

TMR CTD pressure, temperature, salinity profiles from R/V Roger Revelle cruise DRFT08RR from the Southern Ocean, south of New Zealand in 2002 (SOFeX project)

Website: <https://www.bco-dmo.org/dataset/2934>

Version: 2 March 2006

Version Date: 2006-03-02

Project

» [Southern Ocean Iron Experiment](#) (SOFeX)

Programs

» [Ocean Carbon and Biogeochemistry](#) (OCB)

» [Iron Synthesis](#) (FeSynth)

Contributors	Affiliation	Role
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Dataset Description

CTD pressure, temperature, salinity profiles from Trace Metal Clean Rosette (TMR) CTD instrument package

Methods & Sampling

dates: 11 January 2002 to 10 February 2002 (20020111-20020210)

location: N: -54.093 S: -66.602 W: -172.038 E: -169.242

project/cruise: SOFeX/RR

Data Processing Description

DMO notes: original version prepared from CTD (TMR CTD) casts
Added to OCB: 10 January 2006 by Cyndy Chandler (cchandler@whoi.edu)

Questions:

are times UTC or GMT?

still unsure about some user sensors

10 January 2006: Prepared for OCB data system by Terry McKee (PO Dept, WHOI) and Cyndy Chandler, OCB DMO (WHOI).

Data were processed using the standard set of Seabird utilities,

to generate final 1-decibar pressure sorted downtrace files for all CTD casts.
All final processed *.asc CTD files were downloaded by the OCB DMO
in December 2005 from the SOFeX web site:

http://www.mbari.org/SOFeX/Revelle_Data/Revelle_Station_Data/Revelle_TMR_CTD_data.htm

The event number, date, time, latitude
and longitude position information were taken from the *.hdr CTD header files.
For TMR1 station 7, the latitude may have been entered incorrectly during data acquisition
(55 °W) **but was not changed** to be consistent with the
cruise [Activity Log](#) (56 °W).

Final CTD station header record showing history of processing steps:

[TMR-CTD station 7](#)

Final CTD station configuration (con report) files were not provided with .asc files.

MATLAB data processing scripts:

Physical properties of seawater function was used to compute potential density:

[PhyPropSW_sw_pden.m](#)

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Data Files

File
ctd-TMR.csv (Comma Separated Values (.csv), 428.07 KB) MD5:e66bdb44f7a66d3fd761342bf3f6ab2c Primary data file for dataset ID 2934

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Parameters

Parameter	Description	Units
sta	station identifier	dimensionless
ev_type	event type descriptor string	dimensionless
event	unique sampling event composite of date and time	YYYYMMDDhhmm
date	date sampling began	YYYYMMDD
time	time sampling began	hhmm
lon	longitude, negative denotes West	decimal degrees
lat	latitude, negative denotes South	decimal degrees
press	pressure, from CTD Strain Gauge	decibars
depth	depth, calculated from pressure	meters
temp	temperature, from CTD, ITS-90	degrees Celsius
sal	salinity, from CTD, PSS-78 (PSU)	dimensionless
sigma_0	sigma theta (potential density) (from primary T0,C0 sensors)	kilograms/meter ³
potemp	potential temperature, ITS-90 (from primary T0,C0 sensors)	degrees Celsius
fluor	fluorescence, from CTD profiler (is this fluor_chla ??)	micrograms/liter ??
V0	unknown	unknown ??
cond	conductivity, from CTD (from primary C0 sensor)	Siemens/meter

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Instruments

Dataset-specific Instrument Name	CTD Seabird 25
Generic Instrument Name	CTD Sea-Bird 25
Generic Instrument Description	<p>The Sea-Bird SBE 25 SEALOGGER CTD is battery powered and is typically used to record data in memory, eliminating the need for a large vessel, electrical sea cable, and on-board computer. All SBE 25s can also operate in real-time, transmitting data via an opto-isolated RS-232 serial port. Temperature and conductivity are measured by the SBE 3F Temperature sensor and SBE 4 Conductivity sensor (same as those used on the premium SBE 9plus CTD). The SBE 25 also includes the SBE 5P (plastic) or 5T (titanium) Submersible Pump and TC Duct. The pump-controlled, TC-ducted flow configuration significantly reduces salinity spiking caused by ship heave, and in calm waters allows slower descent rates for improved resolution of water column features. Pressure is measured by the modular SBE 29 Temperature Compensated Strain-Gauge Pressure sensor (available in eight depth ranges to suit the operating depth requirement). The SBE 25's modular design makes it easy to configure in the field for a wide range of auxiliary sensors, including optional dissolved oxygen (SBE 43), pH (SBE 18 or SBE 27), fluorescence, transmissivity, PAR, and optical backscatter sensors. More information from Sea-Bird Electronics: http://www.seabird.com.</p>

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Deployments

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	<p>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.</p> <p>Methods & Sampling dates: 11 January 2002 to 10 February 2002 (20020111-20020210) location: N: -54.093 S: -66.602 W: -172.038 E: -169.242 project/cruise: SOFeX/RR</p> <p>Processing Description DMO notes: original version prepared from CTD (TMR CTD) casts Added to OCB: 10 January 2006 by Cyndy Chandler (cchandler@whoi.edu) Questions: are times UTC or GMT ? still unsure about some user sensors 10 January 2006: Prepared for OCB data system by Terry McKee (PO Dept, WHOI) and Cyndy Chandler, OCB DMO (WHOI). Data were processed using the standard set of Seabird utilities, to generate final 1-decibar pressure sorted downtrace files for all CTD casts. All final processed *.asc CTD files were downloaded by the OCB DMO in December 2005 from the SOFeX web site: http://www.mbari.org/SOFeX/Revelle_Data/Revelle_Station_Data/Revelle_TMR... The event number, date, time, latitude and longitude position information were taken from the *.hdr CTD header files. For TMR1 station 7, the latitude may have been entered incorrectly during data acquisition (55 °W) but was not changed to be consistent with the cruise http://ocb.whoi.edu/jg/serv/OCB/SOFeX/Revelle/log.html0">Activity Log (56 °W). Final CTD station header record showing history of processing steps: http://ocb.whoi.edu/SOFeX/PI-NOTES/SX007T01_hdr.txt">TMR-CTD station 7 Final CTD station configuration (con report) files were not provided with .asc files. MATLAB data processing scripts: Physical properties of seawater function was used to compute potential density: http://ocb.whoi.edu/datasys/PhyPropSW/sw_pden.m">PhyPropSW sw_pden.m</p>

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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 (CO₂ 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

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.

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, CO₂ 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).



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