

GGOS Portal

EXECUTIVE SUMMARY

Introduction

The GGOS Portal will be a unique access point for all GGOS products. The portal will also provide a route to the heterogeneous IAG service/technique specific information systems. The portal will be equipped with a database of relevant metadata and WEB services established according to international standards, which will enable searches for relevant data and products in a most effective way.

Background

The IAG services, as components of GGOS, provide very important and valuable data, information, and products, which are indispensable for Earth sciences and their applications. The GGOS portal will give access to these data and products as well as general information about geodesy. The portal will contribute to GGOS objectives to promote and improve the visibility of scientific research in geodesy and to achieve maximum benefit for the scientific community and in society in general. Behind the GGOS portal, each contributing service will continue its own visibility and responsibility to maintain and manage its supporting data and information system.

The IAG services supply essential products that cannot only be promoted by GGOS but are critical to the generation of GGOS products. These products and data are only available at the data centers of the individual components of GGOS. It is clear that for a future GGOS, all the relevant products for Earth sciences and applications have to be made accessible through the GGOS portal, that leads the user – including the non-specialists working in neighboring or different fields – to the individual products and their characteristics, as shown in Figure 1 below. The products and data themselves will remain physically located at many different data and product centers and will be promoted by the individual IAG services as well. As a draw for newcomers or scientists that are not familiar with geodesy, the initial Web pages of the GGOS portal will present the “burning questions” of society and lead the way from there to the products relevant for the corresponding topic, their characteristics, location, availability, latency, accuracy, etc. The expert user will have the ability to skip these introductory pages and immediately proceed to the databases themselves. General information about the GGOS project will also be available through the portal, providing a valuable resource for both the external and internal GGOS communities.

GGOS Portal Architecture

The success of the GGOS portal will depend on data and information providers accepting and implementing a set of interoperability arrangements, including technical specifications for collecting, processing, storing, and disseminating shared data, metadata and products. GGOS interoperability will be based on non-proprietary standards, with preference given to formal international standards. The eXtensible Markup Language (XML) has become a quasi standard to facilitate the sharing of data across different information systems, particularly via the Internet. Moreover, Web services for the support of interoperable Machine to Machine communication over a network are built on XML based standards (SOAP, WSDL).

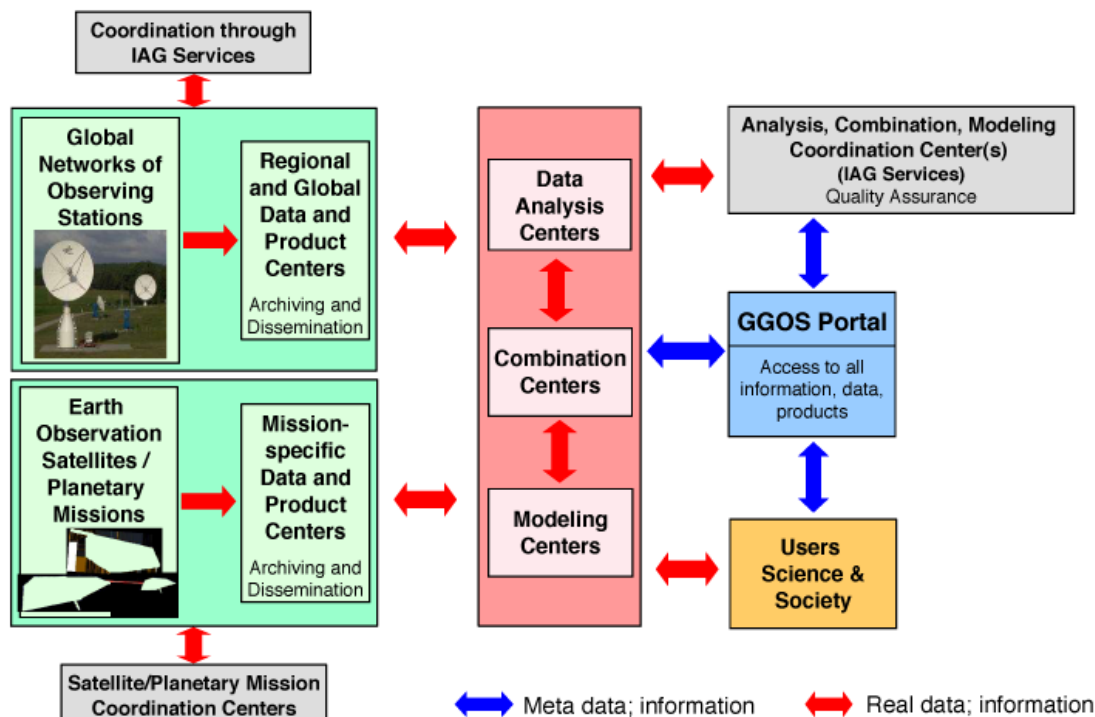


Figure 1. GGOS system design, directing users through the portal to underlying data, products and information.

