

TITLE: SWL2013_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, 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 2013. 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, Nitrate+Nitrite, 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. Some 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 ¹⁸O/¹⁶O ratios were collected in small vials, sealed to prevent evaporation and returned to the lab for analysis. These samples were analyzed at the Chesapeake Biological Laboratory 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 6 tabs within this file:

- Tab 1 "2012-09_SWL_Chem" is the data file with the parameters listed in more detail in the data format below. Nutrient data are from MSI Lab, UC Santa Barbara
- Tab 2 "Cast Event Notes"-self explanatory
- Tab 3 "Overview and 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 "Bottle Quality"
- Tab 6 "2012-09_SWL_Sample List"

Data File Structure:

File Names (Formats): **2013_SWL_Chem-Merged.xls**

Files Data Parameters by Column:

- A Cruise #
- B Cast #
- C Station name
- D place holder
- E Cast start time [UTC]
- F-H Columns to convert lat to decimal degrees
- I Latitude in decimal degrees
- J-L Columns to convert long to decimal degrees
- M Longitude in decimal degrees
- N Station water column depth (m)
- O Cast depth [m]
- P Raw pressure [dbar]
- Q Sample # [All others match to this sample number]
- R Bottle integrity [0=good, 1=leak, 2=bad]
- S Tripping direction (downcast or upcast) [US (up stop), UN (up no stop), USM (up stop mix) or DN (down no stop)]
- T Rosette bottle #
- U CTD Salinity 0
- V CTD Salinity 1
- W SBEox (mL/L) dissolved oxygen sensor
- X Sigma-e
- Y Scan
- Z T0 90C
- AA T1 90C
- AB Xmiss
- AC FLSP
- AD Alt M
- AE Salt Sample #
- AF Salt-1
- AG IOS QF-1
- AH Salt-2
- AI IOS QF-2
- AJ Analyst Comment
- AK Salt
- AL IOS QF
- AM Oxygen Sample #
- AN Oxygen-1 [ml/L]
- AO IOS QF-1

AP	Oxygen-2 [ml/L]
AQ	IOS QF-2
AR	Analyst Comment
AS	Oxygen [mL/L]
AT	Oxygen [μ M]
AU	IOS QF
AV	Nutrient Sample #
AW	Frozen sample
AX	Nitrate+Nitrite-1 [μ M]
AY	IOS QF-1
AZ	Nitrate+Nitrite-2 [μ M]
BA	IOS QF-2
BB	Analyst Comment
BC	Silicate-1 [μ M]
BD	IOS QF-1
BE	Silicate-2 [μ M]
BF	IOS QF-2
BG	Analyst Comment
BH	Phosphate-1 [μ M]
BI	IOS QF-1
BJ	Phosphate-2 [μ M]
BK	IOS QF-2
BL	Analyst Comment
BM	Nitrate+Nitrite [μ M]
BN	IOS QF
BO	Silicate [μ M]
BP	IOS QF
BQ	Phosphate [μ M]
BR	IOS QF
BS	Ammonia [μ M]
BT	Chl Sample #
BU	Filtered Volume [L]
BV	Filtered Volume -2 [L]
BW	Extraceted Volume [L]
BX	Extraceted Volume -2 [L]
BY	ChITOT-1 reading
BZ	IOS QF-1
CA	ChITOT-2 [μ g/L]
CB	IOS QF-2
CC	PhaeTOT-1 [μ g/L]
CD	IOS QF-1
CE	PhaeTOT-2 [μ g/L]
CF	IOS QF-2
CG	Analyst Comment
CH	ChITOT [μ g/L]
CI	IOS QF
CJ	PhaeTOT [μ g/L]
CK	IOS QF
CL	DIC Sample #
CM	DIC System
CN	DIC-1 [μ mol/kg]

CO IOS QF-1
CP DIC-2 [$\mu\text{mol/kg}$]
CQ IOS QF-2
CR DIC [$\mu\text{mol/kg}$]
CS IOS QF
CT Alkalinity Sample #
CU Alkalinity-1 System
CV Alkalinity-1 [$\mu\text{mol/kg}$]
CW IOS QF-1
CX Alkalinity-2 System
CY Alkalinity-2 [$\mu\text{mol/kg}$]
CZ IOS QF-2
DA Alkalinity [$\mu\text{mol/kg}$]
DB IOS QF
DC O18 Sample #
DD O18-1 [‰ VSMOW]
DE IOS QF-1
DF O18-2 [‰ VSMOW]
DG IOS QF-2
DH dup or re
DI O18 [‰ VSMOW]
DJ IOS QF
DK Sort Reference
DL END

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.