

Dataset Expocode 08D820191117

Primary Contact **Name:** Berghoff, Carla F.
Organization: INIDEP
Address: Paseo Victoria Ocampo N°1,B7602HSA,Mar del Plata, Argentina.
Phone: 54 (223) 486-2586 ext.1450
Email: cberghoff@inidep.edu.ar

Investigator **Name:** Berghoff, Carla F.
Organization: INIDEP
Address: Paseo Victoria Ocampo N°1,B7602HSA,Mar del Plata, Argentina.
Phone: 54 (223) 486-2586 ext.1450
Email: cberghoff@inidep.edu.ar

Investigator **Name:** Lutz, Vivian A.
Organization: INIDEP
Address: Paseo Victoria Ocampo N°1,B7602HSA,Mar del Plata, Argentina.
Phone: 54 (223) 486-2586 ext.1440
Email: vlutz@inidep.edu.ar

Investigator **Name:** Negri, Rubén M.
Organization: INIDEP
Address: Paseo Victoria Ocampo N°1,B7602HSA,Mar del Plata, Argentina.
Phone: 54 (223) 486-2586 ext.1450
Email: negri@inidep.edu.ar

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Campaign/Cruise **Expocode:** 08D820191117
Campaign/Cruise Name: VA201911-USH-MDP
Campaign/Cruise Info: DiPlamCC
Platform Type:
CO2 Instrument Type: Equilibrator-IR or CRDS or GC
Survey Type: Research Cruise
Vessel Name: Víctor Angelescu
Vessel Owner: Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP)-Argentina
Vessel Code: 08D8

Coverage **Start Date (yyyymmdd):** 20191117
End Date (yyyymmdd): 20191122
Westernmost Longitude: 67.9 W
Easternmost Longitude: 57.4 W
Northernmost Latitude: 38.1 S
Southernmost Latitude: 55.1 S
Port of Call: Ushuaia
Port of Call: Mar del Plata

Variable **Name:** xCO2_EQU_ppm
Unit: ppm
Description: Mole fraction of CO2 in the equilibrator headspace (dry) at equilibrator temperature (ppm)

Variable **Name:** xCO2_ATM_ppm

Unit: ppm
Description: Mole fraction of CO₂ measured in dry outside air (ppm)

Variable

Name: xCO₂_ATM_interpolated_ppm
Unit: ppm
Description: Mole fraction of CO₂ in outside air associated with each water analysis. These values are interpolated between the bracketing averaged good xCO₂_ATM analyses (ppm)

Variable

Name: PRES_EQU_hPa
Unit: hPa
Description: Barometric pressure in the equilibrator headspace (hPa)

Variable

Name: PRES_ATM@SSP_hPa
Unit: hPa
Description: Barometric pressure measured outside, corrected to sea level (hPa)

Variable

Name: TEMP_EQU_C
Unit: Degree C
Description: Water temperature in equilibrator (°C)

Variable

Name: SST_C
Unit: Degree C
Description: Sea surface temperature (°C)

Variable

Name: SAL_permil
Unit: ppt
Description: Sea surface salinity on Practical Salinity Scale (o/oo)

Variable

Name: fCO₂_SW@SST_uatm
Unit: μatm
Description: Fugacity of CO₂ in sea water at SST and 100% humidity (μatm)

Variable

Name: fCO₂_ATM_interpolated_uatm
Unit: μatm
Description: Fugacity of CO₂ in air corresponding to the interpolated xCO₂ at SST and 100% humidity (μatm)

Variable

Name: dfCO₂_uatm
Unit: μatm
Description: Sea water fCO₂ minus interpolated air fCO₂ (μatm)

Variable

Name: WOCE_QC_FLAG
Unit: None
Description: Quality control flag for fCO₂ values (2=good, 3=questionable)

Variable

Name: QC_SUBFLAG
Unit: None
Description: Quality control subflag for fCO₂ values, provides explanation when QC flag=3

Sea Surface Temperature

Location: In the machine room, about 1.5 m after the intake which is directly through the ship's hull, before the SW pump.
Manufacturer: Seabird, Inc.
Model: SBE 38
Accuracy: 0.001 (°C if units not given)
Precision: 0.0003 (°C if units not given)
Calibration: Factory calibration
Comments: Manufacturer's Resolution is taken as Precision.

