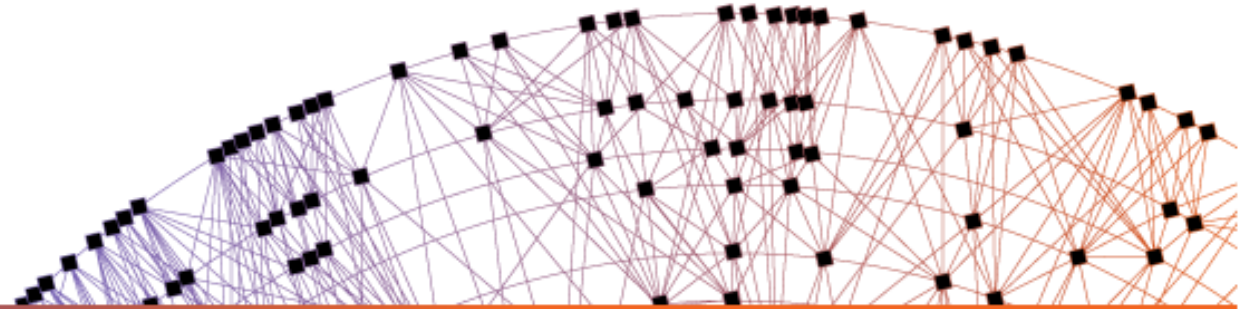


## 8th e-Infrastructure Concertation Meeting

***User perspective:***  
**Example of Federated Earth Science Research  
infrastructures**  
***Socio-Economic Evaluation of e-Infrastructures***

Roberto Cossu / European Space Agency



- **Introduction to GEO-GEOSS**
- **GENESI-DR / -DEC capabilities**
- **Social Economic Benefits of Environmental and Earth Science Infrastructures**

