

**Dataset Expocode** 74JC20170205

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**Dataset** **Funding Info:** UK Natural Environment Research Council - Atlantic Meridional Transect  
**Initial Submission (yyyymmdd):** 20190121  
**Revised Submission (yyyymmdd):**

**Campaign/Cruise** **Expocode:** 74JC20170205  
**Campaign/Cruise Name:** JR16004  
**Campaign/Cruise Info:** JR16004  
**Platform Type:**  
**CO2 Instrument Type:** Equilibrator-IR or CRDS or GC  
**Survey Type:** Research Cruise  
**Vessel Name:** James Clark Ross  
**Vessel Owner:** UK-Natural Environment Research Council  
**Vessel Code:** 74JC

**Coverage** **Start Date (yyyymmdd):** 20170205  
**End Date (yyyymmdd):** 20170309  
**Westernmost Longitude:** 48.9514 W  
**Easternmost Longitude:** 27.1833 W  
**Northernmost Latitude:** 58.7492 S  
**Southernmost Latitude:** 77.9189 S

**Variable** **Name:** xCO2\_equ[umol/mol]  
**Unit:** micro-mol/mol  
**Description:** CO2 mixing ratio measured at Tequ (wet)

**Variable** **Name:** Patm [hPa]  
**Unit:** hecta-Pascal  
**Description:** Atmospheric Pressure

**Variable** **Name:** Tequ [deg.C]  
**Unit:** degrees Celsius  
**Description:** Temperature in Equilibrator

**Variable** **Name:** SST [deg.C]  
**Unit:** degrees Celsius  
**Description:** Sea Surface Temperature (at intake depth=6m)

<b>Variable</b>	<b>Name:</b> Sal <b>Unit:</b> unitless or PSU <b>Description:</b> Salinity
<b>Variable</b>	<b>Name:</b> pCO2_sw[uatm] <b>Unit:</b> micro-atm <b>Description:</b> Seawater partial pressure of CO2 at SST (wet)
<b>Variable</b>	<b>Name:</b> pCO2_atm[uatm] <b>Unit:</b> micro-atm <b>Description:</b> Atmospheric partial pressure of CO2 (wet)
<b>Variable</b>	<b>Name:</b> fCO2_sw[uatm] <b>Unit:</b> micro-atm <b>Description:</b> Seawater fugacity of CO2 at SST (wet)
<b>Variable</b>	<b>Name:</b> fCO2_atm[uatm] <b>Unit:</b> micro-atm <b>Description:</b>
<b>Variable</b>	<b>Name:</b> xCO2atm_dry[umol/mol] <b>Unit:</b> micro-mol/mol <b>Description:</b>
<b>Variable</b>	<b>Name:</b> Pequ [hPa] <b>Unit:</b> hecta-Pascal <b>Description:</b> Equilibration Pressure
<b>Sea Surface Temperature</b>	<b>Location:</b> Adjacent to intake at 6 m depth <b>Manufacturer:</b> SeaBird Electronics <b>Model:</b> SBE45 <b>Accuracy:</b> 0.001 (°C if units not given) <b>Precision:</b> 0.001 (°C if units not given) <b>Calibration:</b> Recorded by National Marine Facilities Sea Systems and kept by British Oceanographic Data Centre ( <a href="http://www.bodc.ac.uk">www.bodc.ac.uk</a> ) <b>Comments:</b>
<b>Sea Surface Salinity</b>	<b>Location:</b> Adjacent to intake at 6 m depth <b>Manufacturer:</b> SeaBird Electronics <b>Model:</b> SBE45 <b>Accuracy:</b> 0.002 <b>Precision:</b> 0.002 <b>Calibration:</b> Recorded and kept by British Antarctic Survey Polar Data Centre ( <a href="https://www.bas.ac.uk/team/business-teams/information-services/polar-data-centre/">https://www.bas.ac.uk/team/business-teams/information-services/polar-data-centre/</a> ) <b>Comments:</b>
<b>Atmospheric Pressure</b>	<b>Location:</b> Met-platform on deck above bridge, 18 m asl <b>Normalized to Sea Level:</b> yes <b>Manufacturer:</b> Vaisala <b>Model:</b> PTB110 barometer <b>Accuracy:</b> 1 hPa (hPa if units not given) <b>Precision:</b> 1 hPa (hPa if units not given) <b>Calibration:</b> Recorded by National Marine Facilities Sea Systems and kept by British Oceanographic Data Centre ( <a href="http://www.bodc.ac.uk">www.bodc.ac.uk</a> ) <b>Comments:</b>
<b>Atmospheric CO2</b>	<b>Measured/Frequency:</b> yes, circa every 20 minutes

