



Group on
Earth Observations

GEOSS Architecture Overview

for the

UIC Meeting

Toronto, Canada, May 6, 2008

presented by

Dr Jay Pearlman, IEEE



ADC



A. Annoni



I. Deloatch



D. Hinsman

Purpose

Support GEO in all *architecture and data management aspects of the design, coordination, and implementation* of GEOSS for comprehensive, coordinated, and sustained Earth observations.

Objectives are to enable GEO

- to facilitate the *participation in* GEOSS,
- to promote the use of standards and references, intercalibration, and data assimilation.
- to converge or harmonize observation methods,
based upon user requirements and building on existing systems and initiatives



J. Pearlman



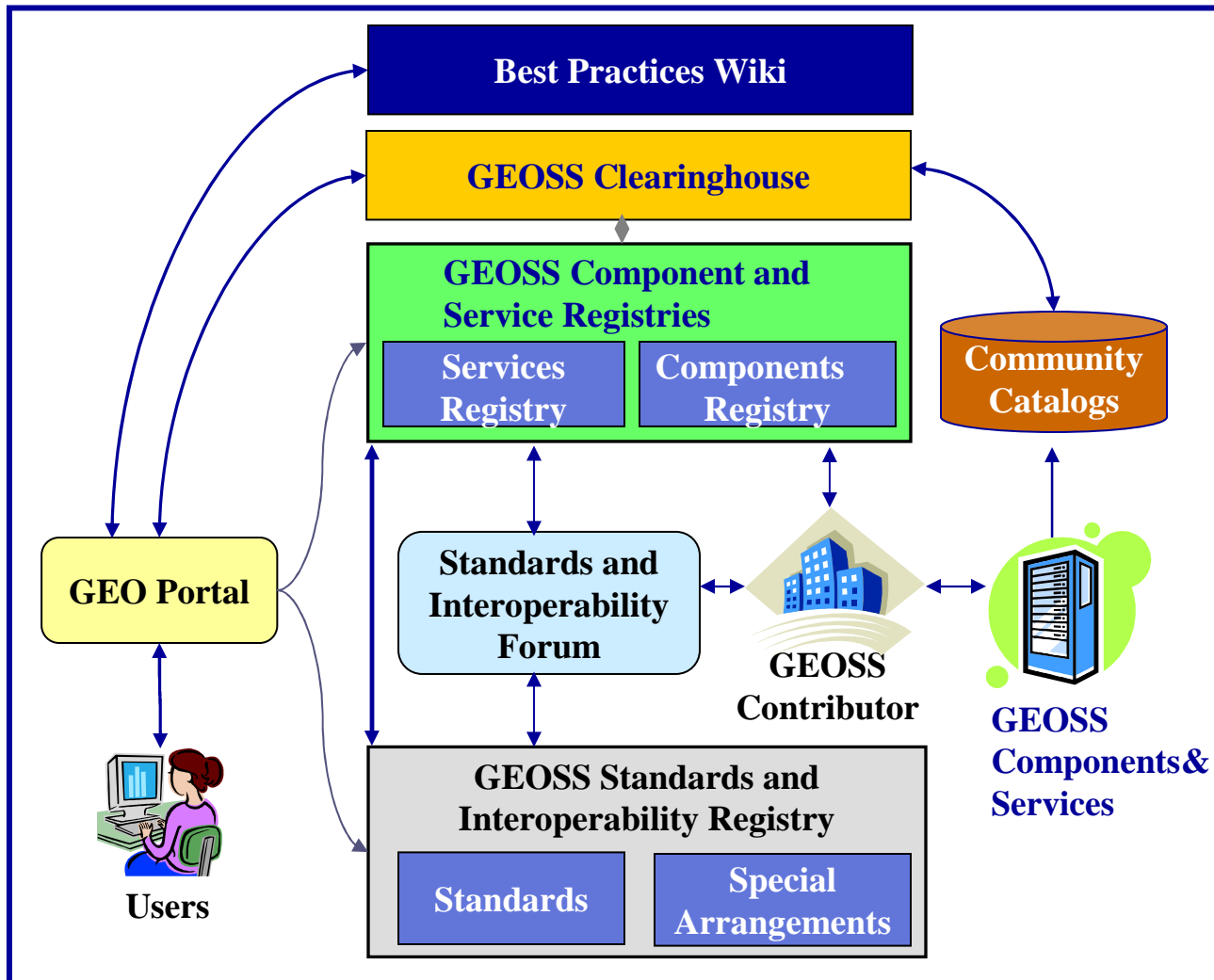
I. Petiteville



R. Shibasaki 2



The Architecture



What is an architecture and how does it serve?

