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Architecture Implementation Pilot

A Vehicle for new GEO S&T Actions

**1st Joint Workshop of the EGIDA Stakeholder Network
and Advisory Board
Bonn, - 09-11. May 2011**

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GEO Secretary

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<http://www.earthobservations.org>



- GEO/GEOSS
- OGC - Open Geospatial Consortium
- AIP - Architecture Implementation Pilot



GEOSS

Global Earth Observation System of Systems

Distributed system of systems

- Improve coordination of strategies and observation systems
- Link all platforms: in-situ, aircraft, satellite, and buoy networks, etc.
- **Facilitate exchange of data and information**
- Identify gaps in our global capacity
- Improve decision-makers' abilities to address pressing policy issues
- Enable solutions for Societal Benefit





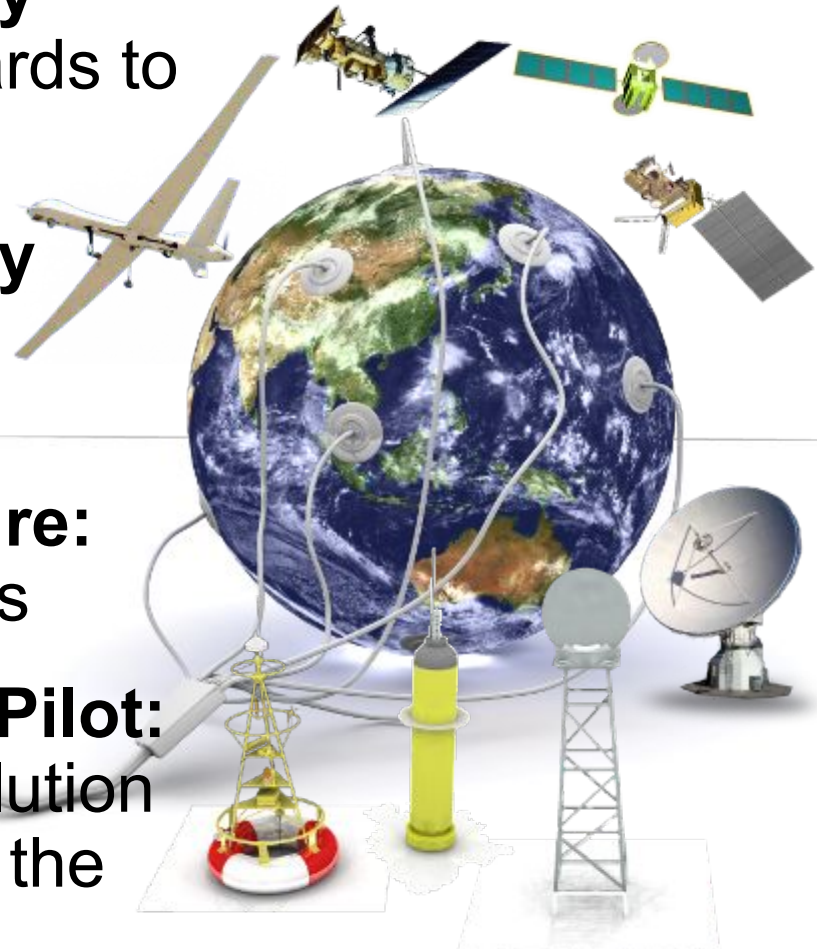
Work Plan 2012-2015 - V0 structure

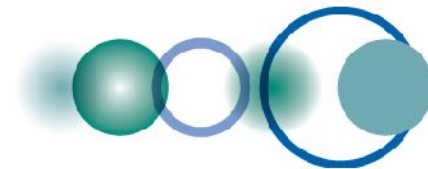
- 3 Management Boards: **Infrastructure**, Institutional Development, Information Services
- 5 **Infrastructure** Tasks, mainly derived from Architecture and Data Management Strategic Targets:
 - GEOSS Common Infrastructure
 - Earth Observing Systems
 - Earth Data Sets
 - GEOSS Communication Networks
 - Gap Analysis



