

**TITLE:** SWL2006\_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 2006. 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 8 tabs within this file:

- Tab 1 "2006-01\_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 2 "Cast Notes"-self explanatory
- Tab 3 "Data Notes"-self explanatory
- Tab 4 "Sampling PLAN" provides a listing of events at each station, date time, and inventory of components for the full Canadian-US cruise.
- Tab 5 "Chla-comparison"
- Tab 6 "original rosette sheet"
- Tab 7 "other depths rosette"
- Tab 8 "Rosette-budget&sampling"

## DATA FORMAT

### Data File Structure:

File Names (Formats): **2006\_SWL\_Chem-Merged.xls**

### Files Data Parameters by Column:

- A (empty)
- B Event number
- C Cast number
- D Station name - based on transect names, see cruise report
- E Cast start time (UTC) (mm/dd/yyyy)
- F Start time (UTC) (hh:mm)
- G-H Columns to convert lat to decimal degrees
- I Latitude in decimal degrees
- J-K Columns to convert long to decimal degrees
- L Longitude in decimal degrees
- M Station water column depth (m)
- N Cast depth (db)
- O Sample number
- P Raw nominal pressure
- Q Bottle number-discrete bottle number on rosette; typically lower numbered bottles were in deeper water
- R Sample number
- S Bottle integrity
- T Tripping direction (downcast or upcast)
- U Raw CTD date this column is empty
- V Raw CTD bottle number this column is empty
- W Nominal targeted depth in water column (m)
- X Raw CTD sensor pressure depth (dbar) FINAL
- Y Raw CTD sensor temperature (C) FINAL
- Z Raw CTD sensor conductivity (mS/cm) FINAL
- AA Raw CTD sensor salinity (psu) FINAL
- AB Raw CTD sensor oxygen (mL/L) NOMINAL
- AC Raw CTD sensor chla ( $\mu\text{g/L}$ ) FINAL
- AD Raw CTD sensor transmission (%) FINAL
- AE Raw CTD sensor stdDev Temp – standard deviation for temperature FINAL
- AF Raw CT sensor StdDev Cond – standard deviation for conductivity FINAL
- AG Raw CT sensor StdDev Sal – standard deviation for salinity FINAL
- AH Salinity bottle value (psu)
- AI Salinity bottle value (psu) dup

AJ Difference CTD salinity (raw) & bottom water salinity  
 AK Bottom water salinity - data quality & comments  
 AL Nutrient sample number  
 AM Nitrate+Nitrite replicate 1 ( $\mu\text{M}$ ) Columns AM-AU analyzed by IOS; replicates shown in second column with differences between replicates where applicable.  
 AN Nitrate+Nitrite replicate 2 ( $\mu\text{M}$ )  
 AO Nitrate+Nitrite ( $\mu\text{M}$ ) diff dups  
 AP Silicate replicate 1 ( $\mu\text{M}$ )  
 AQ Silicate replicate 2 ( $\mu\text{M}$ )  
 AR Silicate ( $\mu\text{M}$ ) diff dups  
 AS Phosphate replicate 1 ( $\mu\text{M}$ )  
 AT Phosphate replicate 2 ( $\mu\text{M}$ )  
 AU Phosphate ( $\mu\text{M}$ ) difference between duplicates  
 AV Delta O-18 (per mil) Measured at University of Tennessee  
 AW Ba (nM)  
 AX Silicate ( $\mu\text{M}$ ) – AX-BC Samples measured at University of Tennessee  
 AY Nitrate+Nitrite ( $\mu\text{M}$ )  
 AZ Phosphate ( $\mu\text{M}$ )  
 BA Ammonia ( $\mu\text{M}$ )  
 BB Chl-a ( $\mu\text{g/L}$ ) (JG)  
 BC Dissolved oxygen bottle ( $\mu\text{M}$ ) (JG)  
 BD Station name  
 BE Raw nominal pressure  
 BF END  
 BG Chla CTD-bottle

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.