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1. INTRODUCTION

EPIC was developed at NOAA's Pacific Marine Environmental Laboratory to manage the large numbers of hydrographic and time series oceanographic *in situ* data sets collected as part of the NOAA climate study programs, such as WOCE, TOGA, and CLIVAR. At present, PMEL maintains approximately 100,000 individual data sets in the EPIC data base.

EPIC tools were developed to provide World Wide Web access to *in situ* data sets for researchers on the PMEL intranet and for the public on the internet. These tools include utilities that simplify the creation of web pages, a set of tools to create dynamically generated graphics and data listings, and a Java data selection tool.

2. WEB UTILITIES

EPIC has developed several utilities designed to reduce the Web-cgi programmer development time (Renton and Soreide, 1997).

2.1 AnyURL

AnyURL is a utility used to create Web pages with FORMS (e.g. scrolling lists, pop-up menus, check boxes, etc.), to point to static URLs (such as gif graphics, mpeg animations, or other Web pages) with HTML. The HTML is created with simple text editing, eliminating the need for a customized cgi program for each HTML FORM.

2.2 cover

Cover can be used for dynamic generation of graphics or listings on the Web by running existing utilities from a Web page. Cover takes user input on FORMS (e.g. scrolling lists, pop-up menus, check boxes, etc.), and passes it to a program in C, Fortran, perl, or a shell script. Again, the HTML is created by simple text editing,

eliminating the need for a customized cgi program for each HTML FORM.

2.3 clickable maps

Clickable maps uses a cgi script to translate mouse clicks on a map to a rectangle in latitude - longitude. The selected area is displayed on the map as a shaded region and the coordinates can be used in a cgi script for a data base search.

2.4 m2gif

Gif images for the Web from Plot Plus (pplus) meta-code files. M2gif translates Plot-Plus (pplus) metacode files into gif images, using the gd ("gifdraw") library. (gd 1.3 is copyright 1998, Quest Protein Database Center, Cold Spring Harbor Laboratory.)

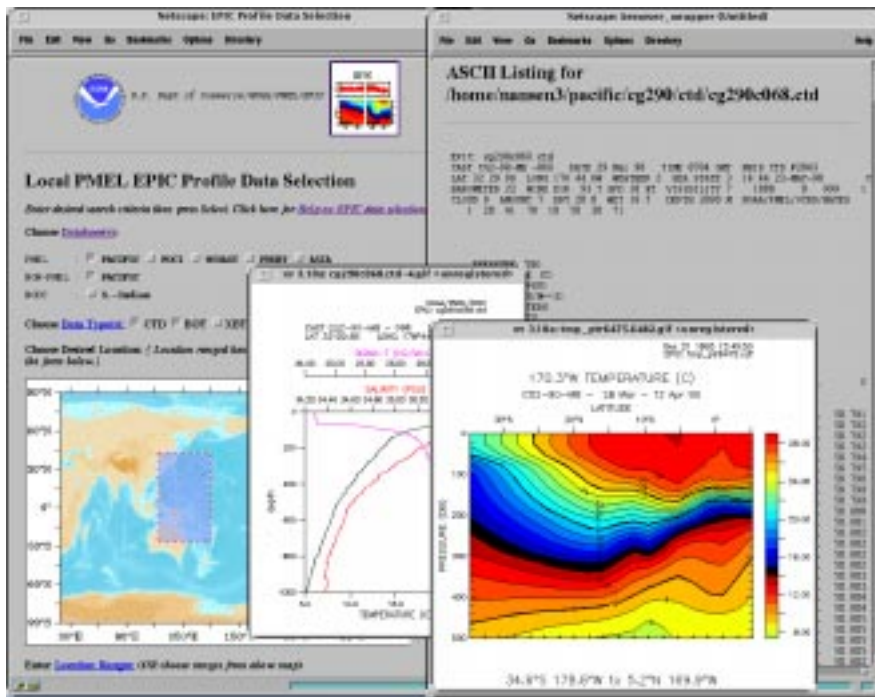


Figure 1. Data selection and display using EPIC tools and the EPIC Web Browser.

3. EPIC WEB BROWSER

The EPIC Web Browser was written to provide easy on-line access to EPIC hydrographic data sets through the World-Wide-Web (Zube et al., 1997). It provides tools that enable the user to view data by creating on-the-fly graphics, generate listings, etc.

