



GEOSS Portal and Service Oriented Architecture

SiriJodha Singh Khalsa IEEE and NSIDC/Univ. of Colorado

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Content

- The architectural fundamentals of GEOSS
- The GEOSS Common Infrastructure
 - Current configuration and capabilities
 - Standards and Interoperability Forum
- Experiences and issues to date
- Evolving capabilities

GEO GROUP ON EARTH OBSERVATIONS

GEOSS Infrastructure









Service Oriented Architecture (SOA)

- At it start GEO endorsed a Services Oriented Architecture (SOA) approach to achieving interoperability across the diverse component systems that would comprise GEOSS
- The thrust of SOA is that interoperability is most readily achieved by focusing on the interfaces among system components
- The sharing of descriptive information about system components, their interfaces, standards and protocols is enabled through registries and a clearinghouse





GEOSS in a Nutshell







Standards and Interoperability

- Registered resources must declare their service endpoints (if they exist) and the associated standards and other "interoperability arrangements"
- This information is stored in the Standards and Interoperability Registry (SIR)
- The Standards and Interoperability Forum (SIF) manages the SIR
- The SIF provides analysis, education and advice on interoperability issues



GROUP ON EARTH OBSERVATIONS Resources Categories



Category Name	Category Description
1. Datasets	Description of individual or collection datasets. The description includes: title, organization, description of the dataset, access protocol and URL, access conditions, and other basic properties including tags (e.g. GEOSSDataCORE). Divided in two subgroups: "Unrestricted (GEOSSDataCore)" and "Other data".
2. Monitoring and Observation Systems	Description and links to: Detection and surveillance systems, in situ and satellite based monitoring systems, Disaster response systems, etc
3. Computational Models	Component process models, social and economic models, land surface models, atmospheric chemistry models, hydrologic and terrestrial water cycle models, etc
4. Initiatives	International, national, and regional initiatives and programmes.
5. Websites and documents	Documents, websites, identification/classification systems, bibliographic, subscription services, digital/virtual reference desks, education and training resources, courses, <i>includes former capacity building material</i>
6. Data Services 6.1 Analysis and visualization 6.2 Alerts, RSS, and Information Feeds 6.3 Catalogues, Inventories and Metadata Collections	 6.1 Visualization/image processing, mapping services, statistical applications, calibration/validation, assessment services, processing services, workflows, 6.2 Real-time alerts, information feeds; supports hazards planning, disasters prevention, early warning 6.3 Description of: Catalogues, archives, Data/metadata search and retrieval systems and services, data discovery systems, data delivery systems, service discovery, etc
7. Software and applications	Interactive programs, downloadable software, tools, for use with EO data and services etc.

Current GEO Portal

- Point of access for information about GEO & GEOSS
- EO News
- Multiple methods of data discovery
- Data visualization



provided by







Issues Discovered in Implementing GEOSS

- Members committing data resources slow to register
- Registrations often incomplete
- To demonstrate value of GEOSS the GCI must:
 - Simplify and enhance component registration
 - Evolve from simple discovery to EO data access
 - Enable/integrate access to key data inventories
 - Focus on Critical EO Priorities and Data-CORE
 - Improve data visualization and helper applications
 - Be adaptable and evolvable





Evolution Plan

- Develop a vocabulary of EO observational parameters to support search and discovery
- Identify, assess and prioritize data sets supporting priority EO parameters
- Assist data providers in enabling online access
- Produce tutorials on use of GCI
- Develop Mediated Access Enablers



ONS GEO Web Portal (GWP)

	Featured GEOSS Core Dataset		
7	Dummy Metadata - 4 GDC Test		
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WATHER	Monitoring services	51	
ECOSYSTEMS	Analysing services	8	
	Mapping services	28	
BIODIVERSITY	Assessment services	10	
CLEAR	Alert systems	<u>44</u>	
	🚸 Geospatial web services	56	
DUILDING	Data processing	8	
	🚸 Data Provision	135	
	🌞 International Initiatives 💷		
	🔶 Capacity Building 🧉		
	🝦 Others 💷		
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- New Portlet configurable to get data from local (ESA) or remote sources
- High visibility given to datasets
- Easy GEOSS Data-CORE discovery
- Search result harmonisation and metadata visibility improved in single portlet







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Brokered Search



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REFINE THIS SEARCH

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AGRICULTUI es.

