

The PRIME Data Set

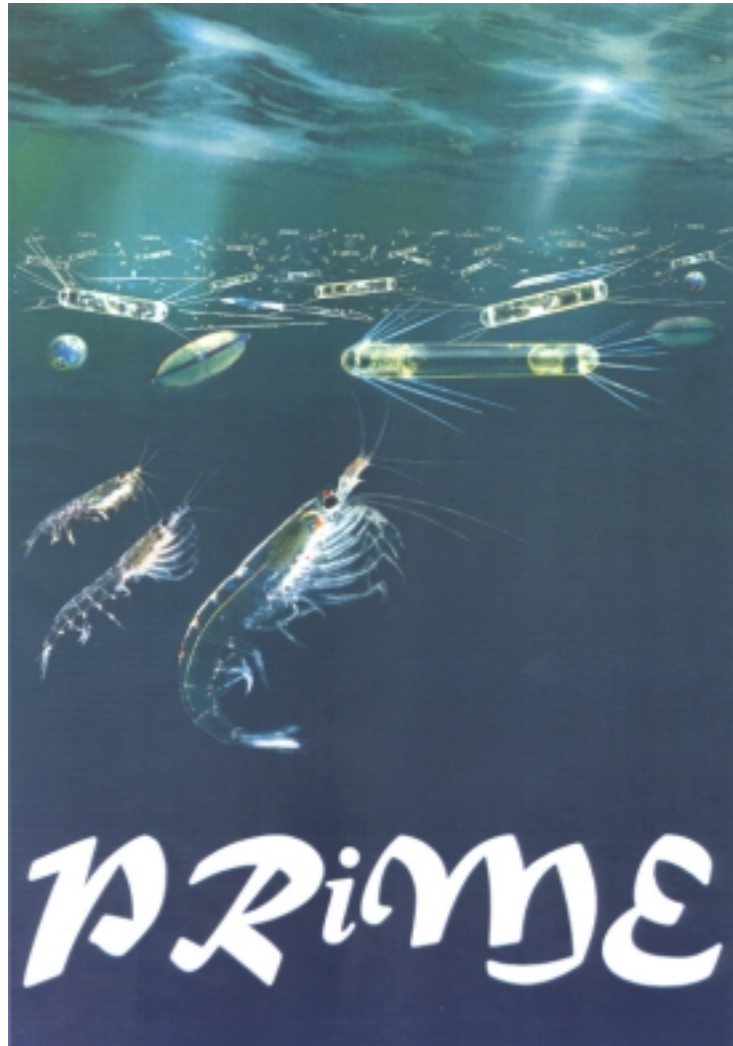
The NERC Community Research Project **Plankton Reactivity in the Marine Environment** (PRIME) ran from early in 1995 to February 1999. Its stated aim was to lay the basis for mathematical models to predict the role of plankton in biogeochemical fluxes which have implications for climate change.

The core theme of modelling within the PRIME programme drew upon both historical data and new data generated by field research undertaken as part of the programme. Two major pieces of fieldwork were undertaken by the PRIME community, (i) a 4 week mesocosm study in 1995 and (ii) a 6 week research campaign in the North-East Atlantic during 1996.

PRIME data management services were provided by the British Oceanographic Data Centre. The data management operation collected over 95% of the data sets identified and built them into an integrated database that forms the core of this electronic publication. The contents of the CD-ROM may be considered as a series of objects. Each object has a data or information content together with a mechanism for delivering these to the user.

PRIME Fieldwork

The PRIME cruise (Discovery 221) ran from June until July 1996. It studied biogeochemical processes in the NE Atlantic, in the region of Ocean Weather Station (OWS) India and also in a region centering on 37 degrees North, 20 degrees West. The first leg of the cruise was based on a warm core eddy (with surface characteristics of a cold core eddy). This was a truly Lagrangian study; drogued buoys and SF₆ marker concentrations were used to ensure sampling was confined within the eddy. The second leg of the cruise returned briefly to the eddy site to document any longer term temporal changes and then focussed entirely on station work at 37 North, 20 West. This work was only semi-Lagrangian as it was based on the position of a single drogued buoy.



Over 50 individual sets were collected during the cruise. This was augmented by the purchase of a vast amount of historical data collected during cruises to OWS India during the early 1970's. The OWS India historical data contains over 1000 individual data sets. They include measurements of temperature, salinity, pigments and primary production as well as abundances of major zooplankton groupings and four key indicator species.

In June and July 1995, fieldwork was based at the University of Bergen's mesocosm facility at Espegrend, Norway. Eight mesocosm bags were deployed for a month, with a variety of nutrient additions to stimulate blooms of key species such as *Emiliana huxleyii*. Daily samples were taken from each of the eight bags and from the surrounding fjord water which acted as a control. Measurements were made of plankton biomass, production, biogeochemical cycling and degree of viral infection.

The PRIME Database

This is by far the most important object on the CD-ROM. It is a relational database that includes all of the data collected during the project with the exception of the surface underway and UOR measurements. The database includes several Mbytes of data and 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 *Windows95* application program, the Database Explorer, has been developed that allows water bottle and net haul data to be retrieved through a powerful and flexible search engine. The database may also be queried using Microsoft Access version 7.0 or later. A set of Microsoft Access forms has been included to provide an interface to all data types held in the database.

The ASCII 'kit-form' database comprises one file per database table. All fields, including internal keys, are supplied to allow the database to be recreated with ease under any database system. Alternatively, conventional data processing applications may be written against these files.

Contents of the PRIME Database Object

- >500 CTD and SeaSoar profiles
- nearly 1000 water bottles sampled
- >600 net hauls sampled
- >450 Secchi disk deployments
- nearly 4000 multisizer samples
- 23 production experiments
- 5 drifting buoy tracks
- 40 days of weather observations
- 49 cruises
- nearly 650 parameters measured

The database is supported by extensive documentation in the Acrobat soft manual. This includes full descriptions of the data collection protocols, a description of the database structure and contents and instructions on the use of the Database Explorer software.

Underway Data

Continuous measurements of sea surface data (temperature, salinity, chlorophyll, carbonate system parameters, dissolved oxygen, dissolved SF₆, nutrients etc.), navigation, bathymetry and meteorology were made on the PRIME cruise at a frequency of 1 minute.

The data are presented on the CD-ROM in a fully documented format. A *Windows95* application program, the Underway Explorer, forms the primary interface to the data. This allows the display of up to six parameters on a stacked time series plot. The data may be simultaneously displayed as a spreadsheet grid that may be exported as ASCII or transferred to other applications using 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 have been selected.

The Acrobat soft 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.