



RIVERS ATMOSPHERE AND COASTS STUDY

RACS(C) MARINE I AND RACS(A) CD-ROM

The RACS Project

The RACS Component of LOIS was probably one of the most ambitious cross-disciplinary research projects ever undertaken. It included several sub-components:

- BIOTA** A study of the salt marshes of the Humber and the Wash.
- RACS (A)** An atmospheric chemistry study looking at air mass changes from the Wash into East Anglia.
- RACS (R)** A study of the rivers that drain into the North Sea.
- RACS (C)** A study of the estuaries, coast and coastal waters between Great Yarmouth and Berwick upon Tweed.

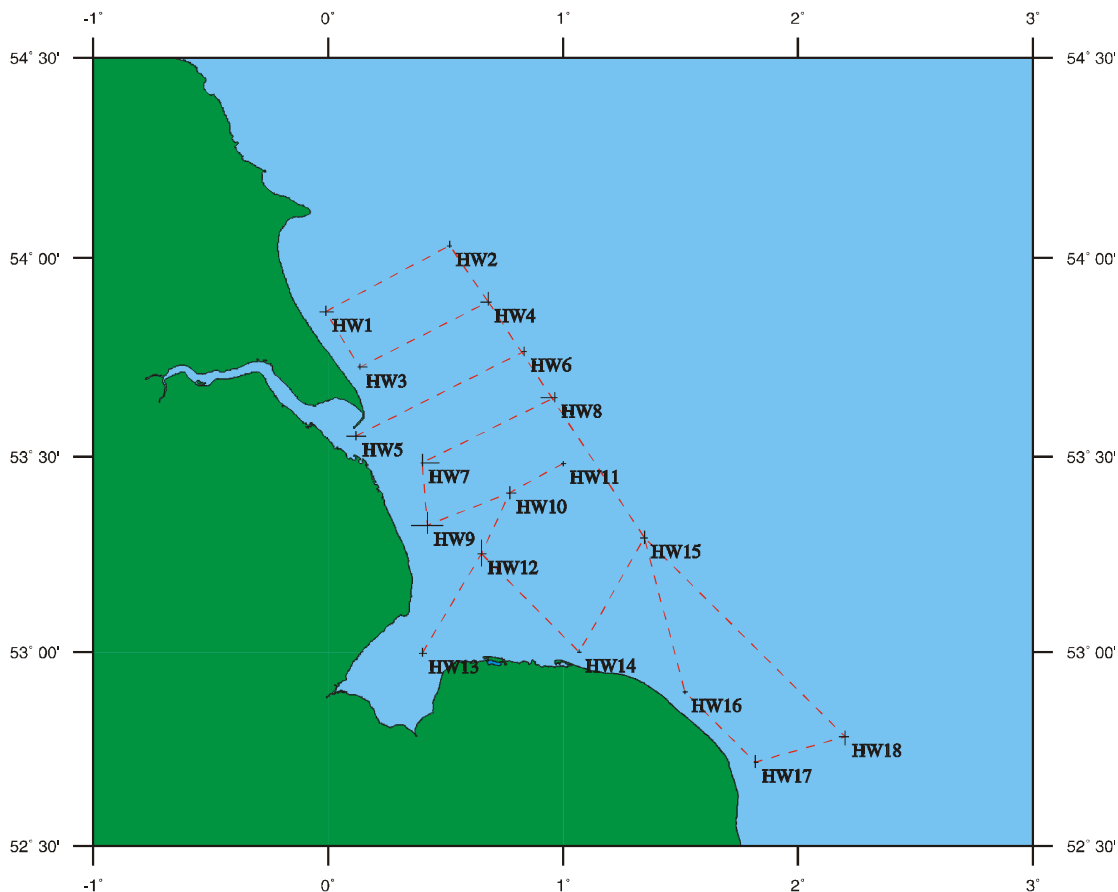
The BIOTA data set has been published on a CD-ROM in the LOIS series, which is available from the CEH Monks Wood laboratory.

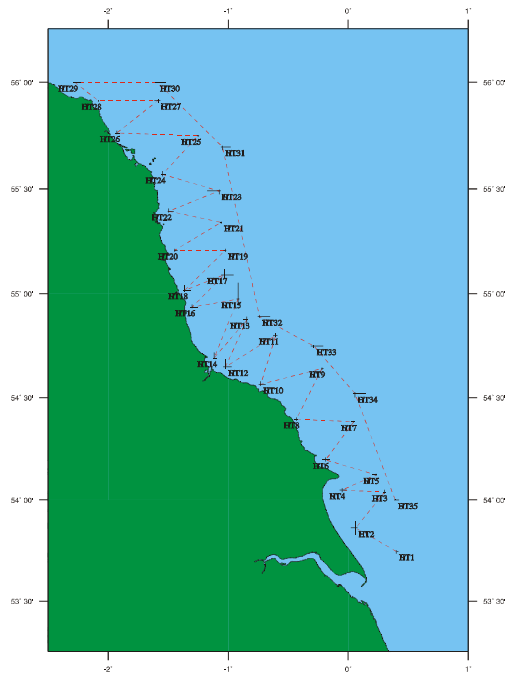
This CD-ROM contains the shipborne data collected in the coastal North Sea, Humber Estuary and Tweed Estuary, the complete RACS (A) data set and a number of RACS (C) 'Special Topic' stand-alone data sets.

Fieldwork

The RACS (C) fieldwork included three major components. Sixteen RRS Challenger cruise legs were dedicated to the repeated surveys of two station networks known as the Humber-Wash and Humber-Tweed grids. RV Sea Vigil and RV Water Guardian undertook thirty-five survey campaigns in the Humber, Ouse

The RACS Humber-Wash Grid





The RACS Humber-Wash Grid

and Trent systems. RV Tamaris and a semi-rigid inflatable carried out thirteen survey campaigns in the River Tweed.

The RACS (A) fieldwork comprised two campaigns involving a survey ship, the MV Guardian, the UEA Atmospheric Observatory at Weybourne and the Imperial College Jetstream research aircraft.

RACS (C) Marine Data Set

This data set is presented on the CD-ROM as a relational database plus a file-based underway data set. A Windows software interface is included for each component. A comprehensive Users' Guide is included as a PDF electronic document.

The relational database includes the sample data collected during the Challenger, Sea Vigil and Tweed campaigns. A summary of its contents is given in the text box. Note that not every parameter was measured on every sample.

It is included on the CD-ROM in three variants of Microsoft JET format together with an ASCII 'kit form' database designed to be compatible with any database management system on any platform.

The data may be interrogated using either Microsoft Access (supplied on the CD as a

run-time application) or the BODC Database Explorer software.