Clearinghouse



Web Portal



Data and Services



Help Desk and Forum





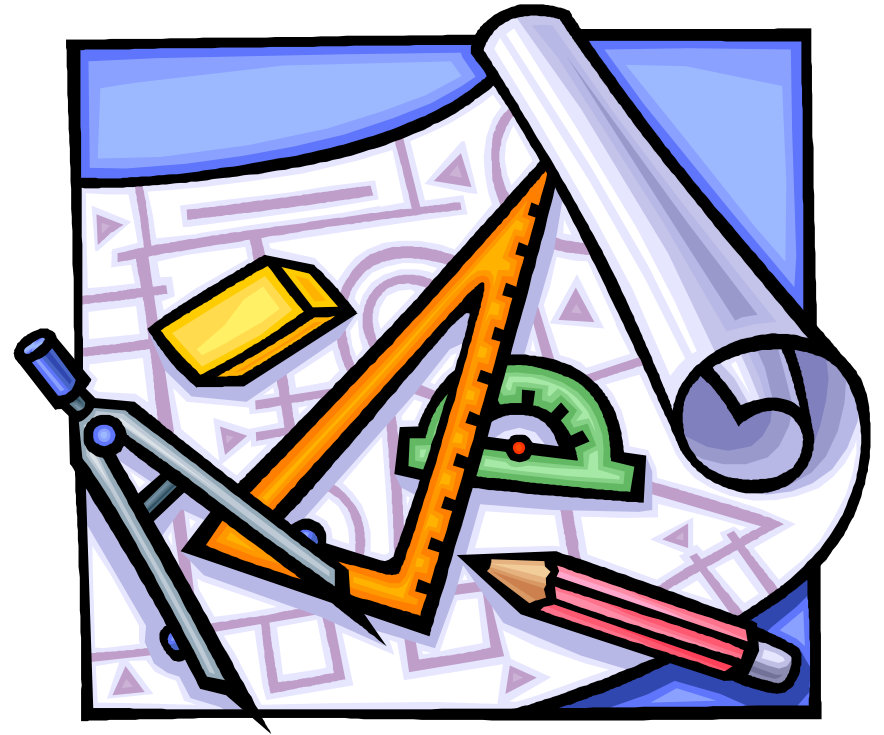
GEOS Challenges

- Multiple ownership/prioritization – a system of systems
- Interoperability – what is it and how do we address it
- Integration of Human factors – broader influence means more impacts, addressing cultures, needs, ...
- Dynamic participation
- End to end “integration” – what does it mean??



Interoperability Objective

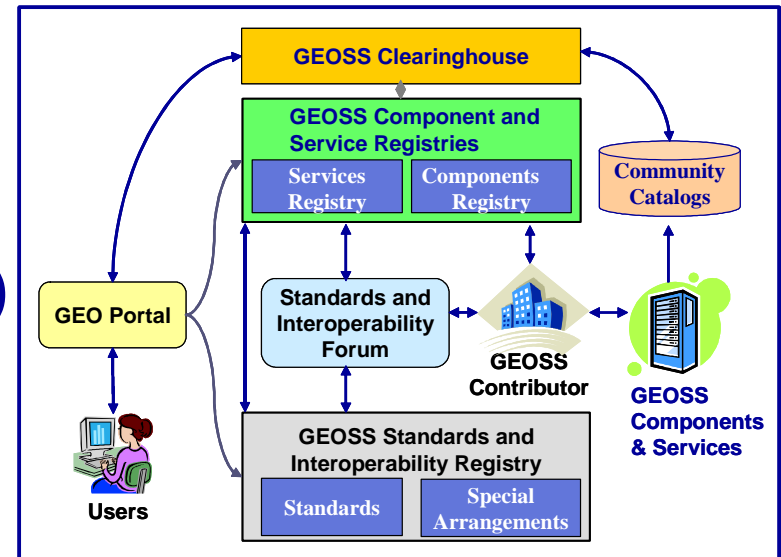
*What few things
must be the same
so that everything
else can be different?*



Enabling Deployment of GEOSS Architecture

Major Accomplishments:

- Registry of contributed GEOSS components and services is operational (75 services to date)
- Registry of standards and interoperability arrangements is operational
- Standards and Interoperability Forum is operational
- Process for standards and interoperability arrangements was validated through Interoperability Process Pilot Projects
- GEOSS Strategic Guidance and Tactical Guidance Documents (Geo IV Document 24 and 25) were issued