Consolidated results





Interoperability Challenges

- Lower entry Barrier (i.e. Overhead/Cost) for both Producers and Users !
- Make it flexible (i.e. avoid interoperability constraints)
- Introduce new capabilities
 - Advanced discovery
 - Quality control
 - Semantic interoperability
 - Multi-disciplinarity
 - Data **Use** (not only discovery and download)







2012-2015 Workplan: Technical Design of GEOSS

- Execute and document Architecture Implementation Pilots (AIPs) and related research activities
 - Recommend improvements to the GEOSS architecture on the basis of AIPs' outcomes
- Define and maintain an Architecture Evolution Strategy based on a gap analysis of the current infrastructure
 - Idenfitication of impediments to greater interoperability
 - Propose corrective measures, building upon new technologies and R&D
- Annually review and/or revise the GEOSS Tutorials to reflect changes in the architecture and operations of GEOSS





GEOSS Tutorials

- Development managed by SIF
- Targeted at both resource providers and users
- Topics
 - Data Quality
 - Data Sharing
 - Resource Registration
 - OGC Services (WMS, WCS, WFS, WPS)
 - Sensor Observation Service (SOS)
 - THREDDS / OPeNDAP
 - Data Discovery and Access
- Will be registered in the CSR as a GEOSS resource
- Tutorial development will continue, be managed and published in the Best Practices Wiki





Interoperability Assessment

- The SIF analyzed GCI registrations and interviewed communities of practice
 - Recommended improvements in GCI functions
 - Studied interoperability issues and community attitudes towards working with the GEOSS
 - Sought metrics that are consistent and meaningful means of monitoring and measuring interoperability status and activity





Interoperability Assessment

- SIF surveyed sampling of GEOSS community and found
 - Funding for interoperability lags behind the realization of its need
 - True understanding of interoperability is not widespread
 - Legal interoperability is viewed as an imperative
 - 50% have not used GEOSS for interoperability successes
- Community brokers and community interoperability
 - None of the respondents has fully embraced GEOSS
 - 100% are either in the process of embracing GEOSS or have future desires to
 - Harmonization and quality are impediments
 - 67% are using community standards or non-standards, not international standards
 - Standards are hard to implement, along with a lack of resources to invest





3rd GEOSS Interoperability Workshop

- "A Look into the Future of GEOSS"
 - Interoperability issues facing GEOSS, current and future
 - Technological innovations to increase the success of GEOSS
 - Community Successes and Community Engagement
 - Other Initiatives (Eye on Earth, EarthCube, etc.)
 - Building Synergy: Leveraging Cross-Community Efforts
- October 19-20, 2011, via WebEx
 - Four hours (13:00 17:00 UTC) each day
 - RSVP required via web form



Resources

• GEO

- http://earthobservations.org

- GEO Portal
 - <u>http://www.geoportal.org/</u>
- GEOSS registries and SIF

– <u>http://geossregistries.info</u>







Backup







Issues

- Value of GEOSS will be measured by depth, breadth, accessibility and interoperability of contributed resources
- Multiple efforts have been made to define data requirements and identify sources for these





Issues, part 2

- Reach out to GEO CoPs and SBAs that are creating datasets, portals, etc. and help them integrate their outputs into the GCI
- Encourage creation of global datasets from compiled/ harmonized national datasets
- Expression of data quality important
 - Has to work for data that is a result of multiple sources, processing steps by different providers