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

RACS (C) Marine I Database Summary

Challenger cruises

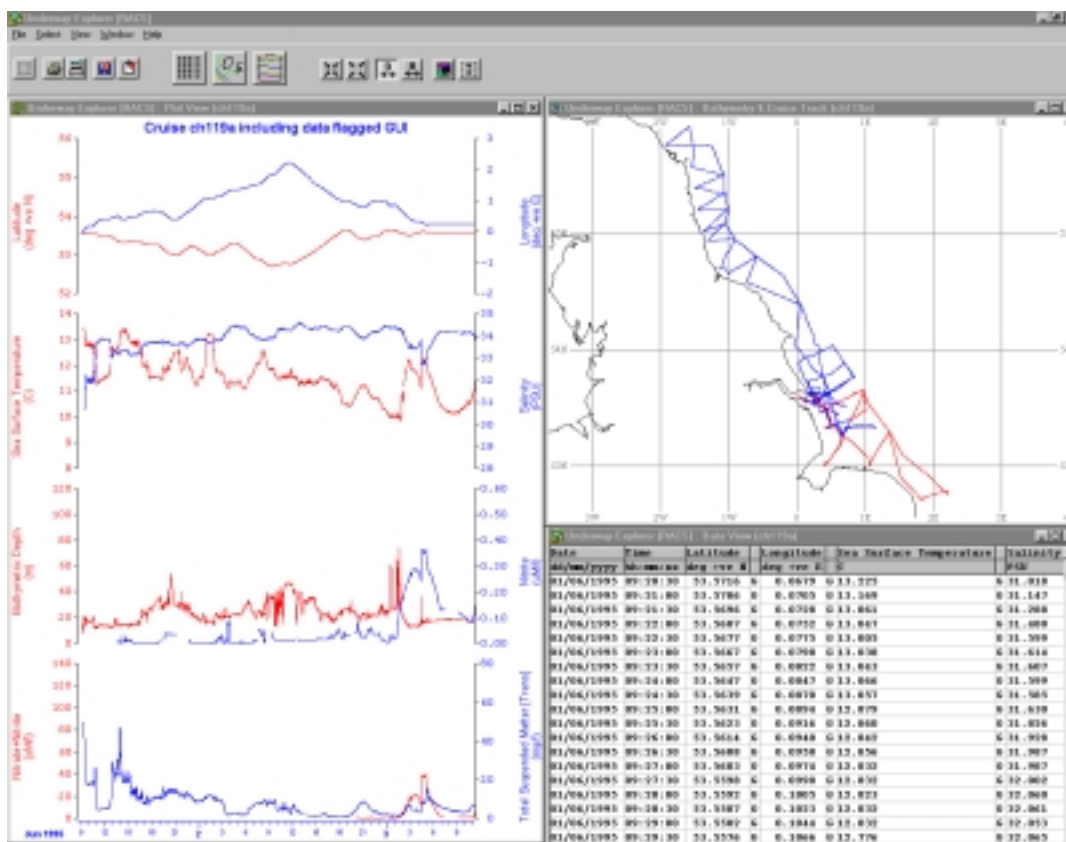
- >1100 CTD Profiles (Temperature, salinity, oxygen, chlorophyll, PAR, attenuation)
- >5000 Surface water samples (Chlorophyll, SPM, POC/PON, DOC/TDN, trace metals, phytoplankton, micropollutants)
- >500 In-situ SPM particle size profiles
- >100 Core samples (Fluxes and pore water chemistry)
- >50 Production experiments (¹⁴C, ¹⁵N and ³³P)

Humber, Ouse and Trent

- >2000 Surface water samples (Temperature, salinity, chlorophyll, oxygen, pH, nutrients, SPM, POC/PON, DOC/TDN, trace metals, micropollutants, trace gases)
- 20 Mudflat cores (Fluxes and pore water chemistry)

Tweed

- >2500 Surface water samples (Temperature, salinity, oxygen, nutrients, SPM, POC/PON, DOC/TDN, trace metals)



BODC Underway Explorer screen shot displaying data from Challenger CH119A

The Users' Guide includes full descriptions of the data collection protocols, a specification of the database structure and advice on how to interrogate the data.

The CD-ROM Users' Guide provides full descriptions of the protocols used to collect the data and a detailed specification of the format used to store the data.

The underway data set consists of continuous (every 30 seconds) measurements of sea surface data (temperature, salinity, nutrients, metals, oxygen, attenuation and chlorophyll) meteorology, navigation and bathymetry made on the Challenger cruise legs.

The RACS (A) Data Set

The RACS (A) data is a set of data files in NASA Ames format, which is a simple ASCII format with a standardised header. The data files contain a rich suite of chemical parameters (nitrogen oxides, ozone, hydrocarbons, sulphur dioxide, DMS, PAN, filtered particulates, etc.), together with meteorology and navigation.