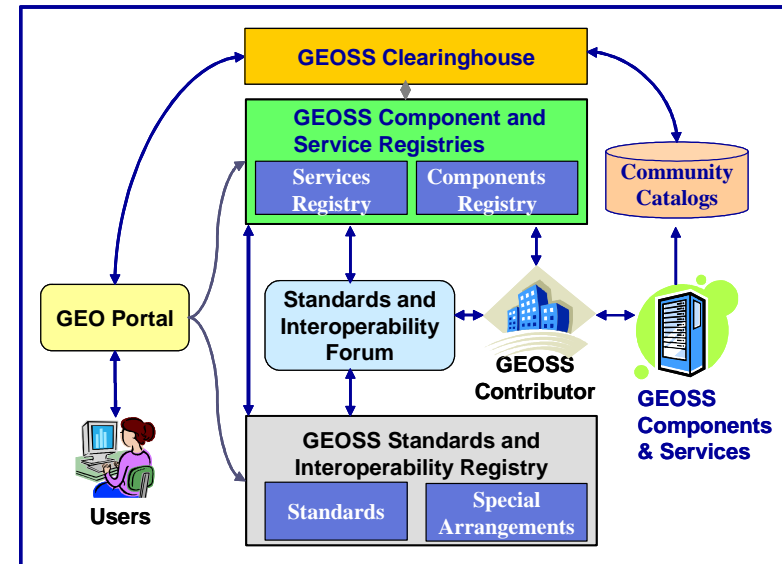


Task AR-07-01

Architecture Implementation Pilot (AIP)

Major Accomplishments:

- AIP Call for Participation (CFP) elicited more than 100 participants
- Three GEO Web portals & three clearinghouses were offered; all were found technically capable
- Interoperability was validated through a pilot implementation
- Seven scenario exercised (wildland fires, biodiversity, disaster responses) and are demonstrated for you in the exhibition



Task AR-07-02



Browse Resources by Societal Benefit Areas

- DISASTERS
- HEALTH
- ENERGY
- CLIMATE
- WATER
- WEATHER
- ECOSYSTEMS
- AGRICULTURE
- BIODIVERSITY

GEO Clearinghouse

Browse Resources by Location

North America

South America

Europe

Asia

Africa

zoom -

change surface image

Find a country/region

Legend

FOCUS ON

IGARSS, 23-27 July 2007, Barcelona, Spain

The 27th International Geoscience And Remote Sensing Symposium (IGARSS) will be held this year in Barcelona, Spain. IGARSS has become an international focus for remote sensing theory, programs, applications and state of the

SHOWCASE

The Elbe region in Saxony was affected by heavy flooding following strong rainfall in conjunction with snowmelt in the Krkonose Mountains (Czech Republic). The Elbe river rose to a level of 7.45 meters. In the city of Dresden, areas near the river had to be evacuated. Along the Elbe, whole districts of several towns were flooded. A state of emergency was declared in

Breaking News

Widespread flooding, the worse since 1954, over 24 Chinese provinces caused over 500 deaths and 3 million evacuations, with enormous damage to dams, roads, buildings and crops. In Mengwa, near Chongin in the Fujian basin, about 150,000 people were stranded on high ground when the Wangjia dam was opened to evacuate floodwaters. In Chongqing Municipality about 29,500 houses collapsed between 17 and 18 July.

[more...](#)

Welcome to GEOportal

The GEOportal provides an entry point to access remote sensing, geospatial static and in-situ data, information and services. The site is currently under construction. Please take a few minutes to browse through the GEOportal and let us what you think.

[more...](#)

MY GEO



TUTORIALS





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GEO Web Portal - 2007

- Demonstrated that organizations are capable of providing workable GEO Web Portal solutions
 - Compusult: <http://www.geowebportal.org>
 - ESA-FAO: <http://www.geoportal.org>
 - ESRI: <http://keel.esri.com/Portal>
- Though visibly similar & meeting basic requirements, the three offer different feature sets.

*Register Information
 on Services (1/2)*

GEOSS [Feedback for this page](#)

GEOSS Service Instance Registration

* Required Fields

Service Basic Information

Component ID*: ?

Service Instance Name*: ?


Abbreviation:

Description*:

Information URL*:

Interface URL* : ?

The page at http://uddi.csiss.gmu.edu says:

 The URL used to invoke the service.

OK

Service Contact Information

Contact Name*: ?

Contact Email*: ?

Service Geographic Extent (Click in the box to enter value in decimal format, e.g. 37.234)

