GROUP ON
EARTH OBSERVATIONS

Call for Participation in AIP-6

GEOSS Architecture Implementation Pilot (AIP)

Issue Date of CFP: 9 February 2013

Due Date for CFP Responses: 15 March 2013

GEOSS Architecture Implementation Pilot, Phase 6
Call for Participation

Introduction

The GEOSS Architecture Implementation Pilot (AIP) develops and deploys new process and infrastructure components for the GEOSS Common Infrastructure (GCI) as well as for the broader GEOSS architecture. The requirements for AIPs are based on meeting user needs and community scenario requirements. The results of the AIPs are conveyed to the GEO Implementation boards to consider for transitioning to the GCI and other GEO Tasks as operational elements. In this way the AIP supports the elaboration of the GEOSS Architecture. This CFP is issued by the GEOSS Design and Interoperability (IN-05) Task Team and guided by the Infrastructure Implementation Board (IIB).

AIP-6 aims to increase the use of GEOSS resources by end-users in applying both in *situ* and remotely sensed data, and by extending results from previous GEO developments through integration with the GEOSS Common Infrastructure (GCI). The specific goals of AIP-6 are to:

1. Increase Societal Benefit Area (SBA) use of GEOSS resources by end-users
2. Increase the availability of GEOSS resources
3. Focus on benefits and usability for Developing Countries
4. Strengthen previous GEO results and technical achievements

The AIP-6 schedule will support the GEO Plenary and Ministerial Summit, scheduled from 15--17 January 2014 in Geneva, Switzerland. The AIP-6 will also support the Sprint to Summit efforts being led by the IIB. A Kickoff Workshop for AIP-6 will be held from 28--29 March in Washington, D.C.

AIP-6 will contain less pioneering, looking to solidify achievements from AIP-5[1]. The CFP for AIP-6 is abbreviated, relying on the previously defined baseline.

This CFP contains the following sections.
1. Activity #1: Increase SBA use of GEOSS Resources
2. Activity #2: Increase availability of GEOSS Resources
3. Responding to the AIP-6 CFP
4. Components Baseline
5. Development Schedule
6. References

Responding to the CFP by 15 March 2013 will support the most efficient, coordinated development of GEOSS based upon a shared understanding of resources participating in AIP-6. CFP responses are requested to be brief.

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[1] http://twiki.geoviqua.org/twiki/bin/view/AIP5/WebHome

Activity #1: Increase Societal Benefit Area (SBA) use of GEOSS Resources

SBA's should continue to increase the use and reuse of the GEOSS resources by the end-user – being it by farmers, doctors, biologists, first responders, and researchers; or indirectly through a (Systems) Integrator that builds applications for the direct end-user. It is essential that in a "Sprint to Summit" year, AIP can demonstrate real-world societal benefits that immediately affect the end-user, with *easy* to understand use cases as well as *easy* to understand results.

To support this goal, AIP-6 will:

- Create and increase awareness of GEOSS, GEOSS resources, and the GCI by the end-user – directly (farmers, doctors, biologists, first responders, researchers, etc.) or indirectly (system integrator, research projects and private sector)

- Focus on benefits and usability for Developing Countries.

- Solidify previous SBA results and technical achievements

AIP-6 seeks to build on achievements of AIP SBA working groups contributing to previous AIP phases. Previous AIP phases developed scenarios that explored new ways for GEOSS users to access and process data into new products and information that informed SBA research, policy formulation and decisions. Previous AIP contributors are encouraged to respond to this CFP with contributions that can further increase the uptake of GEOSS information with SBA users. A particular goal is to have new SBA users demonstrate prior AIP developments that have been further refined for the GEO Summit.

1a. GEOSS SBA Demonstration development

Responders to the CFP must demonstrate – via a presentation and a 3-minute recorded demonstration – for the January 2014 summit and plenary meeting. The presentation includes a comprehensive (non technical) overview of the use cases and scenarios, how the GEOSS end-user benefits from the SBA activities (and use and reuse of the GEOSS resources), overall contribution to GEO of the SBA and how it supports the "Sprint to Summit" – with the intention to show this at the GEO plenary and EO Summit events in January 2014 [2].

1b. Capacity Building: Tutorials

Capacity Building and Tutorials will be important tasks in order to reach out to the developing countries and demonstrate the usability and added value of GEOSS. Through the use of tutorials and expert guidance, new users will discover and access resources that bring value to their SBA tasks. Tutorial development and deployment is managed by the Standards and Interoperability Forum (SIF). The GEO Best Practice Wiki (BPW[3]) is the central location for all tutorial related topics.

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[2] http://www.ogcnetwork.net/system/files/AIP-6_Demo_Capture_Guidelines.ppt

[3] http://wiki.ieee-earth.org/

Capacity Building will identify client applications within SBA that will link to code developed by organizations on the BPW. Executable and/or source code for applications that increase access to GEOSS resources are requested in AIP-6. AIP-6 will also seek organizations to contribute code references to BPW or a link from the BPW to code hosts (e.g., GitHub, SourceForge), creating the "GEOSS App Store". By making API and code available to GEOSS Users, the organizations will leverage different techniques, such as crowdsourcing, to allow geospatial services coming from the different SBA to be uploaded to federated GEO servers and made available to others in the GEO social media. From the point of view of the organizations, motivations to adopt this approach is to explore better integration and analysis between structured and unstructured geospatial data services, to explore new business models and to fulfill goals that require a shorter time between the source and the response to an event.

1c. SBA Integrators

SBA Integrators are individuals and organizations that know both the needs of SBAs and the technology of GEOSS information systems and can work to bridge the communities and promote integration.

AIP-6 seeks to support capacity building with new data sources that are of value to GEO SBAs, e.g. by exploiting the DAB (Discovery and Access Broker).

In AIP-3, a new facet for coordinated development with the SBAs was added with the introduction of the "SBA Integrator". The SBA Integrator works with the Earth Observation (EO) sciences and geoinformatic engineering; to build a network of persons and organizations aimed at meeting the decision support needs of the SBA communities. As such, the SBA Integrator role can be seen as critical to communities' involvement in GEOSS, and hence should be promoted by the GEO organizational activities.

A set of tools and best practices should be codified to aid SBA Integrators in their roles. A SBA Integrator would be responsible for building the community network that is possibly represented by a community portal and is supported by catalogues, datasets and other information resources and services to meet the needs of the community.

Requested Responses to this CFP Activity

For AIP-6 Activity #1, the CFP seeks responses that include any or all of the following contributions:

- Organizations offering to lead GEOSS SBA Demonstration

- Tutorial Development as expert guidance to GEOSS SBA Users.

- Client Applications for GEOSS Users to download and utilize GEOSS resources.

- Persons to serve as SBA Integrators that can bridge SBA and geoinformatics.

Activity #2: Increase availability of GEOSS Resources

AIP's support for the "Sprint to Summit" is to increase usability, stability and reliability of the entire GEOSS technology stack and stimulate the adoption by all *users* – data providers, system integrators, and end-users.

To support this goal, AIP-6 will:

- Build on and increase the use of the GCI by making more resources discoverable and useable. New GCI functionality from brokers and for data sharing will be emphasized

- Increase in-situ data availability as an example of GEOSS Future Products

- Promote and increase the capabilities of the GEOSS Testing Facilities

AIP-6 will seek to promote tutorials, server toolkits, expert guidance, and access brokers to aid data providers in providing synchronous on-line access to their data. Tutorials needed to get data online in AIP-6 will be developed in coordination with the Standards and Interoperability Forum (SIF), which manages an outline of tutorial topics and provides tutorial templates. Tutorials are developed and deployed in the Best Practices Wiki (BPW). An emphasis will be placed on planning for multi-year persistence of the online data access, as well as for quality of service. (See also GCI and IN-03[4] documents)

2a. Coordination with GCI

Promote increased registration of data sources into the GCI. Allow and promote coordination of the GEO DAB and catalogues on registration of data services.

