

SES Data Set Software Interface

Introduction

The *Windows* software interface provided with the SES Data Set CD-ROM provides user-friendly access to the three major components of the SES database. These are:

The SES Moored Instrument Data Set
The SES Underway Data Set
The SES Database

The Moored Instrument Data Set contains time series data from the moored instruments deployed during SES in either ASCII or a binary format known as QXF (a subset of NetCDF). It is accessed using the Mooring Explorer program.

The Underway data set contains navigation, bathymetry, surface hydrography and meteorological data that were logged continuously throughout the SES cruises. It is accessed using the Underway Explorer program.

The SES Database is a relational database containing all the data collected during SES except the moored instrument and underway data. A significant subset of these may be accessed through the Database Explorer program.

A description of each of these programs follows. Users who wish to skip the preamble and simply get into the data should click on the appropriate program heading below to obtain brief 'getting you started' instructions.

BODC Database Explorer

Included on the SES CD-ROM is Version 2.0 of the BODC Database Explorer. This provides access to the following major data sets within the SES Database:

Bottle	Parameters measured on water samples collected by water bottles on the CTD rosette or from the non-toxic supply, together with CTD parameters taken from the downcast at the bottle firing depths.
Core	Parameters measured as profiles along the length of sediment cores.

Whole Core	Parameters measured on entire cores or grab samples plus parameters such as fluxes measured by experiments on whole cores.
Sed Trap	Analytical results on sediment trap samples plus fluxes calculated from these data.
Profile	Miscellaneous instrument profiles. In the SES Database these include XBTs, profiling radiometers, FLY probe data (turbulent energy dissipation) and sound velocity profiles.

This represents a subset of the data present in the SES database. The obvious question to this is 'Why only a subset?' The answer is that the relational database schema used by BODC is undergoing controlled evolution in an operational environment. The Database Explorer is restricted to tables in the database that have 'evolved' to keep software development resources under control. Future BODC CD-ROM releases will cover an increasing proportion of the data with the Database Explorer.

The following data in the SES database may not be obtained by the Database Explorer:

- Underway ADCP data
- CTD profiles
- SeaSoar profiles
- Production data
- Settling Velocity Tube experiment data
- Tidal constituents
- Drifting buoy data

These data must be accessed using the forms included for the purpose in the Access database container.

The data types covered by the Database Explorer may also be obtained through Access forms. However, due to limitations of Access cross-tabulated queries, the format of the data obtained from forms is far less convenient than that delivered by the Database Explorer. It is therefore strongly recommended that the software should be used in preference to forms wherever possible.

The Database Explorer allows a query to be formulated through a series of forms. The first form, Data Selection, fulfils two functions. First, it allows the subset of the data to be specified based on header parameters such as position, date/time, water depth, sample depth, etc. Secondly, it allows specification of the header parameters that are to be included on each row of the final data set.

Once the program knows the data events that are of interest, it goes away and finds the parameters that are present in the database for those events. Forms are then offered that allow the parameters of interest to be specified.

This process is repeated at increasing levels of detail: doing it all at once could involve wading through a choice of hundreds of possibilities.

When the parameters have been specified, the requested data are listed in a grid format with one row per measurement and one column per parameter. This may be saved, printed or copied over the clipboard to another application.

BODC Mooring Explorer

The Mooring Explorer is a new program written to provide a user-friendly interface to the large moored instrument component in the SES data set. It presents the moored instrument data as either stacked time series plots or listed in a grid format with one row per time increment and one column per parameter. This may be saved, printed or copied over the clipboard to another application.

For operational reasons, two formats are used for the moored instrument data on the CD-ROM. Most of the data are in a straightforward ASCII format but certain data types (ADCP, thermistor chains and temperature probes) are in a binary format that is designed to cope with multidimensional data. The Mooring Explorer handles both formats transparently.

The software provides a powerful interactive interface that allows the series of interest to be quickly isolated. Those selected may then be iteratively displayed and listed as required.

Users should note that some of the moored instrument data files are extremely large. In particular, most of the moored ADCP data files contain between 5 and 10 Mb of data. Some of the transmissometer records are also larger than 5 Mb. Displaying such large data sets takes time, even on a high powered (P450 with 128 Mb of RAM) PC. Please be patient when working with these data, especially when working on PCs with less than 64 Mb of RAM. It is conceivable that it may not be possible to work with the larger data files on some systems.

BODC Underway Explorer

The SES CD-ROM includes Version 2.0 of the BODC Underway Explorer. This is a significant improvement over Version 1.0 of the program included on the OMEX 1 and Arabesque CD-ROMs

The Underway Explorer allows the underway data (navigation, meteorology, bathymetry and surface hydrography) to be displayed as stacked time series plots and listed in a grid format with one row per time increment and one column per parameter. This may be saved, printed or copied over the clipboard to another application.

Any subset of the cruise time series may be specified using either the Select dialog box or the zoom facility in the Plot window. Once such a subset has been specified, its spatial context in relation to GEBCO bathymetry is displayed in the Map window. The cruise track is displayed in one colour (blue by default) with the track for the selected data displayed in a contrasting colour (red by default). The most noticeable improvement of version 2.0 is that this map now includes a zoom facility to allow the spatial context of complex, localised cruise tracks to be resolved.

