Temperature logger data from MAPCO2 buoy deployed on NOAA Ship Ronald H. Brown cruise RB-08-02 in the Southwest Atlantic sector of the Southern Ocean near South Georgia Island in 2008 (SO_GasEx project)

Website: https://www.bco-dmo.org/dataset/3288
Version: 07 Jan 2010
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Project
» Southern Ocean Gas Exchange Experiment (SO_GasEx)

Programs
» Ocean Carbon and Biogeochemistry (OCB)
» United States Surface Ocean Lower Atmosphere Study (U.S. SOLAS)

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Dataset Description

SO-GasEx MAPCO2 Buoy - Temperature Logger data
Temperature logger datasets from 18 temperature loggers deployed on the MAPCO2 buoy

Methods & Sampling

For MAPCO2 Buoy Information See: SO-GasEx cruise report, Section 5.5.1 pgs 30-33

Onset PRO V2 temperature loggers were placed at depths between 5 and 105 m depth on the MapCO2 buoy. These loggers have an accuracy of 0.1 ± 0.02 °C.

NOAA Buoy Temperature Sensors Summary - Probe Locations

Deployment 1 Deployment 2 Deployment 3
Depth Sensor Comment Depth Sensor Comment Depth Sensor Comment
5 O SAMI-52 5 O SAMI-52 5 O SAMI-52
19 P SAMI-46 19 P SAMI-46 19 P SAMI-46

25 L Top Drogue 25 L Top Drogue 25 L Top Drogue
34 K Bottom Drogue 34 K Bottom Drogue 34 K Bottom Drogue
34.5 Q SAMI-11 34.5 Q SAMI-11 34.5 Q SAMI-11
40.5 J Top Drogue 40.5 J Top Drogue 40.5 J Top Drogue
49.5 I Bottom Drogue 49.5 I Bottom Drogue 49.5 I Bottom Drogue
50 R SAMI-48 50 R SAMI-48 50 R SAMI-48
56 H Top Drogue 56 F Top Drogue 56 F Top Drogue
65 G Bottom Drogue 65 E Bottom Drogue 65 E Bottom Drogue
65.75 F Top Drogue 65.75 N Top Cable 65.75 N Top Cable
74.75 E Bottom Drogue 74.75 M Bottom Cable 74.75 M Bottom Cable
75.25 S SAMI-16 75.25 S SAMI-16 75.25 S SAMI-16
81.25 D Top Drogue 81.25 B Top Drogue 81.25 B Top Drogue
90.25 C Bottom Drogue 90.25 A Bottom Drogue 90.25 A Bottom Drogue
91 B Top Drogue 96 T SAMI-15 96 T SAMI-15
100 A Bottom Drogue
105 T SAMI-15

Data Processing Description

For MAPCO2 Buoy Information See: SO-GasEx cruise report, Section 5.5.1 pgs 30-33

BCO-DMO Processing Notes
- Generated from original multi sheet file Temperature Probes.xls

BCO-DMO Edits
- multiple sheet .xls file converted to single .xls file containing all three deployments
- DeploymentId added to each data record as Deployment_1, etc.
- single date/time field converted to separate fields and formatted to BCO-DMO convention
- lat/lon added from SAMI CO2, O2, T data files
- any blank fields changed to 'nd' (no data)
- data parameter names reformatted to BCO-DMO convention and depth added to each

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Data Files

File
MAPCO2_Temp.csv (Comma Separated Values (.csv), 133.18 KB) MD5:06f950ef6b1f96940f244c4aa0cfd1bf Primary data file for dataset ID 3288

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Parameters

Parameter	Description	Units
DeploymentId	MAPCO2 Buoy Deployment Id	text
date	Date (UTC)	YYYYMMDD
time	Time (UTC)	HHMM
lon	buoy longitude position in decimal degrees (West is negative)	decimal degrees