**Intake Location:** Met-platform on deck above bridge, 18 m asl

**Drying Method:**

**Atmospheric CO<sub>2</sub> Accuracy:** <2 micro-atm fCO<sub>2</sub>

**Atmospheric CO<sub>2</sub> Precision:** <0.5 micro-atm fCO<sub>2</sub>

**Aqueous CO<sub>2</sub>  
Equilibrator Design**

**System Manufacturer:**

**Intake Depth:** 6 m

**Intake Location:** Hull

**Equilibration Type:** Headspace (vented)

**Equilibrator Volume (L):** 2.5

**Headspace Gas Flow Rate (ml/min):** 200

**Equilibrator Water Flow Rate (L/min):** 1.6

**Equilibrator Vented:** Yes

**Equilibration Comments:**

**Drying Method:** Peltier drier to <20% humidity

**Aqueous CO<sub>2</sub>  
Sensor Details**

**Measurement Method:** IR

**Method details:** Non Dispersive IR Sensor

**Manufacturer:** LICOR

**Model:** LI-840

**Measured CO<sub>2</sub> Values:** xCO<sub>2</sub> dry(wet)

**Measurement Frequency:** Every 11 minutes

**Aqueous CO<sub>2</sub> Accuracy:** <2 micro-atm fCO<sub>2</sub>

**Aqueous CO<sub>2</sub> Precision:** <0.5 micro-atm fCO<sub>2</sub>

**Sensor Calibrations:** Sensor calibration during deployment using 3 gas standards (nominally 254.7, 376.7, 472.1, ppmv CO<sub>2</sub> in synthetic air).

**Calibration of Calibration Gases:** Ship

**Number Non-Zero Gas Standards:** 3

**Calibration Gases:**

BOC gases Ltd., 254.7, 376.7, 472.1, ppmv CO<sub>2</sub> in synthetic air. These are calibrated in lab against NOAA standards (nos:CA07398,CA07305,CB08944) with WMO X2007 certification

**Comparison to Other CO<sub>2</sub> Analyses:**

**Comments:**

**Method Reference:**

Ribas-Ribas et al. 2014. Intercomparison of carbonate chemistry measurements on a cruise in northwestern European shelf seas. Biogeosciences. 11: 4339-4355

**Equilibrator  
Temperature Sensor**

**Location:** Platinum Resistance Thermocouple (PT100) in equilibrator

**Manufacturer:** Pico-Technology

**Model:** PT100 Class B

**Accuracy:** 0.01 (°C if units not given)

**Precision:** 0.01 (°C if units not given)

**Calibration:** Calibrated prior to cruise (ice-point)

**Comments:**

**Equilibrator  
Pressure Sensor**

**Location:** In line with equilibrator

**Manufacturer:** Druck Gmbh

**Model:** PTX7517-3257

**Accuracy:** 0.1 (hPa if units not given)

**Precision:** 0.1 (hPa if units not given)

**Calibration:** Calibrated annually

**Comments:**

**Additional  
Information**

**Suggested QC flag from Data Provider: NA**

**Additional Comments:**

**Citation for this Dataset:**

**Other References for this Dataset:**