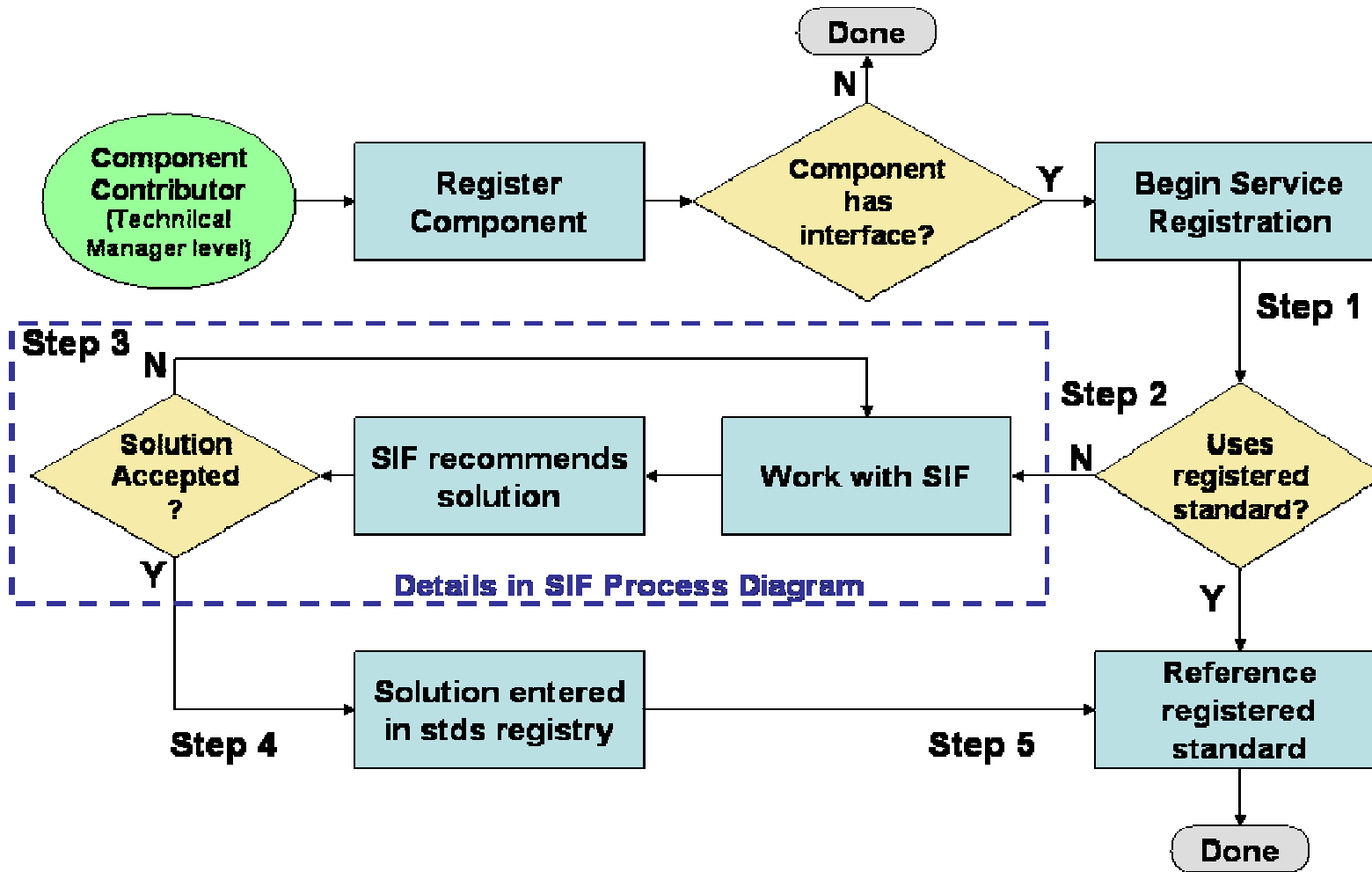
- Service Geographic Extent is specified in EPSG:4326



The Standards and Interoperability Forum (SIF)

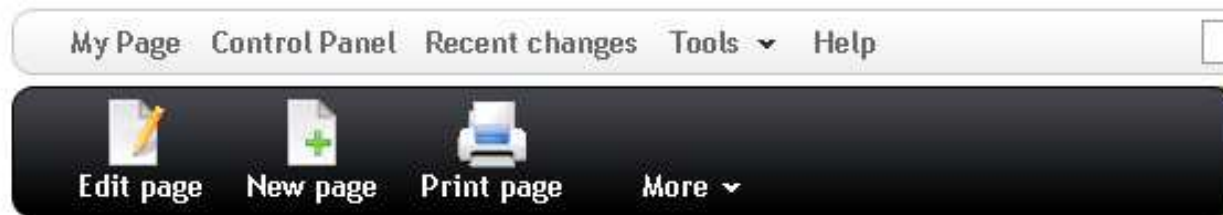
- Provides advice, expertise and impartial guidance on issues relating to standards and interoperability” for GEOSS.
- Its objectives include:
 - help in the identification and adoption of standards required to achieve GEOSS interoperability objectives
 - facilitate cooperation among the many organizations, and national agencies of member countries, in selecting, developing and using standards applicable to GEOSS
 - support education and outreach for international participants and help increase technical and public awareness

GEOSS Interoperability Process





Wiki for Best Practices



Sample Best Practice

This page is a sample best practice using a template

Subject area (pick one):

Short summary of Best Practice:

Why is there a need for this Best Practice?

Provide example application:

How widely deployed (if applicable):

Owner (Originator) Contact Information:

Submitter Contact Information:

Detailed Description of Best Practice (or attach a file using button below)

Also, please provide appropriate keywords in the "Tag" field below.



Group on
Earth Observations

Best Practices Wiki - Summary

- Wiki is on-line at <http://wiki.ieee-earth.org>
- Expert volunteers are being solicited
- Entries are welcome in the pilot phase subject areas
- Comments on the process should be provided to Ruth Duerr at ruth.duerr@ieee.org
- Your participation is important.