Sea Surface Salinity	<p>Location: Near the pCO₂ System.</p> <p>Manufacturer: Seabird</p> <p>Model: SBE 45</p> <p>Accuracy: ± 0.005 o/oo</p> <p>Precision: 0.0002 o/oo</p> <p>Calibration: Factory calibration</p> <p>Comments: Manufacturer's Resolution is taken as Precision.</p>
Atmospheric Pressure	<p>Location: It is located on the bridge visor, on the bow</p> <p>Normalized to Sea Level: Yes</p> <p>Manufacturer: Vaisala</p> <p>Model: PTB210A1A1B</p> <p>Accuracy: 0.25 (hPa if units not given)</p> <p>Precision: 0.01 (hPa if units not given)</p> <p>Calibration: march 2017</p> <p>Comments: Located in the Deck box inside a room conected o the pressure port by a flexible tube</p>
Atmospheric CO₂	<p>Measured/Frequency: Yes</p> <p>Intake Location: lighth mast at the bow on the starboard side</p> <p>Drying Method: Gas stream passes through a thermoelectric condenser (~5 °C) and then through a Perma Pure (Nafion) dryer before reaching the analyzer (90% dry).</p> <p>Atmospheric CO₂ Accuracy: ± 0.5 µatm in fCO₂_ATM</p> <p>Atmospheric CO₂ Precision: ± 0.01 µatm in fCO₂_ATM</p>
Aqueous CO₂ Equilibrator Design	<p>System Manufacturer:</p> <p>Intake Depth: 5 meters</p> <p>Intake Location: Bow</p> <p>Equilibration Type: Spray head above dynamic pool</p> <p>Equilibrator Volume (L): 0.95 L (0.4 L water, 0.55 L headspace)</p> <p>Headspace Gas Flow Rate (ml/min): 70 - 150 ml/min</p> <p>Equilibrator Water Flow Rate (L/min): 1.5 - 2.0 L/min</p> <p>Equilibrator Vented: Yes</p> <p>Equilibration Comments: Primary equilibrator is vented through a secondary equilibrator.</p> <p>Drying Method: Gas stream passes through a thermoelectric condenser (~5 °C) and then through a Perma Pure (Nafion) dryer before reaching the analyzer (90% dry).</p>
Aqueous CO₂ Sensor Details	<p>Measurement Method: IR</p> <p>Method details: details of CO₂ sensing (not required)</p> <p>Manufacturer: LI-COR</p> <p>Model: 7000</p> <p>Measured CO₂ Values: xCO₂(dry)</p> <p>Measurement Frequency: Every 140 seconds, except during calibration</p> <p>Aqueous CO₂ Accuracy: ± 2 µatm in fCO₂_SW</p> <p>Aqueous CO₂ Precision: ± 0.01 µatm in fCO₂_SW</p> <p>Sensor Calibrations:</p> <p>Calibration of Calibration Gases: The analyzer is calibrated every 5 hours with field standards that in turn were calibrated with primary standards that are directly traceable to the WMO X2007 scale. The zero gas is ultra-high purity air.</p> <p>Number Non-Zero Gas Standards: 3</p> <p>Calibration Gases:</p>

Std 1: EKZTPF4, 0.00 ppm, owned by INIDEP, used every ~4.5 hours.
Std 2: LL125773, 206.61 ppm, owned by INIDEP, used every ~4.5 hours.
Std 3: LL125769, 409.49 ppm, owned by INIDEP, used every ~4.5 hours.
Std 4: LL125772, 610.87 ppm, owned by INIDEP, used every ~4.5 hours.

Comparison to Other CO2 Analyses:

Comments:

Method Reference:

Pierrot, D., C. Neil, K. Sullivan, R. Castle, R. Wanninkhof, H. Lueger, T. Johannessen, A. Olsen, R. A. Feely, and C. E. Cosca (2009), Recommendations for autonomous underway pCO₂ measuring systems and data reduction routines, Deep-Sea Res II, 56, 512-522.

**Equilibrator
Temperature Sensor**

Location: Inserted into equilibrator ~5 cm below water level

Manufacturer: Hart

Model: 1523

Accuracy: 0.015 (°C if units not given)

Precision: 0.001 (°C if units not given)

Calibration: Factory calibration

Comments: Resolution is taken as Precision.

**Equilibrator
Pressure Sensor**

Location: Attached to equilibrator headspace. The differential pressure reading from Setra 239, which is attached to the equilibrator headspace, is added to the pressure reading from the LICOR analyzer, which is measured by an external Setra 270 connected to the exit of the analyzer.

Manufacturer: Setra

Model: 270

Accuracy: 0.15 (hPa if units not given)

Precision: 0.015 (hPa if units not given)

Calibration: Factory calibration

Comments: Manufacturer's Resolution is taken as Precision.

**Additional
Information**

Suggested QC flag from Data Provider: NA

Additional Comments: The analytical system operated well during this cruise. Time offset calculated to be 2.90. That value was used. Full unprocessed data files from analytical instrument including flow information and TSG data at time of sampling can be obtained upon request to INIDEP. This dataset contribute to LAOCA network

Citation for this Dataset:

Other References for this Dataset: