# The Development of a data viewer for LOIS and beyond...

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One of the main products of LOIS research as set out in the LOIS Implementation Plan (1994) is "integrated databases for the LOIS study areas that will be made available as CD-ROMs". Targeting the user community, UK and world-wide scientific community, schools and general public, such an undertaking would:

- advertise LOIS and highlight the results of LOIS research
- facilitate access to the LOIS data sets
- improve general understanding of the coastal zone

Since the basic specification of a single CD-ROM, and through numerous interim formulations, three conceptual CD-ROMs have now emerged as the final product. Their respective contents are the Base Data, Model Runs and Integrated Data fronted by a Data Viewer.

**Data prepared for the Base Data Set will be presented in simple formats such as ASCII. These will be stored in a directory structure, with each of the five top-level directories representing a data centre (BODC, IH, BGS, UEA and ITE). Where possible, directory and file naming conventions will be kept consistent across the five data centres. The documentation for the CD-ROM will be stored in Acrobat '.pdf' files, which enables hypertext. These can be viewed using the Acrobat viewer, which will be included on the CD-ROM. The documentation will include explanation of what is in each directory, file, record and field.**

The intention of including model runs on a CD-ROM is to demonstrate what LOIS-developed models can or might do. There are two types of model runs to be included:

- independent runs of individual models (representing the rivers, coasts and estuaries, oceanographic, atmospheric, shelf edge and coastal evolution)
- a linked model from a catchment/river model, through a tidal river/estuary model, through a shelf-wide model to an embedded shelf-edge model.

Documentation to be included on the CD-ROM will comprise, a description of each model and its parameters, a description of each scenario, model input parameters and data, and model output time-series and images. There will be a range of formats used, including ASCII, postscript, 2-D raster, gif and an mpeg animation.

In designing an integrated database for the CD-ROM, the objectives specify that capabilities should include the storage of multi-disciplinary spatial and temporal data and also provide a holistic view of the data. It will have to store such diverse datasets as atmospheric data, water chemistry, species status, digital elevation, bathymetry, river networks, CASI/satellite images, marine water quality data and geological profiles. Similarly, the data viewer (Fig. 1) that interfaces to the integrated dataset should *display* examples of each kind of LOIS data. The data will be georeferenced and displayed in a map format. Simple operations such as zoom and pan will be enabled. In a geospatial sense, conversion between the two predominant map projections that LOIS spatial data is subject to (UK National Grid and Latitude-Longitude) is essential. Finally, simple queries should be possible, *e.g.* click on a point to plot time series; display nitrate data from all LOIS components.

The logical data model for the database component of this CD-ROM is shown in Fig. 2. The role of such a conceptual model is to help visualise how data is stored. In this case the model

is in the form of a cube ('the WIS cube') with attributes (listed in x) at a location (listed in y) for a series of times (listed in z). In a physical sense, the database is being implemented in Microsoft Access, a relational database management system (RDBMS). One of the advantages of using this system is that it can be accessed from Visual Basic or C/C++ programming languages using an appropriate ODBC driver. Within Visual Basic (the language of choice), the Application Programming Interface (API) is being developed to provide a generic programming interface to the CD-ROM database design as well as the data viewer.

The most important future task will be to integrate the data viewer fully with the Access database, enabling testing of the viewer with the full spectrum of integrated data available for display. Next, the map window capabilities will be expanded to display other data types, such as model animation, borehole data and atmospheric data. With certain data types, the enabling of perspective views will be instrumental in this. Another future task will be programming the viewer and database to handle multiple queries.

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| High Level Specification published | End March 1997 |
| Data Received at Data Centres | September 1997 |
| Data Viewer Beta Version | November 1997 |
| Data Viewer Final Version | End December 1997 |
| CD-ROM Publication | March 1998 |

