



Edserplo - A fast integrated oceanographic visualisation tool

Steve Loch ¹, Ravi Chamakuri ², Samrat Banik ², Rashid Khan ²

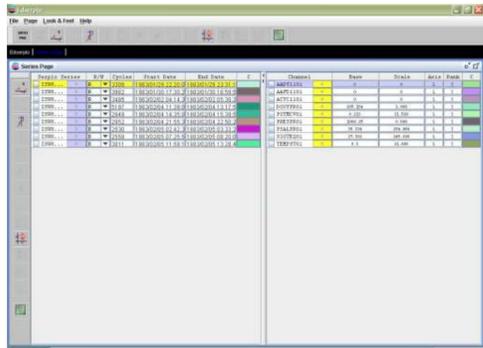
Edserplo

1) BODC, Proudman Oceanographic Laboratory, Liverpool, UK

(contact: sgl@bodc.ac.uk)

2) Staffordshire University, Stafford, UK

Poster by Rashid Khan and Steve Loch



Series Page

Introduction

The British Oceanographic Data Centre (BODC) has created an integrated visualisation tool to meet its needs in appraising the quality of the wide variety of series data given to it by organisations in the UK and beyond. Integrated within Edserplo is the full processing functionality required to quality-control and process data from the 45 gauges of the UK's National Tide Gauge Network. Written in **JAVA** it can be operated outside the confines of BODC on any popular platform.

More Details : http://www.bodc.ac.uk/about/information_technology/software_engineering/edserplo.html

- **Data Types:** Waves, Current Meter, ADCP, Thermistor Chain, Underway, CTD, XBT, Moored Instrument, HF Radar, Drifting Buoy, Argo, Tide Gauge, etc.
- **Display Types:** 11 graphical, including 3 with maps, 4 non-graphical.
- **Formats:** 13 (four writable, two updatable, all readable). Easy to add more.
- **Tidal Analysis.**

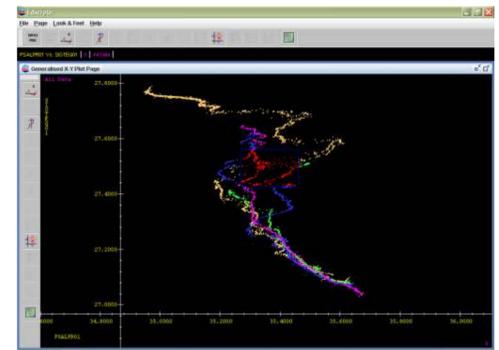
Why Visualisation?

Visualisation provides a direct, simple and expeditious means for uncovering many problems with data

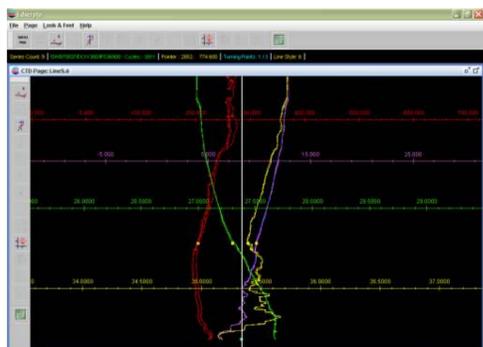
- Problems inherent in the data (Are there gaps or spikes?).
- Possible artifacts added to the data in processing by the originator.
- Errors in processing by BODC (Are the units right? Datum correct?).

In situations where there is a single data stream and known potential problems one can automate some of this assessment. BODC deals with a vast range of data (> 350 formats logged) from a plethora of groups and organizations (> 100) making automated assessment a very much more expensive and less effective option. Undetected errors of the last type would be particularly injurious to BODC's reputation and standing.

Graphics can be zoomed and panned quickly. An arbitrary selection of series and channels can be viewed separately or superimposed. The appraisal of data is recorded through 'flagging' – see box on Special Requirements.



Generalised X Y Plot



CTD Plot

History

BODC first used Silicon Graphics workstations operationally for visualisation and screening in 1988. Four visualisation programs were written or enhanced in the ensuing decade: Serplo (SERies PLOtting), Xerplo (Extended Serplo), Edteva (Tides: Editing, Visualization and Analysis) and Waview (spectral WAVE data VIEWing).

