4.13 A CLIMATE DATA PORTAL

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1. INTRODUCTION

The Climate Data Portal (Soreide *et al.*, 2001) links geographically distributed climate data servers into a network to provide a portal to distributed data in a common data format. Sophisticated tools facilitate selection of desired data from the large, irregular, and disparate collections typical of in-situ observations (Osborne and Denbo, 2002). In the first year, the Climate Data Portal links in-situ data holdings from PMEL's Tropical Atmosphere-Ocean (TAO) project with the PMEL database of in-situ hydrographic data and time series data, sea level data from the global Sea Level Data Center at the University of Hawaii and the National Oceanographic Data Center (NODC) Global Temperature-Salinity Profile Program (GTSPP) dataset. Additional major in-situ datasets have been identified for addition in the upcoming months. Although the Climate Data Portal has a strong focus on in-situ data sets, it could readily include satellite data, gridded products, or model outputs.

Selected data from the distributed data servers can be plotted together on the user's desktop with a powerful networking Java desktop application or through Web pages. The use of Open Source Common Object Request Broker Architecture (CORBA) networking middleware (Zhu, 2002), XML metadata handling (Fabritz and Denbo, 2002) and Lightweight Directory Access Protocol (LDAP) directory services (Denbo, 2002) provides instantaneous network "awareness" of the distributed data servers. Although the Climate Data Portal is a prototype in testing phase, performance has been both stable and robust. See http://www.epic.noaa.gov/cdp/.

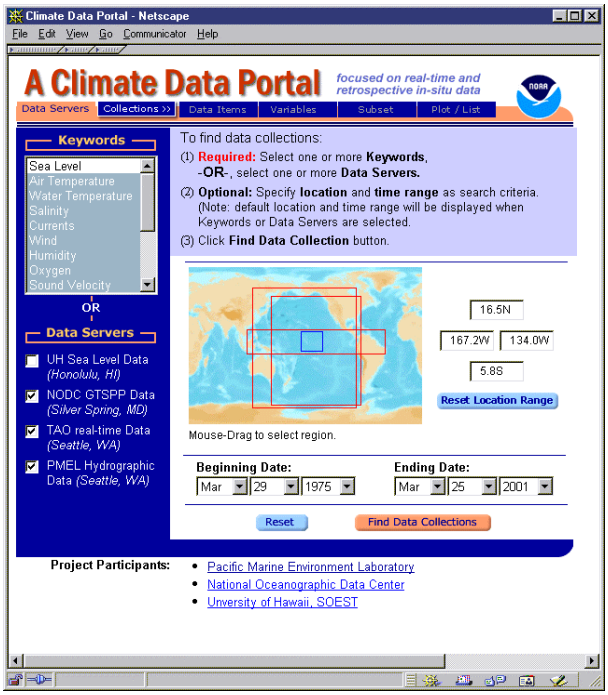

Fig. 1. Map view of data location on web page.

2. USER INTERFACE

The process of locating and selecting individual observations from a number of large collections of in-situ observations is complex. Although the Climate Data Portal builds on decades of experience in designing software for just this purpose, it is still challenging to make this process intuitive for the user.

With the NdEdit Java tool (Osborne and Denbo, 2002), a user can graphically view the locations of selected data sets in any 2D view of space and time (e.g., latitude-longitude map view or latitude-time view). Actions such as selecting, sub-setting or zooming in one 2D view are reflected in the other 2D views. For example, a user can define a narrow filter band in the time dimension to reduce the number of data points shown in the longitude-latitude view (Figs. 2 and 3).

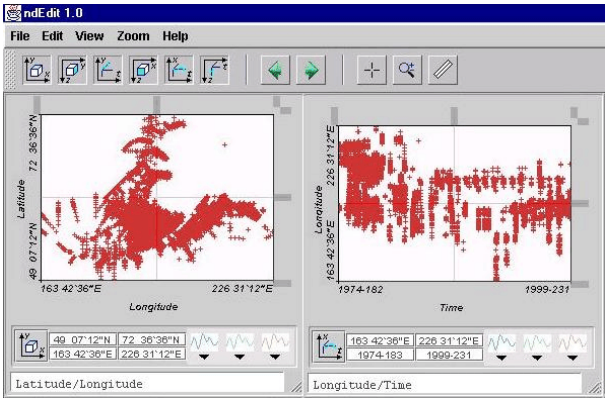

Fig. 2. Latitude-longitude (left) and longitude-time (right) view of 18,000 ocean profiles.

