SeaWiFS images of the SOIREE bloom from the R/V Tangaroa 61TG_3052 cruise in the Southern Ocean during 1999 (SOIREE project)

Website: https://www.bco-dmo.org/dataset/3310
Version: 12March2010
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Project
» Southern Ocean Iron Release Experiment (SOIREE)

Program
» Iron Synthesis (FeSynth)

Contributors	Affiliation	Role
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Dataset Description

This dataset contains images of the SOIREE bloom, as described in Abraham, E.R., Law, C.S., Boyd, P.W., Lavender, S.J., Maldonado, M.T., and Bowie, A.R. (2000) Importance of stirring in the development of an iron-fertilized bloom. Nature 407, 727-730.

The SeaWiFS data were provided by the NASA/DAAC GSFC and are copyright of Orbital Imaging Corps and the NASA SeaWiFS project. The data were processed at CCMS-PML by Samatha Lavender.

The images are in PNG format. Chlorophyll values can be extracted from the imagery by applying the conversion equation:

$log10(chl) = ((Pixel\ value) * slope) + log10(intercept)$

where slope = 0.015 and intercept = 0.01.

The images are in a non-standard Mercator projection and the following formulae may be used to convert latitude/longitude (lat/lon) positions to x/y pixel co-ordinates or vica-versa.

Given lat and lon
Calculate x position:
FractX = (lon - minlon) / (maxlon - minlon)
x = cols * FractX

Calculate y position:
Ymin=logn(tan(DEGTORAD*(45.0+(lat/2.0))))
Ymax=logn(tan(DEGTORAD*(45.0+(maxlat/2.0))))
y=(cols *(Ymax-Ymin))/(DEGTORAD*(maxlon-minlon))

Given x and y
Calculate Longitude:
Fractx=(x-1)/(cols-1)
lon=Fractx*(maxlon-minlon)+minlon

Calculate Latitude:
Ymax=logn(tan(DEGTORAD*(45.0+(maxlat/2.0))));
Ymin=Ymax-(y-1)*DEGTORAD*(maxlon-minlon)/(cols-1);
lat= 2*(atan(exp(Ymin))/DEGTORAD - 45);

Where rows = 431 cols = 445 minlon =137.0 maxlon = 145.0 maxlat = -59.001762
DEGTORAD - conversion from degrees to radians (PI/180.0)

Queries and permission to use the images should be addressed to
Edward Abraham (e.abraham@niwa.cri.nz)

Methods & Sampling

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of Orbital Imaging Corps and the NASA SeaWiFS project. The data were

processed at CCMS-PML by Samatha Lavender.

Data Processing Description

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processed at CCMS-PML by Samatha Lavender.

BCO-DMO Processing Notes

The SeaWIFS images were copied from the Deep-Sea Research II 48 (2001) accompanying CD-Rom

BCO-DMO Edits

- Thumbnail images generated to facilitate access to the images in the BCO-DMO database

Data Files

File
SEAWIFS.csv (Comma Separated Values (.csv), 2.19 KB) MD5:83f8d2df2f5b17d16a8b298cc7a3962a Primary data file for dataset ID 3310

Parameters

Parameter	Description	Units
Date	SeaWIFS image date of collection	YYYYMMDD
Image	SeaWIFS image identifier	text
Description	SeaWIFS image text descriptor	text
ImageFile	Filename of SeaWIFS thunmbnail image	text

Instruments

Dataset-specific Instrument Name	Sea-viewing Wide Field-of-view Sensor
Generic Instrument Name	Sea-viewing Wide Field-of-view Sensor
Dataset-specific Description	SEAWIFS
Generic Instrument Description	The Sea-viewing Wide Field-of-view Sensor (SeaWiFS), a polar satellite rotating around the Earth 14 times per day, is operated and maintained by the US National Aeronautics and Space Administration (NASA) to provide quantitative data on global ocean bio-optical properties. The NASA/DAAC at Goddard Space Flight Center (GSFC) produces binned data and images as the final SeaWiFS data products. For more information refer to SeaWiFS Project Homepage.

Deployments

61TG_3052

Website	https://www.bco-dmo.org/deployment/57827
Platform	R/V Tangaroa
Report	http://bcodata.whoi.edu/Fe_Synthesis/SOIREE/SOIREE_cruisereport.pdf
Start Date	1999-01-31
End Date	1999-03-01
Description	Cruise to the Southern Ocean as part of the Fe Sythesis project whose aim was to maintain a coherent patch of iron-enriched seawater for the duration of SOIREE and to interpret any iron-mediated effects on the patch by conducting measurements and performing experiments during this period.

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Project Information

Southern Ocean Iron Release Experiment (SOIREE)

Coverage: Southern Ocean

Project in the Southern Ocean aimed at maintaining a coherent patch of iron-enriched seawater for the duration of project and to interpret any iron-mediated effects on the patch by conducting measurements and performing experiments during this period of the project.

The Southern Ocean Iron RElease Experiment (SOIREE), was the first in situ iron fertilization experiment performed in the polar waters of the Southern Ocean. SOIREE was an interdisciplinary study involving participants from six countries, and took place in February 1999 south of the Polar Front in the Australasian-Pacific sector of the Southern Ocean.

Approximately 3800 kg of acidified $FeSO_4.7H_2O$ and 165 g of the tracer sulphur hexafluoride (SF6) were added to a 65-m deep surface mixed layer over an area of ~50 km2. Initially, mean dissolved iron concentrations were ~2.7 nM, but decreased to ambient levels within days, requiring subsequent additions of 1550-1750 kg of acidified $FeSO_4.7H_2O$ on days 3, 5 and 7 of the experiment.

During the 13-day site occupation, there were iron-mediated increases in phytoplankton growth rates, with marked increases in chlorophyll a (up to 2 µgl-1) and production rates (up to 1.3 gCm-2d-1). These resulted in subsequent changes in the pelagic ecosystem structure, and in the cycling of carbon, silica and sulphur, such as a 10% drawdown of surface CO_2.

The SOIREE bloom persisted for >40 days following our departure from the site, as observed via SeaWiFS remotely sensed observations of Ocean Colour.

BCO-DMO Note:
All original data and metadata provided on a CD-Rom accompanying the Deep-Sea Research II 48 (2001) volume. The CD-Rom contains the main SOIREE datasets and ancillary information including the pre-experiment 'desktop' database study for site-selection, and satellite images of the SOIREE bloom.
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Related files

SOIREE Preliminary Voyage Report
SOIREE Introduction and Summary, Deep-Sea Research II 48 (2001) 2425-2438
SOIREE Cruise Track

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