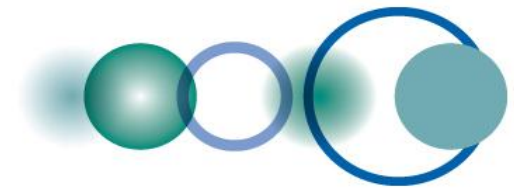


GROUP ON  
EARTH OBSERVATIONS

# GEOSS

THE GLOBAL EARTH OBSERVATION  
SYSTEM OF SYSTEMS

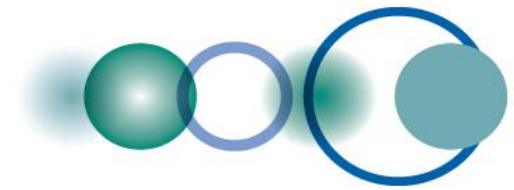




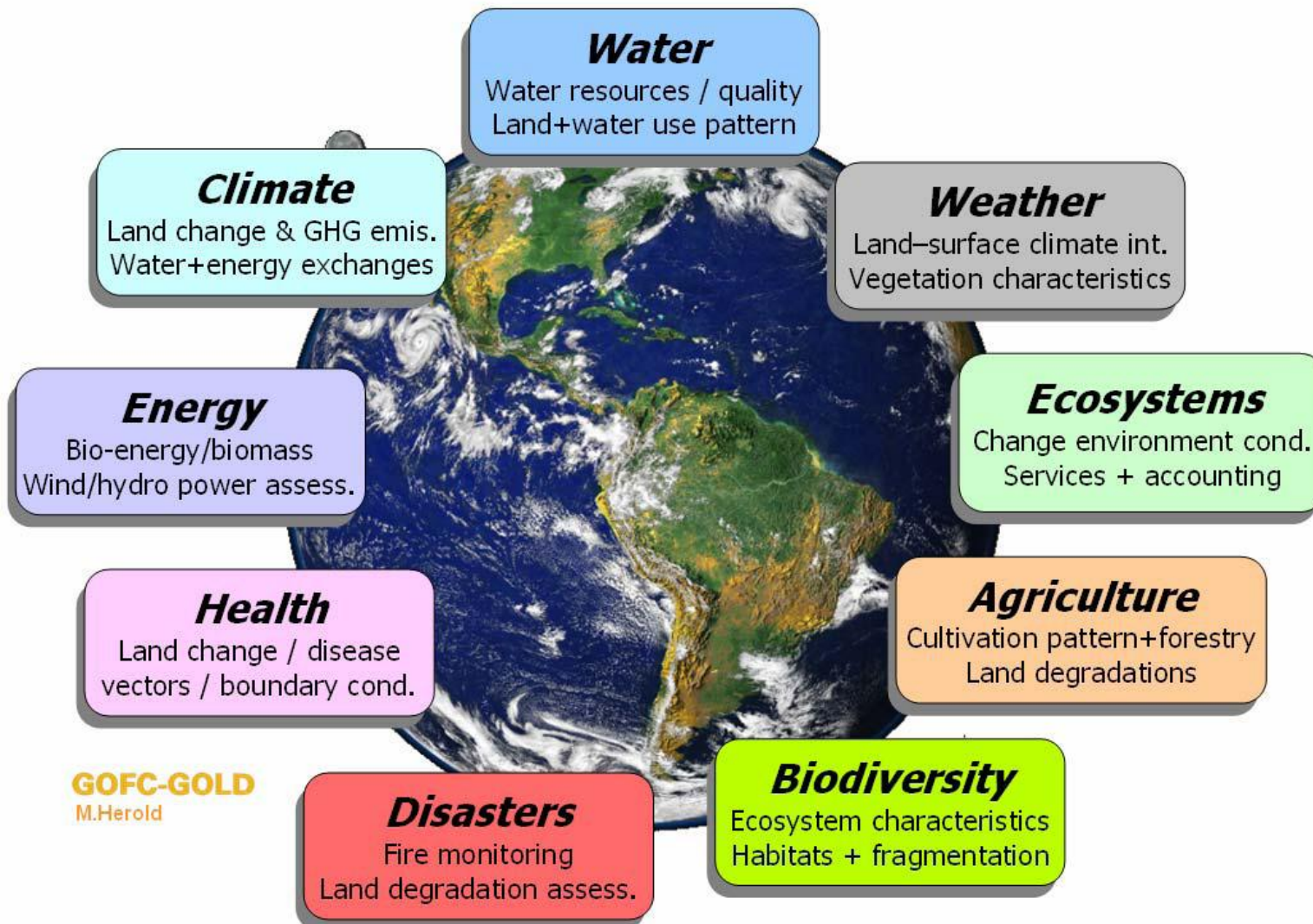
# What is GEOSS/GEO

- GEO **voluntary partnership** coordinating efforts to build GEOSS: A “**system of systems**” composed of contributed EO systems, ranging from primary data collection systems to systems concerned with the creation and distribution of information products.
- Nine “**Societal Benefit Areas**”:
  - disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity.
- GEOSS **10-year implementation plan** for 2005-2015 describes how GEO will achieve comprehensive, coordinated and sustained Earth observations.
- 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.
- As of June 2010, **81 Governments** and EC, plus **58 intergovernmental**, international and regional organisations participate in Plenary
- Four **permanent bodies (Committees)**:
  - ADC - Architecture and Data, STC - Science and Technology,
  - UIC - User Interface, and CBC - Capacity Building Committees.



