MGI36-01 Room:203 Time:May 28 14:15-14:30

Openness & Sharing of Scientific Research Data, with JpGU

MURAYAMA, Yasuhiro[1]*

[1]National Institute of Information and Communications Technology

JpGU has been facilitating sessions related to data and information topics in past meetings, convened by groups/communities with interdisciplinary interests including informatics, scientific data management, data systems, databases, and social network services. This session will be a forum of those topics of papers, encouraging exchanges between those groups and communities. New dimensions and cross-disciplinary subjects are expected for further contribution to advancing the earth and planetary sciences. On the other hand, Open Data and Open Science are increasingly becoming hot topics, in parallel to establishing ICSU-WDS (2008), G8 Open Data Charter (2013), deployment of RDA (2013), and so forth, in addition to development of Open Access of journal articles. The JpGU community will be encouraged to discuss about our reaction, our contribution to the above data and information issues, and what future benefits and problems inherent in earth and planetary sciences will be.

Keywords: research data, data sharing, open data, open science

Operational Scheme of International Data Sharing in IODP (2003-2013)

SUYEHIRO, Kiyoshi[1*]

[1]JAMSTEC

The Integrated Ocean Drilling Program ran from Oct. 2003 through Sep. 2013 and is now succeeded by the International Ocean Discovery Program from Oct. 2013. The scheme for international scientific ocean drilling has be in place since about half a century ago. The data policy of IODP has been in development over the years. This talk will touch on the IODP data collection, distribution, archiving system. All nations participating in IODP are required to agree on principles of scientific ocean drilling including the data policy. In IODP, data producers and data users overlap and co-exist (adopting moratorium period is one mechanism for its support). It requires good data management with the recognition that the data samples are the legacy of the program. An important point is that all discussion on data policy worked bottom up from the science community before accepted by the funding agencies.

Keywords: open data, data sample, moratorium period, repository

Data policy for facilitating inter-institutional research collaboration: Case study of the RIHN

KONDO, Yasuhisa[1]* ; SEKINO, Tatsuki[1] ; ISHIKAWA, Satoshi[1] ; TADA, Yohei[1] ; YASUTOMI, Natsuko[1] ;
NAKANO, Takanori[1]

[1]Research Institute for Humanity and Nature

The Research Institute for Humanity and Nature (RIHN) was founded in 2001. It is part of the National Institutes for the Humanities, a Japanese inter-university research institute corporations. RIHN's mission is to conduct integrative and cooperative research that examines and clarifies the interactions between human and biophysical systems, to identify the key aspects and processes of environmental change and to suggest how harmonious human-environmental relations can be established or enhanced (see http://www.chikyu.ac.jp/rihn_e/goals.html). The RIHN solicits, develops, funds, and hosts fixed-term research projects in collaboration with researchers affiliated with universities and institutes, as well as diverse stakeholders. Most researchers employed by RIHN are not tenured, and tend to leave the institute within a few years. Given the absence of an explicit policy regarding research outcomes, this high academic fluidity has disturbed the accumulation and utilization of research outcomes at the institute.

To address this structural problem, the RIHN established a data policy in 2014. The policy respects the rights of the individuals and groups who create research outcomes as much as possible. Under this principle, the RIHN will not inhibit the execution of contracts required for creating outcomes. Moreover, the RIHN will not prevent individuals and groups from utilizing or giving to third parties the research outcomes they created. These rules are designed to avoid conflicts with the data policies of other institutions as much as possible. Respecting rights of researchers is expected to facilitate the accumulation and utilization of research outcomes.

Keywords: data policy, inter-institutional research collaboration, accumulation and utilization of research outcomes

Activities promoting data sharing at the Center for Spatial Information Science, the University of Tokyo

OGUCHI, Takashi[1]* ; HAYAKAWA, Yuichi S.[1] ; KIRIMURA, Takashi[1]

[1]CSIS, Univ. Tokyo

Sharing data produced by individual researchers is important for science. A system for such data sharing, provided by an organization such as a university center, is useful for effective and efficient data management and reducing labor of each researcher. This presentation introduces such a system operated by the Center for Spatial Information Science, the University of Tokyo, and addresses future perspectives of scientific data sharing.

