

**TITLE:** SWL2005\_Chem-Merged\_README.docx  
**AUTHORS:** Lee W. Cooper and Jackie Grebmeier  
University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory  
tel: +1-410-326-7359 (LC), +1 410-326-7334 (JG),  
fax: +1 410-326-7302  
email: [cooper@cbl.umces.edu](mailto:cooper@cbl.umces.edu), [jgrebmei@cbl.umces.edu](mailto:jgrebmei@cbl.umces.edu)  
website: <http://arctic.cbl.umces.edu>

**FUNDING SOURCE/GRANT NUMBER:** North Pacific Research Board (NPRB) Project #A01/T2201

**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 2005. 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 <sup>18</sup>O/<sup>16</sup>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-acidification 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 5 tabs within this file:

Tab 1 "2005-05\_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

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 "Printout Logsheet"

## DATA FORMAT

Data File Structure:

File Names (Formats): **2005\_SWL\_Chem-Merged.xls**

Files Data Parameters by Column:

A	(empty)
B	Cast #
C	Station number
D	Bottle number
E	Time zone (UTC)
F	Date (mm/dd/yyyy) (UTC)
G	Start time (hh:mm) (UTC)
H-I	Columns to convert lat to decimal degrees
J	North
K	Latitude in decimal degrees
L-M	Columns to convert long to decimal degrees
N	West
O	Longitude in decimal degrees
P	Water depth (m)
Q	Cast depth (db)
R	Sample numbers
S	Bottle integrity
T	Tripping direction (downcast or upcast)
U	Bottle number-discrete bottle number on rosette; typically lower numbered bottles were in deeper water
V	Nominal targeted depth in water column (m)
W	Raw CTD sensor pressure depth (dbar)
X	Raw CTD sensor temperature (C)
Y	Raw CTD sensor conductivity (mS/cm)
Z	Raw CTD sensor salinity (psu)
AA	Raw CTD sensor oxygen (ml/L)
AB	Raw CTD sensor Chla (µg/L)
AC	Raw CTD sensor transmission (%)
AD	StdDev Temperature – standard deviation for temperature
AE	StdDev Conductivity – standard deviation for conductivity
AF	StdDev Salinity – standard deviation for salinity
AG	Sample number
AH	Salinity bottle value (psu) – AH-BC analyzed at IOS
AI	Salinity bottle value (psu) dup
AJ	Difference between CTD salinity and bottom water salinity
AK	Bottom water salinity - data quality & comments
AL	Dif betw'n s_1 and S-2
AM	Dif sqr'd

AN	Depth
AO	Nitrate+Nitrite replicate 1 ( $\mu\text{M}$ )
AP	Nitrate+Nitrite replicate 2 ( $\mu\text{M}$ )
AQ	Nitrate+Nitrite ( $\mu\text{M}$ ) diff dups
AR	Nitrate+Nitrite ( $\mu\text{M}$ ) diff. squared
AS	Silicate replicate 1 ( $\mu\text{M}$ )
AT	Silicate replicate 2 ( $\mu\text{M}$ )
AU	Silicate diff dups
AV	Silicate ( $\mu\text{M}$ ) diff. squared
AW	Phosphate replicate 1 ( $\mu\text{M}$ )
AX	Phosphate replicate 2 ( $\mu\text{M}$ )
AY	Phosphate ( $\mu\text{M}$ ) diff dups
AZ	Phosphate ( $\mu\text{M}$ ) diff. squared
BA	Dissolved oxygen bottle ( $\mu\text{M}$ )
BB	Oxygen-18 (per mill) These samples analyzed at the University of Tennessee
BC	Ba (nM)
BD	Depth – BD-BJ nutrients analyzed at University of California, Santa Barbara
BE	Phosphate ( $\mu\text{M}$ )
BF	Silicate ( $\mu\text{M}$ )
BG	Nitrate + Nitrite ( $\mu\text{M}$ )
BH	Ammonia ( $\mu\text{M}$ )
BI	Chl-A ( $\mu\text{g/L}$ )
BJ	END
BK	Chla ( $\mu\text{g/L}$ ) CTD Scaled X

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.