
BC Nitrate+Nitrite (µM)
BD Ammonia (µM)
BE Chlorophyll (µg/L)
BF Nominal Depth (m)
BG UT Depth (m) from chlorophyll data sheets
BH END
BI Scaled Chla-CTD (µg/L)
BJ CTD log (Chla) scaled
BK BOT log (Chla)
BL Diff log CTD-BOT

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.