TITLE: **Healy2202-SAS_Bottle_data_README.pdf**

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ORIGINAL AWARD TITLE:

Collaborative Research: Taking the Pulse of the Arctic Ocean - A US Contribution to the International Synoptic Arctic Survey

DATA ARCHIVE: NSA Arctic Data Center link: https://arcticdata.io/

DATASET OVERVIEW:
This dataset includes measurements of water samples collected at hydrographic stations from the annual US Coast Guard Healy cruise during September-October, 2022. Data includes by column, Cruise #, Event #, Station Number (#), Station Name (Stn. Name), Station Water Depth (m), Date and time (UTC) (yy/mm/dd), UTC 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, and other data that were electronically measured with sensors on the CTD are also provided for the depths where each bottle was closed. Salinity data for this cruise are limited to bottle samples measured using a salinometer, as there was a sensor failure on the electronic sensor on the CTD.

DATA COLLECTION AND PROCESSING
Water column collections included water sampling for inorganic nutrients, dissolved oxygen, oxygen-18/16 ratios of seawater, salinity and chlorophyll *a* at up to 6 depths at each station from the rosette bottles. Sensor data for temperature are included but salinity measurements were affected by the sensor failure mentioned above. Subsamples for inorganic nutrients were collected from the CTD rosette, filtered shipboard, and frozen for post cruise analyses. Nutrient samples were processed by either technical support at the Institute of Ocean Sciences (IOS), Department of Fisheries and Oceans Canada (DFO) and/or at the Nutrient Analytical Services Laboratory (NASL) at the Chesapeake Biological Laboratory (CBL), (http://nasl.cbl.umces.edu/) at the University of Maryland Center for Environmental Science (UMCES). Samples were processed for all 4 nutrients: phosphate (PO4), nitrite + nitrate (NO2+NO3), silica (SiO4), and to a limited extent, ammonium (NH4); data on dissolved oxygen are available also from the uncalibrated CTD sensor. Water samples for $^{18}O/^{16}O$ ratios were collected in small vials, sealed to prevent evaporation and returned for analysis. These samples were analyzed at the University of Maryland Center for Environmental Science using a Thermo DeltaPlus Stable Isotope Mass Spectrometer coupled to a Gasbench peripheral. Data are reported in the delta

notation relative to Vienna Standard Mean Ocean Water (V-SMOW). 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).

Data File Structure:
File Names (Formats)*: **Healy2202-SAS_Bottle_data.csv**

Files Data Parameters by Column:

A	StationID	cruise name and ctd #
B	CruiseID	Cruise identifier [nominal]
C	Cast_No	written station # from ship notebook
D	CTD_Num	ctd station #
E	StationNme	cbl station name
F	Rosette_Bottle_No	rosette bottle #
G	DataDate	data collection date (YYYYMMDD)
H	hour	data collection hour
I	minute	data collection minute
J	second	data collection second
K	Latitude	latitude [decimal degrees]
L	Longitude	longitude [decimal degrees]
M	day of the year	day of the year of collection
N	CTDPres_dbar	ctd pressure [db]
O	Depth	water depth [m]
P	CTDTemp_1	temp measurement 1 [C]
Q	CTDTemp_2	temp measurement 2 [C]
R	C0S-m	conductivity measurement 1 [mS/cm]
S	C1S-m	conductivity measurement 2 [mS/cm]
T	V0	voltage channels 0-6 that are converted into data using voltage calibration curves
U	V1	voltage channels 0-6 that are converted into data using voltage calibration curves
V	V2	voltage channels 0-6 that are converted into data using voltage calibration curves
W	V3	voltage channels 0-6 that are converted into data using voltage calibration curves
X	V4	voltage channels 0-6 that are converted into data using voltage calibration curves
Y	V5	voltage channels 0-6 that are converted into data using voltage calibration curves
Z	V6	voltage channels 0-6 that are converted into data using voltage calibration curves
AA	CTDFluo_mg_m3	Fluorescence [mg/m^3]
AB	CTDOxy_mL-L	beam transmission [%]
AC	Beam_Transm_perc	dissolved oxygen [mL/L]
AD	PAR	photosynthetic active radiation [Photosynthetic Photon Flux Density, mol m−2s−1]
AE	altimeter	altimeter, distance above seafloor [meters]
AF	Salinity1	salinity measurement 1 [practical salinity units]
AG	Salinity2	salinity measurement 2 [practical salinity units]
AH	sigmat1	Density measurement 1 [sigma-theta, Kg/m^3]
AI	sigmat2	Density measurement 2 [sigma-theta, Kg/m^3]
AJ	chla	chlorophyll a concentration [µg/L]
AK	Silicate	dissolved silica concentration [mmol/m3]
AL	Nitrite_Nitrate	dissolved nitrite and nitrate concentration [mmol/m3]
AM	Phosphate	dissolved phosphate concentration [mmol/m3]
AN	Ammonia	dissolved ammonia concentration [mmol/m3]
AO	DOC	Dissolved organic carbon [µM]
AP	O18	oxygen isotope ratios [18O/16O, ‰ VSMOW]
AQ	N_P	ration of nitrogen to phosphate (ration; dimensionless)

Data Version Number and Date: Version 1, 06/02/2025

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.