SOFeX multi-ship sampling event log from R/V Melville, R/V Roger Revelle, USCGC Polar Star cruises COOK19MV, DRFT08RR, PS02_2002 from the Southern Ocean, south of New Zealand in 2002 (SOFeX project)

Website: https://www.bco-dmo.org/dataset/2820
Version: 02 April 2007
Version Date: 2007-04-02

Project
» Southern Ocean Iron Experiment (SOFeX)

Programs
» Iron Synthesis (FeSynth)
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
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Dataset Description

SOFeX multi-ship sampling event log

Methods & Sampling

Related information:

Descriptions of SOFeX cruise sampling event types

Brief cruise plan description:
Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. A cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel.

A comment on the 'patch_loc' field:
The 'patch_loc' field is usually one of four abbreviation codes indicating the sampling location relative to the 'iron fertilized patches'; N indicates North Patch, S = South Patch, and whether the location is within or outside the patch area or on the edge of the patch.

Data Processing Description

Change history: YYMMDD

070323: original Excel file downloaded from SOFeX data site at MBARI;
original version (v1.0) prepared by Michael Hiscock (hiscock@duke.edu)
070329: added to OCB database by Cyndy Chandler, OCB DMO (cchandler@whoi.edu)
some minor modifications to event type (ev_type) to ensure database
consistency; only significant change to data during posting was:
UID_SFX=109 SOFEX02R 026 event_SFX=20020311045 TMR1
original position was: lon 171.918 E and lat 66.322 N (OCB DMO changed
both to be negative to reflect West and South); Also note that Polar
Star event 20020430523, CTD01 test cast, is reported at -172.917 -74.117
but the CTD data were reported with an Eastern longitude of 172.924.

DMO note: events are grouped by cruise (e.g. not sorted by time); note that
event number comprises a simple Day of Year and not Julian Day (as documented
in the original PI note contributed with the data), and that event_SFX
numbers are not unique, so caution must be used when using event_SFX to
combine data sets. There are 40 pairs of duplicate event numbers.

PI notes: Version 1.0 September 7, 2002
Event logs for the three ships are compiled in the Melville-format.
Event number is YYYYJJJUUUU Y=year J=Julian Day, U=UTC. The event numbers
for Jodi Brewster's SCUFAs and the Melville SF6 data have been included.
A notable addition is the "Time since Fertilization" column for the South
patch and North Patch. I used the midpoint of the first fertilzation of
each patch as time zero. North patch 20020131415. South patch 20020250430.
I would like to keep this event log as complete and accurate as possible.
Please email Michael Hiscock (hiscock@duke.edu) with any additions or corrections.

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Data Files

File
log.csv (Comma Separated Values (.csv), 211.05 KB) MD5:a1dfcc8b0e8beb2ab5b59eef9274099c Primary data file for dataset ID 2820

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Parameters

Parameter	Description	Units
UID_SFX	sequential ID number	dimensionless
cruise_SFX	sofex cruise ID	dimensionless
station	station identifier	dimensionless
event_SFX	sampling event number; composite of date and time (UTC)	YYYYdoYhhmm
pDay_N	North patch days since midpoint of first fertilizaton	decimal days
pDay_S	South patch days since midpoint of first fertilizaton	decimal days
time_obs	obs. time	hhmm
lon	longitude, negative denotes West	decimal degrees
lat	latitude, negative denotes South	decimal degrees
person	individual responsible for event	dimensionless
ev_type	event type description	dimensionless
patch_loc	sampling location relative to patch	dimensionless
comment	sampling method description	dimensionless