Data, products, and information from contributing IAG services will be catalogued in a publicly accessible clearinghouse maintained collectively under the GGOS portal. The catalogue including thesauri will itself be subject to GGOS interoperability specifications, including the standard search and portrayal services.

The functions of the GGOS portal (e.g., search capabilities for stations, satellites, data, products, institutions, data mining tools, visualization, Web services, connections to other catalogues, etc.) are supported by the GGOS Clearinghouse (Figure 2). The GGOS Clearinghouse will be a facility that collects and distributes information concerning the data catalogues and services.

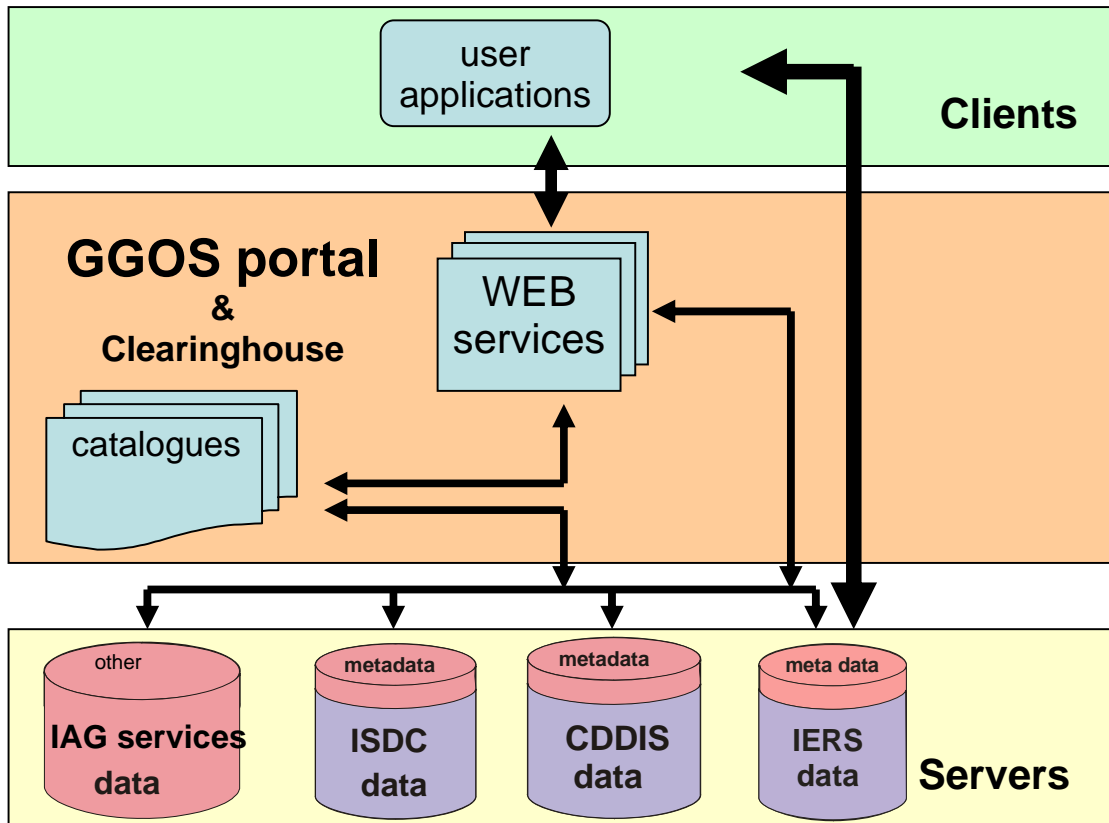


Figure 2. GGOS portal architecture

The GGOS Clearinghouse is a component providing access to a distributed network of catalogues and registries to identified catalogue service and metadata standards that support the interoperability agreements of GGOS. Contributing IAG services may nominate catalogues containing structured, standards-based metadata and other Web services for access by the GGOS Clearinghouse.

The clearinghouse may also serve as a registry for other registers. A registry is an information system on which a register is maintained; whereas, a register is a set of files containing identifiers assigned to items with descriptions of the associated items (definitions from ISO 19135). A registry provides access to the registers that it maintains. The GGOS Clearinghouse will be a registry for distributed catalogue services made accessible by GGOS participants. The GGOS Clearinghouse may also serve as a registry for other registers to be defined, e.g., documents, terminology, coordinate reference systems, codesets, models, etc.

