

# Marine and Freshwater Microbial Biodiversity

Marine and Freshwater Microbial Biodiversity (M&FMB) was a 5-year Thematic Programme funded by the Natural Environment Research Council (NERC).

The programme's main objective was to improve our understanding of aquatic microbial biodiversity, with emphasis on community interactions, ecosystem function (e.g. biogeochemical cycling of carbon and nutrients), and the potential for biotechnological exploitation. BODC co-ordinated the data management activities for this programme in collaboration with the Lake Ecology Group at CEH Lancaster.



RRS Charles Darwin on station



CTD rosette water sampling in the green eutrophic waters of the Gulf of Oman

## Fieldwork programme

The programme involved two major fieldwork activities: a deep ocean research cruise (AMBITION: 'Analysing the Microbial Biodiversity of the Indian Ocean'), and a programme of freshwater studies, mainly centered at Priest Pot, a one hectare, 3.5 m deep, eutrophic pond in the English Lake District.

During field activities, aquatic microbes (viruses, bacteria, microalgae and microzooplankton) were sampled and analysed using new molecular techniques as well as traditional methods alongside a comprehensive suite of underpinning measurements of environmental variables and biogeochemical processes.

## The AMBITION cruise data set

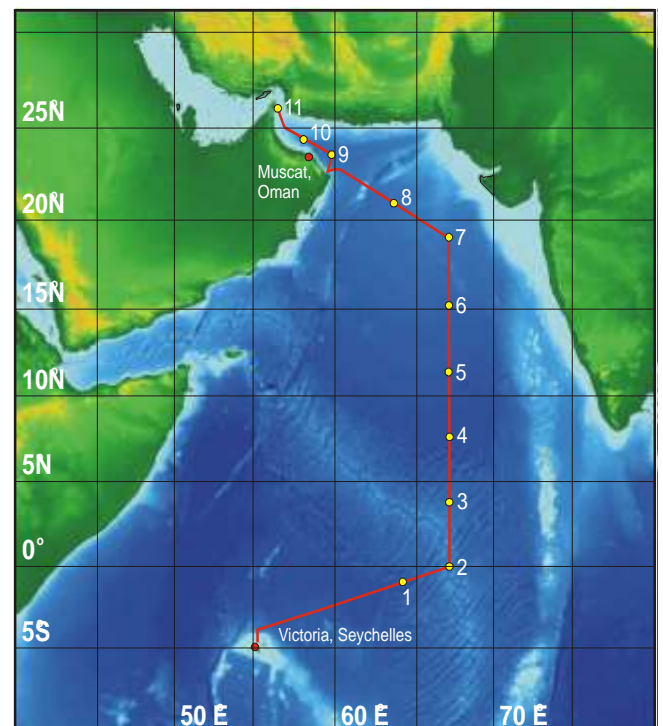
The AMBITION cruise data set has been assembled into BODC's environmental database. It contains over 90% of the data collected.

A total of 430 distinct variables are represented, quantifying the meteorology, hydrography, chemistry, biogeochemistry, and the microbial plankton (bacteria, phytoplankton and microzooplankton) biomass, taxonomic composition and production along the 5500 km cruise track in August-September 2001.

The data set also includes 376 gene sequences from genetic material extracted from environmental samples.

Measurements were mainly made on water samples collected either from the sea surface while the ship was underway or from a range of depths during CTD and water sampling stations at each of 11 sites occupied in the Indian Ocean. The maximum depth sampled at open ocean sites ranged from 300 to 3000 m.

Short sections of 300 m deep CTD and fluorescence profiles were also obtained using a moving vessel profiler (MVP).



AMBITION cruise track including positions of the principal stations

## The M&FMB Priest Pot data set

The Priest Pot Data Set was assembled by the Lake Ecology Group, CEH Lancaster, before being transferred to BODC's database and merged with the M&FMB marine data on the M&FMB CD-ROM.

The data set contains over 90% of the data collected from Priest Pot pond and from a range of other freshwater sites around the UK.

It contains underpinning weekly time-series measurements characterising the physical, chemical and biological condition of the water column at the Priest Pot sampling site between 2002 and 2004, together with data from studies focusing on the seasonal and spatial dynamics of viruses, bacteria and picophytoplankton, trace metal distribution, and on the ubiquity of microbial protists.

The database also contains 376 gene sequences from genetic material extracted from environmental samples.

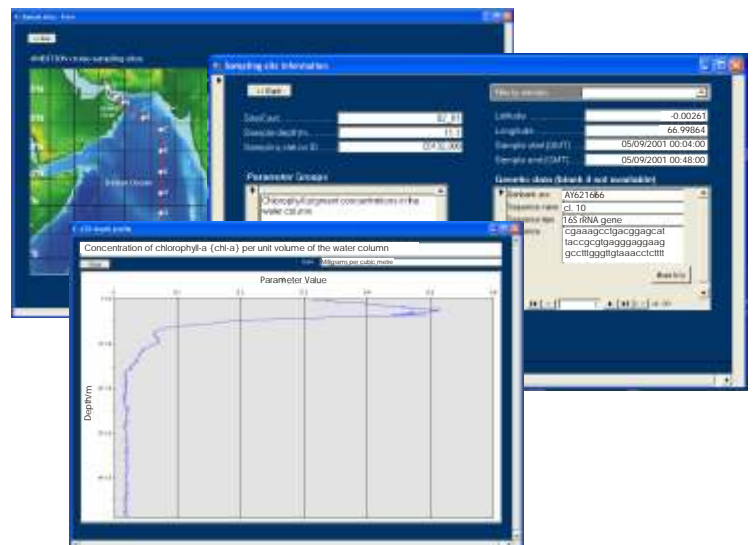


Freshwater sampling sites: Priest Pot (bottom right) and Esthwaite Water, Cumbria, UK

## The M&FMB data set CD-ROM

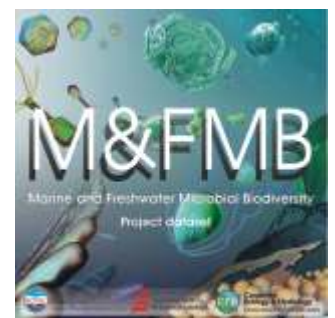
Due for release in 2006, the CD-ROM provides desktop access to M&FMB data, inventories and information via a web page-style interface. The CD-ROM contains:

- A catalogue of the data sets produced by the M&FMB programme with pointers to the data set location, and information on main contact, fieldwork location, methodology and dataset content.
- A relational database containing the environmental molecular and non-molecular data from the AMBITION cruise and from the Priest Pot and associated fieldwork activities.
- A database form interface (MS Access) allowing users to easily browse the molecular and non-molecular data held in the M&FMB database, view depth profiles and identify topics of interest.



### M&FMB dataset browser (above).

Available on the CD-ROM (right), the browser provides access to environmental data, associated genetic sequence information and depth profiles.



For more information about the M&FMB data set, please contact enquiries@bodc.ac.uk or visit our data management web pages at <http://www.bodc.ac.uk/projects/uk/mfmb/>