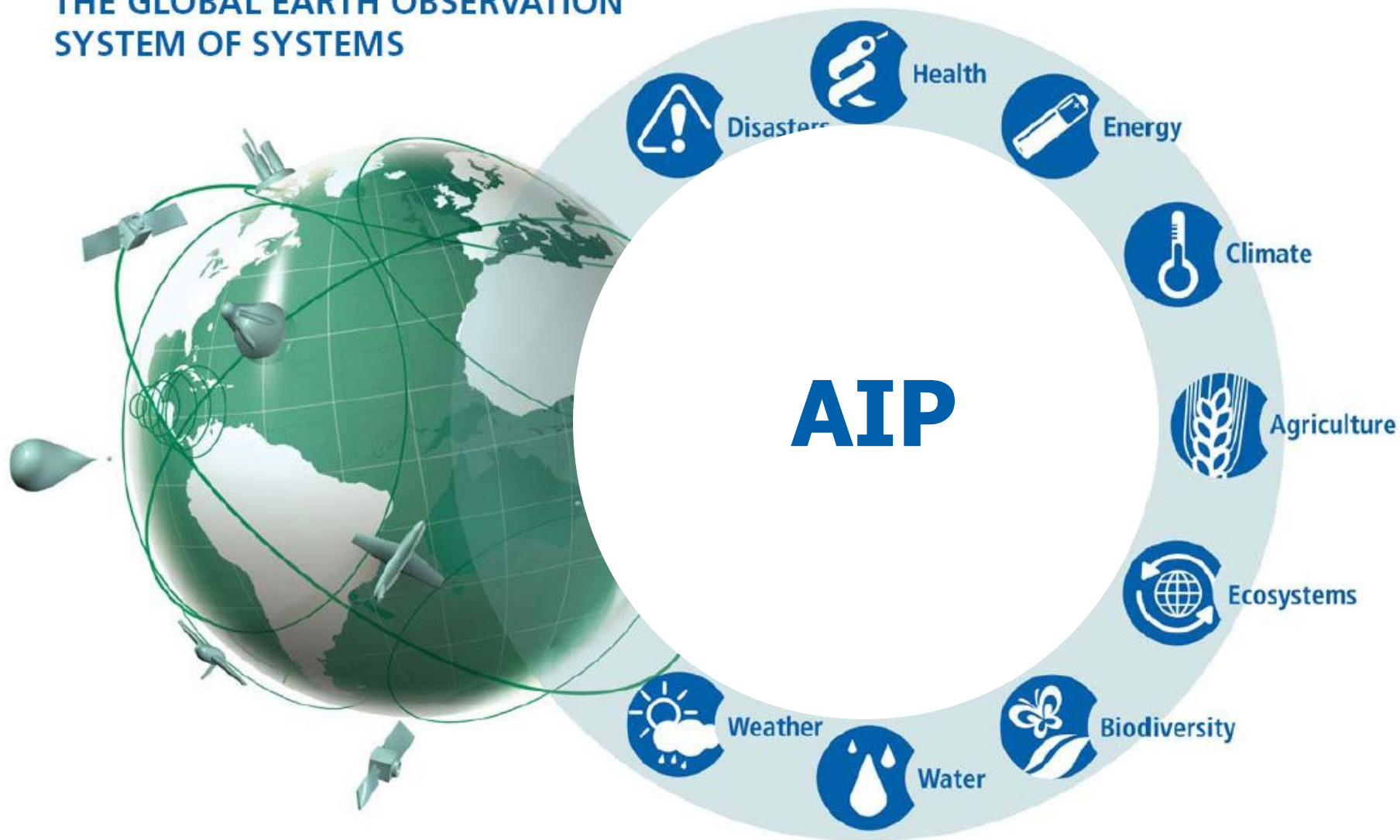
GEO SIR, SIF, GCI, AIP

- **Standards and Interoperability Registry:** association of standards to components
- **Standards and Interoperability Forum:** advice, advocacy, S&I Registry maintenance
- **GEOSS Common Infrastructure:** exposes standardised interfaces
- **Architecture Implementation Pilot:** pilot projects to prepare for evolution of the GEOSS architecture and the GCI





THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS





GEO Task AR-09-01b

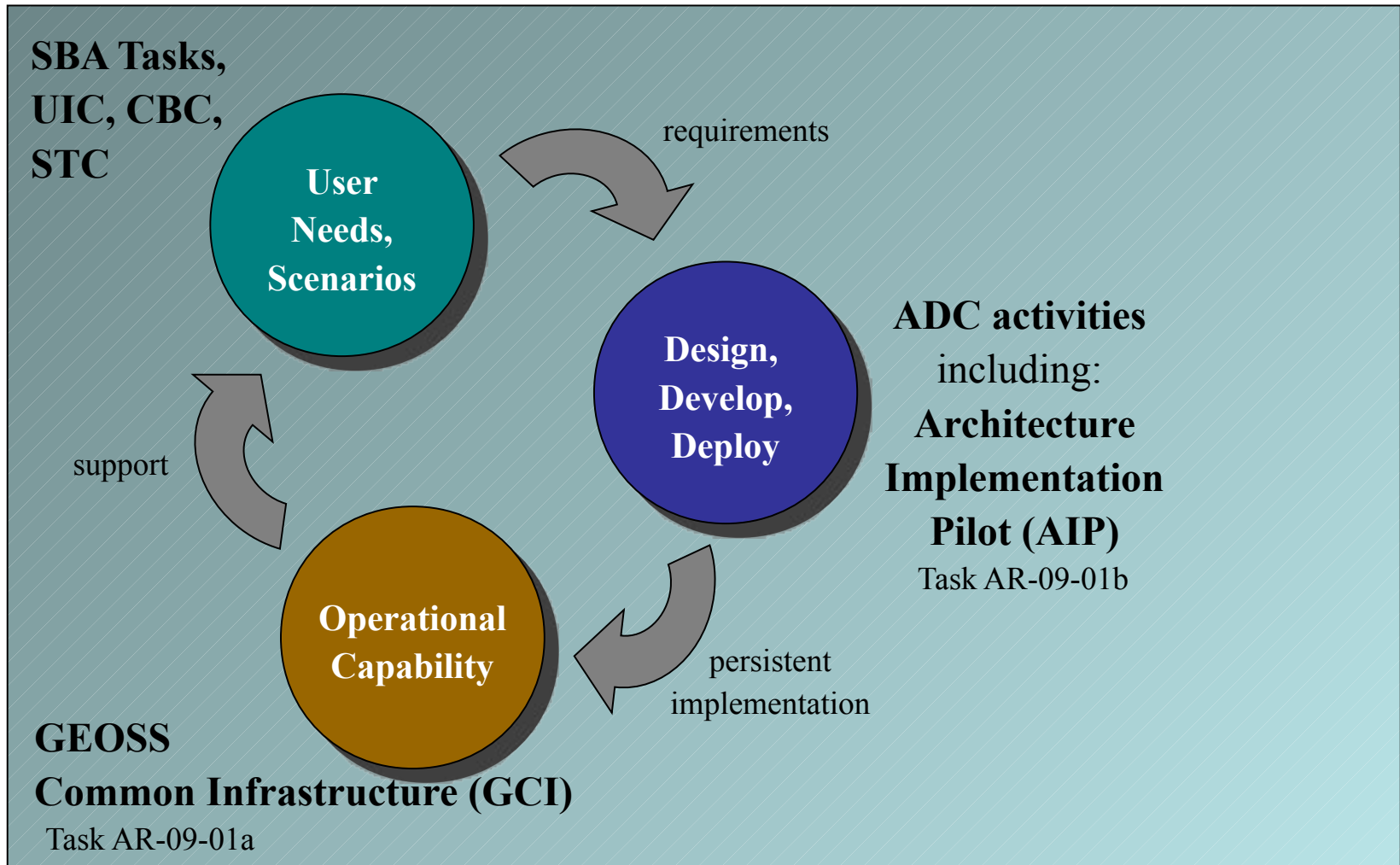
Architecture Implementation Pilot

- Develop and pilot new process and infrastructure components for the GCI and the broader GEOSS architecture
- Continuation of existing efforts and new activities solicited through AIP Calls for Participation (CFPs) and other means

