NODC Data, Services and It's New Geoportal Server

An Ocean of Data on Your Desktop

DATA DISCOVERY, ACCESS AND ARCHIVE

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Overview

- **NODC’s Data and Services**
  - NODC’s Mission-scientific stewardship
  - Archive Paradigm
  - Bring Geoportal Server to NODC

- **An overview of NODC’s Geoportal Server:**
  - Implementation highlights: multiple service links; temporal search, spatial search, improved browse tree, ocean basemap, and ocean locator demo

- **More from NODC’s Geoportal Server**
  - Human to machine
  - machine to machine
  - Bringing it all together

- **Usability test results and future implementation plan**
NODC’s Data and Services
NOAA National Oceanographic Data Center

An Ocean of Data and Information...

Mission: To provide scientific stewardship of national and international marine environmental and ecosystem data and information
Scientific Stewardship

• **Acquire:** receive ocean data from U.S. and foreign sources

• **Archive:** preserve those data assets for the long term

• **Access:** provide access to archived data for business, federal, science, and many other users

• **Add Value:** assemble easy-to-use, long term collections for science and applications
Human and machine interfaces to

*Understand, Preserve, Discover, Access, and Use*

NODC Archive Holdings

The NODC Ocean Archive
Understand and Preserve

Metadata

FGDC  ISO  Ad hoc docs

Other standards

The NODC Ocean Archive
Access and Use

LAS, GIS, KML

WCS, WMS

DAP, THREDDS

FTP and HTTP

Enhanced online access, visualization, and analysis tools

Distributed Access Protocol (DAP) and THREDDS catalogs

Basic FTP/HTTP access for all Archival Information Packages (AIP) in the NODC Ocean Archive
Discovery

Human to Machine Interfaces
- Google
- Data.gov
- GOS
- OAS
- Geoportal Server Web App

Machine to Machine Interfaces
- CSW
- Geoportal Server REST API
- OpenSearch
- SRU/ISO23950
- WAF

The NODC Ocean Archive
An Overview of NODC’s Geoportal Server
Highlights from NODC’s Geoportal Implementations

- Multiple service links
- Temporal search
- Browse by keywords
- NODC’s ocean locator
- NODC’s ocean basemap
- Demo
Geoportal Server-Web interface

Search

Search metadata content, e.g. title:SET; use "AND" for multiple keywords, e.g. water and temperature; use """" to search for an exact phrase, e.g. "water temperature" (Search tip!)

Additional Options

WHEN

- Dates overlap range  - Dates within range

From:  - To:

WHERE

- Ocean Locator
- Base map
- Bounding info

Free Text, Temporal, Spatial, Search

Results 1-1 of 1 record(s)

- Expand results
- Zoom To Results
- Zoom To Search

Analysed L4 foundation sea surface temperature North-Western European shelves data

The ODISSEA North-West Europe Shelves Sea Surface Temperature product is produced at IFREMER/CERSAT. It provides a daily cloud-free foundation sea surface temperature at 0.2 km resolution and is generated by AGS...

Website Details: Metadata Download: LAS TDS OPeNDAP FTP Zoom To

See results through REST API: GEORSS ATOM HTML FRAGMENT KML JSON

Ocean Locator

Base map

Bounding info

HTTP

LAS

TDS

FTP
Browse tree provides another option of data Discovery and access with a further data Filter function.
The original data layers include NGDC’s ETOPO1 (NGDC), NODC’s Sea area and National Marine Sanctuaries map (VLIMAR and NODC), Large Marine Ecosystems map (NOAA LME), Global countries, states/provinces, and cities polygons (ESRI 2004), Marine Eco-regions of the World, the Exclusive Economic Zone (EEZ) boundaries (Conservation International).  

http://data.nodc.noaa.gov/arcgis/rest/services/basemap8/MapServer?f=jsapi
The original data layers include NODC’s Sea area and National Marine Sanctuaries map (VLIMAR and NODC), Coral Reef location map (NOAA CoRIS Team, the original GIS map was achieved from ReefBase), Large Marine Ecosystems map (NOAA LME), Global countries, states/provinces, and cities polygons (ESRI 2004), Marine Eco-regions of the World (WWF), the Exclusive Economic Zone (EEZ) boundaries (Conservation International). The ocean locator is updated whenever a new sea area location is defined in NODC’s Ocean Archive System or new data layers are requested by the users.

Data.nodc.noaa.gov/geoportal
How NODC’s Geoportal Server Enables Machine to Machine Search Capability and Brings all Together?
Machine to Machine - via CS/W

Example: A Search from Desktop-Arcmap>CSWclient returns the location of the data on the map and a brief metadata file with selected metadata fields.
Machine to Machine - OpenSearch

http://data.nodc.noaa.gov/geoportal/openSearchDescription

The through-cloud capabilities of microwave radiometers provide a valuable picture of global sea surface temperature (SST) while infrared radiometers (MODIS) have a higher spatial resolution. To utilize these SST, scientists...