The clearinghouse provides search capability across the catalogues and their registered resources by mapping these catalogues. The GGOS portal will search the GGOS Clearinghouse but will also provide access to other GGOS resources e.g., calendar functions, bulletin boards, etc. Through the use of interoperability standards, additional portals may be established for national or professional communities to access the GGOS Clearinghouse.

The metadata to be held by the clearinghouse is dependent upon the approach used for searching. Two anticipated capabilities for access to remote catalogues (see Figure 3) may include:

- Distributed search approach: search requests are sent in parallel to registered distributed catalogues of the IAG services.
- Harvested approach: The clearinghouse periodically harvests all metadata from registered distributed catalogues. A user search request is executed against the metadata harvested from the remote catalogues and the results are managed and portrayed in the GGOS Clearinghouse.

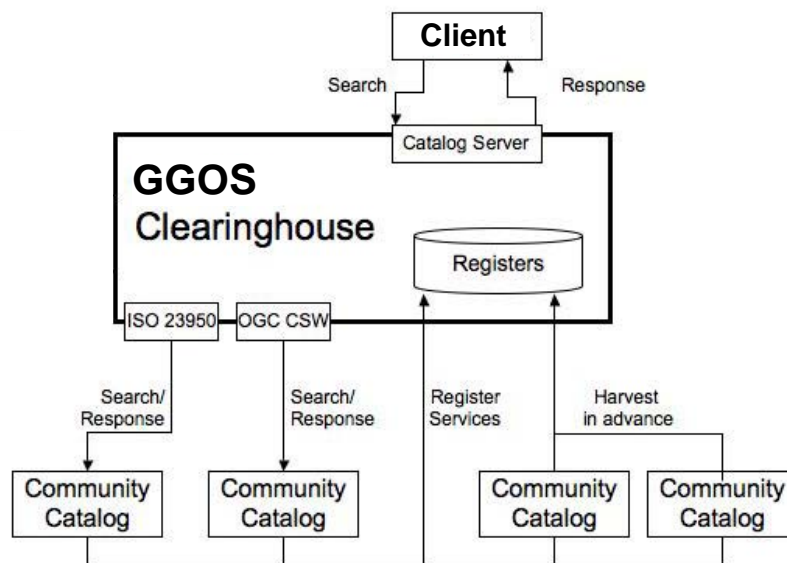


Figure 3. GGOS Clearinghouse architecture – engineering viewpoint (according to D. Nebert).

GGOS Portal Goals and Objectives

The GGOS Portal will provide a Web site that:

- represents a single Web access point (door of entry) for all geodetic products relevant in the framework of GGOS,
- gives access to general information about GGOS,
- helps in answering the “burning questions of society” and leads the way to the products, their characteristics, location, availability, latency, and accuracy,
- constitutes an information resource for GGOS participants (e.g., working group resources, calendar, meeting summaries, presentation archive, etc.),
- gives access to the GGOS Clearinghouse to search data catalogues, products and data sets generated by GGOS components,
- allows searching and information retrieval of descriptive metadata from multiple, diverse target resources, databases, Web pages, and library catalogues.

Once fully established GGOS Portal should offer a set of tools for organized knowledge discovery including visualization to assist identification and selection of appropriate resources (information, data, products).

Tasks to be addressed by the GGOS Portal:

1. Installation and maintenance of a GGOS Web site
 - Basic functionalities, hot spot information, news, tutorials, quick links, announcements, etc.
 - General information on and explanations of data, products, and geodetic techniques, with direction to service-specific resources
 - Facilitate GGOS communication
 - Calendars
 - User forums on relevant topics
 - Bibliography
 - Presentations
 - Meeting summaries
 - Working group activities
2. Installation and maintenance of a clearinghouse
 - Operate a registry as an information system on which registers of contributing services, institutions are maintained [and accessed] according ISO 19135
 - Host catalogues for metadata for all “products” of the IAG services relevant to GGOS based on GGOS standards
 - Ensure interoperability within the GGOS community and to other systems e.g. GEOSS:
 - Data
 - Products
 - Organizational components (e.g., infrastructure, supporting institutions, personnel, services)
 - Networks and their stations
 - Search (temporal, spatial, multi-technique, keywords, etc.) of metadata, data, and product databases
 - Web services (Catalogue Service Web, Web Map Service (Portrayal), etc...
3. Distributed applications for data mining of the GGOS products /data files to be provided through the GGOS Portal include:
 - Data location tools (parse and merge data)
 - Data visualization tools
 - Data analysis tools

The Web portal applications allowing users to download, install and customize the portal services in their own environment.

Based on modern architecture, standards and Web services the requested tasks to build up the GGOS portal can be realized not only by single institutions but also by consortia with distributed server architecture. The portal should be

designed and implemented in such a fashion to permit mirroring/installation at alternate physical locations.