*“fostering interoperability arrangements
and common practices for GEOSS”*

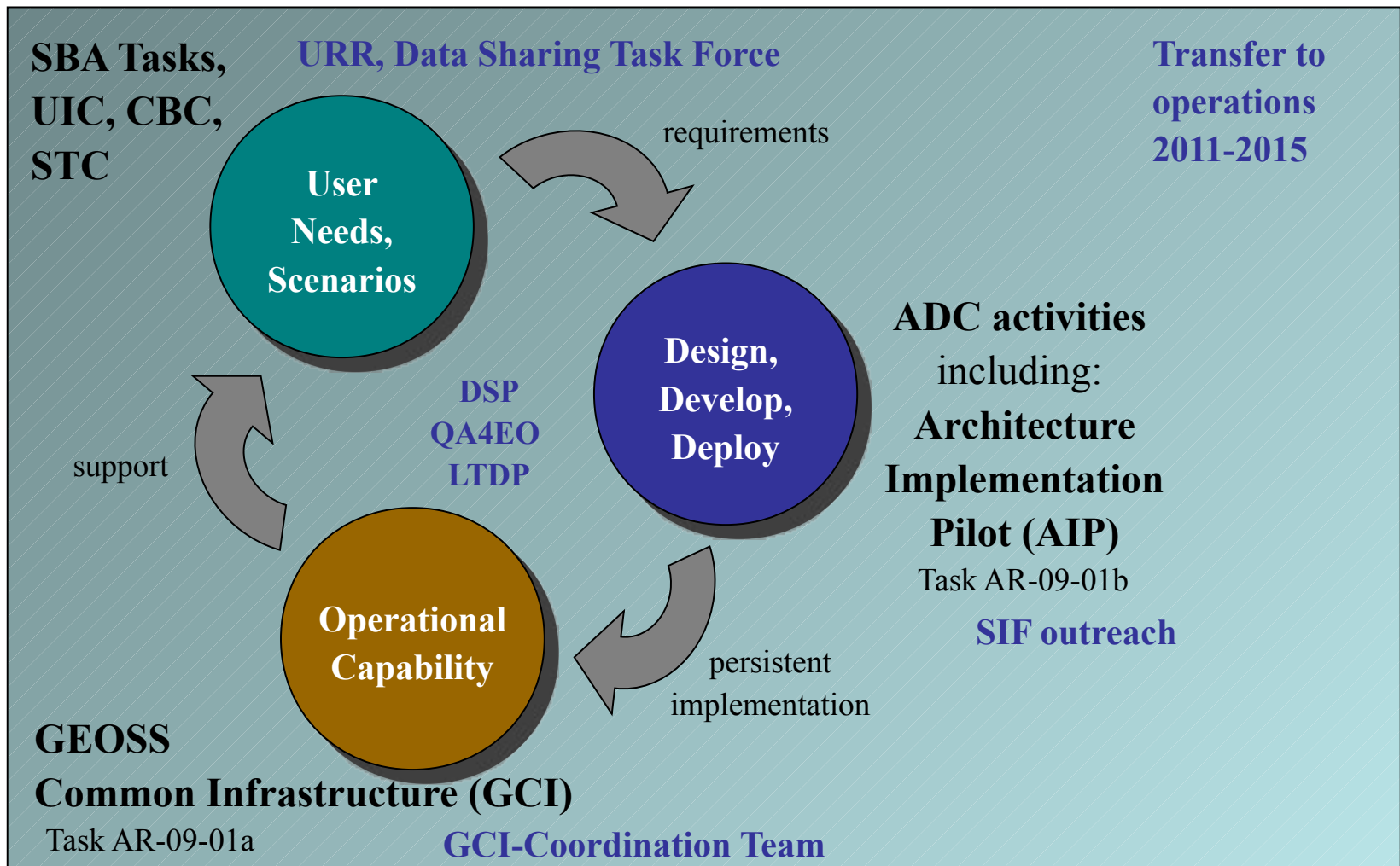


A process Elaboration of GEOSS Architecture



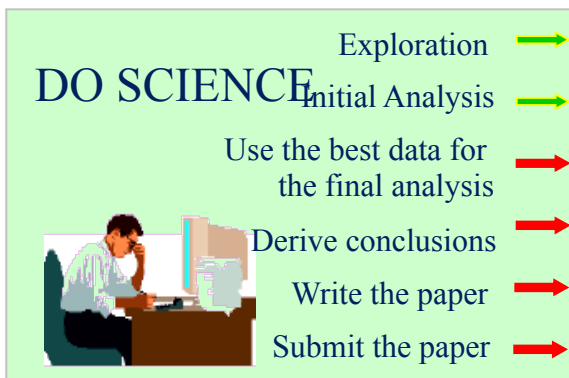
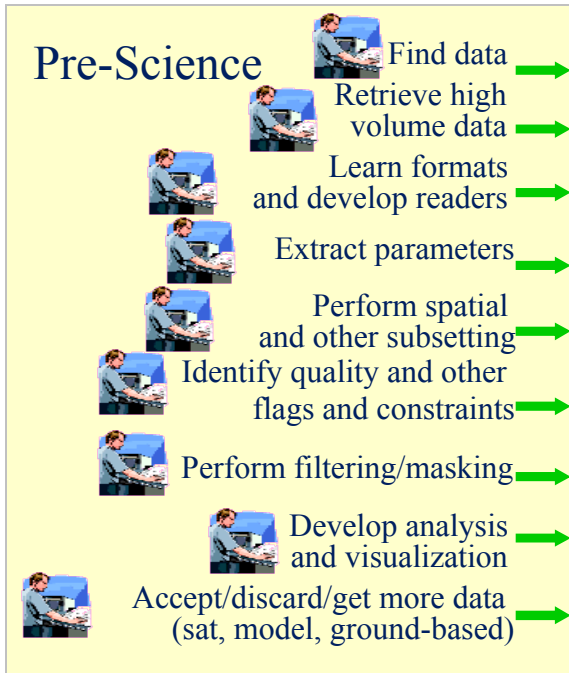


