

**TITLE:** SWL2011\_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 2011. 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 Maryland Center for Environmental Science 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 "2011\_18S\_SWL\_Chem" is the data file with the parameters listed in more detail in the data format below. Nutrient data (columns BT-CK) are from NASL Laboratory at the Chesapeake Bay Laboratory

Tab 2 "Cast Event Notes"-self explanatory

Tab 3 "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 "For ODV"

Tab 6 "Nutrients Compare"

Tab 7 "Nuts compare data"

Tab 8 "Bottle Quality"

Data File Structure:

File Names (Formats): **2011\_SWL\_Chem-Merged.xls**

Files Data Parameters by Column:

A	Cruise #
B	Cast #
C	Station Name
D	place holder
E	Cast start time [UTC] (mm/dd/yyyy , hh:mm)
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) oxygen sensor on CTD
X	Sigma-t (density)
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	QC Process
AL	Salt

AM	IOS QF
AN	Oxygen Sample #
AO	Oxygen-1 [mL/L]
AP	IOS QF-1
AQ	Oxygen-2 [mL/L]
AR	IOS QF-2
AS	Analyst Comment
AT	Oxygen [mL/L]
AU	Oxygen [ $\mu$ M]
AV	IOS QF
AW	Nutrient sample #
AX	Frozen sample
AY	Nitrate+Nitrite-1 [ $\mu$ M]
AZ	IOS QF-1
BA	Nitrate+Nitrite-2 [ $\mu$ M]
BB	IOS QF-2
BC	Analyst Comment
BD	Silicate-1 [ $\mu$ M]
BE	IOS QF-1
BF	Silicate-2 [ $\mu$ M]
BG	IOS QF-2
BH	Analyst Comment
BI	Phosphate-1 [ $\mu$ M]
BJ	IOS QF-1
BK	Phosphate-2 [ $\mu$ M]
BL	IOS QF-2
BM	Analyst Comment
BN	Nitrate+Nitrite [ $\mu$ M]
BO	IOS QF
BP	Silicate [ $\mu$ M]
BQ	IOS QF
BR	Phosphate [ $\mu$ M]
BS	IOS QF
BT	Nutrient Sample # (Grebmeier) Nutrients data from columns BT through CL were analyzed at the Nutrient Analytical Services Laboratory at the Chesapeake Biological Lab.
BU	Frozen sample (Grebmeier)
BV	Nitrate+Nitrite-1 [ $\mu$ M] (Grebmeier)
BW	IOS QF-1 (Grebmeier)
BX	Silicate-1 [ $\mu$ M] (Grebmeier)
BY	IOS QF-1 (Grebmeier)
BZ	Phosphate-1 [ $\mu$ M] (Grebmeier)
CA	IOS QF-1 (Grebmeier)
CB	Ammonia-1 [ $\mu$ M] (Grebmeier)
CC	IOS QF-1 (Grebmeier)
CD	Analyst Comment (Grebmeier)
CE	Nitrate+Nitrite [ $\mu$ M] (Grebmeier)
CF	IOS QF (Grebmeier)
CG	Silicate [ $\mu$ M] (Grebmeier)
CH	IOS QF (Grebmeier)
CI	Phosphate [ $\mu$ M] (Grebmeier)
CJ	IOS QF (Grebmeier)

CK Ammonia [ $\mu\text{M}$ ] (Grebmeier)  
CL IOS QF (Grebmeier)  
CM Ndiff (IOS - JG)  
CN Sdiff (IOS - JG)  
CO Pdif x10 (IOS - JG)  
CP Chl Sample # (Grebmeier)  
CQ Filtered Volume [L]  
CR Filtered Volume -2 [L]  
CS Extracted Volume [L]  
CT Extractd Volume -2 [L]  
CU ChITOT-1 [ $\mu\text{g/L}$ ]  
CV IOS QF-1  
CW ChITOT-2 [ $\mu\text{g/L}$ ]  
CX IOS QF-2  
CY PhaeTOT-1 [ $\mu\text{g/L}$ ]  
CZ IOS QF-1  
DA PhaeTOT-2 [ $\mu\text{g/L}$ ]  
DB IOS QF-2  
DC Analyst Comment  
DD ChITOT [ $\mu\text{g/L}$ ] (Grebmeier) chlorophyll measured shipboard  
DE IOS QF (Grebmeier)  
DF PhaeTOT [ $\mu\text{g/L}$ ] (Grebmeier) no data since Welschmeyer method used  
DG IOS QF (Grebmeier)  
DH DIC Sample # (dissolved inorganic carbon)  
DI DIC System  
DJ DIC-1 [ $\mu\text{mol/kg}$ ]  
DK IOS QF-1  
DL DIC-2 [ $\mu\text{mol/kg}$ ]  
DM IOS QF-2  
DN DIC [ $\mu\text{mol/kg}$ ]  
DO IOS QF  
DP Alkalinityalinity Sample #  
DQ Alkalinity-1 System  
DR Alkalinity-1 [ $\mu\text{mol/kg}$ ]  
DS IOS QF-1  
DT Alkalinity-2 System  
DU Alkalinity-2 [ $\mu\text{mol/kg}$ ]  
DV IOS QF-2  
DW Alkalinity [ $\mu\text{mol/kg}$ ]  
DX IOS QF  
DY O18 Sample # IOS  
DZ O18-1 [ $\text{‰}$  VSMOW]  
EA IOS QF-1  
EB O18-2 [ $\text{‰}$  VSMOW]  
EC IOS QF-2  
ED dup or re  
EE O18 [ $\text{‰}$  VSMOW] (IOS)  
EF IOS QF  
EG O18 Sample # (Grebmeier)  
EH O18-1 [ $\text{‰}$  VSMOW] (Grebmeier)  
EI IOS QF-1 (Grebmeier)

EJ O18 [‰ VSMOW] (Grebmeier)  
EK IOS QF (Grebmeier)  
EL Sort Reference  
EM 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.

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