

ReadMe file:

SBI: HLY-04-02 and HLY-04-03 data from Dr. Victoria Hill

TITLE: Primary Productivity data

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DATA SET OVERVIEW:

14C Primary Productivity data.

Data is from two cruises in the Chukchi and Beaufort Seas onboard the USCGC Healy WAGB-20 during the spring (HLY-04-02) and summer (HLY-04-03) of 2004 as part of the SBI phase II project. A summary list of Bio-Optical stations and locations from the two cruises are given in file Stn\_List\_Arc2004.txt.

Time period covered by the data:

Spring cruise (HLY-04-02)	18 May 2004 to 20 June 2002.
Summer cruise (HLY-04-03)	20 July 2002 to 23 August 2002.

Physical location of the measurement

See Stn\_List\_Arc2004.txt for summary list of station locations.

Spring cruise (HLY-04-02) Arc2004-1

Min Lat: 67.49505; Max Lat: 73.13385 (North)

Min Lon:-168.921; Max Lon:-154.299 (West)

Summer cruise (HLY-04-03) Arc2004-2

Min Lat: 67.35578; Max Lat: 73.78698 (North)

Min Lon: -188.896; Max Lon: 1152.023 (West)

## INSTRUMENT DESCRIPTION:

Packard TRI-CARB 2300TR Liquid Scintillation Analyzer

## DATA COLLECTION and PROCESSING:

Carbon fixation was measured in surface waters (<90m) at selected stations between 7-9am (local time), with additional chlorophyll taken in parallel. Discrete samples were collected in 30L Niskin bottles for chlorophyll and productivity measurements. Optical depths for productivity were estimated with the Secchi disk using Holmes (1970) and corresponded to 80-100, 50, 30, 15, 5 and 1% of surface irradiance. These depths are consistent with in situ irradiance measurements taken after the productivity cast using a Satlantic free-falling profiling 13 channel radiometer.

Primary productivity was measured by  $^{14}\text{C}$  (carbon) uptake fixation with simulated in situ (SIS) incubations. Isotope stocks were prepared according to the recommendations of Fitzwater et al., 1982. Our SIS incubator had neutral density and/or blue plastic filters to simulate in situ irradiance spectra at depths consistent with sample collection.

Temperature was regulated with flowing surface seawater. Samples were placed in 280ml polycarbonate bottles and inoculated with 370 kBq  $^{14}\text{C}$ -NaHCO<sub>3</sub> and incubated for ~24 hours. Total activity added and particulate adsorption was measured at time zero in parallel samples. Particulate material was harvested on 25mm Whatman GF/F filters and rinsed with 5-10ml of 0.01 N HCL in filtered seawater to remove inorganic carbon. Radioactivity was assayed by liquid scintillation counting and corrected for particulate adsorption at time zero, background and counting efficiency.

Dataset includes hourly (mg C m<sup>-3</sup> h<sup>-1</sup>) and daily rates (mg C m<sup>-2</sup> d<sup>-1</sup>) of  $^{14}\text{C}$  uptake measured with both short and long incubation periods with matching chlorophyll (mg m<sup>-3</sup>) measuring using the fluorometric method of Holm-Hansen (1965) by Dean Stockwell of the University of Alaska, Fairbanks.

## DATA FORMAT:

Data is in SeaBASS format (ASCII) tab delimited with a SeaBASS header. The headers include parameters, units, time, location, and other Meta data.

## DATA REMARKS:

Missing or questionable data was not included in the submitted data set or is noted in the header information of the file. Negative productivity rates occur when production is too low to be measured. The label -999 signifies missing data.

## REFERENCES:

Fitzwater, S. E., Knauer, G. A., Martin, J. H., 1982. Metal contamination and its effect on primary production measurements. *Limnology and Oceanography*. 27 (3), 544-551.

Holmes, R. W., 1970. The sechi disk in turbid coastal waters. *Limnology and Oceanography*. 15 (5), 688-694.

Holm-Hansen, O., Lorenzen, C. J., Holmes, R. W., and Strickland, J. D. H. (1965), Fluorometric determination of chlorophyll, *J.Cons.perm.int.Explor.Mer.*, 30 (1), 3-15.