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Data Catalog Publication System in JAMSTEC

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Japan Agency for Marine-Earth Science and Technology (JAMSTEC) has developed the "JAMSTEC Data Catalog", which helps users to find comprehensively databases or datasets which publicize data obtained from JAMSTEC researche activities.

JAMSTEC has explored global oceans especially deep sea, atmosphere, solid earth and biosphere and has also performed many kinds of simulations using High Performance Computers such as the Earth Simulator. JAMSTEC publicizes such data via databases specified by data types or data sites of research projects. For marine-earth observational data JAMSTEC has developed a web GIS based "JAMSTEC Data Search Portal" (J234-002, JpGU Meeting 2009), which enables users to search data by observational points or cruise tracks at single site. However there was no adequate search service to find a database or a dataset.

To handle metadata of databases and datasets in single manner the Data Research Center for Marine-Earth Sciences (DrC) adopted Directory Interchange Format (DIF) in the Global Change Master Directory (GCMD) of NASA as a metadata standard for JAMSTEC's databases and datasets which extend over various scientific categories. Designed to cover wide range of category DIF is suitable for JAMSTEC's metadata standard and also fit to be handled in information systems due to its XML format. DrC has complied information on databases and datasets in JAMSTEC in DIF format and registered them to GCMD. At the same time DrC has also prepared Japanese version of those metadata in DIF format.

JAMSTEC Data Catalog is a web system which enables users to find and browse metadata in DIF format.
Data Catalog initializes a database system using pre-defined XML schema as a XSD file. When a metadata is registered, Data Catalog digests it into database and puts it to a full text search engine. Users can select metadata from hierarchical categories shown in a tree or a list style or search and narrow metadata by simple keyword search or complex search. Metadata have URL links leading users to databases or datasets and cross links to change the page languages. A data manager can selects one or more terms for category classification from metadata schema.

Data Catalog is able to handle different metadata sets with other metadata schema than DIF. Registering metadata schema additionally DrC has developed on the same system the "Document Catalog" publishing cruise reports, technical reports and public relationship documents etc. and the "Geophysical Exploration Data Catalog" publishing single/multi-channel seismography data.

As of now Data Catalog disseminates mainly metadata of databases and data publishing sites in JAMSTEC. DrC is going to extend handling metadata to datasets of various research projects. Although a data manager registers metadata now, DrC is developing a metadata input tool which helps researchers to make metadata in DIF format both in Japanese and English by inputting information on a web interface by themselves.

Keywords: metadata, XML, schema, DIF

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Web-based visualization system connected with online database system for observation data obtained in JAMSTEC research

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Japan Agency for Marine-Earth Science and Technology (JAMSTEC) has been accumulating observation data obtained in several research vessels belonging JAMSTEC. Various equipments are mounted on the research vessels, so various research data, e.g., geomagnetic data and gravity data, are obtained and accumulated. We take on responsibility for proving the observation data for scientists both in Japan and foreign countries. Database system for the observation data has been constructed and web GUI of it has been customized. Preview system of the data on Web directly connected with the database will help user to find the requirement data. For constructing the preview system, our project firstly started to develop the visualization system of the observation data, which will be stored into the database, on web platform. We successfully visualize the data on web browser by using Google Earth API. To visualize geographic data in Google Earth, the data should be written in Keyhole Markup Language (KML). We made the converter system from the observation data into KML as Java Servlet and web GUI for the system. Here, we have improved the web-based visualization system of the observation data. Search system of the data, kernel of the database system, is joined into the visualization system. Visualization has two steps of High and Low resolution. At first, user obtain low-resolution image of the selected data to obtain a certain amount of perspective of the observation results. Because some observation data are very large, it is difficult to smoothly visualize all of such data on Web. Next the data can be visualized at high resolution to understand the detailed observation results in selected area. These visual presentations will be very useful for users to select and acquire the observation data from the database system. By using this preview system, user can search and visualize the observation data on the same platform, so the preview system will improve the usability of the database system.

Keywords: visualization, database, observation data, research vessel, Google Earth API, web technology

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Approaches to Promoting Use of Data Integration and Analysis Products

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We at JAMSTEC (Japan Agency for Marine-earth Science and Technology) have developed and operated the following three websites 1) - 3) toward long-term sustainable services as part of the theme "Development of Technologies for Practical Use" of the DIAS (Data integration and Analysis System).

1) FIntAn (Fruit of Integration and Analysis)
[http://www.jamstec.go.jp/drc/fintan/e/] [Contact: dias-mng [at] jamstec.go.jp]
This is an informational website on the fruits of research and development work by the JAMSTEC under the DIAS. The applied themes include "Ocean & Fishery Resources," "Hydrological Cycle in Eurasian Cryosphere," "Hydrological Cycle in Monsoon Asia" and "Land Ecosystem." Among its research projects, "Ocean & Fishery Resources" involves ocean reanalysis data including their application to fishery resource research. "Hydrological Cycle in Eurasian Cryosphere" deals with Hydrological Process Data in Eurasia and Glacier Inventory Data. "Hydrological Cycle in Monsoon Asia" includes Gridded Precipitation Data of the Asian Region, West Sumatra Rader-Rain Gauge Integration Dataset, Monsoon Asian Heat and Water Balance Dataset, Typhoon Tracks During the Early 20th Century and Historical Rainfall Dataset in the Philippines. Lastly, "Land Ecosystem" provides research and data on the Link System Map of the Ecosystem. Under the theme Development of Technologies for Practical Use, it has conducted research and development into a system to widely disseminate the knowledge obtained through the research of the DIAS project, while providing the data integrated under the project. This website is an informational website which aims to introduce highly specialized data and knowledge based on the latest scientific research to more people in a more easily-understood manner, and encourage its utilization. In particular, the aim is to not only give stylized introductions regarding the data but to make an accessible website whose content can be readily understood, and to this end, columns and glossaries related to each of the research themes have also been prepared.

2) MAPS (My Atlas and Plot Service)
[http://www.jamstec.go.jp/drc/maps/e/] [Contact: dias-mng [at] jamstec.go.jp]
This is a system to provide the above-mentioned datasets. We launched the early website at 2007. We also investigated users'needs through an online questionnaire and through interviews regarding the types and quality of required data, data formats, website functions and so on. Accordingly this website has been remodeled with new datasets and new functions to meet users'needs since the fall in 2010. We have provided online mapping and plotting services with MapServer, and download services with functions of extracting digital data by selected attribute and of converting into another file type. These services provide a powerful visualization and analysis capabilities for the data products. The input items and forms in online questionnaire and Contact-Us page in our website have been refined to collect feedbacks and comments about the new website functions.

3) Inventory System of Hydroclimate Observation Data by Stations
[http://www.jamstec.go.jp/rigc/mahadis/search] [Contact: mahadis-info [at] jamstec.go.jp]
This is a system to provide inventory information of hydroclimate observation data by stations in the Asia-Pacific region and to share the information with users around the world. You can search by Data Source, Station Name, Data Source or WMO Station Number, Period, Latitude/Longitude, etc. and view search result in list view or map view. Additionally, you can download the search results in CSV format. Currently, the information of Monthly Bulletins of the Philippine Weather Bureau from 1907 to 1940 is available.

We will continue to make improvements in the future so that we can return the fruits of DIAS to everyone on a broad scale. Feel free to contact us using the contact information with any questions or requests for each website.