lat	buoy latitude position in decimal degrees (South is negative)	decimal degrees
O_Temp_5m	Temperature from sensor O/SAMI-52 mounted at 5meters depth	degrees celcius
P_Temp_19m	Temperature from sensor P/SAMI-46 mounted at 19meters depth	degrees celcius
L_Temp_25m	Temperature from sensor L/Top Drogue mounted at 25meters depth	degrees celcius
K_Temp_34m	Temperature from sensor K/Bottom Drogue mounted at 34meters depth	degrees celcius
Q_Temp_34point5m	Temperature from sensor Q/SAMI-11 mounted at 34.5meters depth	degrees celcius
J_Temp_40point5m	Temperature from sensor J/Top Drogue mounted at 40.5meters depth	degrees celcius
I_Temp_49point5m	Temperature from sensor I/Bottom Drogue mounted at 49.5meters depth	degrees celcius
R_Temp_50m	Temperature from sensor R/SAMI-48 mounted at 50meters depth	degrees celcius
F_Temp_56m	Temperature from sensor F/Top Drogue mounted at 56meters depth	degrees celcius
E_Temp_65m	Temperature from sensor E/Bottom Drogue mounted at 65meters depth	degrees celcius
N_Temp_65point75m	Temperature from sensor N/Top Cable mounted at 65.75meters depth	degrees celcius
M_Temp_74point75m	Temperature from sensor M/Bottom Cable mounted at 75.75meters depth	degrees celcius
S_Temp_75point25m	Temperature from sensor S/SAMI-16 mounted at 75.25meters depth	degrees celcius
B_Temp_81point25m	Temperature from sensor B/Top Drogue mounted at 81.25meters depth	degrees celcius
A_Temp_90point25m	Temperature from sensor A/Bottom Drogue mounted at 90.25meters depth	degrees celcius
T_Temp_96m	Temperature from sensor T/SAMI-15 mounted at 96meters depth	degrees celcius

H_Temp_56m	Temperature from sensor H/Top Drogue mounted at 56meters depth	degrees celcius
G_Temp_65m	Temperature from sensor G/Bottom Drogue mounted at 65meters depth	degrees celcius
F_Temp_65point75m	Temperature from sensor F/Top Drogue mounted at 65.75meters depth	degrees celcius
E_Temp_74point75m	Temperature from sensor E/Bottom Drogue mounted at 74.75meters depth	degrees celcius
D_Temp_81point25m	Temperature from sensor D/Top Drogue mounted at 81.25meters depth	degrees celcius
C_Temp_90point25m	Temperature from sensor C/Bottom Drogue mounted at 90.25meters depth	degrees celcius
B_Temp_91m	Temperature from sensor B/Top Drogue mounted at 91meters depth	degrees celcius
A_Temp_100m	Temperature from sensor A/Bottom Drogue mounted at 100meters depth	degrees celcius
T_Temp_105m	Temperature from sensor T/SAMI-15 mounted at 105meters depth	degrees celcius

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Instruments

Dataset-specific Instrument Name	MAPCO2 Drifting Buoy
Generic Instrument Name	MAPCO2 Drifting Buoy
Dataset-specific Description	For SO-GasEx MAPCO2 Buoy Configuration See: SO-GasEx MAPCO2 Metadata Report
Generic Instrument Description	The Moored Autonomous pCO2 (MAPCO2) surface drifting buoy designed by NOAA/PMEL is a low profile, high payload buoy. It was used in the SO GasEx project as a drogued drifter instrumented with a variety of autonomous instruments capable of making a coordinated set of physical, geochemical, and biological measurements at high temporal resolutions. These measurements provide a key component in the study of processes controlling air-sea CO2 exchange.