A process Elaboration of GEOSS Architecture

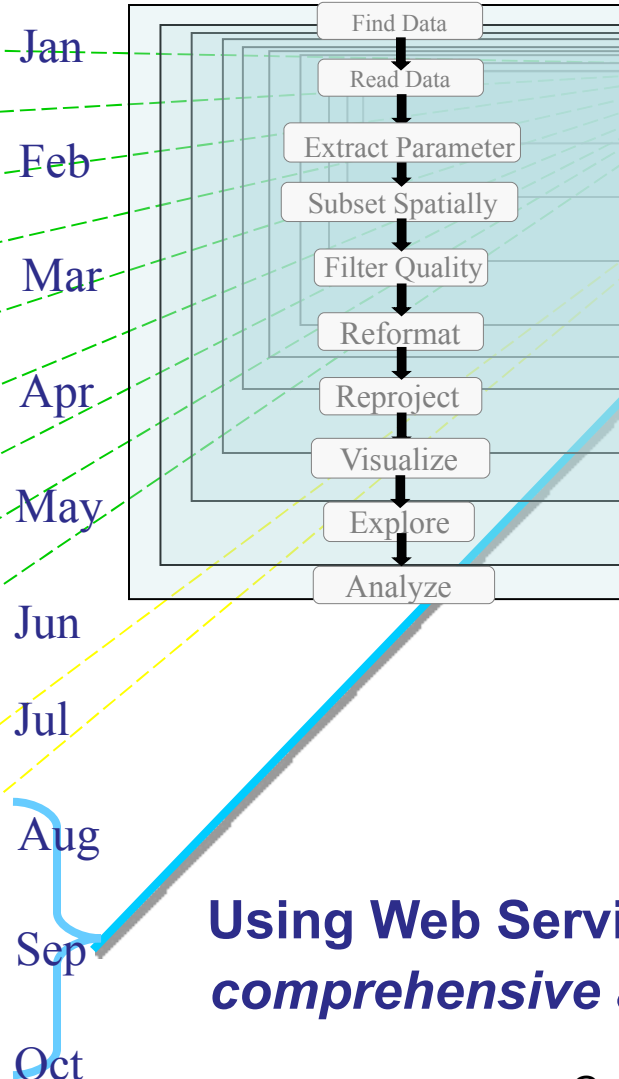




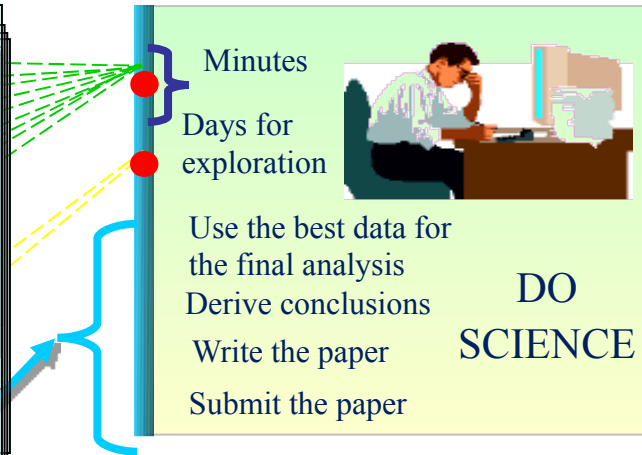
The Old Way:



GEOSS Web-based Services:



The Services Way:



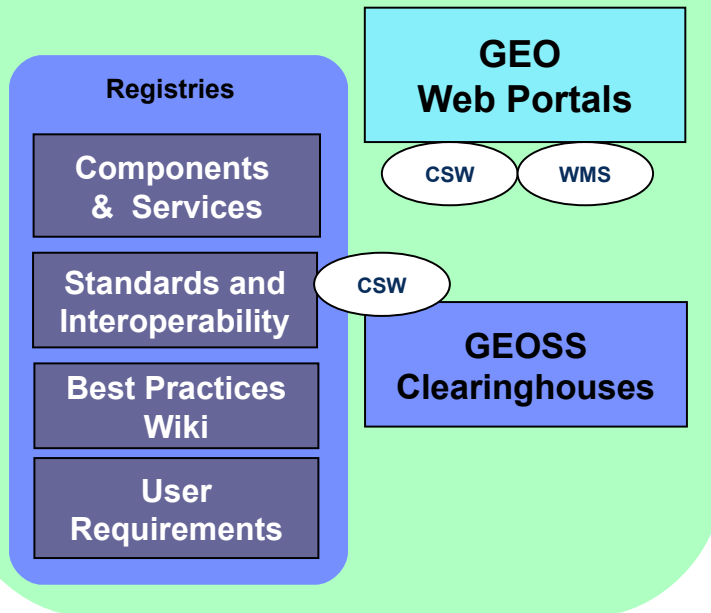
Services “Link-Rich” Environment Provides:
discovery, access, manipulation, visualization, and analysis.

Using Web Services, scientists have more comprehensive access to EO information.