The data are presented on the CD-ROM in a fully documented binary format. A Windows program, the Underway Explorer, provides the primary interface to these data. Parameters may be displayed as a stacked time series plot. The data are given spatial context through a map of the cruise track, overlain on GEBCO-97 bathymetry, which shows the data that have been plotted. Data values are displayed in a tabular format that may either be exported as ASCII or transferred to other applications over the clipboard.

The data were collected from three platforms (MV Guardian, the Weybourne observatory and the Jetstream aircraft) during two campaigns in late 1994 and summer 1995. The data set also includes a small number of later Jetstream flights.

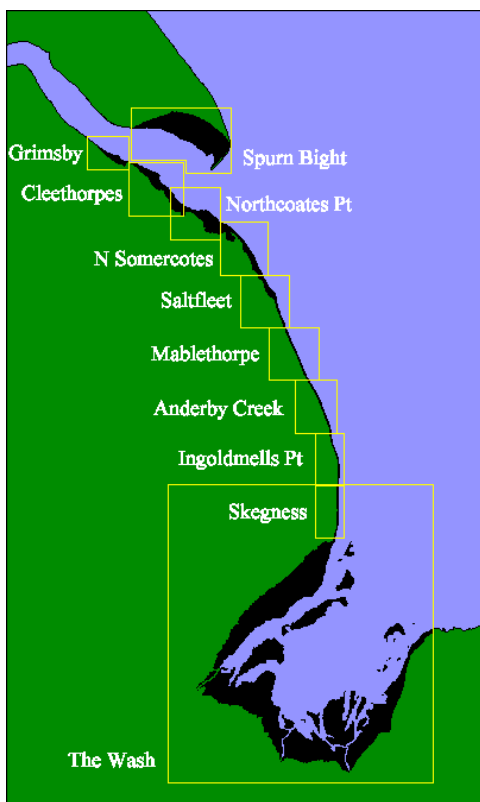
The Users' Guide includes a complete 'hot-linked' index to the RACS (A) data files. Protocol documentation is included in the headers of the data files.

RACS (C) Special Topic Data

The CD-ROM includes data from three RACS-funded Special Topics whose data could not be integrated into the main data structures.

The Humber Observatory was a series of stations on jetties and light floats in the Humber that generated hourly time series of meteorological and oceanographic parameters. These are presented on the CD-ROM as a set of daily data files for each station. Protocol descriptions and site histories are included in the Users' Guide.

ESSC provided a set of digital elevation models, based on remote sensing data, of the coastline between the Wash and the Humber together with digital elevation models of the Holderness coast both



ESSC Digital Elevation Models

before and after the 1994 winter storm period. The data are present as both pixel-value matrices and GIF images. Extensive information, including spatial coverage, resolution and data format is included in the Users' Guide.



RRS Challenger

The third Special Topic data set is a series of levelling surveys along a series of transects on the Holderness coast between October 1994 and March 1995. The data are present as a series of ASCII data files that are fully documented in the Users' Guide.

Acknowledgements

The LOIS programme was funded by the Natural Environment Research Council with additional funding and support for RACS from the Environment Agency. RACS (C) was co-ordinated by Plymouth Marine Laboratory and RACS (A) by the University of East Anglia.

The LOIS CD-ROM Family

This CD-ROM is one of a family of CD-ROM publications of the LOIS project data. Two 'shop window' products have been produced using the STEM data viewer to display example LOIS data and the results of running integrated numerical modelling scenarios from the river catchments to the shelf break. These are available from Plymouth Marine Laboratory.

The CEH Monks Wood laboratory has published the BIOTA data set on CD-ROM.

BODC has published this data set plus the LOIS Shelf Edge Study Data Set (an intensive survey of part of the Hebridean Slope). These products are available from:



British Oceanographic Data Centre,
Joseph Proudman Building,
6 Brownlow Street,
Liverpool,
L3 5DA
UK.

E-mail: enquiries@bodc.ac.uk
WWW: <http://www.bodc.ac.uk>