Cruise: HB1405
Ship: R/V Henry Bigelow
Expocode: 33HH20140902, for Leg1
Expocode: 33HH20140923, for Leg2
Expocode: 33HH20141028, for Leg4
Dates: September 2th – November 5th, 2014 (leg 1, 2 and 4)
Chief Scientist: J. Galbraith (leg 1); Jakub Kircun (leg 2 & 4)
Equipment: TSG-Flow thru system
Total number of stations: 18
Location: U.S. Mid-Atlantic and New England coastal region

The samples were run for Dr. Jon Hare of the NEFSC as part of our coastal ocean acidification monitoring project.

Sample Collection

The discrete samples were collected from the TSG-flow thru system onboard the R/V H. Bigelow by the survey tech Amanda Andrews. The date and time listed in the data file are UTC when each sample bottle was collected.

DIC:
18 locations, 18 samples each 500-ml, no duplicate samples.
Sample_ID#: 90101, etc.; Station, cast number and Niskin bottle number
PI: Dr. Rik Wanninkhof
Analyzed by: Charles Featherstone

pH:
18 locations, 18 samples each 500-ml, no duplicate samples.
Sample_ID#: 90101, etc.; Station, cast number and Niskin bottle number
PI: Dr. Rik Wanninkhof
Analyzed by: Charles Featherstone

TAlk:
18 locations, 18 samples each 500-ml, no duplicate samples.
Sample_ID#: 90101, etc.; Station, cast number and Niskin bottle number
PI: Dr. Rik Wanninkhof
Analyzed by: Dr. Leticia Barbero, Dr. Denis Pierrot and Charles Featherstone

Sample Analysis
DIC:

Instrument ID	Date	Certified CRM (µmol/kg)	CRM Value (µmol/kg)	CRM Offset (µmol/kg)	Blank (Counts)	Avg. Sample Analysis Time

AOML 3	01/16/2015	2016.65	2012.36	4.29	12.0	10
AOML 4	01/16/2015	2016.65	2016.95	0.30	28.0	11

Analysis date: 01/16/2015
Coulometer used: DICE–CM5015- AOML 3
Blanks: 12.0 counts/min
CRM # 0359 was used and with an assigned value of (includes both DIC and salinity):
Batch 129, c: 2016.65 µmol/kg, S: 33.361
CRM values measured: AOML 3: offset 4.29 µmol/kg (2012.36 µmol/kg).
Average run time, minimum run time, maximum run time: 8, 10 and 13 min.

Analysis date: 01/16/2015
Coulometer used: DICE–CM5015- AOML 4
Blanks: 15.9, 28.0 counts/min
CRM # 0087 was used and with an assigned value of (includes both DIC and salinity):
Batch 129, c: 2016.65 µmol/kg, S: 33.361
CRM values measured: AOML 4: offset 0.30 µmol/kg (2016.95 µmol/kg).
Average run time, minimum run time, maximum run time: 8, 11 and 12 min.

Reproducibility: (# samples and average difference): No duplicate samples were collected.

CRM, salinity and HgCl2 correction applied: Salinity correction was applied using TSG salinity.

Remarks

The volume correction was applied due to added $HgCl_2$ (Measured DIC*1.00037).
The first CRM of each cell was used for a CRM correction.

The DIC instruments were stable: the gas loop and CRM values did not change significantly throughout the life span of each cell. The end blanks (AOML 3 =33.5; AOML 4 = 33.2) slightly higher at the end of sample analysis.

The blank on AOML 4 (01/16/2015) was raised from 15.9 to 28.0 before running the CRM.

The samples were analyzed using the DICE (AOML 3 and 4) and a new coulometer from UIC, Inc. CM5015 with CM5011 emulation software.

pH:

Analysis date: 01/16/2015
Spectrophotometer used: HP Agilent 8453

Reproducibility: (# samples and average difference): No duplicates were collected.

Remarks

The equations of Liu et al, 2011 formulated using the purified m-cresol purple indicator was used to determine pH of the samples. pH samples were analyzed at 20^0C at Full Scale (pH 0-14).

Temperature for each sample was measured before analysis using a Hart Scientific Fluke 1523 reference thermometer.

Approximately 80 mL of sample was extracted from each DIC sample bottle by syringe before DIC analysis to determine the pH.

TAlk:
The results posted are duplicate analyses from the same sample bottles used for DIC and pH.
Analysis dates: 02/03/2015
Titration system used: Open cell
CRM batch: 129, S = 33.361, certified TA = 2237.32 µmol/kg

2 CRM samples were run on each cell, before and after the seawater samples. The TA for the water samples was corrected using the averaged ratios between the certified and measured values of the 2 CRMs run on each cell. The following table shows the CRM measurements for each cell.

Cell System	Date	Time	Bottle #	TA	|ΔCRM|
1	2/3/2015	10:47:21	700	2222.57	
1	2/3/2015	17:25:38	981	2224.95	2.38
2	2/3/2015	11:03:20	700	2219.06	
2	2/3/2015	17:17:45	981	2216.36	2.7
				Average	2.54
				Std. Dev.	0.23

Reproducibility: No duplicates were collected.

Remarks

The two systems behaved well during the analyses.

Comments

The latitude, longitude, date, and time reported with the DIC, pH and TAlk measurements were taken from the sample field log. The field log values are provided for reference; no post-cruise assurance of accuracy has been done to this data.

The Sample ID is the sample station, cast number and Niskin bottle number for the discrete samples.

UPDATE:
Between March and June of 2021, all of the data for the discrete samples was put into a uniform format. The supporting information was checked for accuracy, especially the expocode, date, time, and positions.
Additionally, pH results were recalculated to 20 and 25 degrees Celsius.