

EISENEX dissolved iron from R/V Polarstern cruise ANT-XVIII-2 from the Southern Ocean, Atlantic Sector; 2000 (EISENEX project)

Website: <https://www.bco-dmo.org/dataset/2822>

Version: final

Project

» [European Iron Enrichment Experiment](#) (EISENEX)

Program

» [Iron Synthesis](#) (FeSynth)

Contributors	Affiliation	Role
Croot, Peter		Principal Investigator
Laan, Patrick		Co-Principal Investigator
Gegg, Stephen R.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Table of Contents

- [Dataset Description](#)
 - [Methods & Sampling](#)
- [Parameters](#)
- [Deployments](#)
- [Project Information](#)
- [Program Information](#)

Dataset Description

EISENEX dissolved iron measured along surface transects

Data published at PANGAEA, Publishing Network for Geoscientific & Environmental Data

Methods & Sampling

Measurements of Fe(II) and H₂O₂ were carried out in the Atlantic sector of the Southern Ocean during EISENEX, an iron enrichment experiment. Iron was added on three separate occasions, approximately every 8 days, as a ferrous sulfate (FeSO₄) solution. Vertical profiles of Fe(II) showed maxima consistent with the plume of the iron infusion. While H₂O₂ profiles revealed a corresponding minima showing the effect of oxidation of Fe(II) by H₂O₂, observations showed detectable Fe(II) concentrations existed for up to 8 days after an iron infusion. H₂O₂ concentrations increased at the depth of the chlorophyll maximum when iron concentrations returned to pre-infusion concentrations (<80 pM) possibly due to biological production related to iron reductase activity.

In this work, Fe(II) and dissolved iron were used as tracers themselves for subsequent iron infusions when no further SF₆ was added. EISENEX was subject to periods of weak and strong mixing. Slow mixing after the second infusion allowed significant concentrations of Fe(II) and Fe to exist for several days. During this time, dissolved and total iron in the infusion plume behaved almost conservatively as it was trapped between a relict mixed layer and a new rain-induced mixed layer. Using dissolved iron, a value for the vertical diffusion coefficient $K_z = 6.7 \pm 0.7 \text{ cm}^2/\text{s}$ was obtained for this 2-day period. During a subsequent surface survey of the iron-enriched patch, elevated levels of Fe(II) were found in surface waters presumably from Fe(II) dissolved in the rainwater that was falling at this time.

[[table of contents](#) | [back to top](#)]

Parameters

Parameters for this dataset have not yet been identified

[[table of contents](#) | [back to top](#)]

Deployments

ANT-XVIII-2

Website	https://www.bco-dmo.org/deployment/57840
Platform	R/V Polarstern
Report	http://epic.awi.de/Publications/BerPolarforsch2001400.pdf
Start Date	2000-10-25
End Date	2000-12-03
Description	<p>Methods & Sampling</p> <p>Measurements of Fe(II) and H₂O₂ were carried out in the Atlantic sector of the Southern Ocean during EISENEX, an iron enrichment experiment. Iron was added on three separate occasions, approximately every 8 days, as a ferrous sulfate (FeSO₄) solution. Vertical profiles of Fe(II) showed maxima consistent with the plume of the iron infusion. While H₂O₂ profiles revealed a corresponding minima showing the effect of oxidation of Fe(II) by H₂O₂, observations showed detectable Fe(II) concentrations existed for up to 8 days after an iron infusion. H₂O₂ concentrations increased at the depth of the chlorophyll maximum when iron concentrations returned to pre-infusion concentrations (In this work, Fe(II) and dissolved iron were used as tracers themselves for subsequent iron infusions when no further SF₆ was added. EISENEX was subject to periods of weak and strong mixing. Slow mixing after the second infusion allowed significant concentrations of Fe(II) and Fe to exist for several days. During this time, dissolved and total iron in the infusion plume behaved almost conservatively as it was trapped between a relict mixed layer and a new rain-induced mixed layer. Using dissolved iron, a value for the vertical diffusion coefficient $K_z=6.7\pm 0.7$ cm²/s was obtained for this 2-day period. During a subsequent surface survey of the iron-enriched patch, elevated levels of Fe(II) were found in surface waters presumably from Fe(II) dissolved in the rainwater that was falling at this time.</p>

[[table of contents](#) | [back to top](#)]

Project Information

European Iron Enrichment Experiment (EISENEX)

Coverage: Southern Ocean, Atlantic Sector

EISENEX is also known as the G-JGOFS Southern Ocean, Atlantic Sector Cruise
EISENEX project data have been published at PANGAEA, (Publishing Network for Geoscientific & Environmental Data).

See the [EISENEX data at PANGAEA](#)

[[table of contents](#) | [back to top](#)]

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).



