



GROUP ON
EARTH OBSERVATIONS

GEO-VII

3-4 November 2010

Report of the Architecture and Data Committee

Document 13

For information.

Report of the Architecture and Data Committee (ADC)

1 EXECUTIVE SUMMARY

Over the last five years, much has been accomplished from a GEOSS architectural and data management perspective, but much remains to be done. Members joined GEO with the understanding that sharing and integrating Earth observation data and information would not only improve our understanding of the Earth's environment, but also contribute to advances in each of the nine Societal Benefit Areas (SBAs).

2 BENEFITS TO IMPLEMENTING THE VISION

It is well recognized that the Earth behaves as an integrated system, yet our observations of this system are generally collected in a manner that makes integration very difficult. The ADC has undertaken tasks across a spectrum of activities that represent the end-to-end system from requirements gathering, standards setting, distribution and dissemination, operations and research. Each of these elements is essential if data and information integration, or more accurately interoperability, is to be achieved.

3 BARRIERS TO IMPLEMENTING THE VISION

By far and away, the greatest barrier to implementing the vision from an ADC perspective has been the limited implementation of the agreed upon interoperability arrangements (standards) and the limited degree to which content (data, information, services) are being registered so that they can be accessed by a broad community through the GEOSS Common Infrastructure (GCI). There are several reasons why this may be occurring – data sharing policies and practices which limit full and open distribution, confusion regarding multiple portals and clearinghouses, and the complexity with which information technologies are described and discussed. Progress has been made on each of these fronts during this last year.

4 BACKGROUND, STATUS AND PLANS

The work of the Architecture and Data Committee (ADC) has been guided by the following three objectives:

- The Architecture and Data Committee will enable GEO, based upon user requirements and building on existing systems and initiatives, to define the components of GEOSS, and to converge or harmonize observation methods, and to promote the use of standards and references, best practices, intercalibration, and data assimilation;
- The Architecture and Data Committee will enable GEO to define and update interoperability arrangements to which GEO Members and Participating Organizations agree to adhere, including technical specifications for collecting, processing, storing, and disseminating shared data, metadata and products;

- The Architecture and Data Committee will enable GEO to facilitate data management, information management, and common services, and will help to promote data sharing principles in support of the GEO Plenary for the full and open sharing and exchange of data and information, recognizing relevant international instruments and national policies and legislation.

The Architecture and Data Management tasks have achieved significant progress, which is described in the 2009-2011 Work Plan Progress Report.

Highlighted below are some key accomplishments and plans of two of the major activities of the ADC – the Architecture Implementation Pilot and the Standards Interoperability Forum (SIF), respectively. Accomplishments and plans regarding the GEOSS Common Infrastructure Coordination Team (GCI-CT) and the Data Sharing Task Force (DSTF) will be reported separately.

GEOSS Common Infrastructure (GCI)

The ADC contributed to the integration and deployment of the GEOSS Common Infrastructure, including recognition of operational status for the GEO Web Portal, GEOSS Clearinghouse, Best Practices Registry, Component and Service Registry, and Standards and Interoperability Registry. As of September 2010, more than 240 EO Systems, 13,500 services, and 12,400 data sets are registered with GEOSS and are discoverable through the GEO Web Portal.

5 ARCHITECTURE IMPLEMENTATION PILOTS (AIPS)

The GEOSS Architecture Implementation Pilots (AIPs) continue to develop and test new components for the current and future GEOSS Common Infrastructure (GCI). Consistent with the GEOSS 10-Year Plan, AIPs are demonstrating and fostering interoperability mechanisms and common practices for GEOSS. AIP is both moving mature practices forward as good examples of the GEOSS approach, as well as experimenting with technologies that need further development to meet GEOSS needs.

Information technology needed to meet the requirements in the GEOSS 10-Year Implementation Plan is generally available, but not fully refined to meet the needs of all communities participating in GEOSS. There are several areas of further research needed, e.g., how to harmonize data models for remote sensing and Spatial Data Infrastructures. These topics are being addressed in AIP and in coordination with other ongoing tasks like the SIF.

Mature implementations of GEOSS architecture have been developed in AIP for several SBAs through coordination with relevant Communities of Practice. Several Working Groups in AIP (Disaster Management, Energy, Agriculture/Health, Biodiversity and Water) are working in tandem with related GEO tasks to deploy common architecture solutions with SBA different scenarios.

Lastly, a video has been prepared of the GEOSS architecture achievements based on GCI, AIP and other ADC tasks. The video includes a description of the achievements of several SBAs in implementing a common architecture. The video, including selected interviews, concludes with a call to the Ministers on how to continue the development of GEOSS based on a common infrastructure and shared architecture. The video emphasizes the progress that has been made to implement an architecture based on open standards as called for in the 10-Year Plan thereby focusing on the progress of Science and Technology for GEOSS.

6 STANDARDS INTEROPERABILITY FORUM (SIF) PLANS FOR 2011

6.1 GEOSS Interoperability Assessment White Paper

The SIF is preparing a mid-term assessment and White Paper on GEOSS interoperability. To support the assessment, information is being gathered on the status and needs of GEOSS stakeholders with a special effort to reach out to the GEOSS Communities of Practice and other communities of interest. Metrics used to inform the assessment are based on gathered information from communities and users, an interoperability gap analysis, and standards usage. Recommendations for improving the efforts towards the GEOSS interoperability goals will be made.

6.2 Community-Focused Architecture and Community Outreach

The SIF is focusing a concerted effort on GEOSS Communities of Practice and other communities of interest to educate and assist with registration of standards, services, and best practices. In support of this activity, the SIF is generating materials and web-based training to promote the GEOSS Common Infrastructure. The SIF will also make an effort to create ways for GEOSS contributors to benefit from participating in the evolution of GEOSS.

A goal of this activity is to show the benefits of GEOSS interoperability and access for communities, thus expanding the GEOSS user base can be achieved while allowing communities to evolve as they deem necessary.

6.3 Convergence of Standards

The SIF is developing guidelines and best practices for realizing convergence of standards in the Standards and Interoperability Registry. Standards and best practices are significant tools for interoperability within GEOSS. This convergence thus supports and facilitates effective use of GEOSS for decision making and societal benefits. This effort includes the development of a standards rating system that respects the existence and use of community standards.

6.4 Promote Use of the Best Practices Wiki

The SIF will continue to promote the increased use of the GEOSS Best Practices Wiki. This GEOSS component allows all GEOSS providers and users access to what has been achieved by colleagues so that solutions can be reused and knowledge can be gained and propagated throughout the provider and user base of GEOSS. Through the use of common practices in observations and data analyses, data and information become more uniform through voluntary efforts. The SIF will engage in analyzing the Best Practices Wiki and recommending ways to improve its effectiveness.