

Dataset Expocode 642B20150808

Primary Contact
Name: Steve Jones
Organization: Universtiy of Exeter
Address: College of Life and Environmental Sciences, Department of Geography, Hatherly Laboratories, Prince of Wales Road, Exeter, UK, EX4 4PS
Phone:
Email: s.d.jones@exeter.ac.uk

Investigator
Name: Schuster, Dr. Ute
Organization: University of Exeter
Address: College of Life and Environmental Sciences Department of Geography Hatherly Laboratories Prince of Wales Road Exeter UK EX4 4PS
Phone: +44 (0)1392 723701
Email: u.schuster@exeter.ac.uk

Investigator
Name: Jones, Dr. Steve D.
Organization: University of Exeter
Address: College of Life and Environmental Sciences Department of Geography Hatherly Laboratories Prince of Wales Road Exeter UK EX4 4PS
Phone:
Email: s.d.jones@exeter.ac.uk

Investigator
Name: Watson, Prof. Andrew J.
Organization: University of Exeter
Address: College of Life and Environmental Sciences Department of Geography Hatherly Laboratories Prince of Wales Road Exeter UK EX4 4PS
Phone:
Email: andrew.watson@exeter.ac.uk

Dataset
Funding Info:
Initial Submission (yyyymmdd): 20150629
Revised Submission (yyyymmdd): 20151120

Campaign/Cruise
Expocode: 642B20150808
Campaign/Cruise Name: BS098C
Campaign/Cruise Info: UK-Caribbean
Platform Type:
CO2 Instrument Type: Equilibrator-IR or CRDS or GC
Survey Type: VOS Line
Vessel Name: Benguela Stream
Vessel Owner: Seatrade Reefers, The Netherlands
Vessel Code: 642B

Coverage
Start Date (yyyymmdd): 20150808
End Date (yyyymmdd): 20140816
Westernmost Longitude: 71.805 W
Easternmost Longitude: 3.2938 W
Northernmost Latitude: 50.138 N
Southernmost Latitude: 20.119 N
Port of Call: Manzanillo, Dominican Republic
Port of Call: Portsmouth, UK

Variable
Name: pCO2 in Sea Water (Wet)
Unit: uatm
Description: pCO2 in Sea Water (Wet) at SST

Variable	Name: pCO2 in Air (wet) Unit: uatm Description: pCO2 in Air (wet) at SST
Variable	Name: xCO2 in Sea Water (dry) Unit: ppm Description: xCO2 in Sea Water (dry) at Tequ
Variable	Name: xCO2 in Air (Dry) Unit: ppm Description: xCO2 in Air (Dry) at Tequ
Variable	Name: fCO2 in Sea Water Unit: uatm Description: fCO2 in Sea Water at SST
Sea Surface Temperature	Location: Sea chest in engine room, -5m Manufacturer: Aanderaa Model: T-4050 Accuracy: 0.03 (°C if units not given) Precision: 0.01 (°C if units not given) Calibration: Versus ice on ????. - SPEC HEET Comments:
Sea Surface Salinity	Location: Sea chest in engine room, -5m Manufacturer: Aanderaa Model: C-3919B Accuracy: 0.0018 Precision: 0.002 Calibration: Versus discrete samples from throughout voyage, analysed at NOC, UK Comments: Measures conductivity, salinity is calculated from it.
Atmospheric Pressure	Location: Navigation Bridge, 35m Normalized to Sea Level: yes Manufacturer: Model: Accuracy: (hPa if units not given) Precision: (hPa if units not given) Calibration: Performed by MET Office every 6 months Comments:
Atmospheric CO2	Measured/Frequency: Yes, every 2 hours Intake Location: Monkey Island, 40m Drying Method: Atmospheric CO2 Accuracy: 1 Atmospheric CO2 Precision: 0.1
Aqueous CO2 Equilibrator Design	System Manufacturer: Intake Depth: -5 Intake Location: Sea chest Equilibration Type: Percolating Equilibrator Volume (L): 4 Headspace Gas Flow Rate (ml/min): 100 Equilibrator Water Flow Rate (L/min): 4 Equilibrator Vented: Yes

**Aqueous CO2
Sensor Details**

Equilibration Comments:

Drying Method: Condenser, partial

Measurement Method: IR

Method details: Non-dispersal Infrared

Manufacturer: Licor

Model: LI7000

Measured CO2 Values: xCO2(dry)

Measurement Frequency: Every 60 seconds except during calibration routines

Aqueous CO2 Accuracy: 1

Aqueous CO2 Precision: 0.1

Sensor Calibrations: During deployment, every 90 minutes, by 0, 250, 350 and 450 ppm CO2 gas standards

Calibration of Calibration Gases: Ship

Number Non-Zero Gas Standards: 3

Calibration Gases:

NOAA Gas Standards installed 20130428

0B05: 0

45B32: 460.69

35B34: 361.14

25B32: 260.36

Comparison to Other CO2 Analyses:

Comments: LiCor pressure calibrated against sea level pressure.

Method Reference:

Cooper, D. J., Watson, A. J., & Ling, R. D. (1998). Variation of pCO₂ along a North Atlantic shipping route (U.K. to the Caribbean): A year of automated observations. *Marine Chemistry*, 60, 147–164. [http://doi.org/10.1016/S0304-4203\(97\)00082-0](http://doi.org/10.1016/S0304-4203(97)00082-0)

Schuster, U., & Watson, A. J. (2007). A variable and decreasing sink for atmospheric CO₂ in the North Atlantic. *Journal of Geophysical Research*, 112(C11). <http://doi.org/10.1029/2006JC003941>

Watson, A. J., Schuster, U., Bakker, D. C. E., Bates, N. R., Corbière, A., González-Dávila, M., ... Wanninkhof, R. H. (2009). Tracking the variable North Atlantic sink for atmospheric CO₂. *Science*, 326(5958), 1391–1393. <http://doi.org/10.1126/science.1177394>

Pierrot, D., Neill, C., Sullivan, K. F., Castle, R., Wanninkhof, R. H., Lüger, H., ... Cosca, C. E. (2009). Recommendations for autonomous underway pCO₂ measuring systems and data-reduction routines. *Deep Sea Research Part II: Topical Studies in Oceanography*, 56, 512–522. <http://doi.org/10.1016/j.dsr2.2008.12.005>

**Equilibrator
Temperature Sensor**

Location: Sensor inside equilibrator

Manufacturer: Aanderaa

Model: PT2000

Accuracy: 0.04 (°C if units not given)

Precision: 0.04 (°C if units not given)

Calibration: Every 28 days, versus ice and against Aanderaa SST sensor

Comments:

**Equilibrator
Pressure Sensor**

Location: On the equilibrator

Manufacturer: Omega

Model: Barometreic pressure transducer, PX2760-600A5V

Accuracy: 0.1 (hPa if units not given)

Precision: 0.1 (hPa if units not given)

Calibration: Every 28 days against LiCor

Comments:

Other Sensor

Description: Oxygen

Manufacturer: Aanderaa

Model: Optode 3835

Accuracy: <1 um

Precision: <8 um or 5%, whichever is greater

Calibration: None

Comments:

**Additional
Information**

Suggested QC flag from Data Provider: NA

Additional Comments:

Citation for this Dataset:

UK-Caribbean line

Other References for this Dataset:

In preparation