

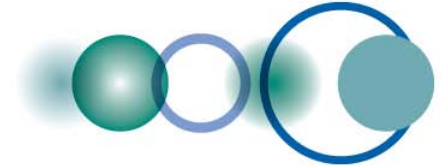


**Architecture Implementation Pilot, Phase 2 (AIP-2)
presentation to ADC-10 meeting, Stresa, Italy**

AIP Phase 2 Progress including demonstration of Transverse Technology Use cases

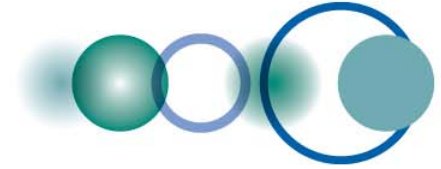
Nadine Alameh, George Percivall
Open Geospatial Consortium
GEO Task AR-09-01b Task POC
7 May 2009



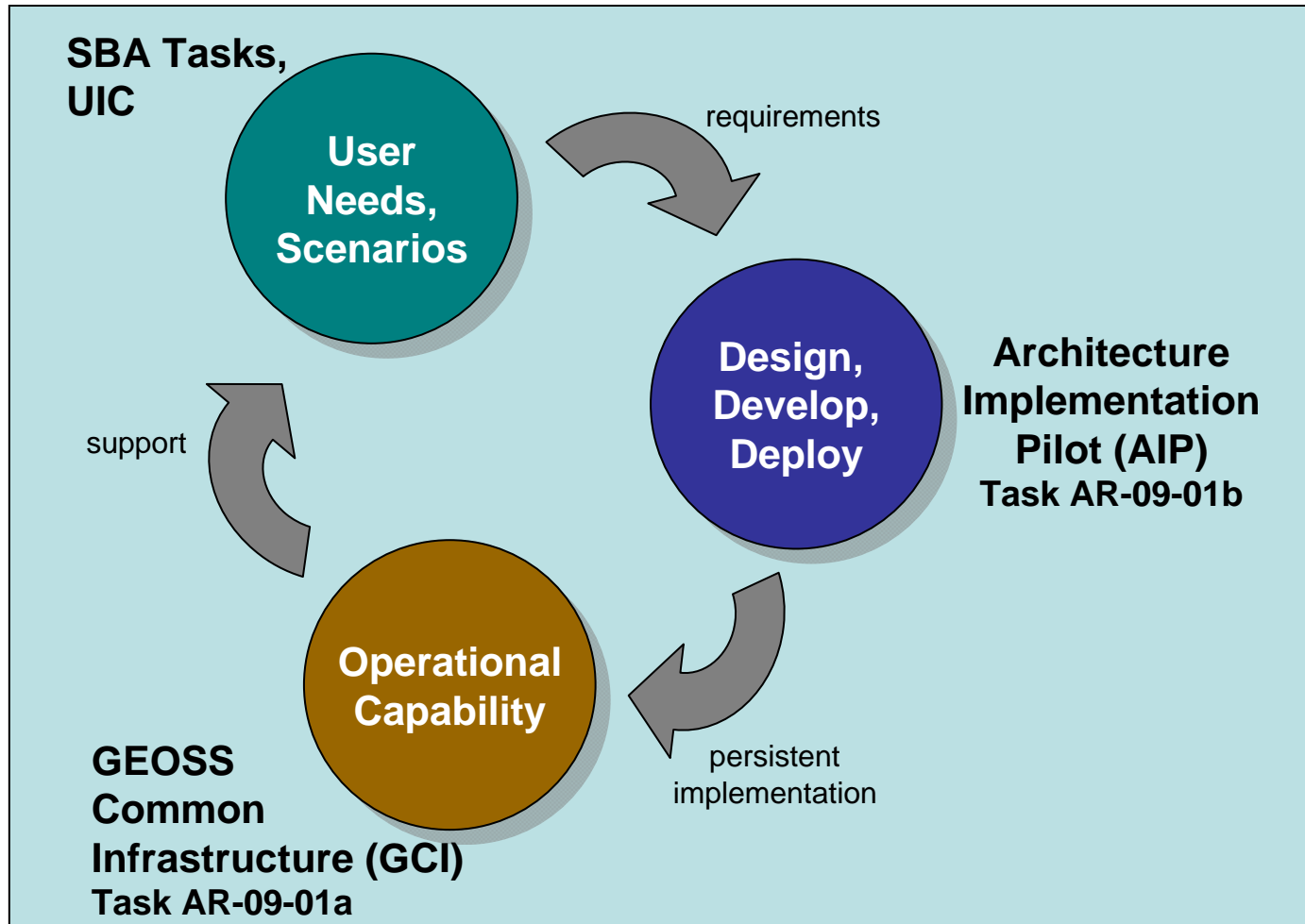


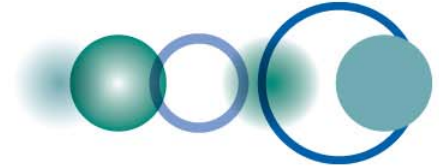
Agenda

- Background
- AIP-2
 - Schedule
 - Themes
 - Working Groups
 - Deliverables
- Video Demonstrations
- Wrap-up
 - AIP-2 discussion topics
 - Topics after AIP-2



Elaboration of GEOSS Architecture

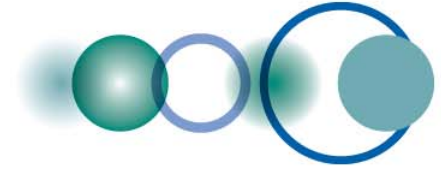




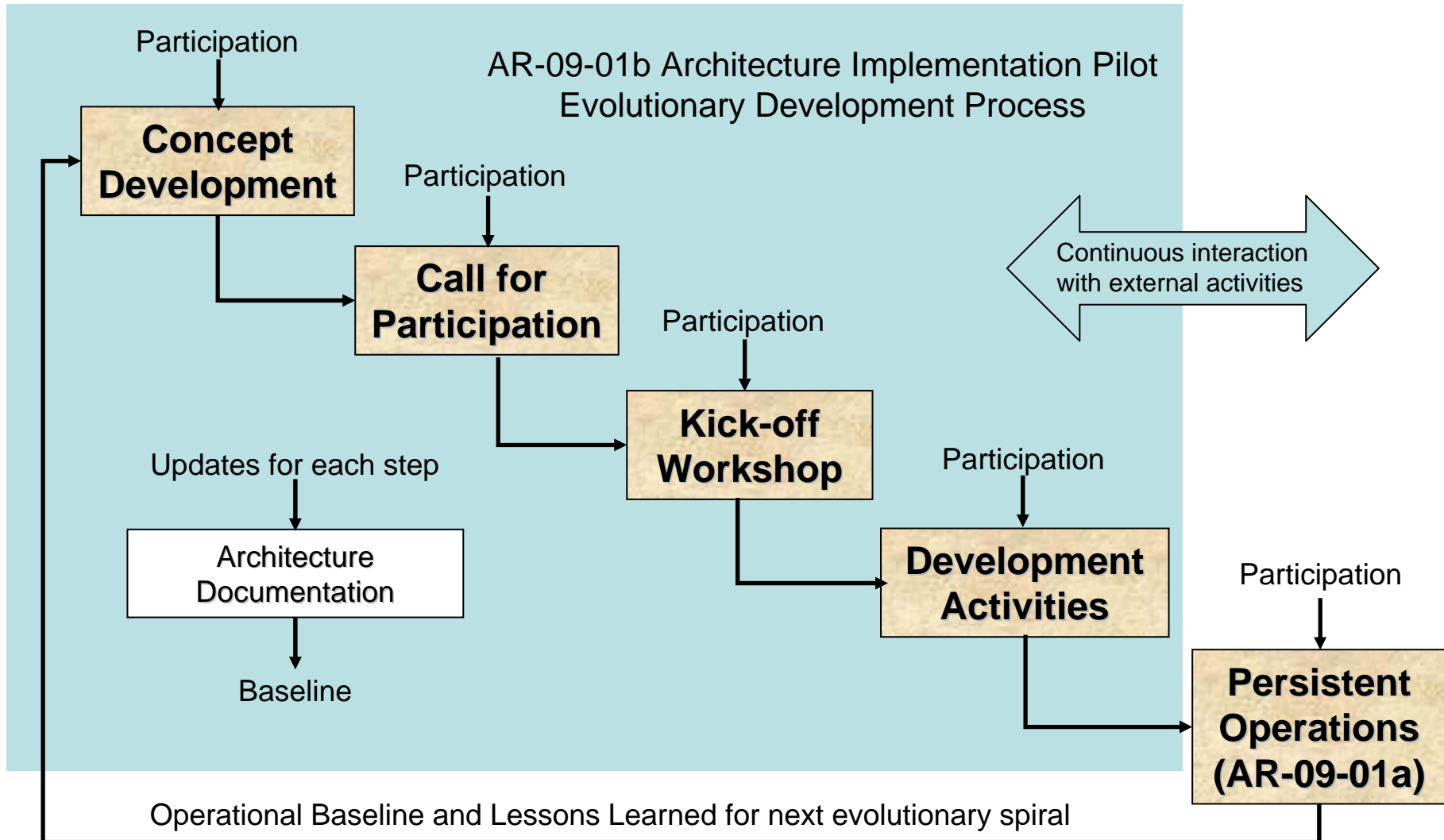
GEO Task AR-09-01b

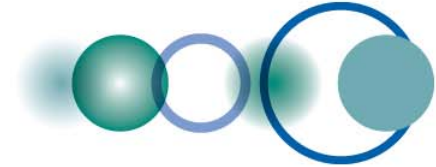
Architecture Implementation Pilot

- Lead incorporation of contributed components consistent with the GEOSS Architecture...
- ...using a GEO Web Portal and a GEOSS Clearinghouse search facility
- ...to access services through GEOSS Interoperability Arrangements
- ...in support of GEOSS Societal Benefit Areas