The GEO Web Portal (GWP) provides access to GEOSS information in the most general fashion and is the starting point for broadest entry to GEOSS. AIP-6 will coordinate with the GCI Providers directly to plan for new client/server interoperability with GEO DAB. This coordination will identify how the existing components of the GCI will provide access and exploit data. Coordination with GCI will include design of tools and methods to allow for new client/server interoperability.

Metadata needs to be represented (in the GEOSS Web Portal) in the same way as it was originally submitted.

Make it easier for dataset providers to bring the datasets (resources) into GEOSS. Clarity of how to add datasets to GEOSS and what is the status of the datasets: test, operational, etc.

2b. Coordination of Data Sharing

AIP-6 will continue to further develop and solidify the work from the AIP-5 Data Sharing Working Group[5], focusing on user registration, authentication, and single sign-on (SSO). SSO

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[4] http://www.scgcorp.com/urr/AppView.aspx?id=272

[5] http://twiki.geoviqua.org/twiki/bin/view/AIP5/DataSharing

user authentication is to be able to handle access to discovered data, via the GCI, that does not require users to login at each data provider's site. This would allow seamless access to data with only one login required. Authentication and SSO options include OpenID and SAML 2.

AIP-6 must also continue to build on findings regarding use metrics. This information would be for the benefit of monitoring GEOSS usage and determining how it is being used. Under no circumstances, will individual information about a user's access to GEOSS-available data be gathered, tracked, monitored, or analyzed. This includes names, organization names, and any other items that could be used to identify a specific user or organization.

AIP-6 encourages mature systems to interoperate with the GCI, to insure consistent and reliable access to GEOSS resources.

AIP-6 will continue (from AIP-5) to address the "legal interoperability Paper"[6] approaches to sharing of data through the GEOSS Data Collection of Open Resources for Everyone (Data-CORE). The GEOSS Data-CORE is a distributed pool of documented datasets, contributed by the GEO community under the following principles, as set forth in the 2010 GEOSS Action Plan:

- The data are free of restrictions on re-use, but may be provided under the following conditions if the data provider wishes:

    o User registration or login to access or use the data;

    o Attribution of the data provider; and

    o Marginal cost recovery charges (i.e., not greater than the cost of reproduction and distribution).

It is important to note that (i) user registration, (ii) attribution of provider, and (iii) marginal cost recovery charges for access to the data are considered conditions and not restrictions in the context of the GEOSS Data-CORE.

Included in the support of legal interoperability is the population of metadata with information related to GEOSS Data-CORE compatible licenses. This information includes the name of the license, a pointer to the actual text of the license, a pointer to a graphic icon for the license, and text for any attribution message associated with the license. This information, if put into the metadata, can be discovered and made known to the data user.

Any legal interoperability contributions to AIP-6 will be used for testing against the existing recommendations and approved licenses, and to evolve the legal interoperability framework. Contributions and AIP-6 results in this area will be reviewed by the Legal Interoperability Subgroup of the GEO Data Sharing Working Group.

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[6] http://twiki.geoviqua.org/twiki/pub/AIP5/GEOSSDataCORELicenses/GEOSS_Legal_Interoperability_Summary_20_Sept_2011.docx

2c. Coordination of Helper Applications

Mature and implement methods that allow Data Providers to enable GEOSS Data CORE and Helper Application information are consistently propagated (in the Web Portal) and link in ISO Metadata (no changes to ISO 19115 / 19139).

Helper applications give the user specific tools (applications) that help interpret certain datasets.

2d. GEOSS Future Products

Sensor Web and Model Web are methods bringing new EO products to users based on GEOSS as a platform makes all sorts of sensor and model data available in an interoperable manner. Data streaming from in-situ and remote sensing sensors (Sensor Web), models (Model Web) offer a huge potential to generate a wide portfolio of on-demand and near real time products.