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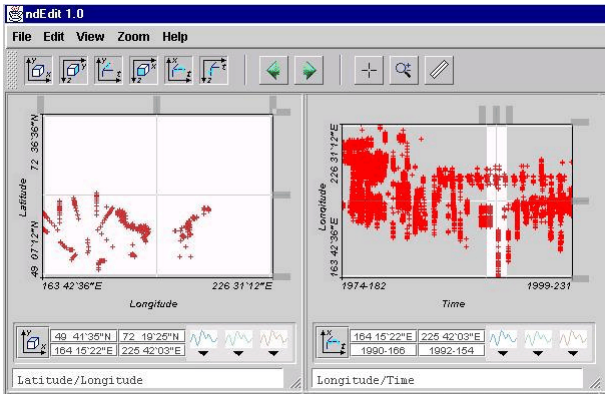

Fig. 3. Windowing on time to subset the data in Fig. 2.

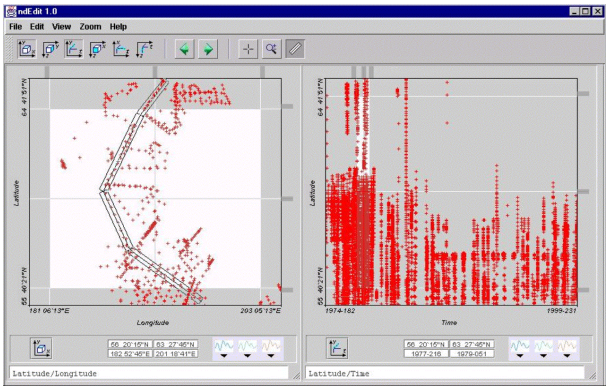

Fig. 4. Section tool used to select data in a multi-segment band of user-settable width (Java application).

Coastline and bathymetry can be displayed and the section tool (Fig. 4) allows the user to drag a multi-segment band (user-settable width) through a data set to create custom vertical sections or select data, for example, along a particular depth contour.

3. SPINOFFS

An early spinoff from the Climate Data Portal development effort is ncBrowse, a popular and successful Java tool for interactive desktop graphical browsing of data and metadata from netCDF data files. Developed in conjunction with the Unidata netCDF support team, ncBrowse reads a large number of netCDF file conventions. NcBrowse has been downloaded by 1428 unique hosts in 46 countries, and is freely available at http://www.epic.noaa.gov/java/ncBrowse/.

SGT, the Java graphics package used within the Climate Data Portal, has proven quite popular, and has had 2943 downloads from 54 countries and is freely available at http://www.epic.noaa.gov/java/sgt/.

The Java data selection utility, NdEdit, has been incorporated into the popular Java OceanAtlas software package in internal test mode, to be made publically available for testing in the near future. The Java OceanAtlas allows a user to interactively browse collections of ocean profile data sets, and is freely available at http://www.oceanatlas.com/.

The Climate Data Portal desktop Java application is fully capable of becoming a collaborative tool environment, and is forming the basis for a new collaborative tool for the Fisheries Oceanography community (Denbo, 2002).

4. LOOKING TO THE FUTURE

The Climate Data Portal has the advantage of underlying technology that is modern, utilizes off-the-shelf components, and is fully object oriented. Therefore it requires lower maintenance than older software systems. It is immediately poised to take advantage of the high-bandwidth speeds of the Next Generation Internet (NGI) to offer the user a level of interactivity with the data that is not otherwise possible. The Climate Data Portal is modern, robust, and scalable software which is workable today and extensible to meeting requirements identified for the future.

5. REFERENCES

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