AI Pilot Development Approach



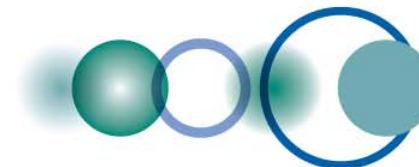


AIP Phase 1 Results – Early 2008

- Elements of the GEOSS Common Infrastructure (GCI) – **Initial Operating Capability established**
- Effective development process for GEO
 - CFP, Kickoff, Execution, etc.
 - **Approximately 120 organizations participated**
 - Methods for international coordination
- Prepared “Architecture Implementation Report”
- **10 Demonstrations** of Initial Operating Capability

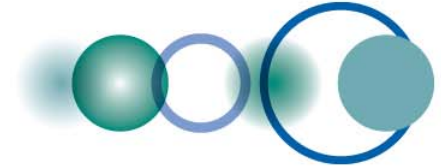


*AI Pilot has broad international participation that could only have occurred with GEO.
High interest & momentum to support GEOSS.*



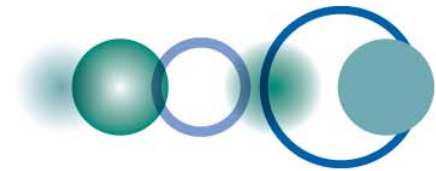
AIP Phase 2 Master Schedule

AIP-2 CFP Announced	June 2008
Kickoff Workshop at NCAR	September 2008
Scenarios and Use Cases defined	January 2009
Demo Capture Workshop	4-5 May 2009
Finalize AIP-2 deliverables	1 st Half of 2009
AIP-2 results transition to operations	2 nd Half of 2009



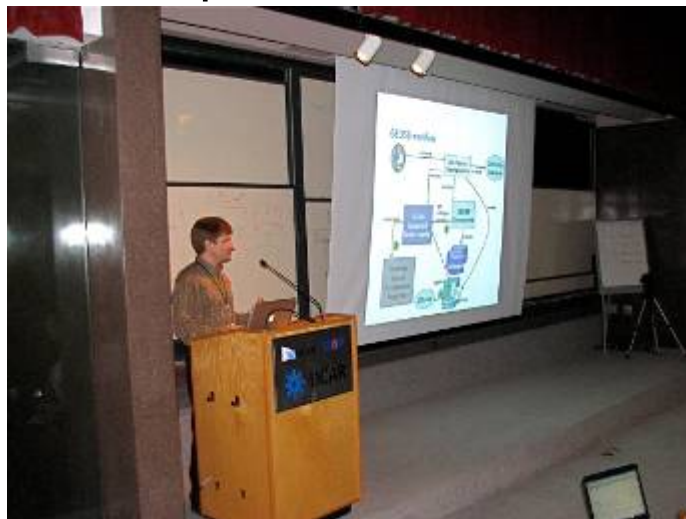
AIP-2 CFP Responses (37 to date)

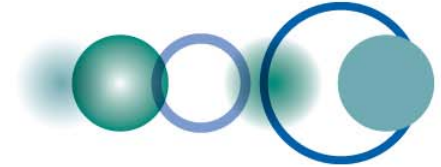
- ACRF
- BKG
- Caribbean Flood Team
- CIESIN
- CNES and ERDAS
- Compusult
- EPA AirNow
- ERDAS Titan
- ESA
- ESIP AQ Cluster
- ESRI
- ESRI Canada
- EuroCryoClim
- GEONETCast
- GEO Grid
- GEO-Ukraine
- Giovanni
- ICAN
- ICT4EO
- INCOSE
- IP3
- ISPRA
- JAXA
- KDDI
- Mines Paris Tech
- NASA World Wind
- NOAA/NASA GOES-R and GMU CSISS
- NOAA IOOS
- NOAA NCDC
- NOAA SNAAP
- Noblis
- Northrop Grumman
- Spot Image
- SURA/NIMSAT/GoMO OS
- USGS
- VIEWS
- Washington University in St. Louis



AIP-2 Kickoff Workshop, September 2008

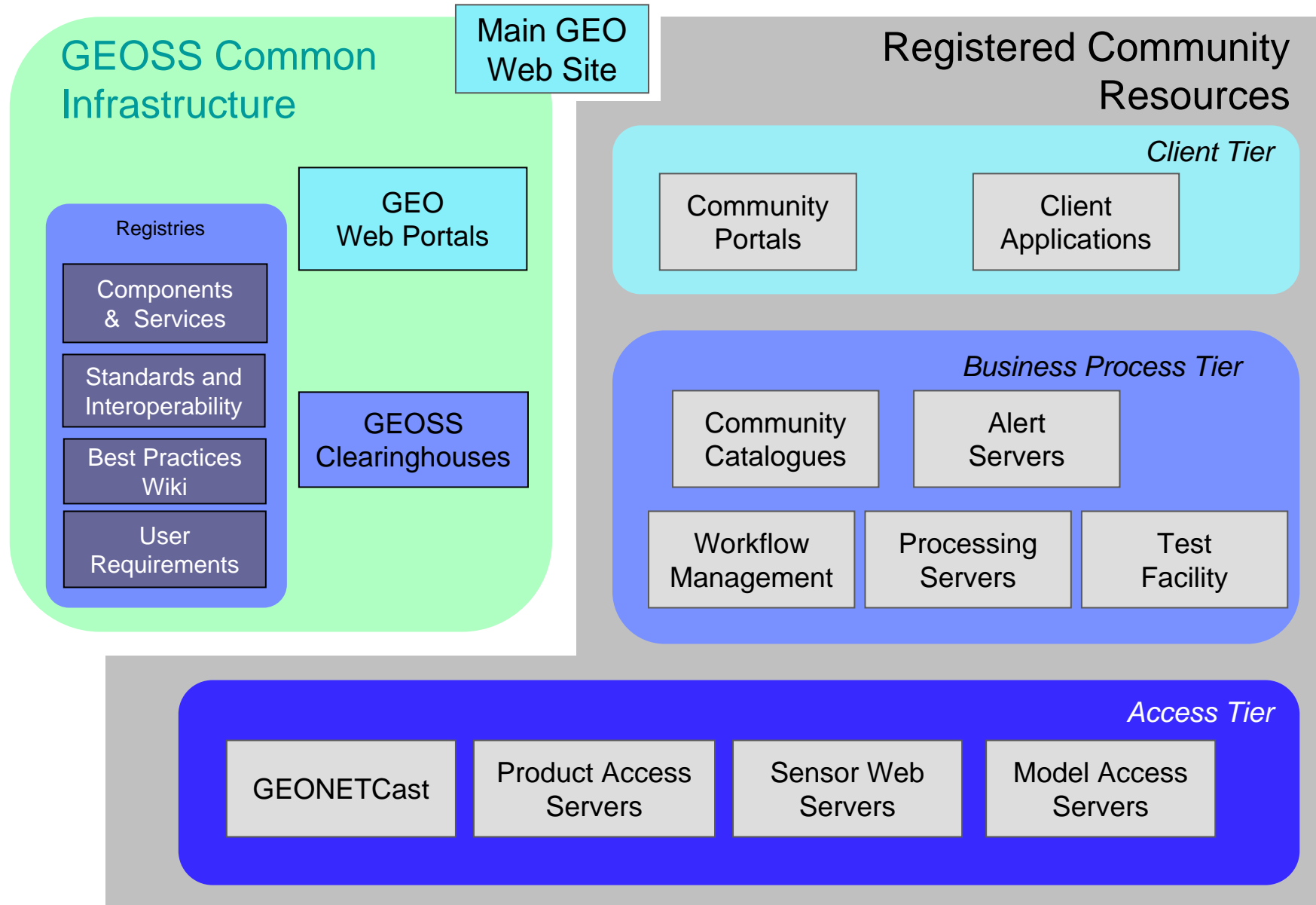
- At NCAR Mesa Laboratory, Boulder, Colorado, USA
- 85 Participants
- 3 Plenary Sessions
- 12 Parallel Sessions based on CFP Responses
- Established Working Groups; and Development Plan