Keywords: data sharing, data distribution, data management

For incentive improvement of data registration - In case of Arctic data Archive System in NIPR -

YABUKI, Hironori[1*] ; SUGIMURA, Takeshi[2] ; TERUI, Takeshi[2]

[1]Japan Agency for Marine-Earth Science and Technology, [2]National Institute of Polar Research

In the National Institute of Polar Research, perform the integration and sharing of data across a multi-disciplinary such as atmosphere, ocean, snow and ice, land, ecosystem, model, for the purpose of cooperation and integration across disciplines, we build the Arctic Data archive System (ADS). ADS to promote the mutual use of the data across a multi-disciplinary to collect and share data sets, such as observational data, satellite data, and numerical experiment data. Through these data sets, clarify of actual conditions and processes of climate change on the Arctic region, and further contribute to assessment of the impact of global warming in the Arctic environmental change, to improve the future prediction accuracy. Currently, researchers have been uploaded various data. To promote the data registered by researchers, it is necessary to provide the benefits for researchers.

Now, Japan Link Center (JaLC) performs the investigation of DOI mechanisms of research data, even in Japan has enabled DOI given to research data. DOI is a digital object identifier, and is an identifier given permanent link to a document, etc. on the Internet. It makes possible for researchers to cite the data used in a scientific publication, which is called "data citation". DOI of research data for researchers to use, not only the citation data to scientific papers is simplified, and also by obtaining the metadata, search of data is become easily. On the other hand, data contributors become possible to be right evaluated and rewards for their published data in the same way as for scientific publications. However, the DOI registration to JaLC is just structure, and can be technically given about any kind of data without quality. The responsibility for the data quality and long term storage and keeping permanent link of data is in the DOI publisher side. National Institute of Polar research started discussion to giving DOI to scientific data. In this presentation, we will presentation the discussion situation.

Keywords: Arctic, Environment, Global Warming, DOI

JpGU Datasets Exhibition Session activities and its summary

HIGUCHI, Atsushi[1] ; MOTEKI, Qoosaku[2]* ; YOSHIMURA, Kei[3]

[1]Center for Environmental Remote Sensing (CEReS), Chiba University, [2]Japan Agency for Marine-Earth Science and Technology (JAMSTEC), [3]Atmosphere and Ocean Research Institute (AORI), the University of Tokyo

Datasets Exhibition session's first scope was to enhance utilization of various datasets for the Earth environment by a cross-cutting way. Studies on observation data and its network, data rescue, data centers, data assimilation, good collaboration exercises, model development and its distribution, and visualization tools were encouraged to participate. We discussed on effective usage of the datasets, enhancement of collaboration, efficient feedback system, training and outreach activities, etc. We will report our activities and summary of the session.

Keywords: Datasets Exhibition, Data Sharing, Visualization

Consideration of the scholarly information infrastructure in open science era on upper atmospheric research

KOYAMA, Yukinobu[1]* ; KURAKAWA, Kei[2] ; SATO, Yuka[3] ; TANAKA, Yoshimasa[3] ; IKEDA, Daisuke[4] ;
ABE, Shuji[5] ; NOSE, Masahito[1] ; NAKANO, Shin'ya[6]

[1]Graduate School of Science, Kyoto University, [2]National Institute of Informatics, [3]National Institute of Polar Research, [4]Graduate School of Information Science and Electrical Engineering, Kyushu University, [5]International Center for Space Weather Science and Education, Japan, [6]The Institute of Statistical Mathematics

Most of the ground-based observational data in the upper atmosphere is acquired freely without the special restrictions. The infrastructure for interdisciplinary study such as metadata database for search performance improvement of the open data, and data analysis software for convenience improvement has been built from 2009 by the Japanese IUGONET project. On the other hand, the activity that DOI minting to data is in progress by the ex-World Data Centers in the IUGONET project. In our presentation, upper atmospheric research is treated as a test-bed,

the element which should be composed of scholarly information infrastructure including from data and literature is pointed out.