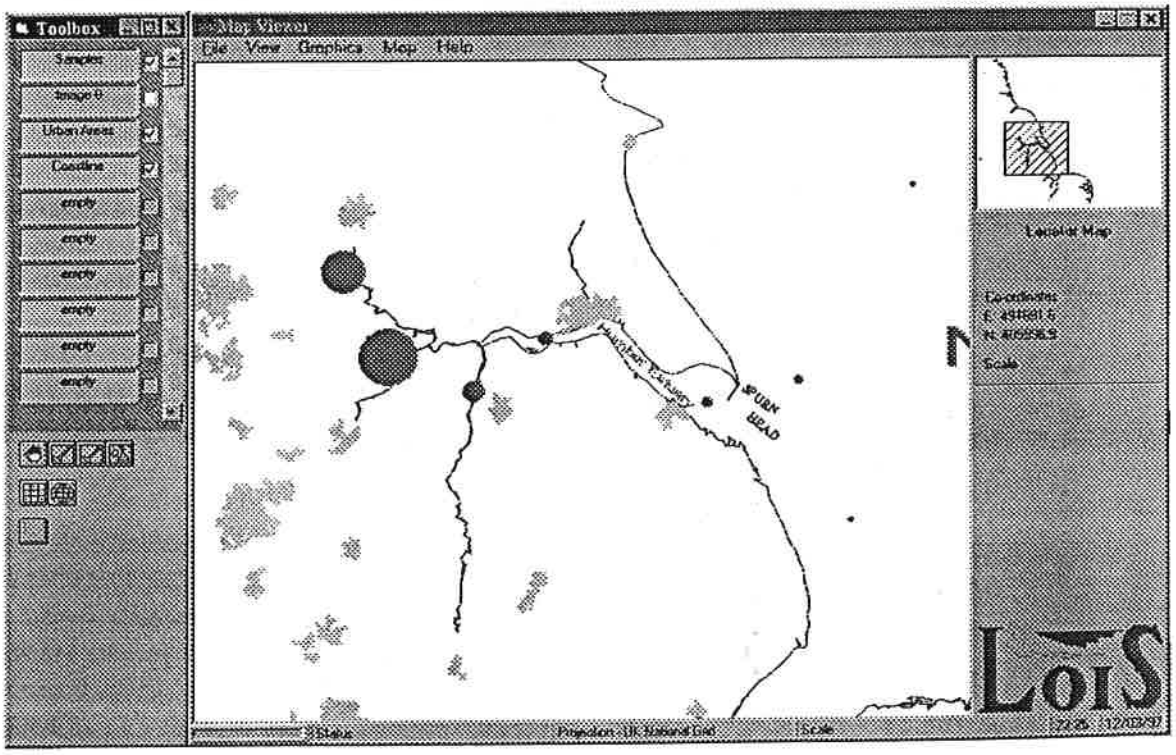


Figure 1

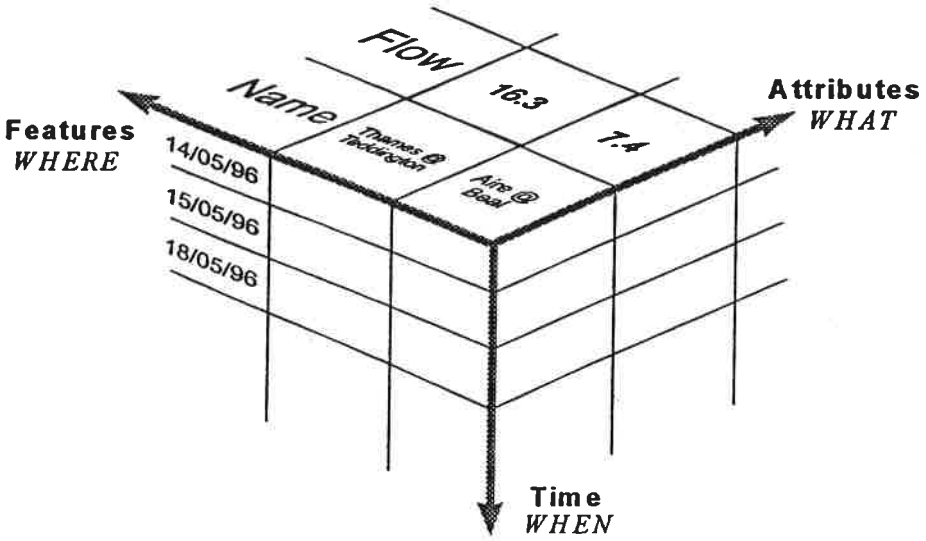
FlOW
Name
16.3
7.4
Attributes
WHAT
Features
WHERE
14/05/96
15/05/96
18/05/96
Time
WHEN

Figure 2

LOIS land-ocean interaction study



# Land-Ocean Interaction Study

## Second Annual Meeting
## Hull

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