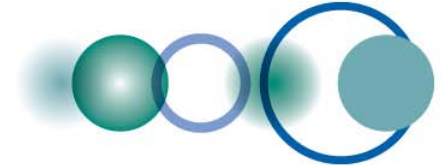




AIP Phase 2 Themes

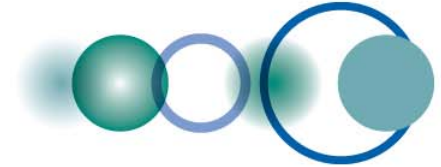
- Augment the GEOS Common Infrastructure





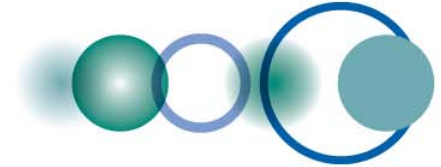
AIP Phase 2 Themes

- Augment the GEOSS Common Infrastructure
- Emphasize SBAs identified by UIC/ADC collaboration
- Develop "persistent exemplars"
- Elaborate GEOSS Architecture
 - Scenarios and Use Cases
 - Service and Component types
 - Interoperability Arrangements



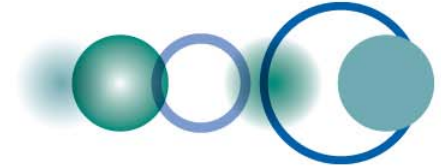
AIP-2 Working Groups (WGs)

- **Community WGs**
 - Disaster Response
 - Flood disaster management scenario
 - Climate Change and Biodiversity
 - Pika Distribution scenario
 - Polar ecosystems scenario
 - Arctic food chain scenario
 - Renewable Energy
 - Site selection process for solar and wind energy scenario
 - Air Quality and Health
 - Smoke events and AQ scenario



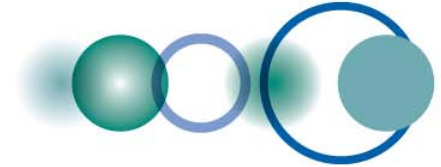
Community WG Leaders

- Disaster Response
 - Stuart Frye, NASA;
 - Didier Giacobbo, Spot Image
- Health SBA: Air Quality
 - David McCabe, EPA
 - Frank Lindsay, NASA;
 - Stefan Falke & Rudy Husar, Washington Univ.
- Biodiversity and Climate Change
 - Stefano Nativi, CNR;
 - Gary Geller, NASA/JPL
- Energy SBA
 - Thierry Ranchin & Lionel Menard, Mines Paris Tech;
 - Ellsworth LeDrew, Univ Waterloo;



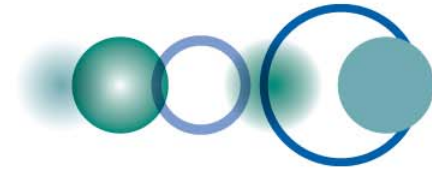
AIP-2 Working Groups (WGs)

- **Transverse Technology WGs:**
 - Portals and Application Clients
 - Clearinghouse, Catalogues, Registries and Metadata
 - Access Services: products, sensors, models
 - Workflow and Processing
 - Test Facility for Service Registration

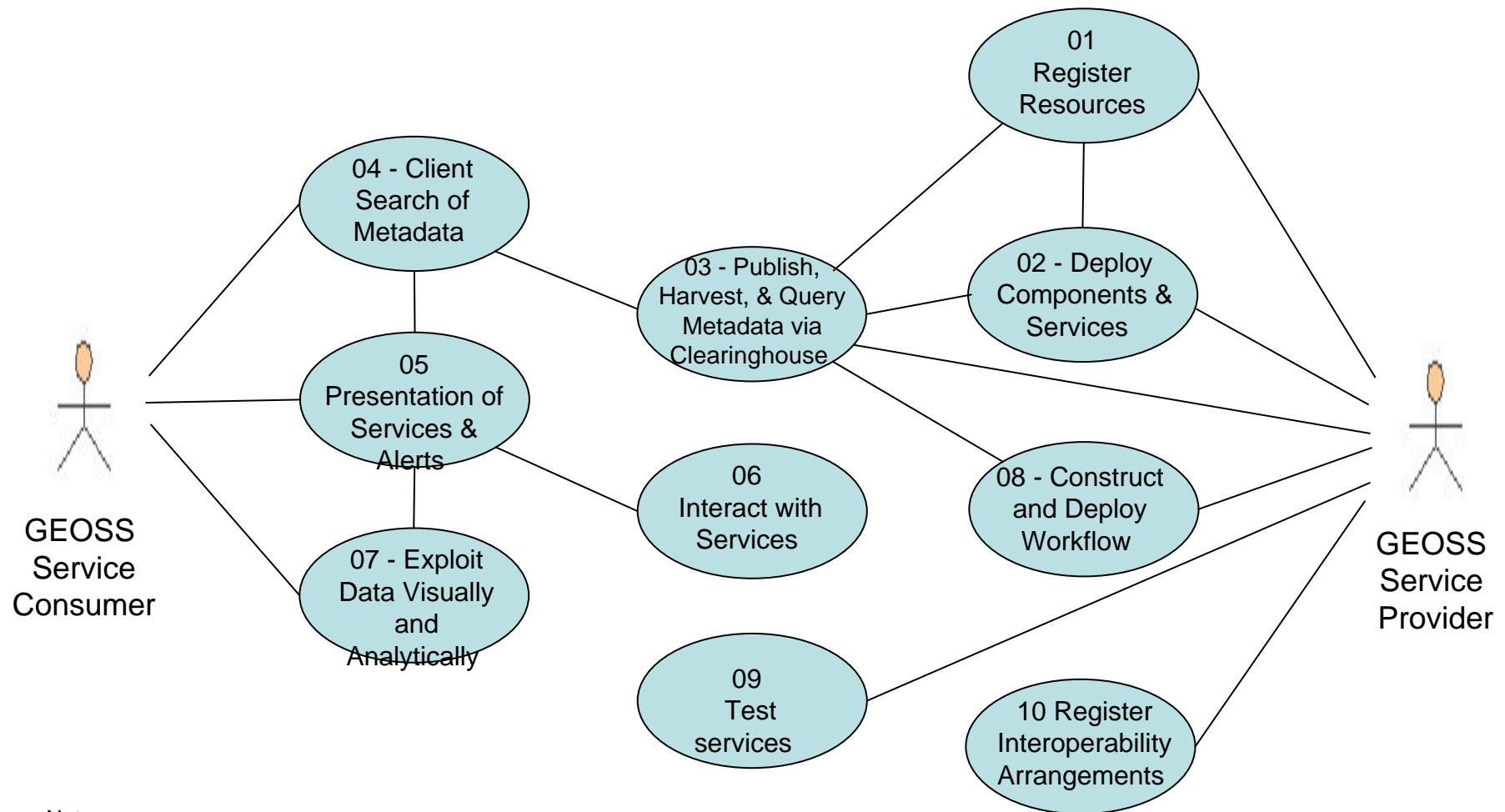


Transverse Technology WG Leaders

- Catalogues, Clearinghouse, Registries and Metadata
 - Doug Nebert, USGS;
 - Josh Lieberman
OGC/Traverse;
 - Ted Haberman, NOAA
- Workflow and Alerts
 - Greg Yetman, CIESIN
 - Eugene Yu, GMU;
 - Satoshi Sekiguchi, AIST;
- Test Facility for service registration
 - Gianni Sotis, Mauro Semerano, ESA
- Portals and application clients
 - Nadine Alameh,
OGC/Mobilaps;
 - Herve' Caumont,
OGC/ERDAS
- Access Services: products, sensors, models
 - Herve' Caumont,
OGC/ERDAS;
 - Glenn Rutledge NOAA,
 - Hans Peter Plag, UNR;
 - Anwar Vahed, ICT4EO;
 - Luis Bermudez SURA;

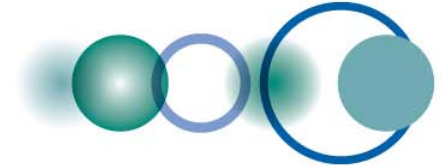


AIP-2 Use Case Diagram



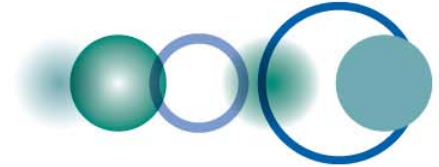
Notes:

- [Summary list](#) of AIP-2 Use Case Diagram
- Hyperlinks from Use Cases ellipses to AIP Google Site pages are to be added.
- [Relationships](#) between use cases may be one of four types – association, extends, includes, and inheritance



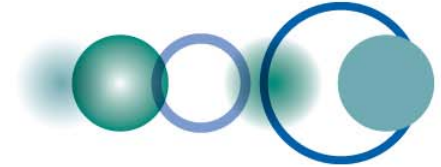
Scenarios and Use Cases

- Transverse Use Cases support Community Scenarios
- Scenarios: end user view of the value of GEOSS
 - Focused on topics of interest to a community
 - Occur in a geographic Area of Interest (AOI)
 - Steps in a scenario are Use Cases
 - Scenarios developed by Community WGs
- Use Cases: reusable service oriented architecture
 - Use cases for discovery, data access, etc
 - Utilize Interoperability Arrangements
 - Use Cases developed by Transverse Technology WGs



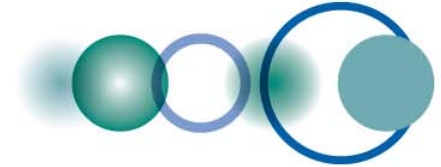
Reusable Practice for Implementing SBAs in the GEOSS Architecture

1. SBA experts develop end-to-end **Scenario** for decision makers use of Earth Observations
2. SBA scenario is structured in **Enterprise Models**
3. GEOSS architects map enterprise model to Transverse Technology **Use Cases**
4. **Specialized Use Cases** are developed for the SBA including services and interoperability arrangements
5. **Services** are deployed, registered and tested as **components** with emphasis on persistent exemplars
6. SBA Scenarios are tested and refined

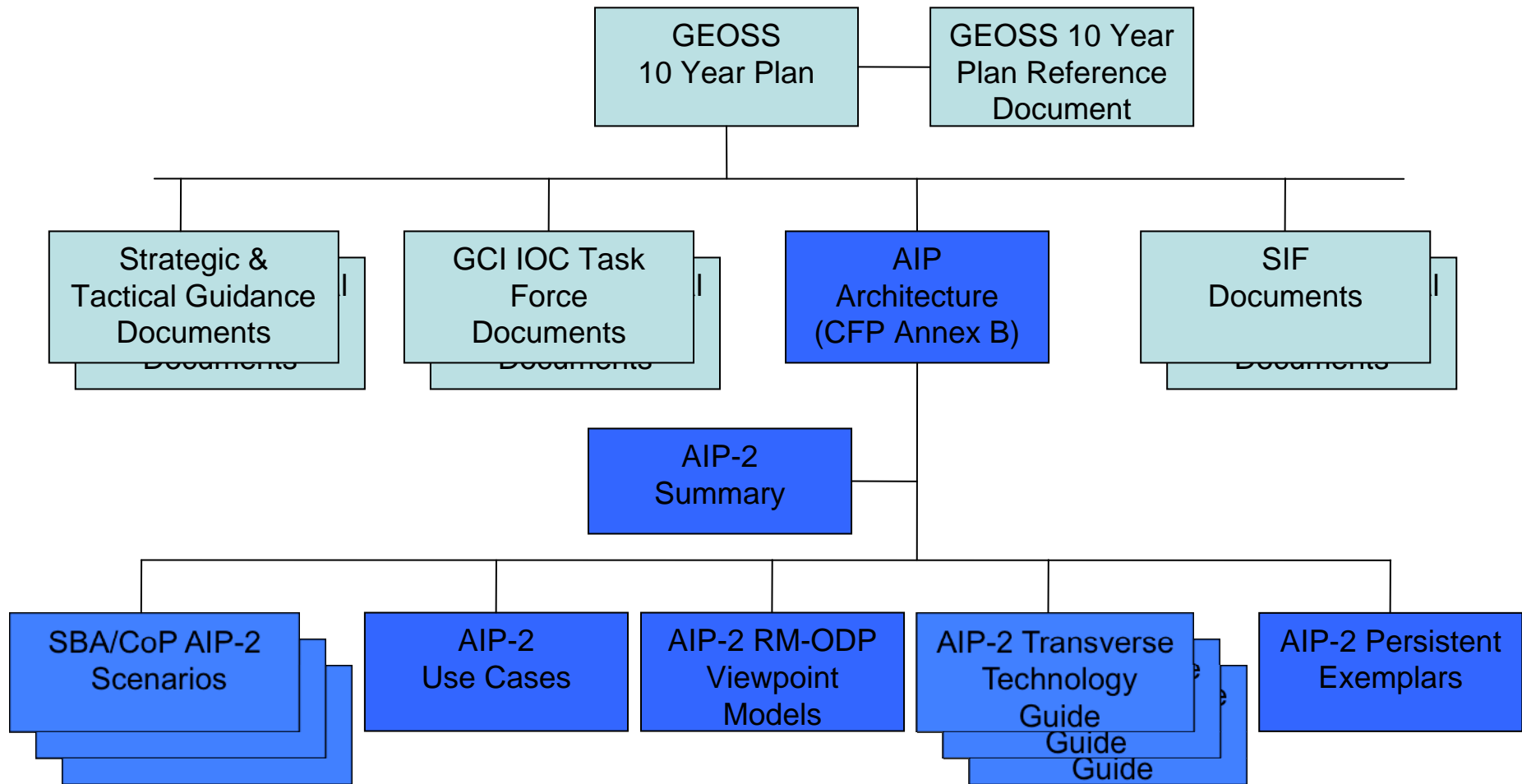


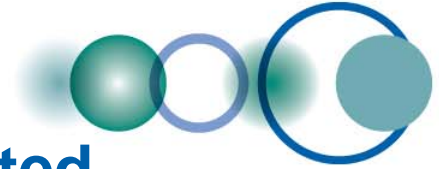
AIP-2 Deliverables (GEO Task AR-09-01b)

- Demonstration
 - Demonstration of community Scenarios implemented through transverse Use Cases
 - Demonstrations to be recorded and made available via WWW
- Persistent Exemplars
 - Registered services ('continuous operation') with 99% availability (~7 hours down time a month); on a reliable network; plan for performance scaling
 - Nomination to operational task (AR-09-01a)
- Engineering Reports
 - To be considered for GEOSS Best Practice Registry*
 - Community Scenarios
 - Transverse Technology Use Cases
 - AIP-2 Summary Report



Document Tree - draft

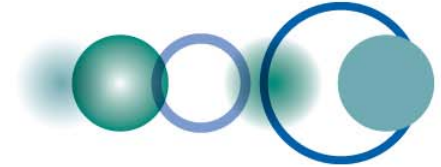




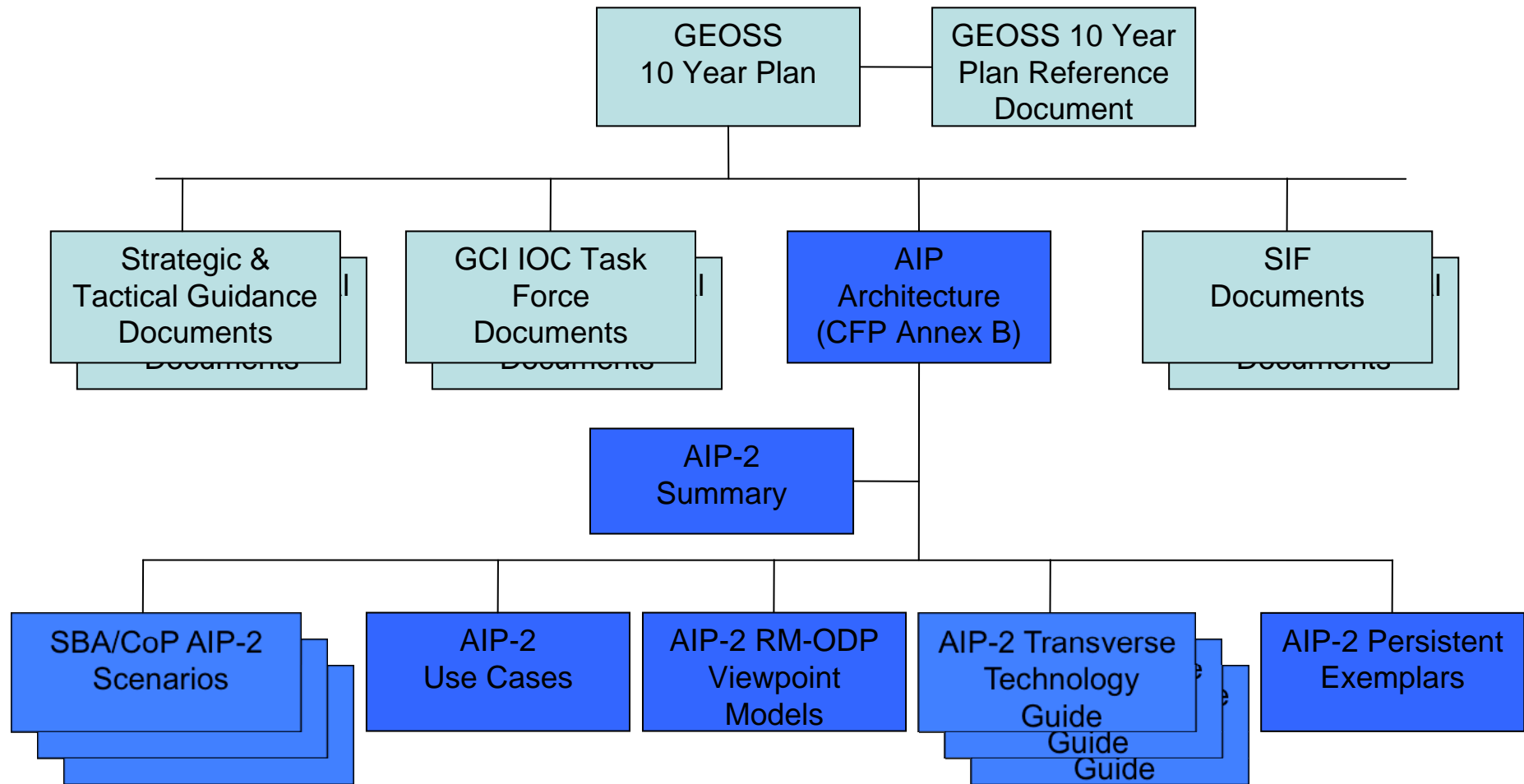
GEOSS Reference Model of Open Distributed Processing Model – ISO/IEC 19793 Standard