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Deployments

COOK19MV

Website	https://www.bco-dmo.org/deployment/57826
Platform	R/V Melville
Report	http://ocb.whoi.edu/SOFeX/CRUISES/proj_description.pdf
Start Date	2002-01-19
End Date	2002-02-26
Description	Brief cruise plan description: Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. The designations SOFeX-N and SOFeX-S are sometimes used to distinguish between two iron enriched patches - one in low silicate waters north of the polar front (SOFEX-N), and the other in high silicate waters south of the polar front (SOFEX-S). All three ships, Melville (MV), Revelle (RR) and Polar Star (PS), worked in SOFEX-S, but only the Revelle and Melville worked in the SOFeX N patch and shuttled between the two patches. The R/V MELVILLE sailed several weeks after the R/V REVELLE to arrive in the study area just as the 'patches' were forming in response to iron fertilization. The MELVILLE's team planned to make detailed measurements of phytoplankton physiology and rate processes, and to sample daily for phytoplankton growth rates and biomass, soluble and particulate iron and zooplankton biomass. A cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel. **Methods & Sampling** Related information: Descriptions of SOFeX cruise sampling event types Brief cruise plan description: Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. A cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel. A comment on the 'patch_loc' field: The 'patch_loc' field is usually one of four abbreviation codes indicating the sampling location relative to the 'iron fertilized patches'; N indicates North Patch, S = South Patch, and whether the location is within or outside the patch area or on the edge of the patch. **Processing Description** Change history: YYMMDD 070323: original Excel file downloaded from http://www.mbari.org/SOFeX/multi_ship_data.htm">SOFeX data site at MBARI; original version (v1.0) prepared by Michael Hiscock (hiscock@duke.edu) 070329: added to OCB database by Cyndy Chandler, OCB DMO (cchandler@whoi.edu) some minor modifications to event type (ev_type) to ensure database consistency; only significant change to data during posting was: UID_SFX=109 SOFEX02R 026 event_SFX=20020311045 TMR1 original position was: lon 171.918 E and lat 66.322 N (OCB DMO changed both to be negative to reflect West and South); Also note that Polar Star event 20020430523, CTD01 test cast, is reported at -172.917 -74.117 but the CTD data were reported with an Eastern longitude of 172.924. DMO note: events are grouped by cruise (e.g. not sorted by time); note that event number comprises a simple Day of Year and not Julian Day (as documented in the original PI note contributed with the data), and that event_SFX numbers are not unique, so caution must be used when using event_SFX to combine data sets. There are 40 pairs of duplicate event numbers. PI notes: Version 1.0 September 7, 2002 Event logs for the three ships are compiled in the Melville-format. Event number is YYYYJJJUUUU Y=year J=Julian Day, U=UTC. The event numbers for Jodi Brewster's SCUFAs and the Melville SF6 data have been included. A notable addition is the "Time since Fertilization" column for the South patch and North Patch. I used the midpoint of the first fertilzation of each patch as time zero. North patch 20020131415. South patch 20020250430. I would like to keep this event log as complete and accurate as possible. Please email Michael Hiscock (hiscock@duke.edu) with any additions or corrections.

DRFT08RR

Website	https://www.bco-dmo.org/deployment/57824
Platform	R/V Roger Revelle
Report	http://ocb.whoi.edu/SOFeX/CRUISES/proj_description.pdf
Start Date	2002-01-06
End Date	2002-02-14
Description	Brief cruise plan description: Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. The designations SOFeX-N and SOFeX-S are sometimes used to distinguish between two iron enriched patches - one in low silicate waters north of the polar front (SOFEX-N), and the other in high silicate waters south of the polar front (SOFEX-S). All three ships, Melville (MV), Revelle (RR) and Polar Star (PS), worked in SOFEX-S, but only the Revelle and Melville worked in the SOFeX N patch and shuttled between the two patches. The R/V ROGER REVELLE from Scripps Institution of Oceanography sailed first. The REVELLE team added iron to two areas referred to as 'the North and South patches'. After the iron and an inert chemical tracer (SF6) were added, the REVELLE's primary mission was to map the size and characteristics of the South patch using a SeaSOAR fish towed behind the ship that pumped water up to the ship for sampling and analysis. The REVELLE also collected samples for initial biological shipboard mapping of iron concentrations, nutrients, chlorophyll, and photosynthetic efficiency. A cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel. **Methods & Sampling** Related information: Descriptions of SOFeX cruise sampling event types Brief cruise plan description: Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. A cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel. A comment on the 'patch_loc' field: The 'patch_loc' field is usually one of four abbreviation codes indicating the sampling location relative to the 'iron fertilized patches'; N indicates North Patch, S = South Patch, and whether the location is within or outside the patch area or on the edge of the patch. **Processing Description** Change history: YYMMDD 070323: original Excel file downloaded from http://www.mbari.org/SOFeX/multi_ship_data.htm">SOFeX data site at MBARI; original version (v1.0) prepared by Michael Hiscock (hiscock@duke.edu) 070329: added to OCB database by Cyndy Chandler, OCB DMO (cchandler@whoi.edu) some minor modifications to event type (ev_type) to ensure database consistency; only significant change to data during posting was: UID_SFX=109 SOFEX02R 026 event_SFX=20020311045 TMR1 original position was: lon 171.918 E and lat 66.322 N (OCB DMO changed both to be negative to reflect West and South); Also note that Polar Star event 20020430523, CTD01 test cast, is reported at -172.917 -74.117 but the CTD data were reported with an Eastern longitude of 172.924. DMO note: events are grouped by cruise (e.g. not sorted by time); note that event number comprises a simple Day of Year and not Julian Day (as documented in the original PI note contributed with the data), and that event_SFX numbers are not unique, so caution must be used when using event_SFX to combine data sets. There are 40 pairs of duplicate event numbers. PI notes: Version 1.0 September 7, 2002 Event logs for the three ships are compiled in the Melville-format. Event number is YYYYJJJUUUU Y=year J=Julian Day, U=UTC. The event numbers for Jodi Brewster's SCUFAs and the Melville SF6 data have been included. A notable addition is the "Time since Fertilization" column for the South patch and North Patch. I used the midpoint of the first fertilzation of each patch as time zero. North patch 20020131415. South patch 20020250430. I would like to keep this event log as complete and accurate as possible. Please email Michael Hiscock (hiscock@duke.edu) with any additions or corrections.