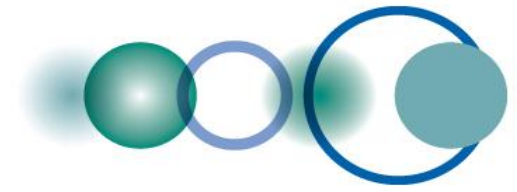


# GEO societal benefit areas

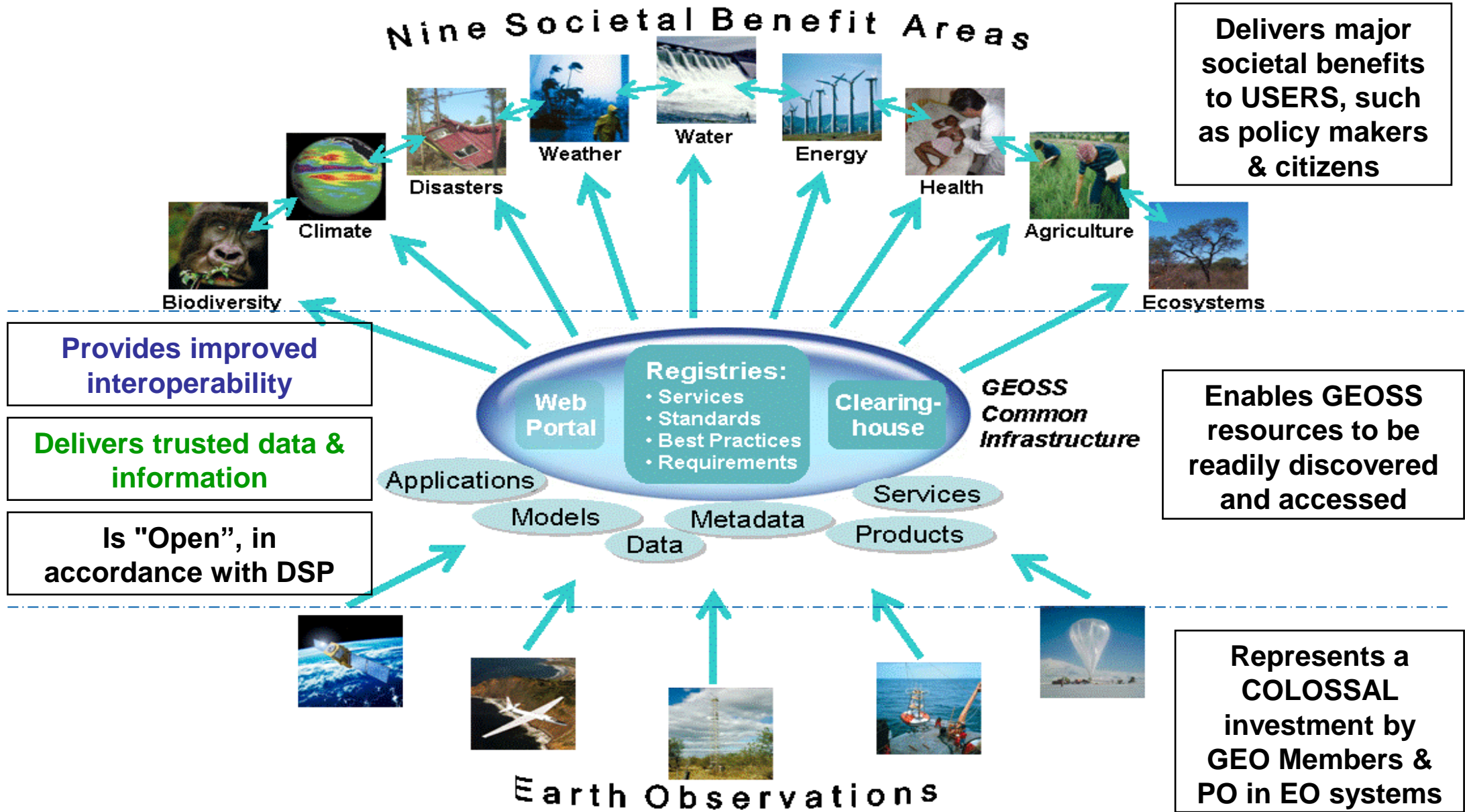


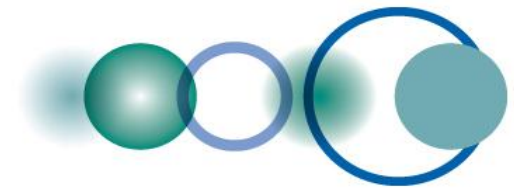
**GOFC-GOLD**  
M.Herold

Information needs and observation requirements for all GEO societal benefit areas emphasize the multitude of benefits from continuous and consistent global land cover observations (from 2007 GEO Ministerial Summit Early Achievement on “Improved global land cover observations and assessments”).