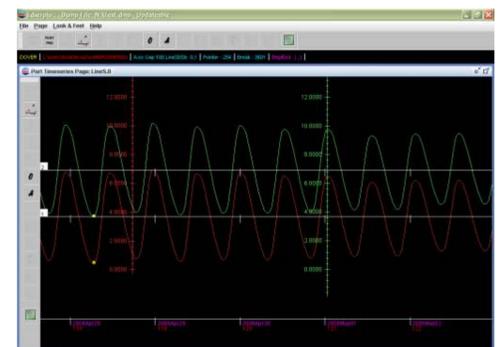
These were written in Fortran or Fortran & C++ and used the IRIS GL API for visualization. This meant that all four programs were tied to the SGI platform and operating system, IRIX. This dependency on a particular platform had long been identified as a liability to BODC's continued operation.

In mid 2003 resources were found to start the development of a new, integrated, Java-based, program to replace BODC's visualization workhorses: Edserplo. Edserplo takes over or extends most of the functionality present in its antecedents with its name chosen as a conflation of Edteva and Serplo.

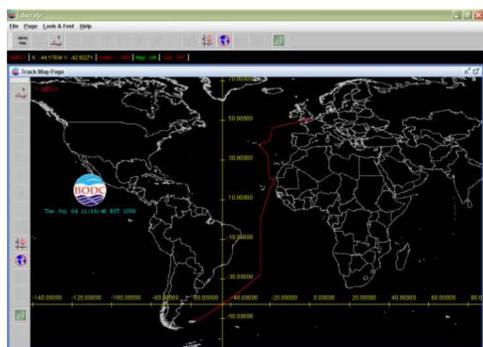
Meeting Special Requirements

When not dealing with tidal data, editing is restricted, in line with BODC's remit, to modifying the flags that BODC stores with the data and not the data per se. The presence of these flags, one for each data value, means that all of BODC's associated software must be engineered to handle them. This is not a normal requirement in scientific processing where suspect data can simply be left out. When the scientist receives data from BODC he or she can make that judgement by excluding data flagged in particular ways. For example there's a flag to indicate interpolation ('I'), another for substitution ('R'); an 'M' is applied by BODC to signify a suspect value.

Because this is a strategic piece of software with a large volume of data streaming through it there is a premium on making user interaction as fast as possible. Many of the commands are mediated by the keyboard and not by the mouse. Fast panning and zooming are standard on all relevant displays.



Port Timeseries Plot



Track Map Plot

Development, Customisation and Licensing Issues for non-BODC users

Edserplo 1.0 was nominally completed at the end of June 2006. All modules have been written including tidal analysis. Principal components have been on beta test since September 2005. The integrated XHTML User Guide and Tutorial is embryonic but should be available in the autumn of 2006. Tidal analysis is anticipated to be available late September, 2006.

Edserplo is integrated with the BODC's systems but can be operated in a standalone manner. It can also be enhanced to incorporate additional formats in a manner not requiring alteration to the central code. A new format can be accommodated by creating an additional class which is an extension of the associated abstract class implementing where appropriate specific (Java) interfaces. Formats need not support flags.

BODC's 8-character parameter codes are used and their interpretation is made available from the BODC Controlled Vocabularies database; however these codes need not be used or if used can be accessed through a Web service. Parameter names need not be limited to 8 characters and can be less.

Maps and associated software come from ESRI and will require licensing if that aspect of the code is used.

Tidal processing is dependent on access to the Proudman Oceanographic Laboratory's database of tidal analyses of UK ports.

BODC is at an early stage in its consultation with NERC's Business Unit on matters of licensing and support. The tidal processing and the screening aspects are likely to be treated separately.

Tidal Processing

The tidal processing capability forms a substantial proportion of Edserplo's overall functionality, perhaps 40% as measured by lines of code. This includes the generation of residuals, channel differences, statistics and tidal analyses. Edserplo is used to amalgamate weekly input to create monthly and yearly port files. As well as flagging, editing includes interpolation, gap filling, linear time-shifting, cycle deletion and insertion, etc.



Timeseries Plot with Track Map

Minimum Requirements

For Intel or compatibly powered machines: 500MB RAM, 500MHz processor, numeric keypad, JAVA SDK 1.5.

The distribution includes the Edserplo JAR file itself which is approximately 1MB, supplemented by format and mapping software and maps taking an additional 170 MB. Maps and mapping software are not required with the Tidal Processing component.