Keywords: Open Science, Upper Atmospheric Research, Open Data, Metadata, Identifier, Data Centric Science

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Semantic Web based Mashup of Data Systems for Open Data and Open Science

RITSCHEL, Bernd[1]* ; SEELUS, Christoph[1] ; NEHER, Gunther[2] ; IYEMORI, Toshihiko[3] ; KOYAMA, Yukinobu[3] ; YATAGAI, Akiyo[4] ; MURAYAMA, Yasuhiro[5] ; KING, Todd[6] ; HUGHES, John[7] ; FUNG, Shing[8] ; GALKIN, Ivan[9] ; HAPGOOD, Mike[10] ; BELEHAKI, Anna[11]

[1]Helmholtz Centre Potsdam - GFZ German Research Centre for Geosciences, [2]University of Appliance Sciences Potsdam, [3]Kyoto University, [4]Nagoya University, [5]National Institute of Information and Communications Technology, [6]University of California Los Angeles, [7]Jet Propulsion Laboratory Pasadena, [8]NASA Goddard SFC, [9]Univ Massachusetts, [10]STFC Rutherford Appleton Lab, [11]National Observatory of Athens

Open Data and Open Science are initiatives which provide a framework and rules for openly shared governmental and scientific knowledge. This paper describes our efforts and latest experiments to mashup heterogeneous geo and space science data systems and servers according to Open Data and Open Science concepts based on the semantic web approach. The main focus here is on the mashup of data server designed, implemented and run by three different e(i)-science infrastructure projects, which are the Japanese inter-university IUGONET metadata database, the European Union funded ESPAS platform and the GFZ prototype of a semantic web based ISDC data portal. The intersection of the scientific domains of the projects and related data is the near earth-space area including in-situ and remote geomagnetism observations. The appropriate data systems and servers based on different e-infrastructure solutions are not interoperable. To overcome this disadvantage the design of an interoperable layer upon the used infrastructure based on
- merged domain and terminological models (ontologies)
- transformations of resources into RDF structures, and
- the mashup of linked data resources
has been done in cooperation with the information science department of the university of applied sciences Potsdam. This paper also shows the latest results of our experiments integrating D2R server and services for the mashup of relational database stored resources and the use of the Open Semantic Framework (OSF) for the enhancement of the semantic web based GFZ ISDC prototype.

Abbreviations:
ESPAS - near-Earth space data infrastructure project and data server
IUGOENT - Inter-university Upper atmosphereGlobal Observation NETwork
ISDC - Information System and Data Center
D2R - Relational Database to RDF
OSF - Open Semantic Framework
RDF - Resource Description Framework

Keywords: Open Science, Semantic Web, Linked Data, Ontology, RDF, Interoperability

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Development of a repository system for upper atmosphere and space science using the WEKO

MABUCHI, Takahiro[1]* ; KASAHARA, Yoshiya[1] ; TAKATA, Yoshihiro[1] ; MATSUHIRA, Takuya[1] ;
GOTO, Yoshitaka[1] ; YAMAJI, Kazutsuna[2] ; HAYASHI, Masaharu[3]

[1]Kanazawa Univ., [2]National Institute of Informatics, [3]Hitotsubashi Univ.

In the present paper, we introduce a repository system for upper atmosphere and space science that has functions of data disclosure and flexible authentication.

WEKO is an open source software for repository system developed by National Institute of Informatics (NII). WEKO works on the NetCommons2 (NC2), which is a Content Management System (CMS), and is used for JAIRO Cloud and institutional repositories of academic communities and universities. In addition, WEKO is able to provide specific metadata format such as Dublin Core, Junii2 using the harvesting protocol OAI-PMH.

It is not sufficient to introduce WEKO by default for a data repository of upper atmosphere and space physics. For example, the default metadata formats are not appropriate for observation data in the field of upper atmosphere nor space science. Secondly, it is necessary to customize the functions implemented in WEKO for our use case. So we added some additional functions to improve WEKO, and we constructed a repository site for Akebono VLF Data[1]. We also plan to adopt SPASE (Space Physics Archive Search and Extract) metadata format into WEKO.

It is noted that WEKO is used not only for an open data repository but also for a closed database among specified users by introducing authentication system. We propose to apply Single-Sign-On (SSO) authentication via Shibboleth to WEKO, which can be realized by customizing NC2 layer. Because Shibboleth has already been adopted by Academic Access Management Federation in Japan (GakuNin) flexible access is available for the WEKO data.

In the presentation, we introduce our repository site, which are customized for the scientific data repository for satellite and discuss future works for further development.