PS02_2002

Website	https://www.bco-dmo.org/deployment/57825
Platform	USCGC Polar Star
Report	http://ocb.whoi.edu/SOFeX/CRUISES/proj_description.pdf
Start Date	2002-02-11
End Date	2002-02-21
Description	Cruise dates provided by David Forcucci, USCG Science Liaison Brief cruise plan description: Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. The designations SOFeX-N and SOFeX-S are sometimes used to distinguish between two iron enriched patches - one in low silicate waters north of the polar front (SOFEX-N), and the other in high silicate waters south of the polar front (SOFEX-S). All three ships, Melville (MV), Revelle (RR) and Polar Star (PS), worked in SOFEX-S, but only the Revelle and Melville worked in the SOFeX N patch and shuttled between the two patches. The USCGC Polar Star was the third of the three vessels to occupy the SOFeX study area in 2002. The main focus of the scientific party aboard the Polar Star was to assess how much carbon was removed from the iron fertilized patches. The cruise report includes a more complete description of the Polar Star cruise and a cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel. **Methods & Sampling** Related information: Descriptions of SOFeX cruise sampling event types Brief cruise plan description: Three ships were involved in the SOFeX experiment. Each ship operated in the study area at a different time to afford the longest observation time. A cruise logbook includes daily entries filed by the Chief Scientist aboard each vessel. A comment on the 'patch_loc' field: The 'patch_loc' field is usually one of four abbreviation codes indicating the sampling location relative to the 'iron fertilized patches'; N indicates North Patch, S = South Patch, and whether the location is within or outside the patch area or on the edge of the patch. **Processing Description** Change history: YYMMDD 070323: original Excel file downloaded from http://www.mbari.org/SOFeX/multi_ship_data.htm">SOFeX data site at MBARI; original version (v1.0) prepared by Michael Hiscock (hiscock@duke.edu) 070329: added to OCB database by Cyndy Chandler, OCB DMO (cchandler@whoi.edu) some minor modifications to event type (ev_type) to ensure database consistency; only significant change to data during posting was: UID_SFX=109 SOFEX02R 026 event_SFX=20020311045 TMR1 original position was: lon 171.918 E and lat 66.322 N (OCB DMO changed both to be negative to reflect West and South); Also note that Polar Star event 20020430523, CTD01 test cast, is reported at -172.917 -74.117 but the CTD data were reported with an Eastern longitude of 172.924. DMO note: events are grouped by cruise (e.g. not sorted by time); note that event number comprises a simple Day of Year and not Julian Day (as documented in the original PI note contributed with the data), and that event_SFX numbers are not unique, so caution must be used when using event_SFX to combine data sets. There are 40 pairs of duplicate event numbers. PI notes: Version 1.0 September 7, 2002 Event logs for the three ships are compiled in the Melville-format. Event number is YYYYJJJUUUU Y=year J=Julian Day, U=UTC. The event numbers for Jodi Brewster's SCUFAs and the Melville SF6 data have been included. A notable addition is the "Time since Fertilization" column for the South patch and North Patch. I used the midpoint of the first fertilzation of each patch as time zero. North patch 20020131415. South patch 20020250430. I would like to keep this event log as complete and accurate as possible. Please email Michael Hiscock (hiscock@duke.edu) with any additions or corrections.

