

# Dimethyl Sulphide Biogeochemistry within a Coccolithophore Bloom



DISCO Data Set  
CD-ROM



QinetiQ

## The DISCO project

DISCO was an integrated, multidisciplinary Lagrangian study of the routes, rates and controls on the biogeochemical cycling of dimethyl sulphide (DMS) within a bloom of the coccolithophorid alga, *Emiliana huxleyi*.

## Fieldwork

The fieldwork took place between 5<sup>th</sup> June and 1<sup>st</sup> July 1999 in the northern North Sea aboard RRS Discovery. The biogeochemical process study was preceded by ~ 52 000 km<sup>2</sup> survey of the region in order to locate an *E. huxleyi* bloom suitable for study.

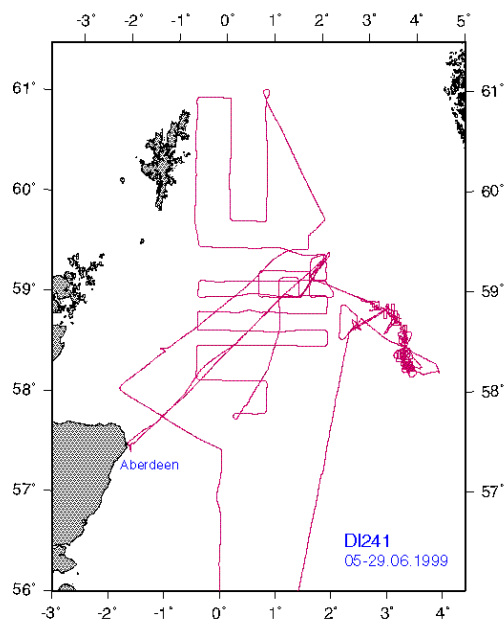


Figure 1: Cruise track in the study area.

The bloom chosen for study was initially centred at ~ 58° 56'N 02° 52' E, and a 40 km<sup>2</sup> patch labelled for study with 30 g SF<sub>6</sub> was marked on 16<sup>th</sup> June. The original patch was re-labelled with further SF<sub>6</sub> on 24<sup>th</sup> June. During the process study, the patch drifted in a south-easterly direction and was eventually subducted under Norwegian coastal water at the end of the process studies on 26<sup>th</sup> June.

## Achievements of the fieldwork

1. Survey of surface waters of northern North Sea.
2. Laying of an SF<sub>6</sub> patch to facilitate a Lagrangian study.
3. Monitoring of physical and optical properties of the patch.
4. Measurement of concentrations of dissolved and particulate components.
5. Measurements of dynamics of production, respiration, grazing and sedimentation.
6. Focus on DMS biogeochemical cycling.

## CD-ROM contents

The British Oceanographic Data Centre provided DISCO data management services and collated available data sets.

There are three main components of the CD-ROM

- Relational database
- Underway data set
- Time-series data set (instruments deployed on moorings or drifting buoys)

## DISCO relational database

The relational database contains data from:

- 3 drifting buoys
- 72 CTD profiles
- 3335 ADCP profiles
- 299 underway pump samples
- 519 CTD bottles
- 10 zooplankton nets
- 59 on-deck incubation experiments
- 92 XBT profiles

The relational database is presented on the CD-ROM in two variants of Microsoft JET format, together with an ASCII 'kit-form' database designed to be compatible with any database management system.

A *Windows* application program, the Database Explorer, has been developed that allows all data to be retrieved through a powerful and flexible search engine. Alternatively, the data may be accessed through the Microsoft Access (version 7.0 or later) forms interface, or by using the ASCII 'kit-form' database.

The database is supported by extensive documentation in Adobe *Acrobat* PDF format. The content of the database section is shown below.



A description of the database structure, including definitions of the tables and the relationships between them.



Full documentation about sampling and analysis protocols used by project scientists, and data processing carried out at BODC.



Instructions on how to use this *Windows* application, providing easy access to the database contents.



Information for those users who wish to use *Access* to interrogate Microsoft JET versions of the database.



Instructions for those users who wish to import the database into their own relational database management system.

## DISCO Time-series Data Set

The time-series data set consists of moored ADCP data, and data from 9 temperature miniloggers deployed on a drifting buoy.

The data are presented on the CD-ROM as a series of files in either ASCII format (temperature miniloggers) or NetCDF binary format (ADCP data). Both data types are handled by the Mooring Explorer interface software. This allows the data to be displayed graphically or listed in a tabular format that may be exported to other applications (*via* the clipboard).