References

[1] Akebono VLF/MCA Data Repository https://akebono-vlf.db.kanazawa-u.ac.jp/

Keywords: WEKO, NetCommons2, Space science, Metadata, Akebono Satellite, SPASE
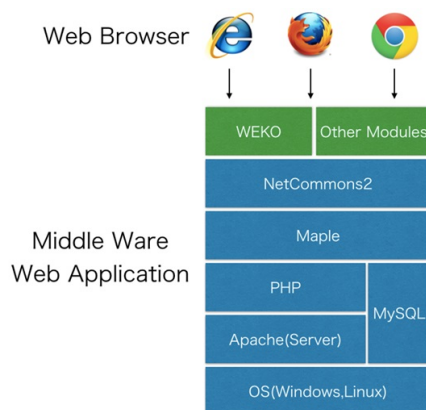
WEKO system configuration diagram

The effort in DIAS toward sharing earth science data by metadata management

SHIMIZU, Toshiyuki[1]* ; ONO, Masafumi[2] ; KITAMOTO, Asanobu[3] ; KINUTANI, Hiroko[2] ; KUROIWA, Kaori[4] ;
NAKAHARA, Yoko[1] ; MIURA, Satoko H.[5] ; YOSHIKAWA, Masatoshi[1] ; LI, Jiyi[1]

[1]Graduate School of Informatics, Kyoto University, [2]EDITORIA, The University of Tokyo, [3]National Institute of Informatics,
[4]Remote Sensing Technology Center of Japan, [5]Japan Aerospace Exploration Agency

Data Integration and Analysis System Program (DIAS-P) is building the data infrastructure by collecting and managing various global environment data and metadata like observation data and model data at home and abroad, for the purpose of interoperability data usage. To properly manage a variety of data, it is important to create and manage the metadata of the data. We are creating metadata for the data in DIAS at the dataset level in the format of ISO19115/19139. We are also collecting the data from related data centers and building the search system for searching the metadata from various fields and in various formats.

To smoothly share the metadata in DIAS and in order to implement the appropriate search for metadata in various formats, we are aiming at developing and operating a metadata mediation system, to centrally manage the metadata and make the metadata usable for the applications like the search system. To unify and align the metadata formats, we are using GI-cat which is a software for broker catalog services. Also, the metadata mediation system aim to manage the information associated with the metadata (metadata of metadata) including the mapping information between English and Japanese metadata. We are considering on the usage of GI-cat in our case including the possibility of the update of GI-cat itself, by discussing with the members of ESSI-Lab, who are the developers of GI-cat. We introduce our attempt on the format conversion of actual metadata from the collaborative institutes, and metadata sharing in DIAS using GI-cat. Furthermore, in this presentation, with the treatment of various metadata in DIAS, we also introduce our attempt on the creation of DOI (Digital Object Identifier) to the datasets in DIAS. We are discussing the mapping between the metadata created for DIAS datasets and the metadata required for DOI registration.

Keywords: DIAS-P, DIAS, earth observation data, metadata

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Towards Constructing Visible Disaster Mitigation Community Network in Yokohama

KIM, Ahyi[1]* ; UEMATSU, Hiroki[2] ; IWAMOTO, Sui[1] ; SASAKI, Akiko[1] ; TAKEUCHI, Tatsuya[3] ;
FUJIHARA, Satoru[4]

[1]Yokohama City University, [2]Senshu University, [3]Yokohama National University, [4]ITOCHU Techno-Solutions

As is well known, Japan is one of the most seismically active countries in the world. For this reason, government and a number of research institutes have been developed both basic and applied seismological researches extensively. However, along with these studies, to live in such country it is also important that each individual gets prepared to protect his/her home and family from future disaster. For this purpose, it is necessary to promote disaster awareness of people. In addition, preparedness priority should vary by region and/or community. Therefore, in this study we selected small community in Yokohama and developed a visible disaster mitigation network so that people in the community actively participate seismic monitoring and share information. Yokohama is located in the southern Kanto where the three plates meet, and there is no question about suffering a devastating earthquake in the future. The selected area is reclamation district and there are a number of old apartments where a big population of elderly person lives alone. So we utilized the network as home monitoring system for them as well. The network consists of a server located in the main office and distributed tiny sensor units. Each unit composed of QCN sensor provided by Stanford University and Raspberry Pi. The size of unit is about 30 cm by 10 cm by 10 cm and it is easily installed at houses and schools. Once the sensor detects the ground motion, the data is sent to the server and calculate seismic intensity and evaluate the status of building. In our presentation we will show how we utilize the network in the community and demonstrate various applications developed for people and school in the community.

Keywords: MEMS accelerometer, Sensor network, Citizen Seismic Network