GEOSS Engineering Viewpoint

GEOSS Common Infrastructure

Main GEO
Web Site



Registered Community Resources

Client Tier

Community
Portals

CSW

WMS

Client
Applications

CSW

W*S

Business Process Tier

CSW

Community
Catalogues

Mediation
Servers

Alert
Servers

WPS

Workflow
Management

Processing
Servers

Test
Facility

Access Tier

GEONETCast

WMS

WFS

WCS

Product
Access
Servers

SOS

SAS

SPS

Sensor Web
Servers

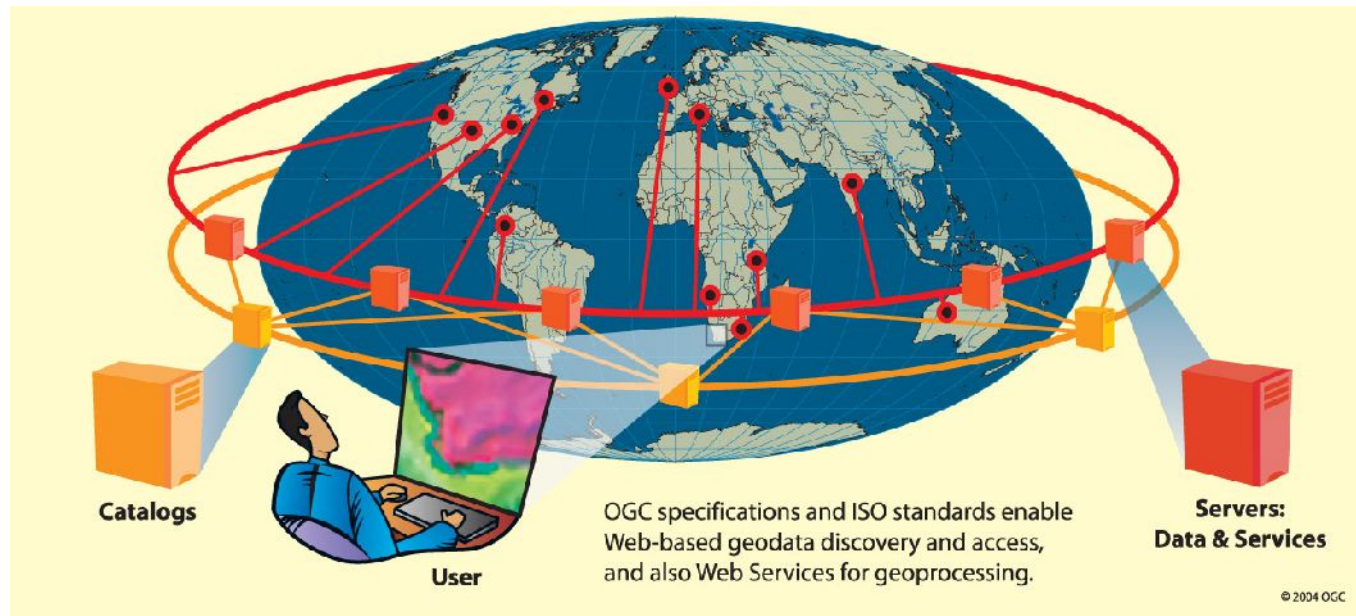
W*S

Model Access
Servers

The OGC Mission



- To serve as a global forum for the ***development, promotion and harmonization of open and freely available geospatial standards ...***



OGC from an Organizational Perspective

<http://www.opengeospatial.org/projects>





GEOSS Interoperability Arrangements

- From the GEOSS 10 Year Plan Reference Document -

- Interoperability through open interfaces
 - Interoperability specifications agreed to among contributing systems
 - Access to data and information through service interfaces
- Open standards and intellectual property rights
 - GEOSS adopting standards; agreed upon by consensus, preference to formal international standards
 - GEOSS will not require commercial or proprietary standards
 - Multiple software implementations compliant with the open standards should exist
 - Goal is that at least one of the implementations should be available to all implementers "royalty-free"



AIP Reusable Process for Deploying 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 mapped to Use Cases
- Engineering Use Cases support SBA Scenarios
 - Use cases for discovery, data access, etc
 - Utilize Standards & Interoperability Arrangements
- Reusable service oriented architecture
 - Leverages ‘operational domain value’ through interoperable services





AIP Phase 1 Results in 2007

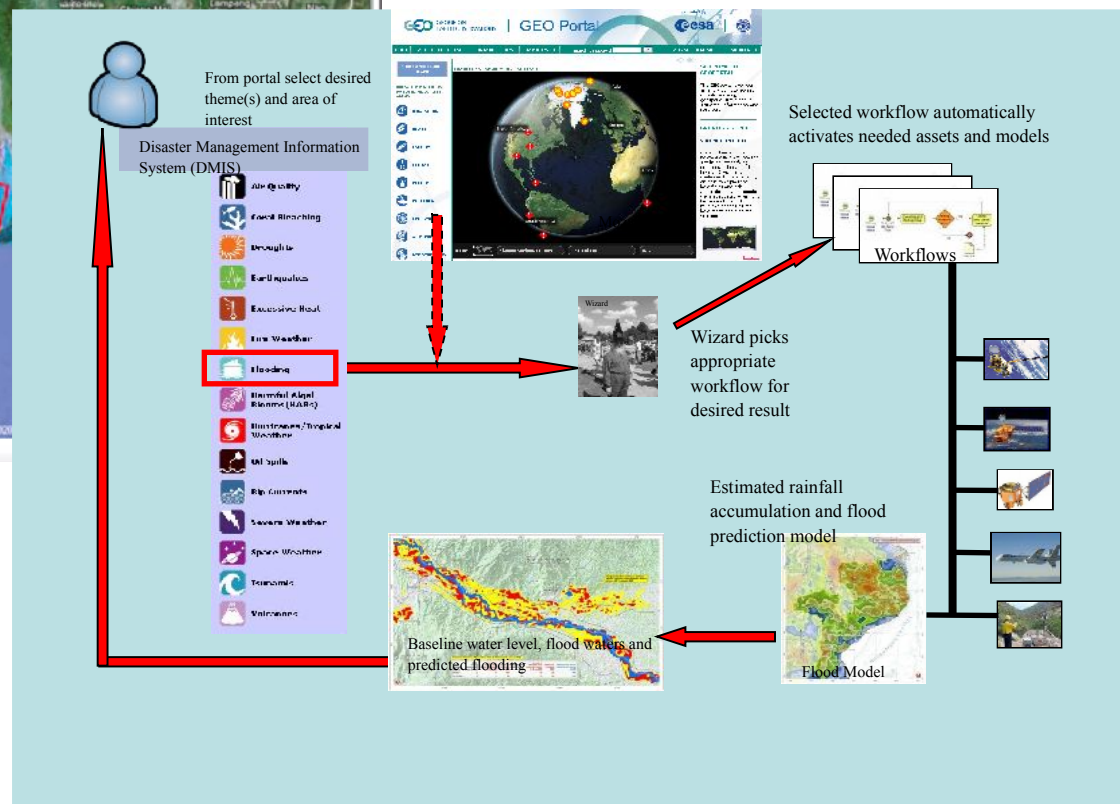
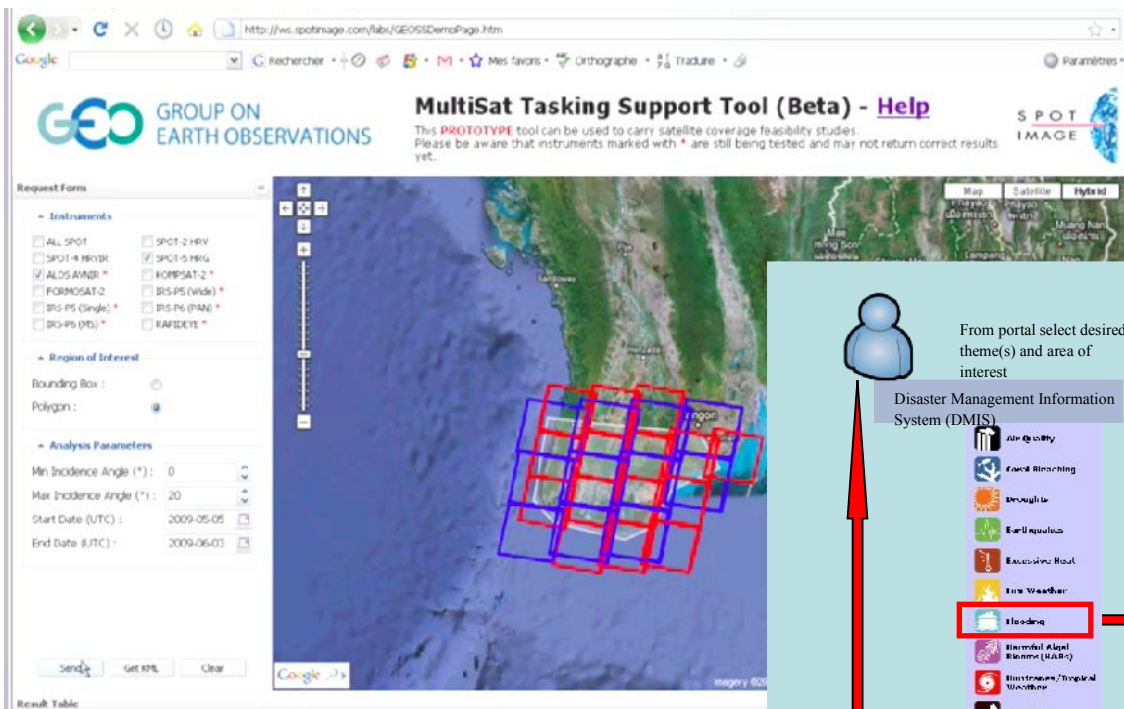
- Elements of the GEOSS Common Infrastructure (GCI) – **Initial Operating Capability established**
- Effective development process for GEO
 - CFP, Kickoff, Execution, etc.
 - **Approximately 120 organizations participated**
 - Methods for international coordination
- **10 Demonstrations** of Initial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