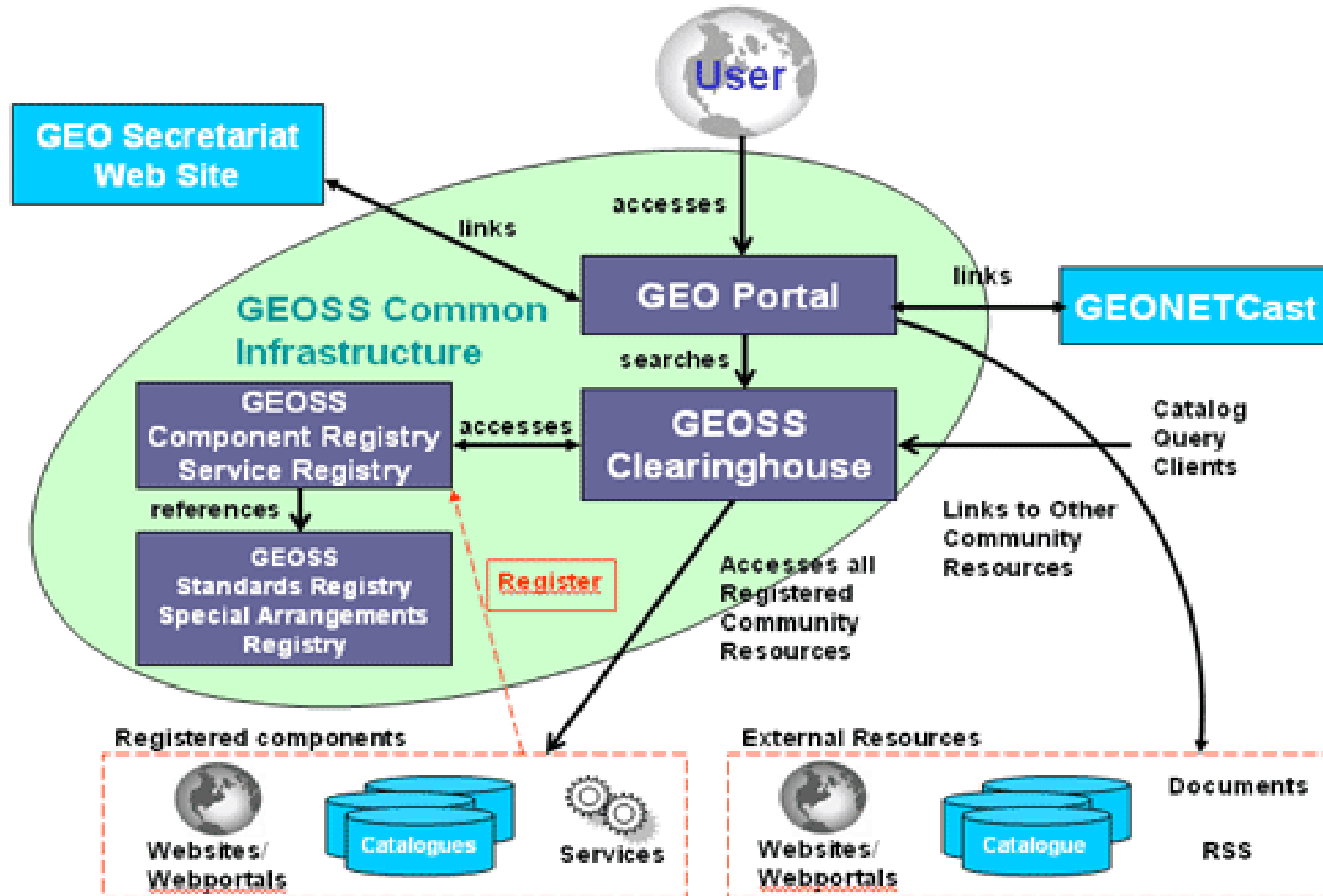


# GEOSS Operational View





# GCI operational interaction diagram





# Overview of GENESI-DEC

*from Digital Repositories  
to  
Digital Earth Communities*



## GENESI-DEC

**INFRA-2010-1.2.3 : Virtual Research Communities**

**Duration : May 1, 2010 – April 30, 2012**

**Total EC funding : 2.15 M€**



EC Grant Agreement no. 261623





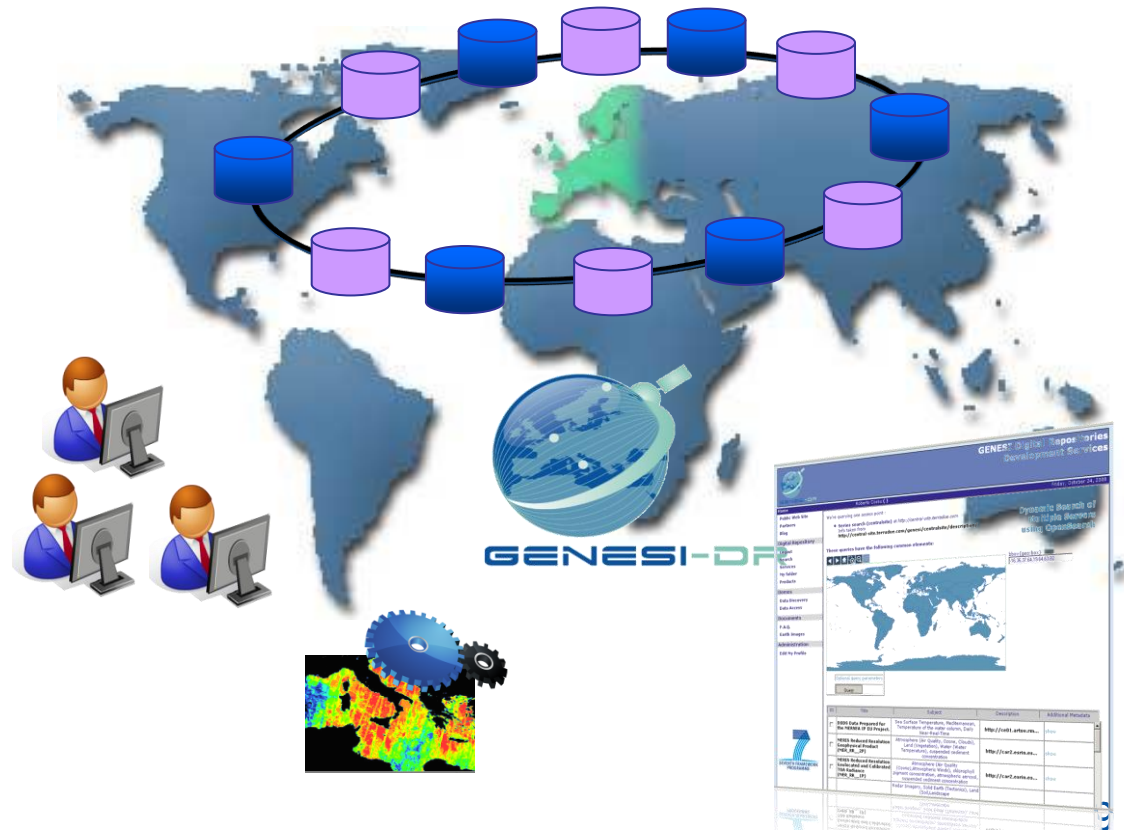
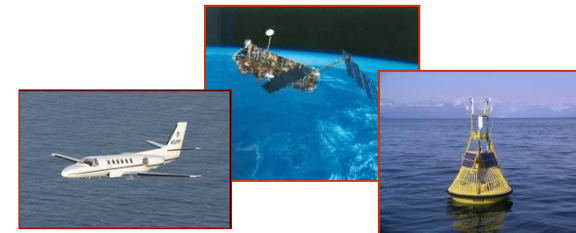
The achievements of the predecessor: **GENESI-DR**

*Ground European Network for Earth Science Interoperations – Digital Repositories*

an **Earth Science e-infrastructure** connecting **Digital Repositories** spread all over Europe

allowing:

- Easy and fast access to **heterogeneous data** (airborne, in situ, satellite) to authorized users (following provider's policies);
- Effective data and **service discovery** capabilities through the same interface in a transparent and homogeneous way;
- **On demand processing** capabilities;
- Easy integration of new Digital Repositories thanks to the **standardization and scalability** (the work done by GENESI-DR will be included by OpenGeospatialConsortium in the next release of *Catalogue Services for the Web* specs);
- **Accessibility through user applications** via the exposed programming interfaces.