Documentation for contributors



Contributing to and Benefiting from GEOSS, the Global Earth Observations System of Systems

Strategic Guidance for current and potential contributors

Purpose of this Document: This document answers strategic questions for current or potential contributors of GEOSS systems, from the perspective of high-level systems architecture and data management. A companion 'Tactical Guidance' document provides more technical information for managers and implementors of systems, data centres, etc. For additional information about GEO and GEOSS, see <http://earthobservations.org>

What is the Global Earth Observations System of Systems (GEOSS)?

As a "system of systems", GEOSS is composed of contributed Earth Observation systems, ranging from primary data collection systems to systems concerned with the creation and distribution of information products. Although all GEOSS systems continue to operate within their own mandates, GEOSS systems can leverage each other so that the overall GEOSS becomes much more than the sum of its component systems. This synergy develops as each contributor supports common arrangements designed to make shared observations and products more accessible, comparable, and understandable.

How is GEOSS managed by the Group on Earth Observations (GEO)?

GEOSS is overseen by the Group on Earth Observations (GEO), an intergovernmental organization at the ministerial level. The GEO vision is to realize a future wherein decisions and actions for the benefit of humankind are informed via

DRAFT

Contributing to and Benefiting from GEOSS, the Global Earth Observations System of Systems

Tactical Guidance for current and potential contributors

Purpose of this Document: This short document is for technical managers (eg of information systems or data centres) seeking to contribute to and benefit from the GEOSS - and explains the 'interoperability process' to be followed to ensure that systems are compatible and suitably interfaced to the GEOSS. A companion 'Strategic Guidance' document provides high-level advice on systems architecture and data management. For additional information about GEO and GEOSS see <http://earthobservations.org>

Introduction

The overall GEOSS is a federated system that grows ever more useful over time as its constituent GEO Members and Participating Organizations link their contributed GEOSS components together. More details may be found in the "Strategic Guidance" document.

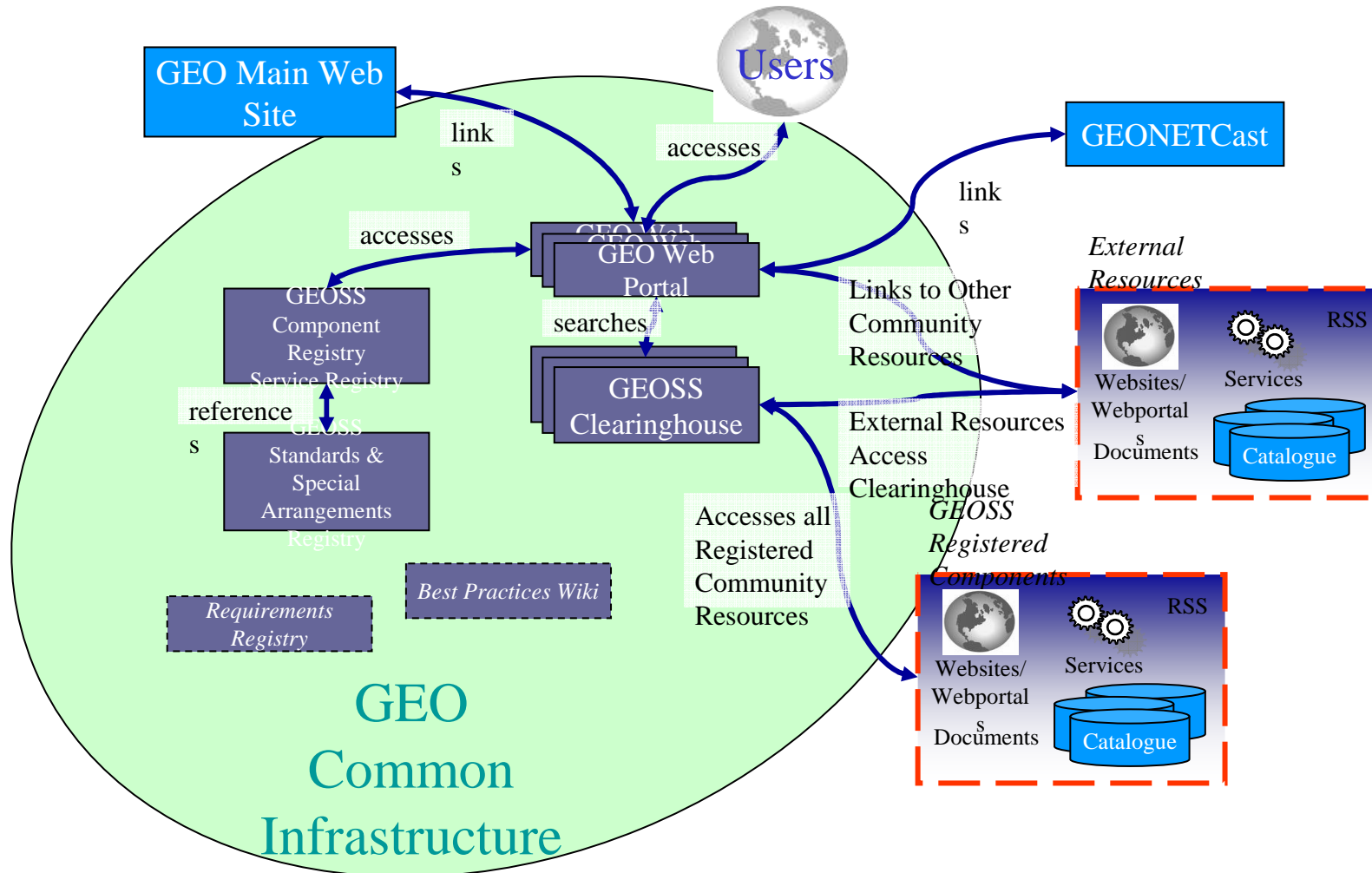
All the GEOSS Components and Services need to be registered respectively in the Component Registry and the Service Registry. This registration process for the new components & services provided by the GEO Members and Participating Organizations is described further down in the present document. Following the registration, the components & services need to be linked to the existing GEOSS systems (they are not linked to systems as much as they are accessible from a centralized or distributed portal/clearinghouse through interoperability arrangements) respecting some constraints like the interoperability standards or the