Dataset-specific Instrument Name	Onset PRO V2 temperature logger
Generic Instrument Name	Onset HOBO Pro v2 temperature logger
Dataset-specific Description	NOAA Buoy Temperature Sensors Summary - Probe Locations Deployment 1 Deployment 2 Deployment 3 Depth Sensor Comment Depth Sensor Comment Depth Sensor Comment 5 O SAMI-52 5 O SAMI-52 5 O SAMI-52 19 P SAMI-46 19 P SAMI-46 19 P SAMI-46 25 L Top Drogue 25 L Top Drogue 25 L Top Drogue 34 K Bottom Drogue 34 K Bottom Drogue 34 K Bottom Drogue 34.5 Q SAMI-11 34.5 Q SAMI-11 34.5 Q SAMI-11 40.5 J Top Drogue 40.5 J Top Drogue 40.5 J Top Drogue 49.5 I Bottom Drogue 49.5 I Bottom Drogue 49.5 I Bottom Drogue 50 R SAMI-48 50 R SAMI-48 50 R SAMI-48 56 H Top Drogue 56 F Top Drogue 56 F Top Drogue 65 G Bottom Drogue 65 E Bottom Drogue 65 E Bottom Drogue 65.75 F Top Drogue 65.75 N Top Cable 65.75 N Top Cable 74.75 E Bottom Drogue 74.75 M Bottom Cable 74.75 M Bottom Cable 75.25 S SAMI-16 75.25 S SAMI-16 75.25 S SAMI-16 81.25 D Top Drogue 81.25 B Top Drogue 81.25 B Top Drogue 90.25 C Bottom Drogue 90.25 A Bottom Drogue 90.25 A Bottom Drogue 91 B Top Drogue 96 T SAMI-15 96 T SAMI-15 100 A Bottom Drogue 105 T SAMI-15
Generic Instrument Description	The HOBO Water Temp Pro v2 temperature logger, manufactured by Onset Computer Corporation, has 12-bit resolution and a precision sensor for ±0.2°C accuracy over a wide temperature range. It is designed for extended deployment in fresh or salt water. Operation range: -40° to 70°C (-40° to 158°F) in air; maximum sustained temperature of 50°C (122°F) in water Accuracy: 0.2°C over 0° to 50°C (0.36°F over 32° to 122°F) Resolution: 0.02°C at 25°C (0.04°F at 77°F) Response time: (90%) 5 minutes in water; 12 minutes in air moving 2 m/sec (typical) Stability (drift): 0.1°C (0.18°F) per year Real-time clock: ± 1 minute per month 0° to 50°C (32° to 122°F) Additional information (http://www.onsetcomp.com/) Onset Computer Corporation 470 MacArthur Blvd Bourne, MA 02532

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Deployments

RB-08-02

Website	https://www.bco-dmo.org/deployment/57846
Platform	NOAA Ship Ronald H. Brown
Report	http://bcodata.whoi.edu/SO-GasEx/SO_GasEx_Cruise_Report.pdf
Start Date	2008-02-29
End Date	2008-04-12
Description	The Southern Ocean GasEx experiment was conducted aboard the NOAA ship Ronald H. Brown with 31 scientists representing 22 institutions, companies and government labs. The cruise departed Punta Arenas, Chile on 29 February, 2008 and transited approximately 5 days to the nominal study region at 50°S, 40°W in the Atlantic sector of the Southern Ocean. The scientific work concentrated on quantifying gas transfer velocities using deliberately injected tracers, measuring CO2 and DMS fluxes directly in the marine air boundary layer, and elucidating the physical, chemical, and biological processes controlling air-sea fluxes with measurements in the upper-ocean and marine air. The oceanic studies used a Lagrangian approach to study the evolution of chemical and biological properties over the course of the experiment using shipboard and autonomous drifting instruments. The first tracer patch was created and studied for approximately 6 days before the ship was diverted from the study site, 350 miles to the south, to wait near South Georgia Island for calmer seas. After more than 4 days away, we returned to the study area and managed to find some remnants of the tracer patch. After collecting one final set of water column samples and recovering the two drifting buoys deployed with the patch, we relocated to the northwest, closer to the area where the first patch was started. A second tracer patch was created and studied for approximately 15 days before we had to break off the experiment and transit to Montevideo, Uruguay for the completion of the cruise.

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Project Information

Southern Ocean Gas Exchange Experiment (SO_GasEx)

Website: http://so-gasex.org/

Coverage: Southwest Atlantic sector of the Southern Ocean (nominally at 50°S, 40°W, near South Georgia Island)

The Southern Ocean Gas Exchange Experiment (SO-GasEx; also known as GasEx III) took place in the Southwest Atlantic sector of the Southern Ocean (nominally at 50°S, 40°W, near South Georgia Island) in austral fall of 2008 (February 29-April 12, 2008) on the NOAA ship *Ronald H. Brown*. SO-GasEX is funded by NOAA, NSF and NASA.