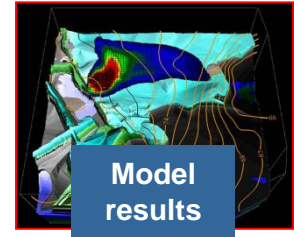
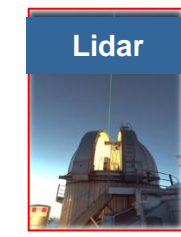
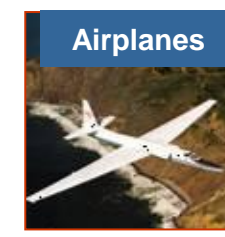
GENESI Digital Repositories Development Services

Title	Subject	Description	Address/URL
2008 Data Repository for the MARCS of the United Kingdom	Marine Biological Association	Marine Biological Association	http://www.marlab.ac.uk
2008 Data Repository for the MARCS of the United Kingdom	Marine Biological Association	Marine Biological Association	http://www.marlab.ac.uk
2008 Data Repository for the MARCS of the United Kingdom	Marine Biological Association	Marine Biological Association	http://www.marlab.ac.uk

→ GENESI-DR

# The current deployment topology

- 166 heterogeneous series
- Approximately 4,000,000 records!!!
- All records are **secured** when this is required by Data Owners



- **GENESI-DR** has successfully set up many collaborations with projects and organizations:
  - **GRID and Research Infrastructures**, e.g. EGEE, SEADATANET, Cyclops, SEE-GRID-SCI, Metafor..
  - The GENESI-DR has contributed to the **e-IRG (e-Infrastructure Reflection Group)** Report on Interoperability Issues in Data Management
  - **EC GEO** - Research science community, e.g. EnviroGRIDS...
  - **International environmental programmes**, e.g. Charter for Disaster Management, GEO/GEOSS, CEOS, International Society for Digital Earth...
- ...Many more relations established in Europe and world-wide...