A multi-day GEOSS Future Products workshop will take place immediately preceding AIP-6 kick-off. Results of the workshop will be considered for uptake in AIP-6. Workshop information at http://www.ogcnetwork.net/node/1872

2e. Testing Facilities

In an effort to further mature the interoperability of services, AIP-6 should build upon the AIP-2 test facility (provided by USGS) to provide persistent procedures to support the registration of services, communication about the adherence of a service to a standard, and operational monitoring of services including: WMS, WFS, WCS, CSW. To check if a service adheres to a standard, it will be necessary to explore the usage of the OGC testing facility, based on TEAM Engine, within the test facility developed in AIP-2.

The Service Test Facility is intended to ensure proper and interoperable use of GEOSS components and services in applications and interfaces. The Test Facility is intended to promote predictable and reliable access to services registered with the GEOSS Service Registry. The facility will support service providers, service operators, technology providers, integrators, and other users. It will provide a means for service operators and technology providers to get feedback on the efficacy of their interfaces and applications in implementing and using GEOSS Interoperability Arrangements. The Test Facility should enable web services developers to test their data and model prototypes for GEOSS SBA scenarios and demonstrations.

AIP-6 invites more clients, e.g., WebGIS Clients, that can access the GEOSS data sources in order to test a maximum of client / server combinations.

2f. GEOSS Demonstration development

While more difficult to convey, it is desired to showcase achievements in developing the geoinformatics for GEOSS at the GEO events in January 2014. Key is to show how advancements in GEOSS interoperability arrangements, through the use of open standards, are the basis for meeting the needs of GEOSS users.

Requested Responses to this CFP Activity

For AIP-6 Activity #1, the CFP seeks responses that include the following contributions:

- Coordinated activity of the GCI Component providers in developing 'Sprint To Summit' capability along with the needs of the advances in AIP-6.

- Increased access to Priority EO Data Sources as using GEOSS Interoperability Arrangements and considering the Legal Interoperability Paper.

- User registration, authentication, and single sign-on (SSO) functionality

- Participants to implement licensing in their metadata

- Implementation of use metrics recommendations and a GCI component to handle the metrics.

- Integration and testing to enable GCI promote Helper Applications for users.

- New products for GEOSS coming from Sensor Web and Model Web.

- Data access assistance: tutorials, server toolkits, expert guidance

- Enhancements to the GEOSS Test Facility.

Responding to the AIP-6 CFP

Responses are anticipated to be on the order of 5 pages or less.
Responses should follow the following outline:

- Overview
- Proposed Contributions for each Activity
  1. Increase SBA use of GEOSS Resources
  2. Increase availability of GEOSS Resources
- Paragraph describing the Responding Organization

A template for responding to this CFP is available at
http://earthobservations.org/geoss_call_aip.shtml

Engineering Architecture Baseline

The GEOSS Architecture Tasks have defined an approach to defining the elements of the GEOSS Service Oriented Architecture. This architecture is intended for use by the developers of GEOSS and should not be a requirement for Users. For example: while the GCI shows the users "resources", engineering development needs to discuss components and services.

- **Components** allow for coordinated management of the system. Components are combination of hardware, software and networks. Components are built, deployed and persist to provides Services.

- **Services** are how components interact. The doorway to a service is an interface. Services and interfaces are defined using GEOSS Interoperability Arrangements – either Special Arrangements or preferably International Standards. Interoperability Arrangements are listed in the GEOSS Standards and Interoperability Registry (SIR).

- **Use Cases** are descriptions of what can be achieved using the Services, e.g., Discovery, Access, Workflow, etc. See AIP Use Case as defined in the AIP-5 CFP architecture[7].

