

Underway determinations (includes Fe) from R/V Kaiyo-Maru cruise KY0103-02 from the Northwestern Sub-Arctic Pacific in 2001 (SEEDS I project)

Website: <https://www.bco-dmo.org/dataset/2893>

Version: 28August2008

Version Date: 2008-08-28

Project

» [Subarctic-Pacific Iron Experiment for Ecosystem Dynamics Study I](#) (SEEDS I)

Program

» [Iron Synthesis](#) (FeSynth)

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Dataset Description

SEEDS 2001 Underway Determinations

Underway measurements made on days 3, 6, 8, 10, and 12

Includes Fe data

Methods & Sampling

The underway survey was conducted to determine the position and shape of the patch using the ship's pumping system which had an intake at 6 m below the surface. fCO₂ and SF₆ were sampled from the ships pumping system (6 m depth) at 1 and 6 minute intervals, respectively.

Sampling intervals during underway sampling of chlorophyll-a and fCO₂ SF₆ and iron concentration were 5-10 and 1 and 6 and 5-10 min respectively with ship's speed of 18.5 km h⁻¹.

Additional underway sampling was also carried out for determination of iron, chlorophyll-a and nutrients concentrations using the clean pumping system with a towed fish from the ship's side connected to Teflon tubing.

Dissolved Fe (<0.22 µm), chl a, and nutrients (NO₃, NO₂, Si, PO₄, NH₄) were sampled from a towed clean fish (depth not given) at 5-10 minute intervals.

Data Processing Description

Concentrations of iron in underway samples (filtered by 0.22 μ m) were determined by flow injection analyzer with chemiluminescence detection.

SF6 concentration was determined by a twin sparge-cryogenic traps system coupled to an electron-capture detector-gas chromatograph.

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Data Files

File
Underway.csv (Comma Separated Values (.csv), 219.73 KB) MD5:6e8edb4324778fe9fb129c4e468a3408 Primary data file for dataset ID 2893

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Parameters

Parameter	Description	Units
date	Date UTC	YYYYMMDD
lat	latitude, negative denotes South	decimal degrees
lon	longitude, negative denotes West	decimal degrees
time_local_JST	Local Time - Japan Standard Time	HHMM
speed	Ship's speed in knots	knots
heading	Ship's heading in degrees	degrees
SF6	SF6 concentration	fM
X_CO2	X_CO2	(tbd)
f_CO2	f_CO2	(tbd)
Diss_Fe	Diss_Fe	nM
NO3	NO3	uM
NO2	NO2	uM
Si	Si	uM
PO4	PO4	uM
NH4	NH4	uM
Chl_a	Chl_a	jmg/m3

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Deployments

KY0103-02

Website	https://www.bco-dmo.org/deployment/57835
Platform	R/V Kaiyo-Maru
Start Date	2001-07-13
End Date	2001-08-06
Description	Patch enrichment = Leg 2: 13 Jul 2001 (Kushiro)--06 Aug 2001 (Tokyo)Note: No cruise track was contributed for this deployment. Data are plotted outside what is displayed as the "best available" cruise track from the data contributed

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Project Information

Subarctic-Pacific Iron Experiment for Ecosystem Dynamics Study I (SEEDS I)

Website: <http://www.seeds-exp.jp/en/index.html>

Coverage: Western subarctic gyre in the North Pacific at 48.5°N, 165°E

An in situ test of the iron limitation hypothesis in the subarctic North Pacific Ocean was performed. First experiment of two (see SEEDS 2004)

A single enrichment of dissolved iron caused a large increase in phytoplankton standing stock and decreases in macronutrients and dissolved carbon dioxide. The dominant phytoplankton species shifted after the iron addition from pennate diatoms to a centric diatom, *Chaetoceros debilis*, that showed a very high growth rate, 2.6 doublings per day. Conclusion was that the bioavailability of iron regulates the magnitude of the phytoplankton biomass and the key phytoplankton species that determine the biogeochemical sensitivity to iron supply of high-nitrate, low-chlorophyll waters.

Data was collected at a total of 13 stations and from 3 moored sediment traps.

- Stations were occupied IN patch for days 0, 2, 4, 7, 9, 11 and 13.
- Stations were occupied OUT patch for days 2, 4, 7, 9, 11, 13.

It is not explicitly stated but it appears that at all stations two CTD sampling rosette casts were made: clean and rms. The clean rosette appears to have typically sampled the mixed layer (<50 m) e.g. 5, 10, 20, 30, 50 m. The rms rosette appears to have typically sampled the euphotic zone (<200m) e.g. 10, 20, 30, 40, 50, 80, 100, 150, 200 m.

Sediment traps were deployed at:

- CENTRE: 20 m
- IN: 40, 60, 100, 200 m
- OUT: 20, 40, 60 and 100 m

Traps were recovered several times. Deployment times (days):

- CENTRE: 3.95, 2.83, 2.02, 1.98, 1.93, 2.05
- IN: 3.99, 2.84, 2.03, 2.00, 1.95, 2.01
- OUT: 5.17, 3.97, 3.42

BCO-DMO/Doug Mackie Note:

Throughout these data, stations are identified as D2-I, D2-O, etc. D2-I indicates "Day 2, in patch station". while D2-O indicates "Day 2, out patch station". This applies to all station identifiers.

Related file

[SEEDS 2001 Project Documentation](#)

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, 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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