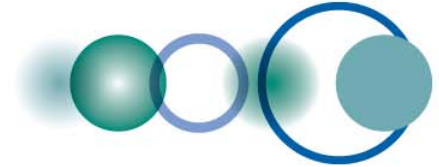
- Set of UML models organized using the 5 RM-ODP viewpoints
- Developed by INCOSE group led by Larry McGovern, NGC
- Working with the Scenario working groups
- Will be published as an AIP-2 Engineering Report

- Status by RM-ODP Architecture Viewpoints:
 - Enterprise – 100% of Enterprise for all SBAs
 - Information – 100% of Enterprise for all SBAs
 - Computational – 100% of Enterprise for all SBAs
 - Engineering – Scheduled for next AIP
 - Technology – Scheduled for next AIP



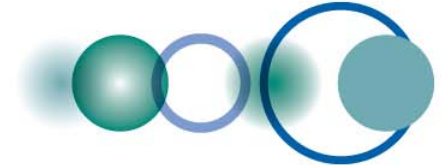
Document Tree - draft





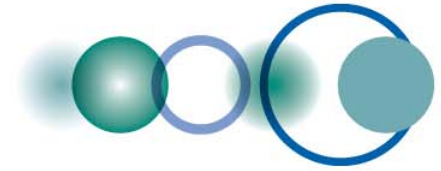
AIP-2 Scenario Demonstrations

- **AQ & Health – Smoke Event: Rudy Husar, David McCabe**
- **Biodiversity: Pika Distribution: Stefano Nativi**
- Biodiversity: Arctic Food Chain: Stefano Nativi
- Biodiversity: Polar Ecosystems: Doug Nebert
- **Disaster Management: Stuart Frye, Didier Giacobbo**
- Renewable Energy - Facility Planner: Lionel Menard



AIP-2 Technology Demonstrations

- GEO Web Portal to Clearinghouses
 - Compusult - Robert Thomas
 - **ESA/FAO – Gianni Sotis, Jolyon Martin**
 - **ESRI – Marten Hogeweg**
- Geo-Processing with WPS: Brian Falk
- **Publish, test, register, and monitor: Hervé Caumont**



ESRI GEO Portal

<http://geoss.esri.com>

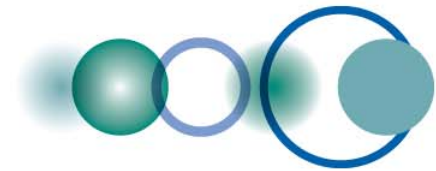
1 May 2009

Marten Hogeweg (mhogeweg@esri.com)

ESRI Inc © 2009

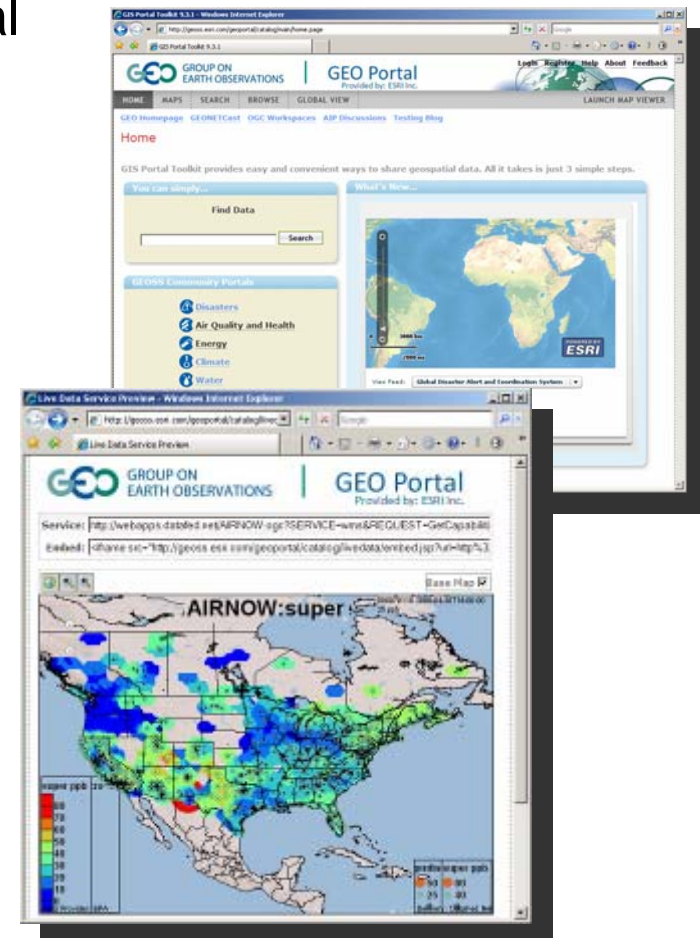
Redlands, CA, USA

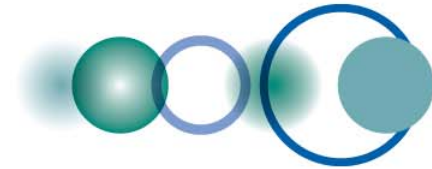




ESRI GEO Portal Demonstration

- Purpose: Enable Discovery and Use of Earth Observation and other Geospatial Resources
- Provides complete GEO Portal and Clearinghouse capabilities:
 - Register Resources
 - Finding Resources
 - Preview Resources
 - Manage the Clearinghouse
 - Harvesting from other Clearinghouses
 - Search other Clearinghouses





ESRI GEO Portal Demonstration

Quick Access to Community Portals and GEO resources



Intuitive Interface, Powerful Search



Reusable Search Widget in Air Quality and Health Community Portal



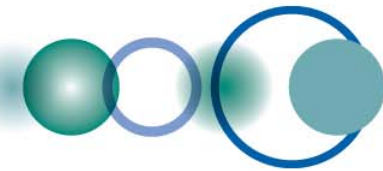
AIP-2 ESA-FAO GEOportal Demo Capture Workshop

4/5 May 2009

The Palazzo dei Congressi di Stresa

Stresa, Italy

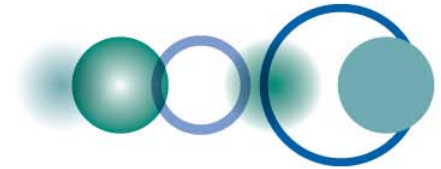




Guidelines for demo capture

- The ESA-FAO GEOportal provides an entry point to the GEO System of Systems to access Earth Observation information and services.
- It is part of the GEOSS Common Infrastructure (GCI) and addresses the needs of the nine GEO Societal Benefit Areas

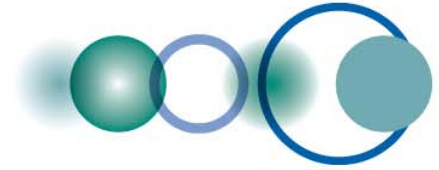




ESA-FAO GEOportal Demo

Demo presenting :

- the main GEOportal functionalities
 - Search alerts on the rotating globe
 - Navigating related information provided by GEOportal
 - Display of WMS images
 - Alternative ways to search information on GEOportal:
 - Searching through SBAs
 - Searching by Country/Continent
 - Simple search
 - Advanced search
- AIP-2 transverse technology use cases testing.



