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 DATA DESCRIPTION : 'Bottle:Rosette:Up:NoStop and Stop as specified in SAMPLE METHOD’

 $REMARKS

 REPLACE

 Flag channels were initialized with zeros. Non-zero values have the following significance:

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 1 = Sample for this measurement was collected but not analyzed. Sample lost.

 2 = Acceptable Measurement

 3 = Questionable Measurement (Probably Good)

 4 = Poor Measurement (Probably Bad)

 5 = Measurement Not Reported (Bad)

 6 = Mean of replicate measurements

 7 = Manual chromatographic peak measurement

 8 = Irregular digital chromatographic peak integration

 9 = Sample was planned for this measurement from this bottle but was not collected

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 Sampling Methods are expressed with the following codes:

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 ROS:UN - No Stop

 ROS:US - Stop for 30 seconds

 ROS:USM - Up Stop Mix (Stop 30s, up 1m, down 2m, up 1m, wait 30s, close bottle)

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 Bottle Integrity flags are expressed with the following codes:

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 0 = good

 01 = bottom spigot leak

 10 = top valve leak]

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$END

\*COMMENTS

Chemistry Sampling and Analysis Methods:

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**The rosette was not stopped during the upcast when the Niskin bottles were closed. To account for bottle flushing and timing offsets the CTD data associated with the Niskins were taken from -4.4 seconds before the closure based on matching CTD and water sample salinities in the top 300m where the vertical gradient of salinity is high.**

For further information see corresponding processing document in the DOC directory in folder "Individual Data Reports"

Salinity samples were collected in 200 mL type II glass bottles with screw caps and disposable plastic inserts. On board, samples were analyzed in a temperature-controlled lab on a Guildline AutoSalinometer Model 8400B (SN: 69086), which was standardized with IAPSO standard seawater. Onshore, samples from casts 48 – 72, were analyzed February 2-11, 2011 in a temperature-controlled lab on the Guildline AutoSalinometer Model 8400B (SN: 69572), which was standardized with IAPSO standard seawater.

Oxygen samples were collected in ~140 mL calibrated ground glass stoppered Erlenmeyer flasks and analyzed at sea using an automated Scripps Institution of Oceanography (SIO) Winkler-based UV titration system, consisting of laptop with LVO2 software (v2.34), 2 Brinkmann 665 Dosimats, pencil UV lamp, UV100BQ photodiode detector, mini stirrer with a water bath sample holder mounted on top, 2 Platinum Resistance Thermometers (PRT) to monitor solution temperatures, an analogue to digital converter to convert voltages from the detector and the 2 PRTs to a digital signal. The methodology followed was as described in the SIO Oxygen Titration Manual Version 10-Apr-2003.

Nutrient samples (nitrate plus nitrite, silicate and orthophosphate) were collected in polystyrene test tubes. One sample was analyzed on board and one was frozen as a backup for analysis on shore at IOS. For the samples analyzed at sea, if analysis could be performed within 24 hours the samples were stored at 4 degree C, if not they were frozen at -20 degree C. All samples were analyzed fresh on board using a Technicon auto-analyzer following methods described in Barwell-Clarke and Whitney (1996).

Ammonium samples were collected in 40.5 mL glass tubes, and analyzed on board following the Holmes et al. (1999) fluorometric protocol. Samples were kept in the dark for 5 to 8 hours at room temperature. Samples were then measured using a Trilogy fluorometer (Turner Designs) in UV mode.

Oxygen Isotopes Samples were collected into 30 ml glass vials. Once at room temperature, the caps were retightened and the vials inverted for storage. Samples were analyzed at the University of Calgary using a mass spectrometer connected to a H2O-CO2 equilibration unit. Samples were analyzed May to June 2012 (21 to 22 months after collection).

Dissolved Inorganic Carbon (DIC) and Alkalinity:

DIC and Alkalinity were collected into 250 or 500 mL glass bottles. Samples were kept at 4 degree C until analysis and preserved with HGCL2. Samples were analyzed April to May 2011 (7 to 8 months after collection).

Alkalinity ("Alkalinity:Total") and DIC ("Carbon:Dissolved:Inorganic") were measured from the same sample bottle at select stations. In addition, more frequent samples of Alkalinity were collected at most stations and have been labelled "Alkalinity:Total:Potentiometric" to distinguish this set of separate samples, even though both sets of Alkalinity samples were measured using potentiometric titration.

DIC was analyzed at the Institute of Ocean Sciences using two systems, a SOMMA (Single-Operator Multi-Metabolic Analyzer) and a VINDTA - Coulometer systems to determine DIC.

Alkalinity samples were analyzed at the Institute of Ocean Sciences using an automated potentiometric titration system to determine the total alkalinity.

Total Chlorophyll-a (>0.7um) samples were collected into 2-L polyethylene bottles, immediately placed in dark bags and stored in a fridge. Samples were filtered onto 25 mm glass fiber filters (Whatman GF/F) under low vacuum filtration. If the sample could not be filtered immediately, it was kept cool until filtered and the time taken until filtered was noted. Filters were then folded in half in aluminum foil and stored at -80°C for later analysis at IOS. Chlorophyll-a samples were processed following Strickland and Parsons (1972) and modifications from the Joint Global and Ocean Flux Study (JGOFS) Protocols (1994). Filtered chlorophyll-a samples were transferred from an aluminum pouch and placed in a 20 mL scintillation vial. Ten ml of 90%acetone/10% double distilled water was added and the samples were extracted in a -20°C freezer for a 24 +/-2 hours extraction period **and** analyzed on a Turner 10AU fluorometer, calibrated in May 2010 with commercially pure chlorophyll a standard (Sigma). **Fluorescence readings taken before and after acidification were used to calculate chlorophyll and phaeopigment concentrations (Holm-Hansen et al 1965).** Samples were analysed at IOS, November 2010, 2 months after collection.

**Phytoplankton and bacterioplankton were collected in 2 ml capacity cryogenic vial and fixed with 0.2 ml of 10% paraformaldehyde by vortex mixing. Samples were maintained for at least 15 min at laboratory temperature to allow fixation, and then stored at -80 degree C until analysis at the Bedford Institute of Oceanography. Cell concentrations of picophytoplankton, nanophytoplankton, and bacterioplankton (i.e. non-autofluorescent picoplankton) in thawed samples were analyzed by flow cytometry (Becton Dickinson FACSort) following protocols in routine use (Li and Dickie, 2001).**

References:

1. J. Barwell-Clarke and F. Whitney. 1996. Institute of Ocean Sciences Nutrient Methods and

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2. Holm-Hansen, O., Lorenzen, C.J., Holmes, R.W., and Strickland J.D.H. 1965. Fluorometric

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