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



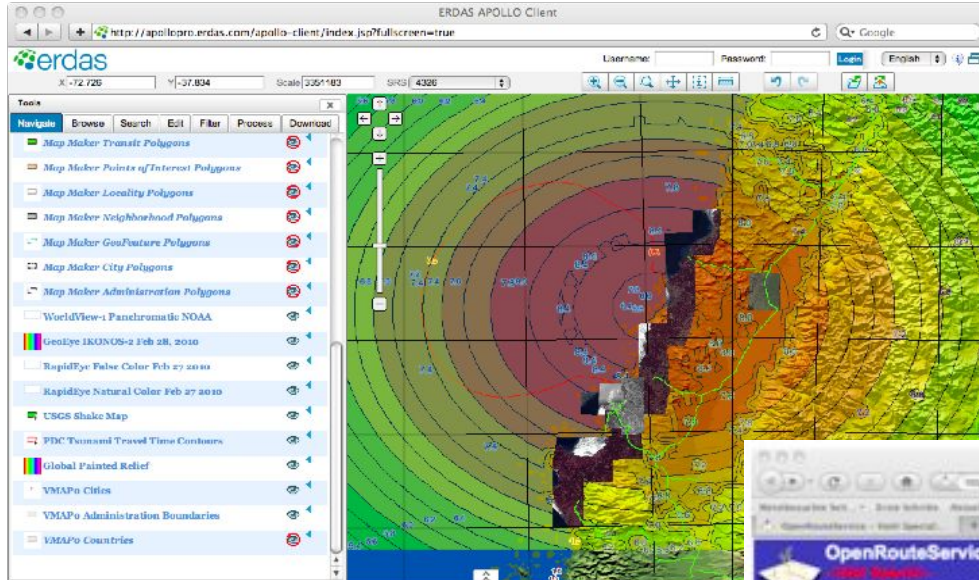
AIP-2 Flood Tasking and Product Generation

Aid levels for disaster relief funding can be released within days, in advance of on-site damage assessment.