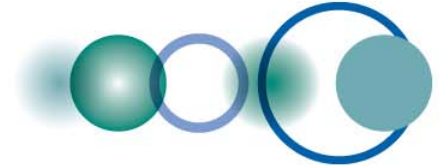
Compusult Geo Portal Demo Summary

4/5 May 2009

The Palazzo dei Congressi di Stresa

Stresa, Italy





Compusult Geo Portal - Transverse Demonstration

- Goals:
 - Demonstrate Searching across more than one catalogue/clearinghouse through more than one interface.
 - Demonstrate searching directly through SBAs
 - Demonstrate portrayal and management of resources from disparate resource providers
- Storyboard
 - Introduce the portal
 - Show brief portal highlights
 - Wiring diagram of what will happen
 - Perform search across multiple catalogues
 - Perform search through alternative Interface
 - Perform typical search related to a SBA working group
 - Bind to discovered services and demonstrate managing resources



Discovery/View - Windows Internet Explorer

http://www.geoportal.org/fofy/geo/Find-view

Discovery/View

Provided by: **COMPUSULT**

GEO GROUP ON EARTH OBSERVATIONS | **GEO Portal**

Welcome! Home - Language - Sign In

GEO Portal | Discovery/View | Browse | GEOS Registry

To start a Discovery, use the links on the left of the Map to (1) Locate your Area of Interest and (2) Search the GEOS Clearinghouse.

WLS Client

File View Map ADI Tools Help

Assistant Name: Hub

What would you like to do?

- Locate: Locate / Define an area of interest
- Place Name
- Coordinates
- Shapefile
- Search/Discover: Find Services, Datasets, Data and Products
- Search Clearinghouse/1/Details
- Search Data Warehouse
- Manage Maps: Remove, Rename, Edit and Create Maps
- Download and Saved Maps
- Save / Export: Save / Email Maps and ACl's
- Save Map
- Save ACl to Shapefile
- Print/Export Map as OGC Content
- Save Search Criteria
- Save Result Set

Map

17:43:16 2009-09-27 10:30:21 pm

super ppb

100
80
60
40
20
0

0 10 20 30 40 50 60 70 80 90 100

100% 100%

Internet

Results - Windows Internet Explorer

http://www.geoportal.org/fofy/geo/Find-view

Type: WMS

Layer ID: 5F80E014-80EC-0F43-0B9C-83C04E

Title: Particulate Matter

Description: AIRNOW - Realtime PM AIRNOW is an general funded continuous PM2.5 and ozone system establishes the spatial and temporal patterns of the key pollutants PM2.5 and ozone.

Originator: Washington University in St. Louis

Rank: 45.50673923941715

Last Updated: 2009-09-27 10:07:42

[View Details](#) [View Map](#)

[View in WorldWind](#) [View in Google Earth](#)

Resource Type: Web Mapping Service (WMS)

Type: WMS

Layer ID: 703E0346-580D-7108-0E07-D10000

Title: Particulate Matter 2.5

Description: AIRNOW - Realtime PM AIRNOW is an general funded continuous PM2.5 and ozone system establishes the spatial and temporal patterns of the key pollutants PM2.5 and ozone.

Originator: Washington University in St. Louis

Rank: 45.50673923941715

Last Updated: 2009-09-27 10:07:42

[View Details](#) [View Map](#)

[View in WorldWind](#) [View in Google Earth](#)

Resource Type: Context Document

Context Document ID: 44031C41-875D-0267-8295-4070A94A7808

Title: AIRNOW DataFed Web Map Server 1.0.0 - Realtime PM

Description: AIRNOW - Realtime PM AIRNOW is an EPA project to gather and distribute near real-time data from several funded continuous PM2.5 and ozone monitors. from the point of view of the CASINE project the AIRNOW system establishes the spatial and temporal patterns of the key pollutants PM2.5 and ozone.

Originator: Washington University in St. Louis

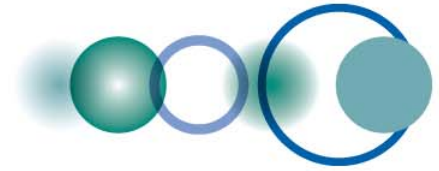
Rank: 45.50673923941715

Last Updated: 2009-09-27 10:07:42

[View Details](#) [View Map](#) [Download](#)

[Back To Search](#) [Add results 1 - 10 to my map](#) [Add top 10 results to my map](#) [Previous](#) [Next](#)

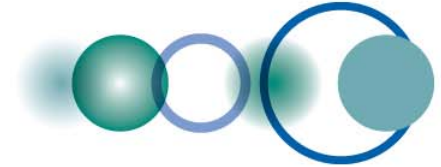
Internet 100%



Using the GEOSS Common Infrastructure Publish, Test, Register and Monitor a Data Access Service

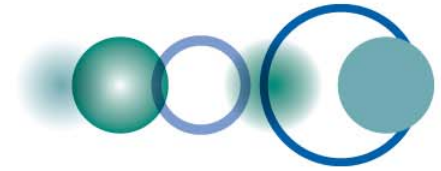
GEOSS Architecture Implementation Pilot-2
Transverse Technology Working Group





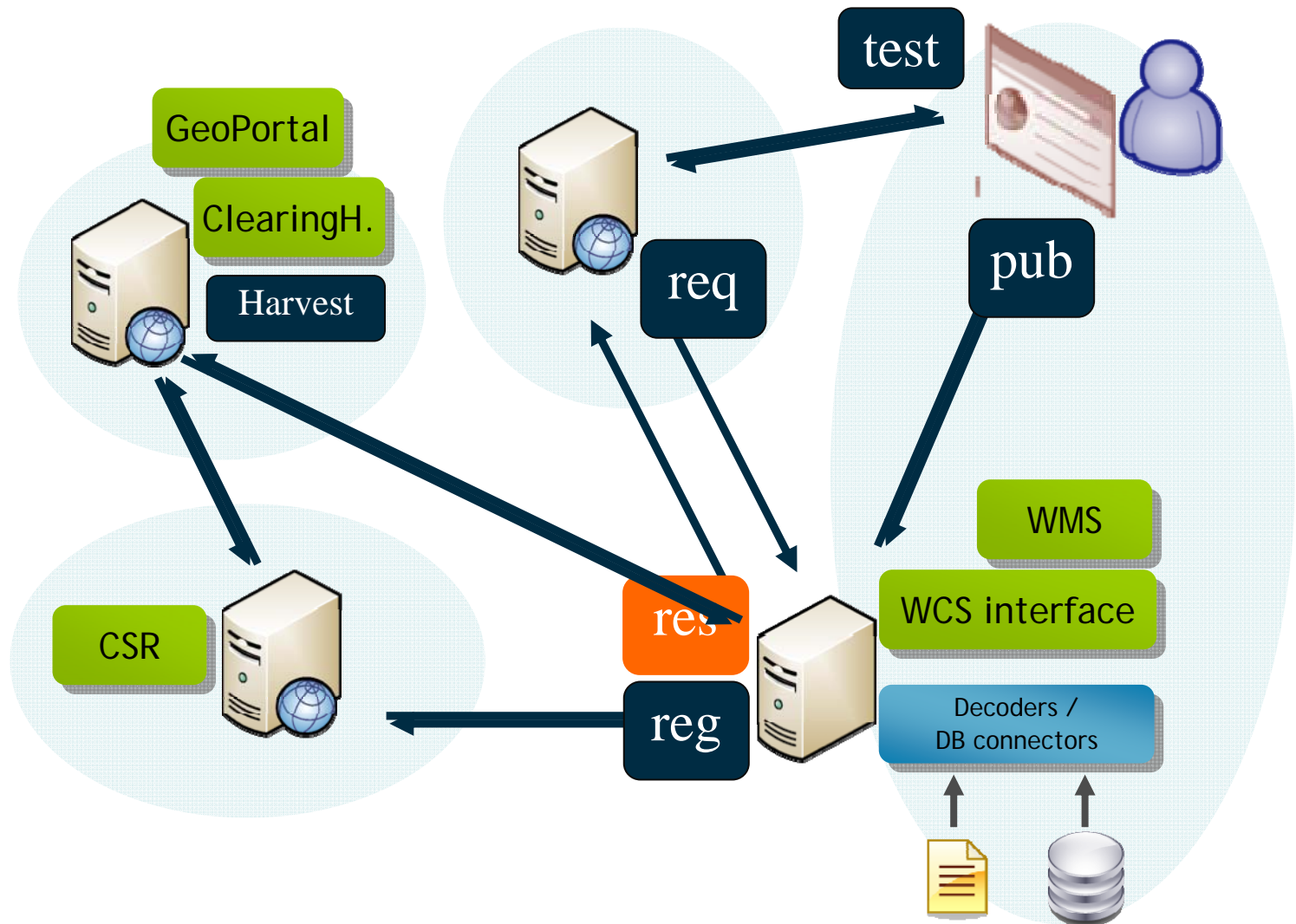
GCI End-to-End scenario

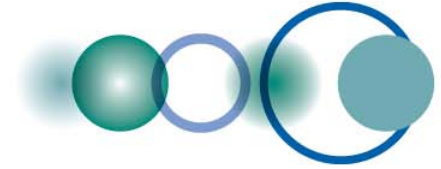
- Behind the scenes, organisations like Data provider, Service provider, Catalog Provider, GeoPortal provider have to team-up to serve a category of users
 - Deploy a Data Access Web Service
 - Test the service interface
 - Register a web service in the CSR
 - Monitor a web service
- As a result, an update at one end (e.g. new dataset) must reflect at the other end (e.g. GeoPortal search) of the Service Oriented Architecture



