GULF OF MEXICO FRAMEWORK BATHYMETRY DATA SERVICE
Final Report on NOAA CAP 2005
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d. Project Narrative

Data Access Point: *http://www.ngdc.noaa.gov/mapserver/cgi-bin/mapserv?map=bathydb.map&service=wfs&request=getcapabilities&version=1.0.0*

During the project period of performance the National Geophysical Data Center and Coastal Services Center collaborated to publish a Web Feature Service for national scale bathymetry. The original intent of the project was to publish data for the Gulf of Mexico region. However, during project development it became clear that expanding the geographic scope of the project would not incur additional costs. Early project work focused on stabilizing the database configuration and building the database view to support the WFS. We evaluated the elevation framework schema several times, trying to match the requirements and elements of a typical bathymetric sounding record to the

recommended schema standard. The schema design appeared to be both complex and lacking a design element that would carry the simple mass point features, tidal datum references, survey identifiers and dates that are fundamental to a sounding record. For this reason a simple database view was constructed that contained the desired elements and these elements were used to populate a simple flat schema design.

In the original CAP proposal we identified the ArcIMS product as our target application server. Part of this selection was based on the planned deployment by ESRI of a WFS 1.1 capability within the time frame of the CAP project. After a considerable amount of time it became clear that the WFS 1.1 was not actually going to be deployed on the ArcIMS application. We examined the MapServer platform as an alternate application server. Some of the MapServer literature indicated a support for GML 3.x Based on this information we decided to change to the MapServer application. Although we found that it did support the GML 3.x specification, it did not support the WFS 1.1 in a stable release. For the purpose of trying to reach the largest possible audience we scaled back to implement the service using the WFS 1.0 and the GML 2.1.X version that are most commonly paired together. The combination of trying to use GML 3.x and WFS 1.0 seemed like a poorly supported compromise.

A presentation or client application was not a defined task of the project. Most testing was conducted using GET requests in a URL string from a browser. Bathymetry queries can rapidly exceed the 10's or 100's of thousand records when a large geographic area is selected. Although a database constraint can easily limit this event, we decided to leave the query window unconstrained for the broadest usability until significant load limits are identified on the host. Some testing with the uDIG client was successful; however visual WFS clients of this type seem to have difficulty with large volume requests.

A two page fact sheet on the project has been drafted and attached below. After internal review and further copy edits this will be released on the CSC website. The service will also be highlighted on an agency-wide Enterprise GIS web service reference and shared with participants of the Integrated Ocean Observing System (IOOS) program office at a meeting on July 24 2007.

Plans are to continue to support the project with the next major change coming when a production level release of WFS 1.1 becomes available from either ESRI or the MapServer community. We would like to further examine the possibilities of using the framework elevation schema for bathymetry and are interested on providing input to this process outside of the scope of this project.

d. Status of our Data Management Activities

What Framework data theme(s) are being managed for service under this project?

Bathymetry/Elevation

What is the data volume of Framework data being managed for service (number of features, megabytes)

Over 70 million features covering Atlantic, Gulf of Mexico, Pacific, and Great Lakes

Who are the primary organizations providing data for this project?

NOAA Office of Coast Survey

What hardware and software are being deployed for data management, configuration and WFS service

Dell 2650, 4GB RAM, 2 CPU's and RHEL 3
Oracle 10.2.0.2.0 w/SDO_Geometry

Dell 2500, 2GB RAM and RHEL 3
Minnesota MapServer version 4.10.1

e. Status of Framework Web Feature Services

Has the service been registered with geodata.gov

An FGDC record for this data source has been created and published on the NOAA NOS Data Explorer which is a registered node for harvesting by GOS. The record does not currently appear in the GOS. Additional changes to the metadata record are planned to show the alternate "Digital Form" resulting from this project activity.

Describe your experience and purpose in accessing the data through geodata.gov or dedicated applications

Access to this data service has been most successful through direct URL request via a browser interface. Dedicated client applications show inconsistent results with this service. Most clients read the getCapabilities response, some read the getFeatureType response and only in rare conditions are the getFeature requests successfully read.

Describe any internal or external users and applications that are using this WFS

This service is primarily used in an experimental capacity. It is estimated that the primary users are scientific, educational and in some cases state resource managers.

f. Project Management

Will this project's activities continue in the future?

Yes, NOAA intends to greatly expand it use of OGC services, especially WFS. This specific service will be maintained and upgraded when production grade implementations of the WFS 1.1 specification become available using either ESRI or MapServer applications.

Describe the next phase in your project?

We will investigate and try to determine why some of the public domain WFS readers fail to accept the response that the MapServer configuration provides.

We will continue to investigate how simple bathymetry soundings can best be included in the existing or a modified elevation framework standard.

We will research the steps necessary to publish this data source using the WCS standard.

g. Feedback on the Cooperative Agreements Program

What are the programs strengths and weaknesses?

The conference calls provide an excellent opportunity to hear the lessons learned by others.

The program focus area may have been a little ahead of its time-premature. Vendor implementations were nowhere near ready, thus extending the project deadline.

Better documentation of the framework schemas, including more instances/examples could help reduce the learning curve.

Where does the program make a difference?

The program allows organizations to identify the implementation hurdles with trying to support the designated standards without putting primary missions at risk. It also provides access to some very talented standards professionals that otherwise are difficult to contact and engage.

Was the assistance you received sufficient or effective?

Yes, the overall assistance offered was appropriate for the task. If there was some approach to expanding the lessons learned aspects of the conference call that would help. Perhaps have more frequent special topical conference calls.

What would you recommend doing differently?

More frequent conference calls. Consider sponsoring the development of a open sourced high quality WFS.

Are there factors that are missing or need to consider that were missed

No

Are there program management concerns that need to be addressed, Time Frame

No

If you were to do this again, what would you do differently?

We would consider writing minimally compliant WFS from scratch that would directly read the data from the RDBMS exclusive of a spatial extension and output the desired schema. We might have spent more time early in the project articulating the discontinuity between the elevation framework schema and the “natural” data model for a simple bathymetric sounding.