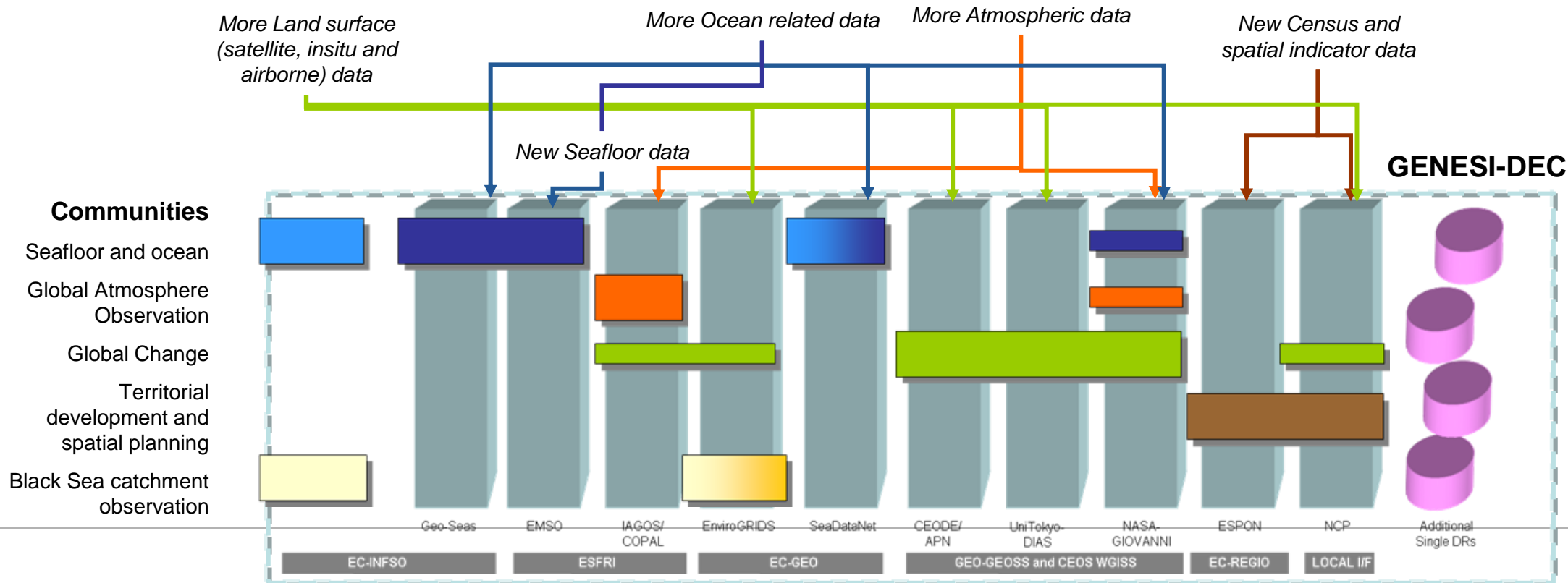




# Adding data and addressing new communities

## GENESI-DEC:

- Providers come from Europe, US, China, Japan (agreements already reached)
- Not only “GENESI-fication” of single DRs but (complex) *interoperation with data infrastructures* (included ESFRI projects)
- More (and new) *data (greater focus on non-satellite data)*
- *More communities* (offered with data and a large set of *customizable services*)

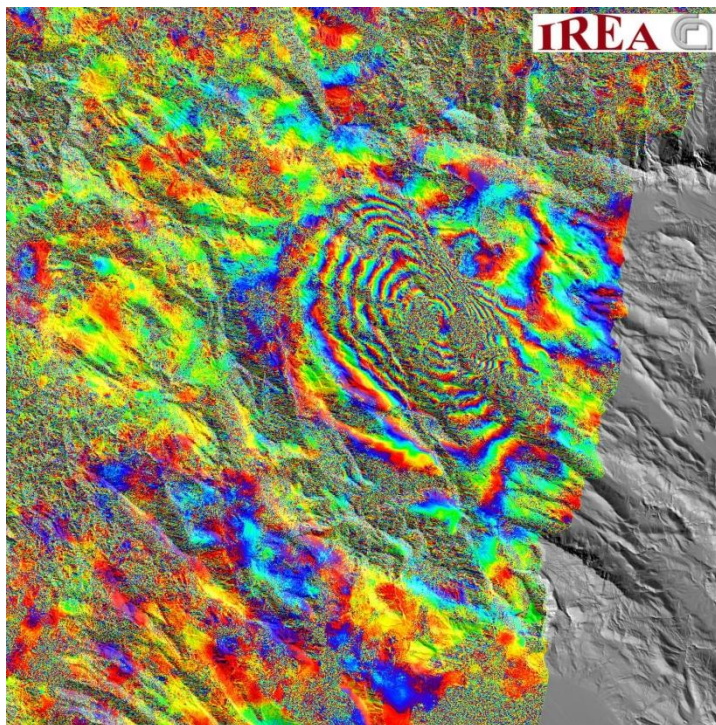
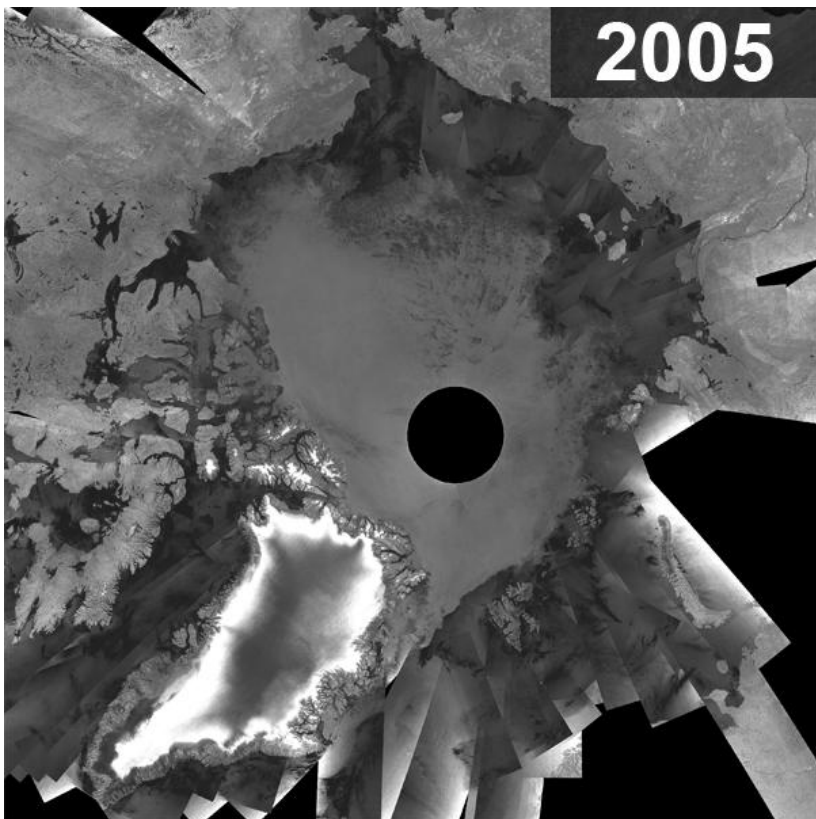