2008 Program

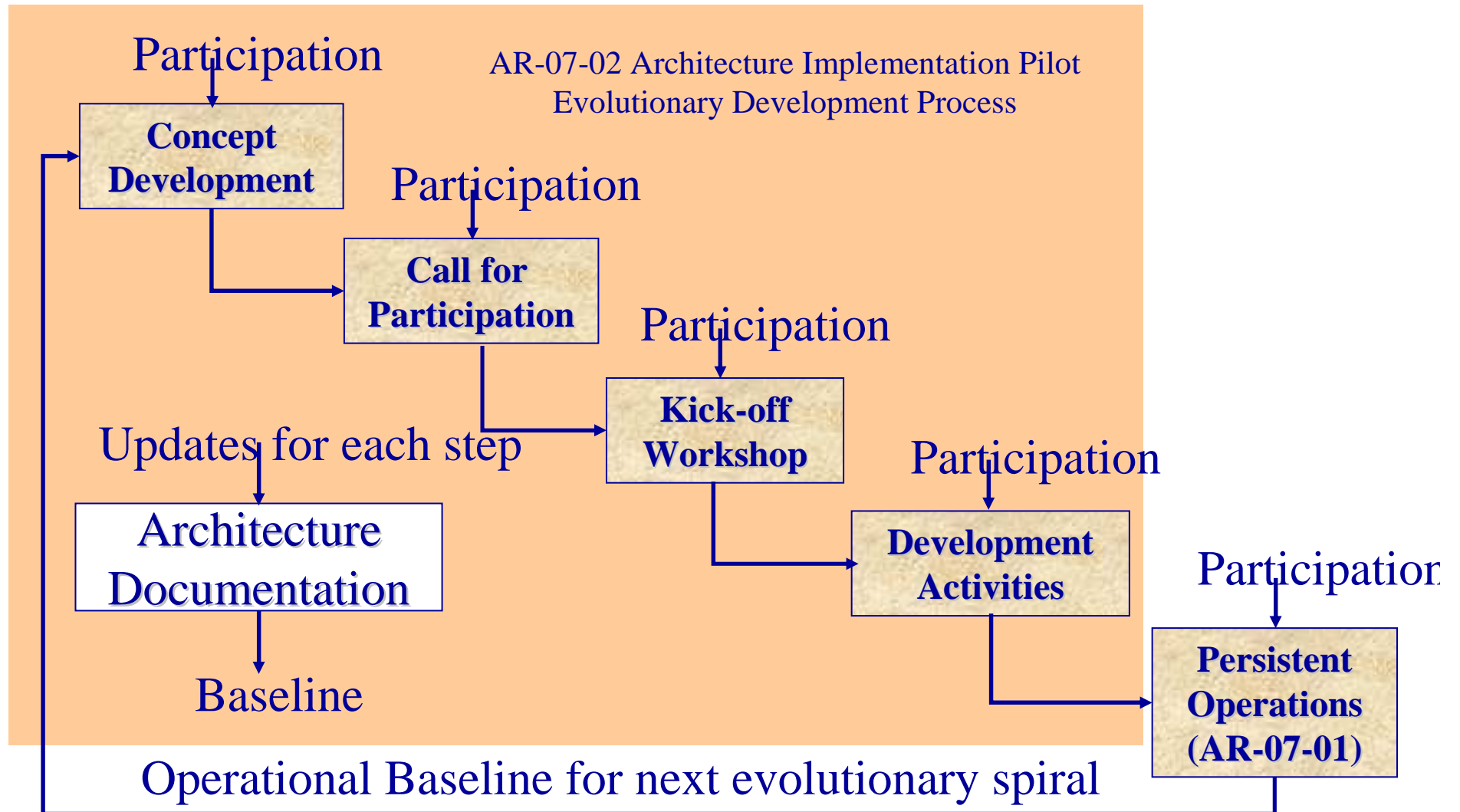
- **Operations** – creating a sustained operational capability. Implement ability to confirm operational interface and interoperability of offered services. Additional testing and interoperability development are required from the clearinghouse to community catalogs.
- **Interoperability** – focus on standards, metadata, sensor information including intercalibration, data harmonization, quality assurance, and data sharing principles
- **Horizontal Development** – for observations, data management, and registries with impact to multiple societal benefit areas or multiple systems. This includes areas such as virtual constellations, sensor web, GEONETCast and others.
- **Capability Maintenance** – for radio frequency protection