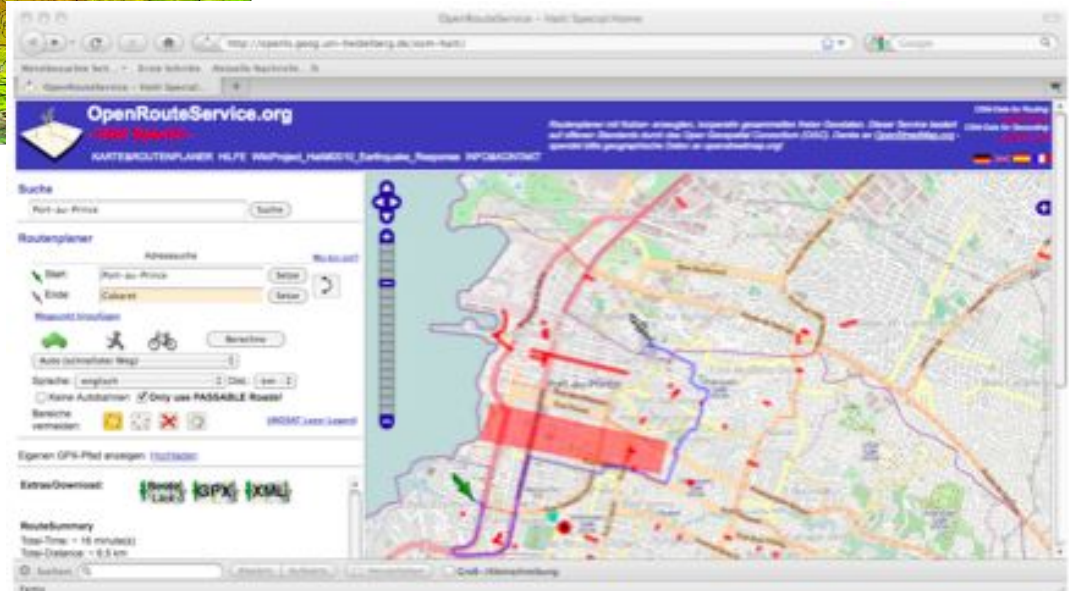


GEOSS Interoperability Arrangements in Disaster Management Response



- Earthquake in Chile
- ERDAS Apollo used in AIP-2

- Earthquake in Haiti
- Response to AIP-3 CFP
University of Heidelberg





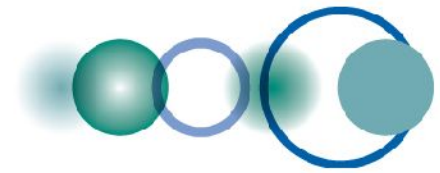
Scenarios in AIP-3 CFP

Scenarios begun in AIP-2

- Disaster Management
- Health: Air Quality
- Biodiversity and Climate Change – Prediction of an Ecosystem Evolution
- Biodiversity and Climate Change – Arctic Spatial Data Infrastructure
- Energy

Scenarios new in AIP-3

- Water – Drought
- Water – Water Quality
- Extreme Precipitation
- Health and the Environment Scenario – Early Warning of Malaria



AIP-3 Working Groups and Leaders

- Disaster Management
 - Didier Giacobbo
 - Arnaud Cauchy
- Water: Quality and Agricultural Drought
 - Will Pozzi
 - Stefano Nativi
 - Liping Di
 - Brad Lee
- Health: AQ and Infectious Disease
 - Stefan Falke
 - François Marques
- Biodiversity and Climate: Ecosystem evolution and Arctic SDI
 - Doug Nebert
 - Stefano Nativi
- Energy: Environmental Impacts
 - Lionel Menard
 - Isabelle Blanc
- End-to-End Engineering
 - Nadine Alameh
 - Josh Lieberman
 - Larry McGovern
- Data Harmonization
 - Herve Caumont
- Data Sharing Guidelines
 - Steve Browdy
 - (CIESIN)
- Vocabularies and Semantics
 - Cristiano Fugazza
 - Roberto Lucchi
 - Masahiko Nagai

4th Phase of the AI Pilot

http://www.earthobservations.org/geoss_call_aip.shtml



The goals of AIP-4 are to:

- Increase on-line access to “Critical EO Priorities Data Sources”
- Ensure that datasets are discoverable through the GCI
- Demonstrate effectiveness of general and specialized software tools for using data.
- AIP-4 involves less new development than previous phases → better focus on access to priority EO data sources.
- AIP-4 schedule is shorter → provide results in time for the GEO-VIII Plenary in November 2011. No Kickoff Workshop as in previous phases.

Architecture Implementation Pilot on the Web

<http://www.ogcnetwork.net/AIP>



General Information

<http://www.ogcnetwork.net/AIP>

Call for Participation - AIP-4

http://www.earthobservations.org/geoss_call_aip.shtml

Responses AIP-4:

<http://www.ogcnetwork.net/node/1677>

AIP - A Vehicle for new GEO S&T Actions?



- *Experience* what GEO/GEOSS means.
- Add value to scientific data through AIP scenarios.
- AIP helps cross-checking GEOSS needs and priorities with industry, government and other S&T communities, outputs can contribute proposals and guidelines to assist (national) R&D agencies in addressing GEO needs.
- AIP provides a forum, visibility, state-of-the-art technology input and a ground-rooted approach to the GCI.

**„The conventional view serves to protect us
from the painful job of thinking“**

(John Kenneth Galbraith, economist)



Thank you!
Any Questions?

In planning:
GEOSS educational
workshop on
climate.
At the OGC TC in
Boulder
(19th -23rd Sept. 2011)

[http://www.opengeospatial.org/
event/1109tc](http://www.opengeospatial.org/event/1109tc)

Thanks to Hervé Caumont and
George Percivall for their support.