- **Scenarios** to meet GEOSS User Needs are accomplished with Use Cases. The AIP Engineering Reports provide scenarios for several previous SBA's[8]

The GEOSS Common Infrastructure (GCI) components (Figure 1) are the main operational components. Development components are outside of the GCI in Figure 1. For definitions of the developmental components see [AIP 2010-2[9]], [AIP 2011-2[10]], and GEOSS BPW[11]

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[7] http://www.earthobservations.org/documents/cfp/201202_geoss_cfp_aip5_architecture.pdf

[8] http://www.earthobservations.org/geoss_call_aip.shtml

[9] http://www.earthobservations.org/documents/cfp/20100129_cfp_aip3_architecture.pdf

[10] http://www.ogcnetwork.net/AIP3ERs
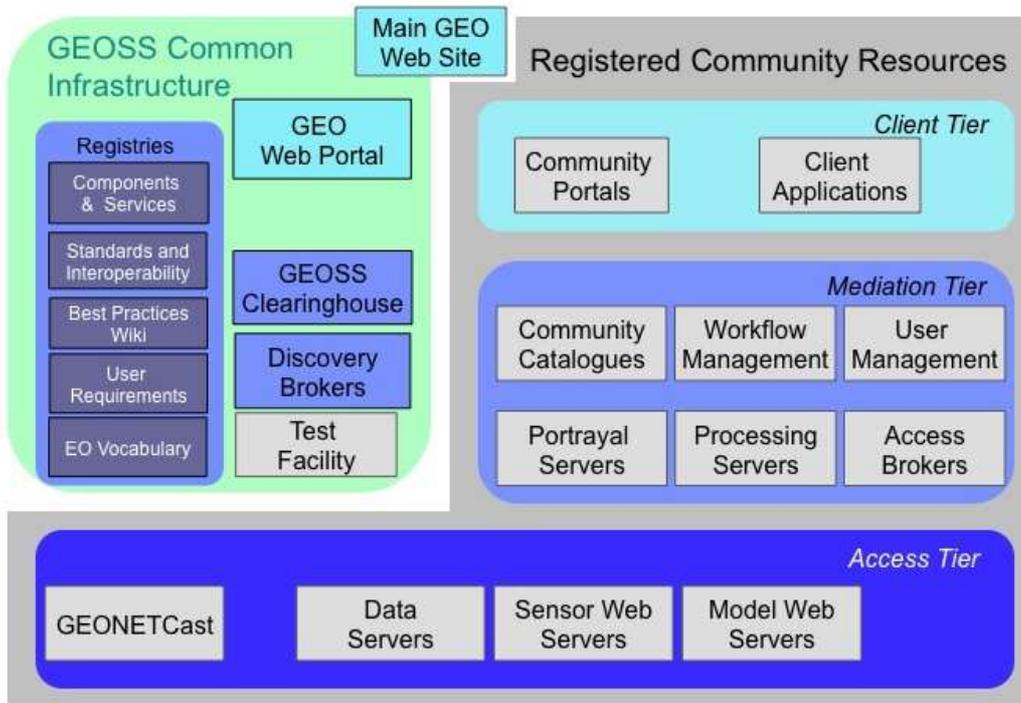
[11] http://wiki.ieee-earth.org/

Figure 1 – GEOSS Engineering Components

Development Schedule

AIP develops and pilots new process and infrastructure components for the GCI and the broader GEOSS architecture through an evolutionary development process consisting of a set of phases. Each phase addresses a set of SBA and geoinformatic topics. The result of an AIP development phase is a milestone that allows GEO to examine (1) the elements of the architecture that have advanced to sufficient maturity to be considered part of the mature system baseline, and (2) the elements of the architecture that need to be enhanced or added to better meet the goals of GEO. For a full description of the AIP Development Process see [AIP 2013-1[12]].

The initial schedule for AIP-6 development is show below.

AIP-6 will be executed in accordance with the GEOSS AIP Development Process. The following table details the major events associated with the AIP-6 process:

CFP Issued	9 Feb 2013
CFP Response Due Date for Kickoff	15 March 2013
Kickoff Workshop at the GEOSS Future Products Workshop in Washington DC, USA	28 – 29 March 2013
Results demonstrated at GEO Plenary and Ministerial Summit in Geneva, Switzerland	15 - 17 January 2014
Completion of AIP-6 activities	February 2014

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[12]

http://www.earthobservations.org/documents/cfp/201302_geoss_cfp_aip6_development_process.pdf