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Global 10km Analyzed SST data set

File 10.14 sea surface temperature analysis produced daily on an operational basis at the Naval Oceanographic Office using a weighted average of AVHRR, GOES, and AMSR-E SST retrievals. Pathfinder 9km climatology is used when no...

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TMI 25km gridded SST data sets

Version 3b TMI Ocean Products, in November 1997, the TMI radiometer with a 10.7 GHz channel was launched aboard the TRMM satellite. The important feature of microwave retrievals is that SST can be measured through clouds, w...

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AMSR-E 25km gridded SST data sets

The Advanced Microwave Scanning Radiometer (AMSR-E) was launched on May 4, 2002, aboard NASA’s Aqua spacecraft. The National Space Development Agency of Japan (NASDA) provided AMSR-E to NASA as an indispensable part of Aqua...

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TMI gridded L3 orbital SST data sets

Version 3b TMI Ocean Products, in November 1997, the TMI radiometer with a 10.7 GHz channel was launched aboard the TRMM satellite. The important feature of microwave retrievals is that SST can be measured through clouds, w...

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MODIS Aqua L2P swath SST data sets

The production of the MODIS L2P data is a joint collaboration between JPL, OBPG and BSMAS. BSMAS is responsible for sea surface temperature algorithm development, error statistics and quality flagging, while the OBPG is NASA...

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MODIS Terra L2P swath SST data sets

The production of the MODIS L2P data is a joint collaboration between JPL, OBPG and BSMAS. BSMAS is responsible for sea surface temperature algorithm development, error statistics and quality flagging, while the OBPG is NASA...

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North Sea and Baltic Sea L4 SST data sets

The L4 analysis is based upon nighttime CERES SST L2P subset SST observations from several satellites and instruments such as AMSR-E, ATIS, ATSR-2, MODIS and CERES: European Space Agency - Center for Environmental Information Systems (CEOS) - Earth Observation Data Information System (EODIS) - Data Management - Ocean SAR - Ocean Color - SST - SST

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EODIS - Ocean SAR - Ocean Color - SST - SST

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Geoportal Server – REST URL


- “Show me in HTML format the first 25 datasets with the keyword *temperature*, between 1986 and 1990, within the bounding box 137.72 E to 143.29 E and 33.36 N to 36.14 N”

- Want it in KML? Change the “html” to “kml”.
Geoportal Server Components
Usability Test Results and Future Implementation Plan
ESRI’s geoportal server was designed for users who have GIS background. NODC did many customizations to make the gpt server be easier to both GIS and non-GIS users. To evaluate the changes and get ideas for future implementations, we conducted usability test within a small group of data users.
### Usability Test Results - Questions List

<table>
<thead>
<tr>
<th>Query</th>
<th>Which part do you find difficult? 1. Free text; 2. Temporal search; 3. Spatial search; or any other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Water temperature, wave height data for Gulf of Mexico during the past 5 years</td>
<td></td>
</tr>
<tr>
<td>2. Wind data from remote sensing for California coast</td>
<td></td>
</tr>
<tr>
<td>3. Ocean current data for Chukchi Sea for a time period covering 2009 to present</td>
<td></td>
</tr>
<tr>
<td>4. Station data from a NOAA cruise e.g. &quot;Townsend Cromwell&quot; from 1960s</td>
<td></td>
</tr>
<tr>
<td>5. Can you find this data with the following information</td>
<td></td>
</tr>
<tr>
<td>Place: Black Sea</td>
<td></td>
</tr>
<tr>
<td>Institution: Woods Hole Oceanographic Institution (WHOI)</td>
<td></td>
</tr>
<tr>
<td>Data collected: 2003</td>
<td></td>
</tr>
<tr>
<td>6. Please define a search by yourself and provide a short description below: 😊</td>
<td></td>
</tr>
</tbody>
</table>

**Suggestions:**

The test queries were selected from real user requests to NODC. Normally when users could not figure out how to find the data, they send the requests to NODC’s user services. The average time used for each test is between 15 to 45 minutes.
32 out of 34 users provided their contact information; and 19 of them are willing to be in touch with us for future updates.

40% students
60% researcher/scientist
28% data management

Testers are from America, Asia, and Europe with good English or poor English skills
Usability Test Results

NODC's Geoportal Server Usability Test Results
% of Users whom Had Problem With the Service

- Spatial Search
- Web Interface
- Free Text Search
- Search Help Document
- Browse Tree
- Data Visualization
- Temporal Search
- Metadata
Future implementation plan

• Map locator: improve the map layout; make the locator work with automatic zoom

• Free text search: configure the search default syntax; add ontology service to Geoportal Server

• Web interface: distinguish between two ways of search; make the most popular REST APIs shown on top of the results list; others

• Data visualization: on-going

• ISO19115-2 metadata capability: on-going with ncISO (NGDC) metadata and ISO19115 metadata from the xsl (NCDDC) transformation
Acknowledgements

- Thank you to Christine White and her team at ESRI who continue to help us improve our Geoportal

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Thank You!