Other BODC CD-ROMs

Many users will have more than one BODC-produced project data set on CD-ROM. It is appreciated that these users will want to use the software with more than one CD-ROM. At the time of publication, it is technically feasible to use the Explorer software suite with the following BODC CD-ROM products:

Mooring Explorer	OMEX I Project Data Set LOIS Shelf Edge Study Data Set
Database Explorer	OMEX I Project Data Set ARABESQUE Project Data Set LOIS Shelf Edge Study Data Set
Underway Explorer	North Sea Project BOFS North Atlantic Data Set OMEX I Project Data Set ARABESQUE Project Data Set LOIS Shelf Edge Study Data Set

Whilst it is possible to obtain multiproject functionality by repeated installation of the software, this will inevitably lead to confusion through the presence of multiple versions of the software. Moreover, it places severe constraints on software development paths, as there is no potential for development of Registry data structures.

Consequently, a mechanism is being developed to allow users to build multiproject functionality from a single software installation. A software utility, the Explorer Manager, is used to load projects through installation files prepared by BODC. At present, the software and data files must be requested from BODC. However, by the end of 1999 it is planned to implement Explorer Manager distribution on the Web.

The BODC Database Explorer

The BODC Database Explorer is a *Windows* application that allows data from the database to be retrieved in a grid format that may be exported to other applications, such as spreadsheets. It has been tested successfully under *Windows95*, *Windows98* and *Windows NT 4.0*.

The program is designed to support one or more BODC CD-ROMs containing JET 3.0 (*Access 7.0*) databases providing the project-specific installation program has been run for each CD-ROM to be used. It includes full information on its use through an on-line help system, including functional descriptions of all the menu options and control buttons. However, a brief description of how to get started is included here.

When the program is launched through either the BODC entry in the Start menu, a shortcut or *Windows Explorer*, a splash screen is briefly displayed followed by the opening of the program control window. The following actions are then required to display data.

- Select the Open Project option from the File menu and choose the project appropriate to the CD-ROM currently loaded.
- Click on the Define option in the Data menu and choose the type of data required.
- Use the Selection dialog presented to choose the subset of stations you want and the header fields that you require on each row of the grid.
- Click on the Show option in the Data menu.
- Use the dialogs provided to select the parameters you wish to include in your grid. These cover three hierarchical levels that describe the parameters in increasing detail. If you are unsure which of the higher-level categories to include, then err on the side of inclusion rather than exclusion. You can always reject unwanted parameters at the more detailed levels that follow.
- The header parameters included in the grid may be modified, if required, by choosing the Index Fields option from the Data menu.

This is all you need to do to access the data. Control over how the data are presented is provided through both the menus and the toolbar buttons. Consult the on-line help or simply experiment to discover what these can do.

The BODC Mooring Explorer

The BODC Mooring Explorer is a *Windows* application that allows the moored instrument files on the CD-ROM to be plotted as stacked time series. The data may also be listed in a grid format that may be exported to other applications, such as spreadsheets. The mooring position may also be displayed overlaid on a map of GEBCO bathymetry.

The program has been tested successfully under *Windows95*, *Windows98* and *Windows NT 4.0*. It contains on-line help, including functional descriptions of all the menu options and control buttons. However, a brief description of how to get started is included here.

When the program is launched through either the BODC entry in the Start menu, a shortcut or *Windows Explorer*, a splash screen is briefly displayed followed by the opening of the program control window. The following actions are then required to display data.

- Select the Open Project option from the File menu and choose the project appropriate to the CD-ROM currently loaded.
- Click on the Select menu to open the Selection Dialog, which allows the series of interest to be specified. The form is in three parts. The top, 'Primary data selection criteria', allows various selection criteria to be specified. The result of this is to restrict the choices available in the other two sections to entries matching the selection. The selection may be refined, if desired through the 'Secondary data selection criterion' section. Once the number of series displayed in the bottom section of the form has been reduced to a manageable number, the series of interest may be chosen by a mouse left-click. Note that more than one series may be chosen at this stage.
- Press 'OK' to open the View Dialog. This controls the series, or part of a series, which is to be plotted or listed. The time interval, data channels and quality control flag values may all be used to restrict what is displayed. If you don't like working with parameter codes, right click in the Parameters Available window to get plain language definitions. This dialog may be opened at any time to update the selection criteria by selecting the Moorings option from the View menu.
- Click on one or more of the three large control buttons to open the plot window, data grid or mooring location map. The icons on the buttons clearly indicate which button does what.

This is all you need to do to access the data. Control over how the data are presented is provided through both the menus and the toolbar buttons. Consult the on-line help or simply experiment to discover what these can do.

The BODC Underway Explorer

The BODC Underway Explorer is a *Windows* application that allows data from the underway files to be presented as time series plots and listed in a data grid that may be exported to other applications. The program also provides an indication of the spatial context of the data through a map of the cruise track overlaid on a coastline and bathymetric contours. The program has been tested successfully under *Windows NT 4.0*.

The content of all program windows, be it a plot, a map or a data grid may be saved onto disk or printed using any printer installed on the *Windows* system. It is designed to support one or more BODC CD-ROMs containing underway data files providing the project specific installation program has been run for each CD-ROM to be used.

The program includes full information on its use through an on-line help system, including functional descriptions of all the menu options and control buttons. However, a brief description of how to get started is included here.

When the program is launched through either the BODC entry in the Start menu, a shortcut or *Windows Explorer*, a splash screen is briefly displayed followed by the opening of the program control window. Three actions are then required to display data.

- Select the Open Project option from the File menu and choose the project appropriate to the CD-ROM currently loaded.
- Click on the Select menu to open the Selection Dialog. This may then be used to choose the cruise, time interval and up to six parameters of interest.
- Click on one or more of the three large control buttons to open the plot window, data grid or cruise track map. The icons on the buttons clearly indicate which button does what.

This is all you need to do to access the data. Control over how the data are presented and access to more advanced features such as zoom capabilities are provided through both the menus and the toolbar buttons. Consult the on-line help or simply experiment to discover what these can do.