## DISCO Underway Data

Continuous measurements of sea surface hydrography, meteorology, navigation and bathymetry were made during the DISCO cruise. The parameters included are:

- Latitude and longitude
- Distance along track
- Bathymetric depth
- Salinity
- Sea temperature
- Fluorometer voltage and calibrated chlorophyll-a concentration.
- Optical attenuation
- Atmospheric pressure
- Air temperature
- Relative humidity
- Wind speed and direction
- Photosynthetically available radiation (PAR)
- Solar radiation
- Dissolved SF<sub>6</sub>

The data are presented in a fully documented binary format. The Underway Explorer program can be used to display the data as stacked time-series plots and a spreadsheet grid that may be exported as ASCII or copied to other applications over the clipboard.

The data are given spatial context by a map of the cruise track overlain on GEBCO-97 bathymetry, which indicates the subset of the data that has been selected.

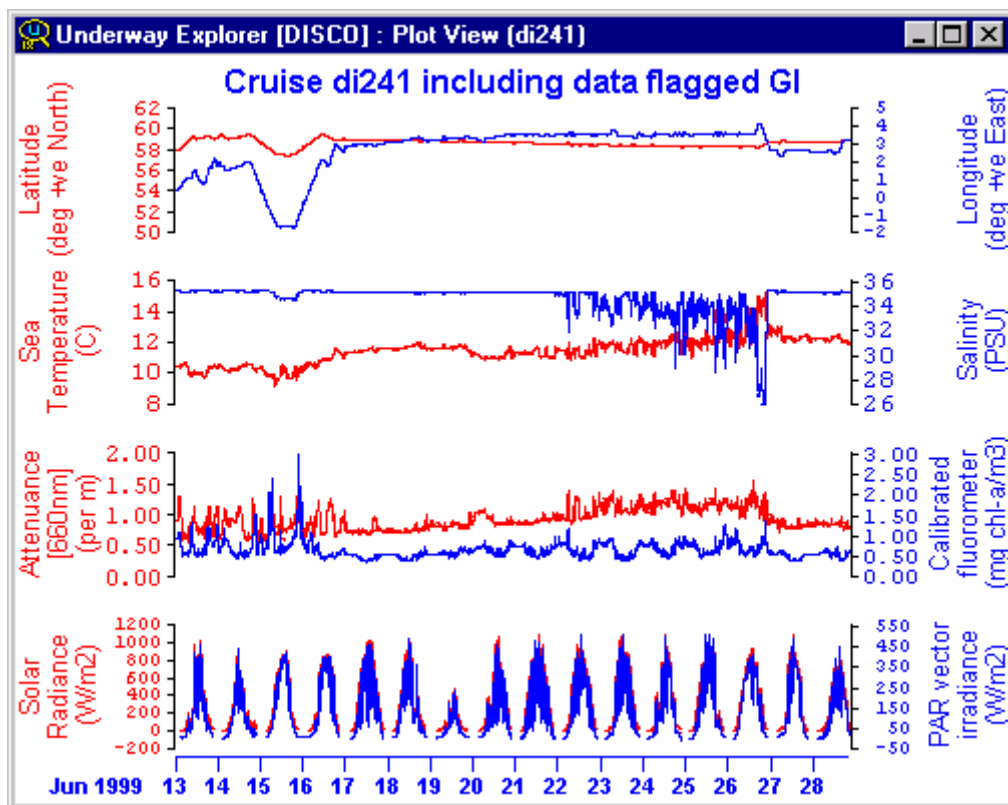


Figure 2: Underway Explorer plot of eight parameters measured during DISCO.

The Adobe *Acrobat* manual provides full descriptions of the protocols used to collect the data, a specification of the format used to store the data, and instructions for using the Underway Explorer software.

### **BODC software support**

The BODC Explorer Software installation program on the CD-ROM configures the Database, Underway and Moorings Explorer programs for the DISCO Project Data Set.

BODC personnel will do their utmost to assist you if you have problems installing the software or using the CD-ROM. Queries may be emailed to [enquiries@bodc.ac.uk](mailto:enquiries@bodc.ac.uk). This group mailbox is checked virtually every working day.

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The work involved scientists from the following institutions:

- *Plymouth Marine Laboratory, Plymouth, UK*
- *Proudman Oceanographic Laboratory, Merseyside, UK*
- *School of Environmental Sciences, University of East Anglia, UK*
- *University of Highlands and Islands and Scottish Association for Marine Science (SAMS), Oban, UK*
- *Marine Biological Association, Plymouth, UK*
- *Defence Research Agency, Haslar, UK.*
- *Southampton Oceanographic Centre, Hants, UK.*

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