6.9 AN ARCIMS-BASED WEB PORTAL TO REAL-TIME OBSERVATIONS AND FORECASTS FOR ESTUARIES AND THE COASTAL OCEAN

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1. INTRODUCTION

The National Ocean Service's (NOS's) Coast Survey Development Laboratory has developed and implemented a map-based Web portal called *nowCOAST* to provide the marine community with the capability to view all on-line, real-time observations as well as NOS and National Weather Service (NWS) forecasts for major U. S. estuaries and seaports, adjacent coastal ocean regions, and the Great Lakes. The portal provides spatial-referenced links to real-time information from meteorological, oceanographic, and rive observing networks operated by federal and state agencies and educational institutions and to forecast point guidance from NOS and NWS forecast models and NWS weather and marine forecasts. Thus, it provides a 'one-stop shopping' web site to real-time information from a variety of sources in the coastal states. This information is needed for commercial shipping, recreation activities, as well as coastal monitoring, prediction, and hazard assessment and response. The purpose of this paper is to describe the Web portal and discuss plans for future versions.

2. OVERVIEW OF THE PORTAL

nowCOAST was constructed using ESRI's commercial off-the-shelf GIS software Arc Internet Map Server (ArcIMS) Version 3.x. The map server along with the Apache 1.3.x Web server and Jakarta Tomcat 1.3.x servlet engine runs on a Dell Precision 530 2.2Ghz Intel Xeon computer. The portal user interface (Fig. 1) was designed to serve both Geographic Information System (GIS) and non-GIS experienced users. Customizations were made in DHTML and JavaScript for the purpose of meeting the needs of these two distinct user groups. The non-GIS user group focuses on finding the data and/or forecast products they need and not on specifying map backgrounds, etc. Since this group is presumably unfamiliar with standard GIS software tools and functions, a Web interface was created that quickly guides the user to the information they choose. Three 'pull-down' menus were created for the user to select:

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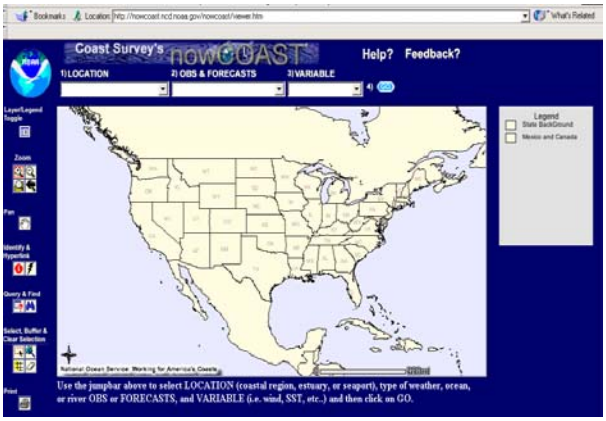

Fig. 1: nowCOAST user interface.

1) location (i.e. an estuary, seaport, coastal region, or Great Lake), 2) type of observation or forecast (i.e. weather, ocean, river, or water quality observations or model forecasts, or surface forecasts), and 3) variable (i.e. water level, air temperature, wave height, etc.). After selecting any or all of the 3 options, the user chooses "Go" to create a map for their specified information and location. To further inspect the data or forecast product, GIS and non-GIS users may choose to utilize the out-of-the-box GIS functionality of the ArcIMS Web portal. Common GIS tools include Search, Zoom, Pan, Select by Rectangle, Identify, Query, and Print. These tools can be used to enrich the user's experience with the portal.

Metadata including URL addresses on Web sites providing real-time observations and NOAA forecast products was collected manually with a series of Perl scripts and inserted into a MS Access database. Quality control, verification, and conversion scripts were also written in Perl and connected to the Access database via the Open Database Connectivity Perl Database Interface (DBI) module. DBase files (DBF) IV tables were exported from Access and imported into ESRI's ArcView 3.x. The DBF tables were then converted to shapefiles and added as content to the ArcIMS MapService.

The Federal Geographic Data Committee (FGDC)-compliant metadata for *nowCOAST* is available at the National Spatial Data Infrastructure Clearinghouse http://130.11.52.184/servlet/FGDCServlet and also at

http://chartmaker.ncd.noaa.gov. The metadata refers to each online source of information included in the *nowCOAST* Web portal.

3. CONTENT

3.1 *Observations*

Presently, the portal provides spatially-referenced links to the following weather and ocean observing networks: NOS' Physical Oceanographic Real-Time System (PORTS) and National Water Level Observation Network stations, National Data Buoy Center's (NDBC) fixed buoys and Coastal-Marine Automated Network (C-MAN) stations, NWS/FAA/DOD's Automated Surface Observing System (ASOS) and FAA's Automated Weather Observing System (AWOS) sites, as well as non-federal government run stations (ex. Chesapeake Bay Observing System, Coastal Observing and Prediction System in FL, Texas Automated Buoy System, and the Gulf of Maine Ocean Observing System). In addition, it provides links to NWS/DOD radiosondes, boundary layer wind profilers operated by NOAA and state agencies, and NWS Doppler weather radar sites. For real-time river observations, the portal links to USGS river gages and also Integrated Flood Observing and Warning System (IFLOWS) stations. For water quality observations, the portal provides linkages to EPA's Environmental Monitoring for Public Access Community Tracking (EMPACT) stations. An example of a *nowCOAST* map displaying clickable links to Web sites providing displays of real-time observations for the depicted stations in given in Fig. 2.

Fig. 2: Example of map depicting observing sites and 100 km coverage of NWS Doppler weather radars in southern New England.

3.2 *Forecasts*

The Web portal provides links to NOAA's weather and oceanographic model point forecast guidance from NWS' Model Output Statistics (MOS), Extra-Tropical Storm-Surge Model, NOAA WaveWatch III Model, and NOS' estuarine forecast models for the Chesapeake Bay, Port of New York/New Jersey, and Galveston Bay. An example of a *nowCOAST* map depicting county and marine forecast zones and locations where forecast model point guidance are available is given in Fig. 3.

In addition, it links to county weather and coastal marine zone forecasts prepared by NWS' Weather Forecast Offices and also to the high seas forecasts produced by the NWS' Marine and Tropical Prediction Centers.

Fig. 3: Example of map depicting NOS and NWS forecast model point forecast guidance along with county weather forecast and marine zones for the Port of New York and New Jersey.

4. PLANS

The *nowCOAST* Web portal is available at *http://chartmaker.ncd.noaa.gov/csdl/op/nowcoast.html*. At the present time, the Web portal is maintained during weekdays. However, NOS plans to make *nowCOAST* an operational web server at its Center for Operational Oceanographic Products and Services (CO-OPS) in early 2003. Future versions of *nowCOAST* will have the capability to display gridded fields from NOS and NWS forecast models and potentially from NWS' Interactive Forecast Preparation System.

5. ACKNOWLEDGMENTS

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