GEOS Service Oriented Architecture

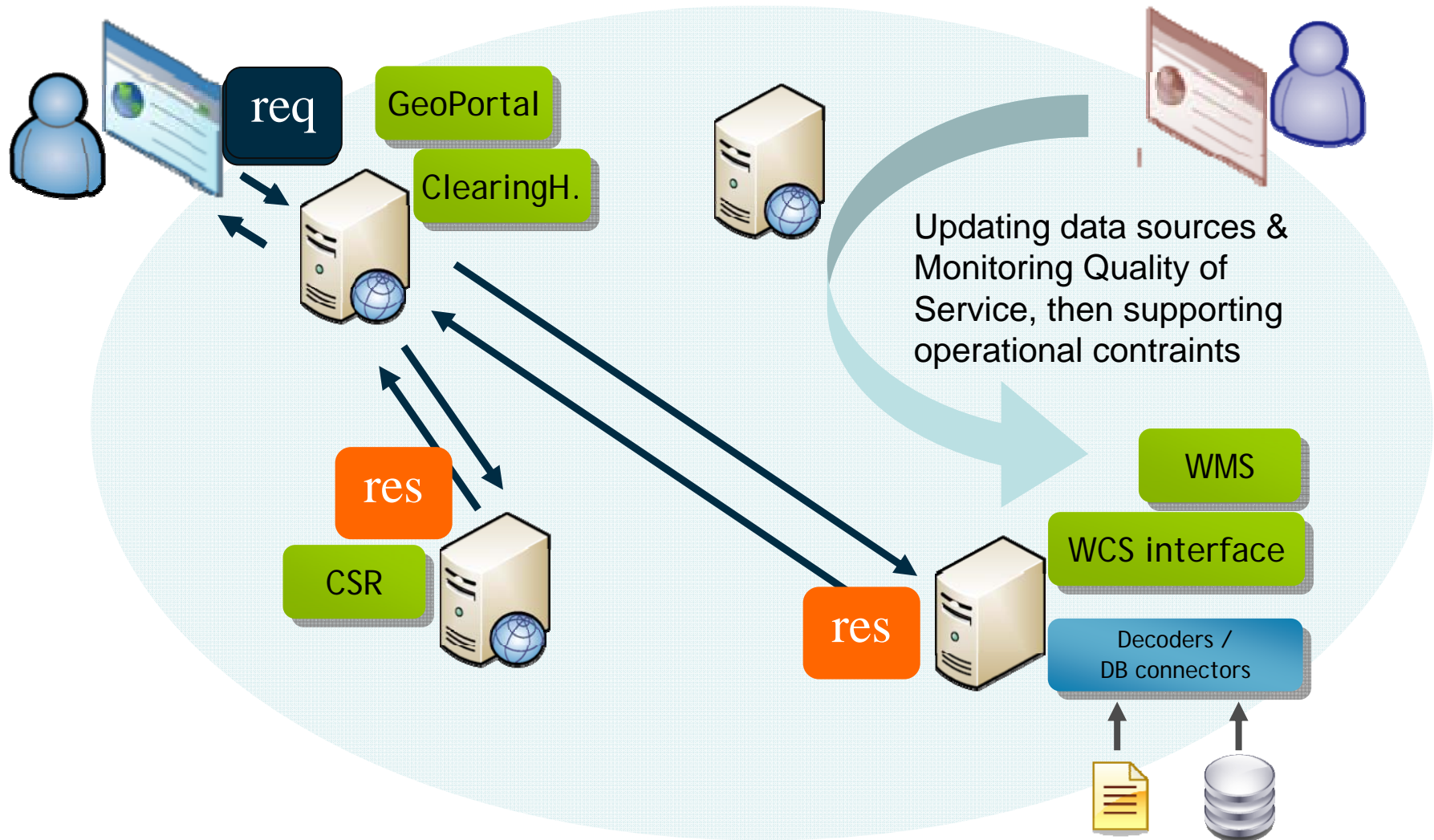
Organizations team-up to deliver service to the user

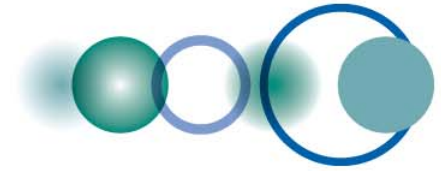




GEOS Service Oriented Architecture

Then user sees the tip of the iceberg...



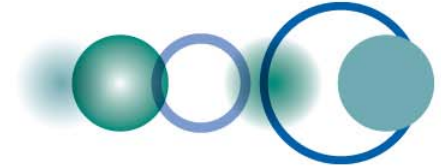


Geoprocessing Demo

GEOSS AIP-2

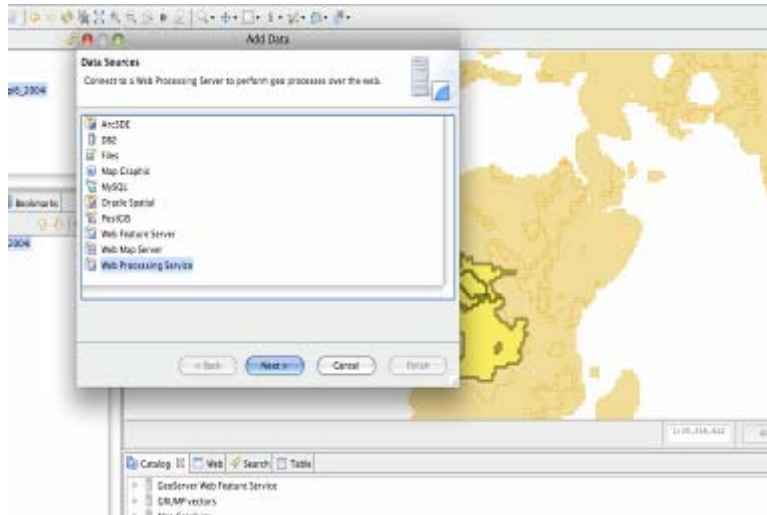
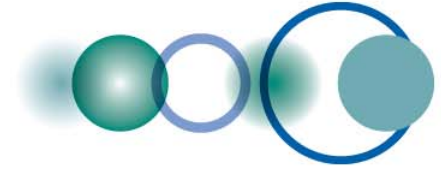
Workflow and Processing WG