GEOSS Common Infrastructure





AI Pilot Development Approach





UIC - ADC Coordination

- Scenarios for SBA context identified through UIC/ADC coordination
 - Thanks to Els LeDrew and Gary Foley for supporting and attending
- UIC Goal
 - engage users in development and implementation of a sustained GEOSS that provides information required for societal benefit areas as specified by user groups on national, regional and global scales
- Next meeting of UIC: Toronto, May 6-8, 2008
 - “Kick the Tires” workshop on Air Quality on May 5



2008 Program

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Four Virtual Constellations (CEOS)

A virtual Constellation can provide better temporal, spatial and spectral resolution and related data management/dissemination

Atmospheric Composition Constellation - example:

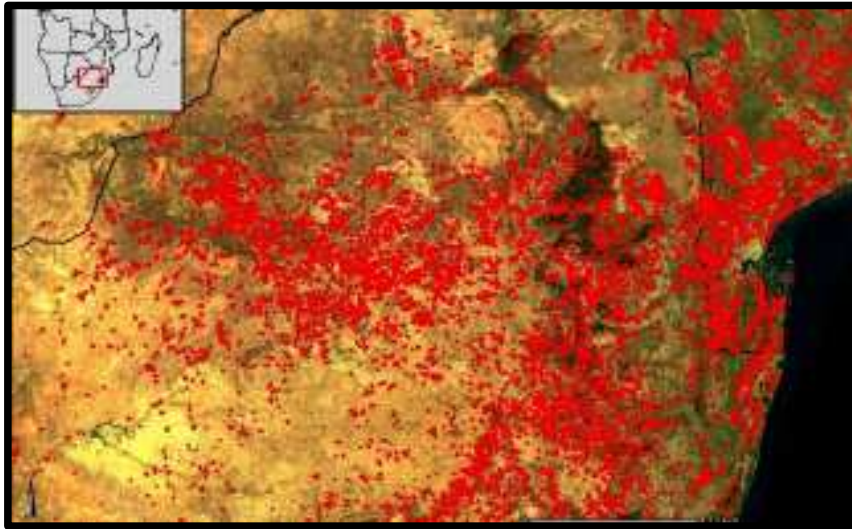
Aviation and Volcanic Eruptions

- Previously, the US (NASA, USGS, and NOAA) and ESA (PROMOTE) provided national alerts based on their satellite data in their own formats
- Through GEOSS, regional services are being combined to provide a global service





Active Sensor Web Development

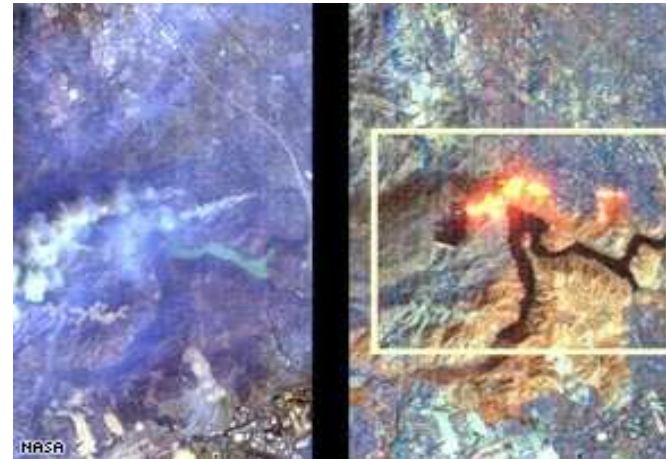


Pictures courtesy NASA and SAC & Meraka, CSIR

- **Sensor Web - Fire detection and modelling**
- MODIS fire detection
- EO-1 a closer look
- UAV tasked for even closer inspection
- Integration of In-Situ Fire Camera System

What is a Sensor Web?