The research objectives for Southern Ocean GasEx are to answer the following questions:

- What are the gas transfer velocities at high winds?
- What is the effect of fetch on the gas transfer?
- How do other non-direct wind effects influence gas transfer?
- How do changing pCO2 and DMS levels affect the air-sea CO2 and DMS flux, respectively in the same locale?
- Are there better predictors of gas exchange in the Southern Ocean other than wind?
- What is the near surface horizontal and vertical variability in turbulence, pCO2, and other relevant biochemical and physical parameters?
- How do biological processes influence pCO2 and gas exchange?
- Do the different disparate estimates of fluxes agree, and if not why?
- With the results from Southern Ocean GasEx, can we reconcile the current discrepancy between model based CO2 flux estimates and observation based estimates?

Related files

SO-GasEx cruise report
SO-GasEx Science Plan
SO-GasEx Implementation Plan

The SO-GasEx cruise report and Science and Implementation plans, may also be available at the SO-GasEx science Web page.

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Program Information

Ocean Carbon and Biogeochemistry (OCB)

Website: http://us-ocb.org/

Coverage: Global

The Ocean Carbon and Biogeochemistry (OCB) program focuses on the ocean's role as a component of the global Earth system, bringing together research in geochemistry, ocean physics, and ecology that inform on and advance our understanding of ocean biogeochemistry. The overall program goals are to promote, plan, and coordinate collaborative, multidisciplinary research opportunities within the U.S. research community and with international partners. Important OCB-related activities currently include: the Ocean Carbon and Climate Change (OCCC) and the North American Carbon Program (NACP); U.S. contributions to IMBER, SOLAS, CARBOOCEAN; and numerous U.S. single-investigator and medium-size research projects funded by U.S. federal agencies including NASA, NOAA, and NSF.

The scientific mission of OCB is to study the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change through studies of marine biogeochemical cycles and associated ecosystems.

The overarching OCB science themes include improved understanding and prediction of: 1) oceanic uptake and release of atmospheric CO2 and other greenhouse gases and 2) environmental sensitivities of biogeochemical cycles, marine ecosystems, and interactions between the two.

The OCB Research Priorities (updated January 2012) include: ocean acidification; terrestrial/coastal carbon fluxes and exchanges; climate sensitivities of and change in ecosystem structure and associated impacts on biogeochemical cycles; mesopelagic ecological and biogeochemical interactions; benthic-pelagic feedbacks on biogeochemical cycles; ocean carbon uptake and storage; and expanding low-oxygen conditions in the coastal and open oceans.

United States Surface Ocean Lower Atmosphere Study (U.S. SOLAS)

Website: http://www.us-solas.org/

Coverage: Global

The Surface Ocean Lower Atmosphere Study (SOLAS) program is designed to enable researchers from different disciplines to interact and investigate the multitude of processes and interactions between the coupled ocean and atmosphere.

Oceanographers and atmospheric scientists are working together to improve understanding of the fate, transport, and feedbacks of climate relevant compounds, and also weather and hazards that are affected by processes at the surface ocean.

Oceanographers and atmospheric scientists are working together to improve understanding of the fate, transport, and feedbacks of climate relevant compounds.

Physical, chemical, and biological research near the ocean-atmosphere interface must be performed in synergy to extend our current knowledge to adequately understand and forecast changes on short and long time frames and over local and global spatial scales.

The findings obtained from SOLAS are used to improve knowledge at process scale that will lead to better quantification of fluxes of climate relevant compounds such as CO2, sulfur and nitrogen compounds, hydrocarbons and halocarbons, as well as dust, energy and momentum. This activity facilitates a fundamental understanding to assist the societal needs for climate change, environmental health, weather prediction, and national security.

The US SOLAS program is a component of the International SOLAS program where collaborations are forged with investigators around the world to examine SOLAS issues ubiquitous to the world's oceans and atmosphere.

Â» International SOLAS Web site

Science Implementation Strategy Reports

US-SOLAS (4 MB PDF file)
Other SOLAS reports are available for download from the US SOLAS Web site

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Funding

Funding Source	Award
National Oceanic and Atmospheric Administration (NOAA)	unknown SO_GasEx NOAA
National Aeronautics & Space Administration (NASA)	unknown SO_GasEx NASA
National Science Foundation (NSF)	unknown SO_GasEx NSF

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