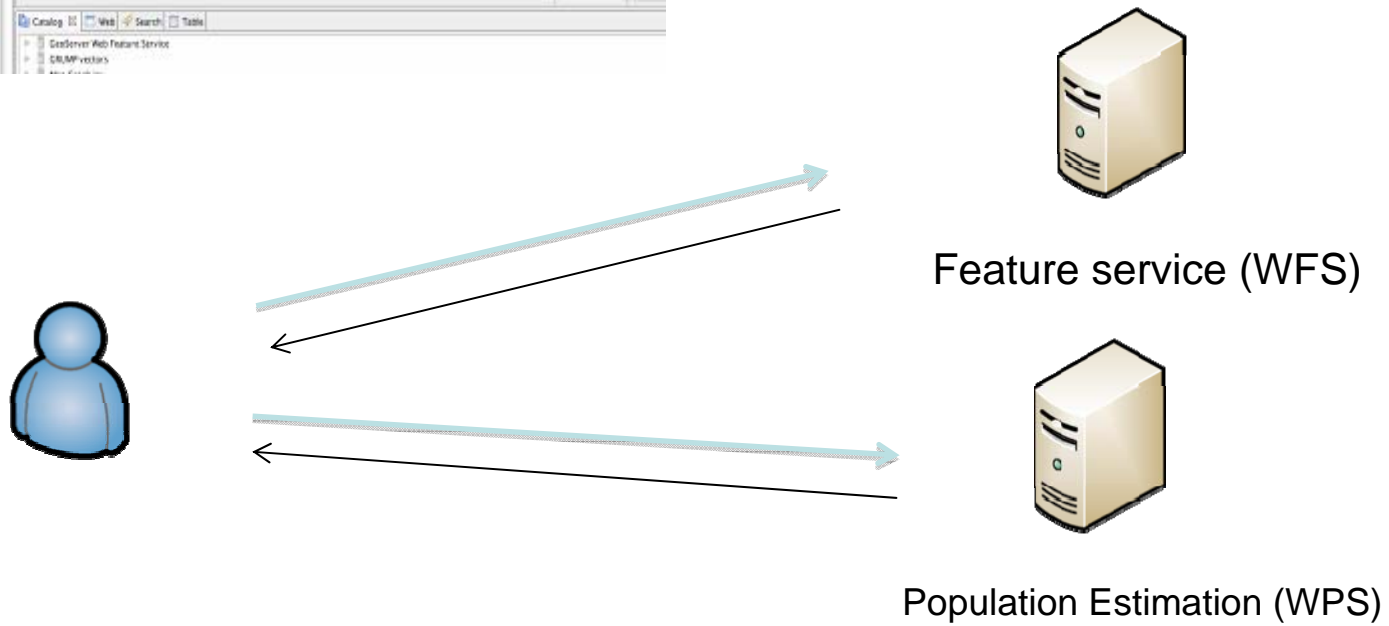


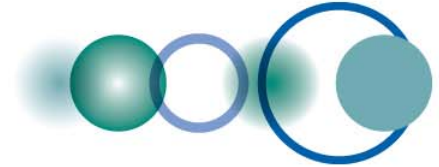
Overview

- This demonstration illustrates the use of SEDAC's WPS to perform a Geo-processing task on features obtained from a WFS operated by UNEP.
- A plugin for uDig that implements WPS client functionality is used to connect to our service (available from 52north).
- The scenario represented involves a GIS analyst wishing to obtain an estimate of the number of residents in Nile Basin states.



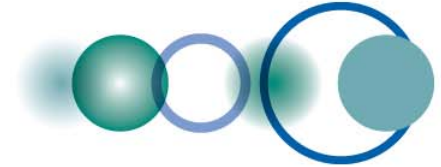
uDig interface with 52north plugin





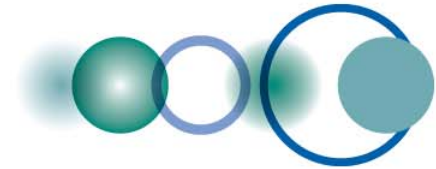
AIP-2 Discussion Topics (1 of 2)

- Clearinghouses
 - Multiplicity: should they all return the same results?
 - Sample Queries, Queryables, Query Interface
- Who is the user?
 - Need better understanding of the users
 - Aid in defining expected behavior of GCI
- End-to-End: Discovery, Access, Fusion, Decision
 - Clear consistent registrations are needed for discovery of components/services
 - Provide standardized way for easy visualization and browsing

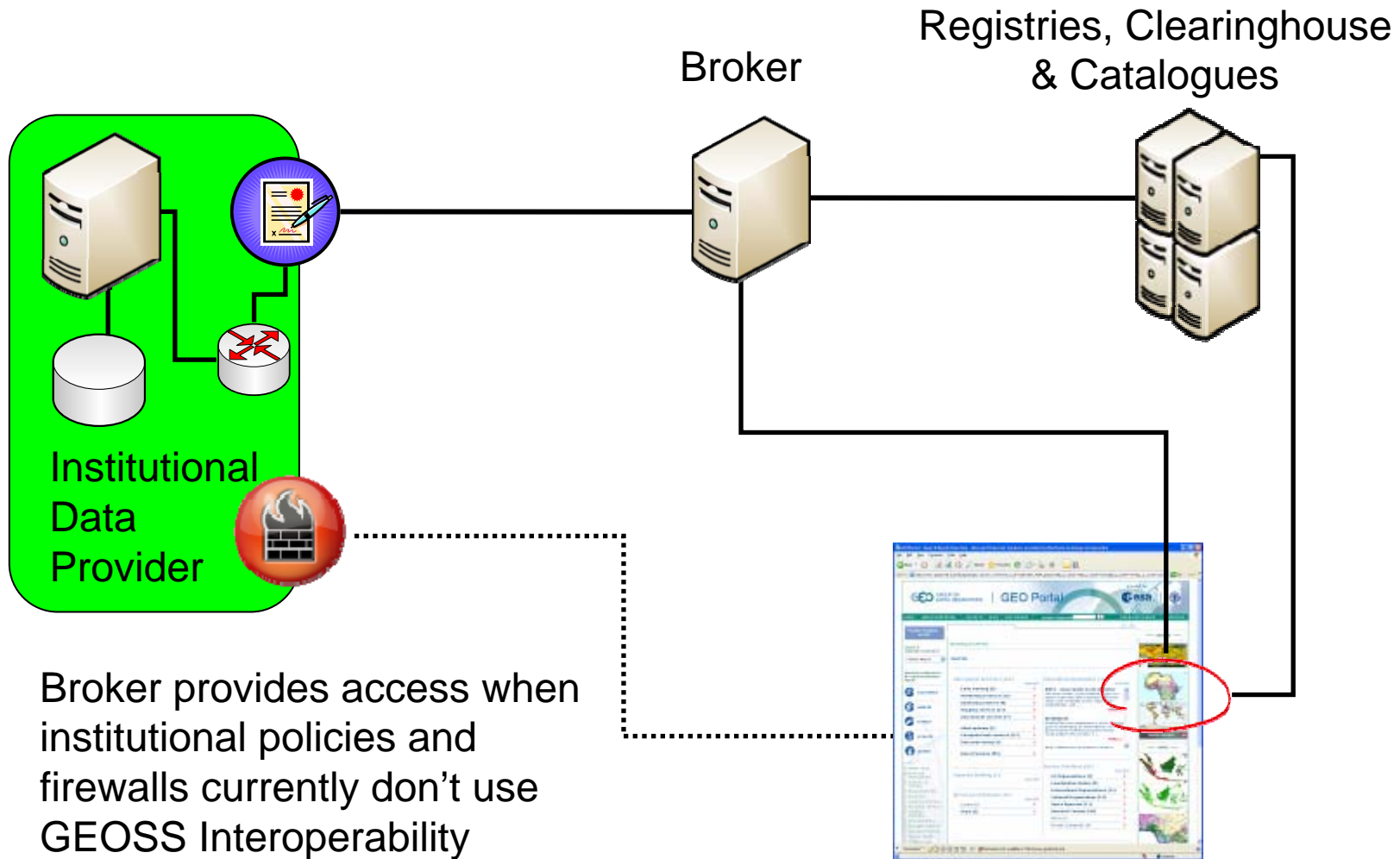


AIP-2 Discussion Topics (2 of 2)

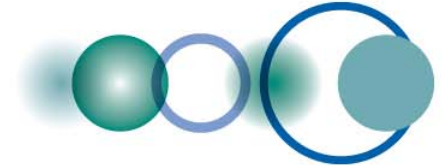
- Mix of operations and research
 - From pilot to persistent exemplars to sustained operations
- Variations on approach to Interoperability
 - GEOSS interoperability “based on non–proprietary standards, with preference to formal international standards.”
 - Alternative: Client/server interaction by reuse of portlets, i.e., code sharing
 - Alternative: Brokers for Data Providers



Brokers Provide GEOSs Interoperability

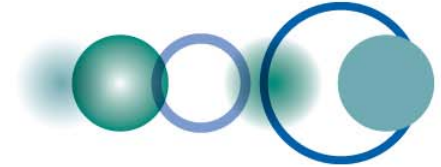


Broker provides access when institutional policies and firewalls currently don't use GEOSs Interoperability Arrangements



Topics after AIP-2

- GIGAS: EC FP7 Project – GEOSS, INSPIRE, GMES
 - AIP-2 Deliverables to GIGAS
 - INSPIRE and GMES inputs into AIP-3 planning
- Coordination with UIC
 - GEOSS User Typology
 - UIC/CBC Decision Support CFP
 - AIP-3 SBA Identification: Water, Climate, AQ
- Planning AIP-3
 - Coordination with ADC Data Tasks
 - CEOS Systems Engineering
 - GeoDRM and Security and data policy



References

- GEO
 - earthobservations.org
- GEO Architecture Implementation Pilot
 - www.ogcnetwork.net/Alpilot
- GEOSS registries and SIF
 - geossregistries.info

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