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Project Information

Southern Ocean Iron Experiment (SOFeX)

Website: http://www.mbari.org/expeditions/SOFeX2002/

Coverage: Southern Ocean, south of New Zealand

Before he passed away in 1993, John Martin suggested that an increase in the flow of iron-rich dust to the ocean causes phytoplankton (single celled algae) to grow. The increased photosynthesis removes carbon dioxide from surface waters as the algae create biomass. This carbon dioxide is replaced by carbon dioxide gas that flows into the sea from the atmosphere. Reduced carbon dioxide in the atmosphere cools the planet (CO_2 is a greenhouse gas that warms the earth). The results of this work, funded by the National Science Foundation, the Department of Energy, and the US Coast Guard, will be a much better understanding of how biological processes may regulate climate. (see Related Info: Fe cycle)

A direct test of the 'Martin Hypothesis' that trace concentrations of Fe are responsible for phytoplankton's ability to grow by direct experimental addition of Fe to the surface waters. Consequently the distribution of bioavailable Fe in the surface waters determines large geographical areas primary production and the following flux of fixed organic matter to the deep sea. The aim of the SOFeX project is to investigate the effects of iron fertilization on the productivity of the Southern Ocean. The results of this work will contribute significantly to our understanding of important biogeochemical processes which bear directly on the global carbon cycle, atmospheric carbon dioxide concentration, and climate control.

The SOFeX-N and SOFeX-S designations are sometimes used to distinguish between two iron enriched patches - one in low silicate waters north of the polar front (SOFEX-N), and the other in high silicate waters south of the polar front (SOFEX-S). All three ships, Melville (MV), Revelle (RR) and Polar Star (PS), worked in SOFEX-S, but only the Revelle and Melville worked in the SOFeX N patch and shuttled between the two patches.

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Program Information

Iron Synthesis (FeSynth)

Coverage: Global

The two main objectives of the Iron Synthesis program (SCOR Working Group proposal, 2005), are:
1. Data compilation: assembling a common open-access database of the *in situ* iron experiments, beginning with the first period (1993-2002; Ironex-1, Ironex-2, SOIREE, EisenEx, SEEDS-1; SOFeX, SERIES) where primary articles have already been published, to be followed by the 2004 experiments where primary articles are now in progress (EIFEX, SEEDS-2; SAGE, FeeP); similarly for the natural fertilizations S.O.JGOFS (1992), CROZEX (2004/2005) and KEOPS (2005).

2. Modeling and data synthesis of specific aspects of two or more such experiments for various topics such as physical mixing, phytoplankton productivity, overall ecosystem functioning, iron chemistry, CO_2 budgeting, nutrient uptake ratios, DMS(P) processes, and combinations of these variables and processes.

SCOR Working Group proposal, 2005. "The Legacy of *in situ* Iron Enrichments: Data Compilation and Modeling".
http://www.scor-int.org/Working_Groups/wg131.htm

See also: SCOR Proceedings Vol. 42 Concepcion, Chile October 2006, pgs: 13-16 2.3.3 Working Group on The Legacy of *in situ* Iron Enrichments: Data Compilation and Modeling.

The first objective of the Iron Synthesis program involves a data recovery effort aimed at assembling a common, open-access database of data and metadata from a series of *in-situ* ocean iron fertilization experiments conducted between 1993 and 2005. Initially, funding for this effort is being provided by the Scientific Committee on Oceanic Research (SCOR) and the U.S. National Science Foundation (NSF).

Through the combined efforts of the principal investigators of the individual projects and the staff of Biological and Chemical Oceanography Data Management Office (BCO-DMO), data currently available primarily through individuals, disparate reports and data agencies, and in multiple formats, are being collected and prepared for

addition to the BCO-DMO database from which they will be freely available to the community.

As data are contributed to the BCO-DMO office, they are organized into four overlapping categories:
1. Level 1, basic metadata
(e.g., description of project/study, general location, PI(s), participants);
2. Level 2, detailed metadata and basic shipboard data and routine ship's operations
(e.g., CTDs, underway measurements, sampling event logs);
3. Level 3, detailed metadata and data from specialized observations
(e.g., discrete observations, experimental results, rate measurements) and
4. Level 4, remaining datasets
(e.g., highest level of detailed data available from each study).

Collaboration with BCO-DMO staff began in March of 2008 and initial efforts have been directed toward basic project descriptions, levels 1 and 2 metadata and basic data, with detailed and more detailed data files being incorporated as they become available and are processed.

Related file

Program Documentation

The Iron Synthesis Program is funded jointly by the Scientific Committee on Oceanic Research (SCOR) and the U.S. National Science Foundation (NSF).

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.

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