- Some headlines
  - Reducing loss of life and property from natural and technological *disasters*
  - Understanding environmental factors affecting human *health* and well being
  - Improving management of *energy* resources
  - Understanding, assessing, predicting, mitigating and adapting to *climate* variability and change
  - Improving *water* resource management through better understanding of the water cycle
  - Improving *weather* information, forecasting and warning
  - Improving the management and protection of terrestrial, coastal and marine *ecosystems*
  - Supporting sustainable *agriculture* and combating desertification
  - Understanding, monitoring and conserving *biodiversity*



# Social Economic Benefit examples

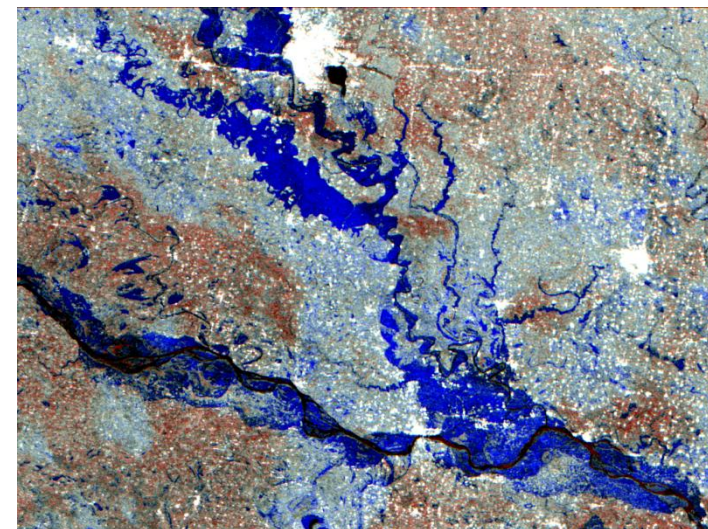


April 2009 - Few hours after the earthquake it was possible to produce the interferogram analysing in parallel timeseries of Envisat Satellite products

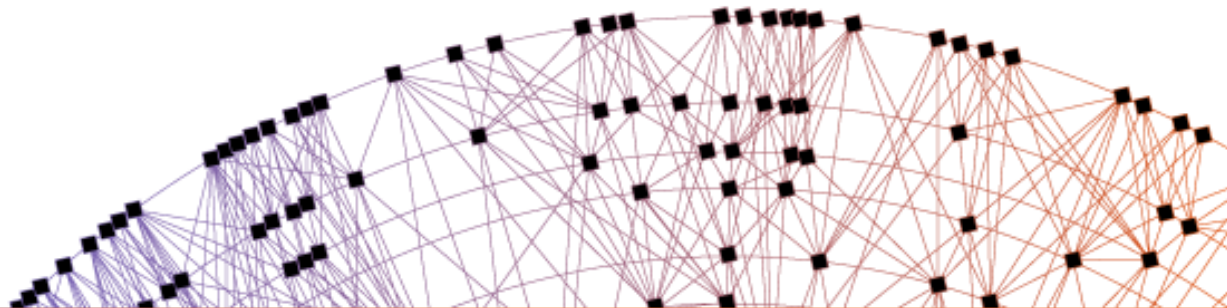
14 September 2007 - Satellites witness lowest Arctic ice coverage in history



August 2007 – India floods maps







Supporting grid and high performance computing reporting across Europe

**Thank you!**

**[roberto.cossu@esa.int](mailto:roberto.cossu@esa.int)**