A geospatial information infrastructure connecting heterogeneous in situ and remote sensors



Task DA-07-04

Report of the ADC, November 2007



Summary

- The infrastructure components are ready and available
- Integration of these components is planned under the IOC
- Key contributions are requested for for registering services, contributions of best practices and participation in SIF regional teams
- Continuation of the ADC activities includes sensors, data policy, quality assurance, interoperability arrangements, etc

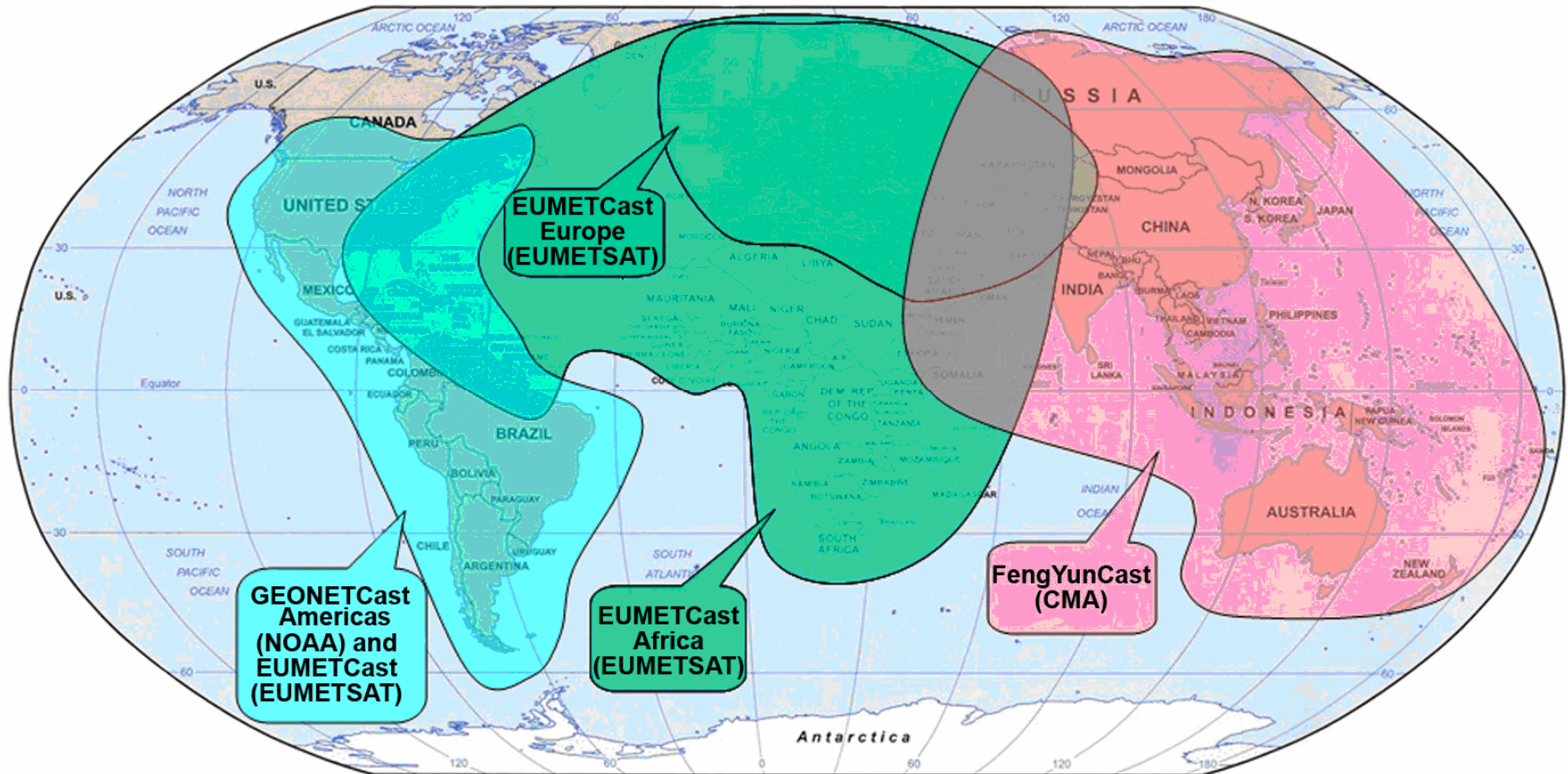


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Thank You



GEONETCast – information across the Globe








Task CB-06-04

GEOSS Component Registration


* Required Fields

Component Basic Information

Component Name*:	<input type="text" value="U.S. Geospatial One-Stop"/> 
Abbreviation:	<input type="text" value="geodata.gov"/>
Description*:	<input type="text" value="This Component provides comprehensive access to U.S. geospatial data and services. It enables publishing of data sets through the collection or harvest of descriptive metadata and enables search and visualization of geospatial data through certain standards-based services."/> 
GEO Sponsor*:	<input type="text" value="United States"/> 
Responsible Organisation:	<input type="text" value="U.S. Geological Survey"/> 
URL to Component Information:	<input type="text" value="http://geodata.gov"/> 

Register Information on Component

Component Contact Information

Contact Name*:	<input type="text" value="User Support"/> 
Contact Email*:	<input type="text" value="support@geodata.gov"/> 