The EPIC Web Browser consists of a set of perl routines that generate HTML-formatted text. These routines

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are designed to be called as cgi-scripts, either with the POST or GET command. Alternatively, the scripts can also be called from inside other perl programs.

The EPIC Web Browser is the analysis tool behind our Web-based interface to PMEL data (see below). The following functions are available:

- Plot (T, S, Sigma-t, Ox) vs. Pressure/Depth
- Plot Temperature vs. Salinity
- Plot user-selected Property vs. Pressure/Depth
- Plot two user-selected Properties against each other
- List data-file in ASCII format
- Download data-file in binary (EPIC/netCDF) format
- View meta-data/attributes of data-file
- Edit data-file selection list
- Download data-file selection list
- Plot Station Locations
- Make vertical section plots

4. JAVA TOOLS

Java has been used to extend and enhance the capabilities of the existing Web access of EPIC (Denbo et al., 1997).

4.1 Java Interface to EPIC data selection

The Java interface to EPIC data selection is an example of combining Java applets with existing, proven technology, i.e. HTML forms and cgi scripts.

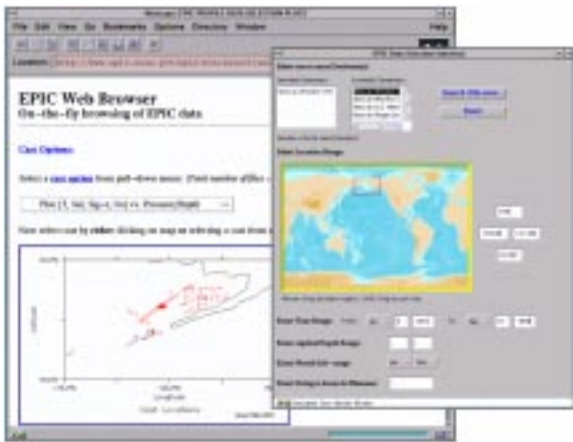


Figure 2. EPIC data selection using Java applet to interface to the EPIC Web Browser software.

This applet provides an interface to on-line databases by collecting the users database query input and launching an existing cgi script using a simple HTTP/GET command. The script then searches our databases and starts the EPIC Web Browser.

The more interactive nature of applets (compared to HTML forms) allows for a more convenient selection of the required parameters by the user. For example, using a Java applet to select the geographical regions from a map is much simpler and quicker than the HTML forms version of the interface.

4.2 Java-enhanced Interface to Real-time TAO Data

The taoinfo applet was designed to provide interactive access to the most recent data collected by the TAO array. This applet is a combination of Java to display tex-

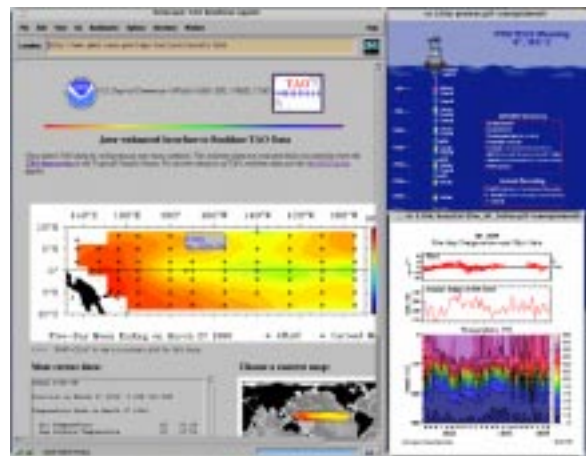


Figure 3. Java applet to display real-time TAO data. Data display is provided using EPIC tools.

tual summary information and existing cgi-bin scripts to create and display the buoy summary plots.

5. ACKNOWLEDGEMENTS

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Additional Information is Available At:

EPIC Home
Page: <http://www.pmel.noaa.gov/epic/home.html>
On-Line Data
Access: <http://www.epic.noaa.gov/epic/epicselect.html>
gd library: <http://www.boutell.com/gd/>
Plot Plus: <http://www.halcyon.com/www2/dwd/>

Web Utilities: <http://www.pmel.noaa.gov/epic/doc/web-utilities.html>
EPIC Web
Browser: http://www.epic.noaa.gov/epic/browser/browser_doc.html
Java Tools: <http://www.epic.noaa.gov/epic/java/java-info.html>
Java On-Line
Data Access: <http://www.epic.noaa.gov/epic/edssel/edssel.html>

6. REFERENCES

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