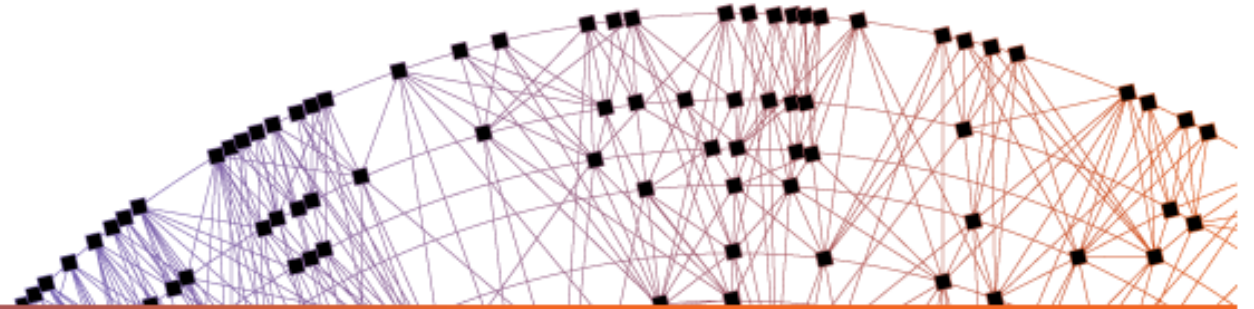


8th e-Infrastructure Concertation Meeting

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**

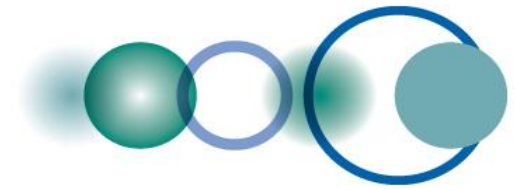


GROUP ON
EARTH OBSERVATIONS

GEOSS

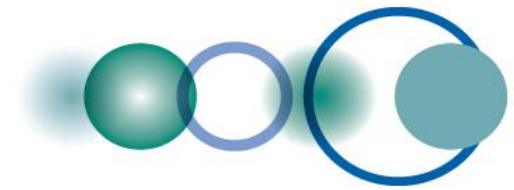
THE GLOBAL EARTH OBSERVATION
SYSTEM OF SYSTEMS



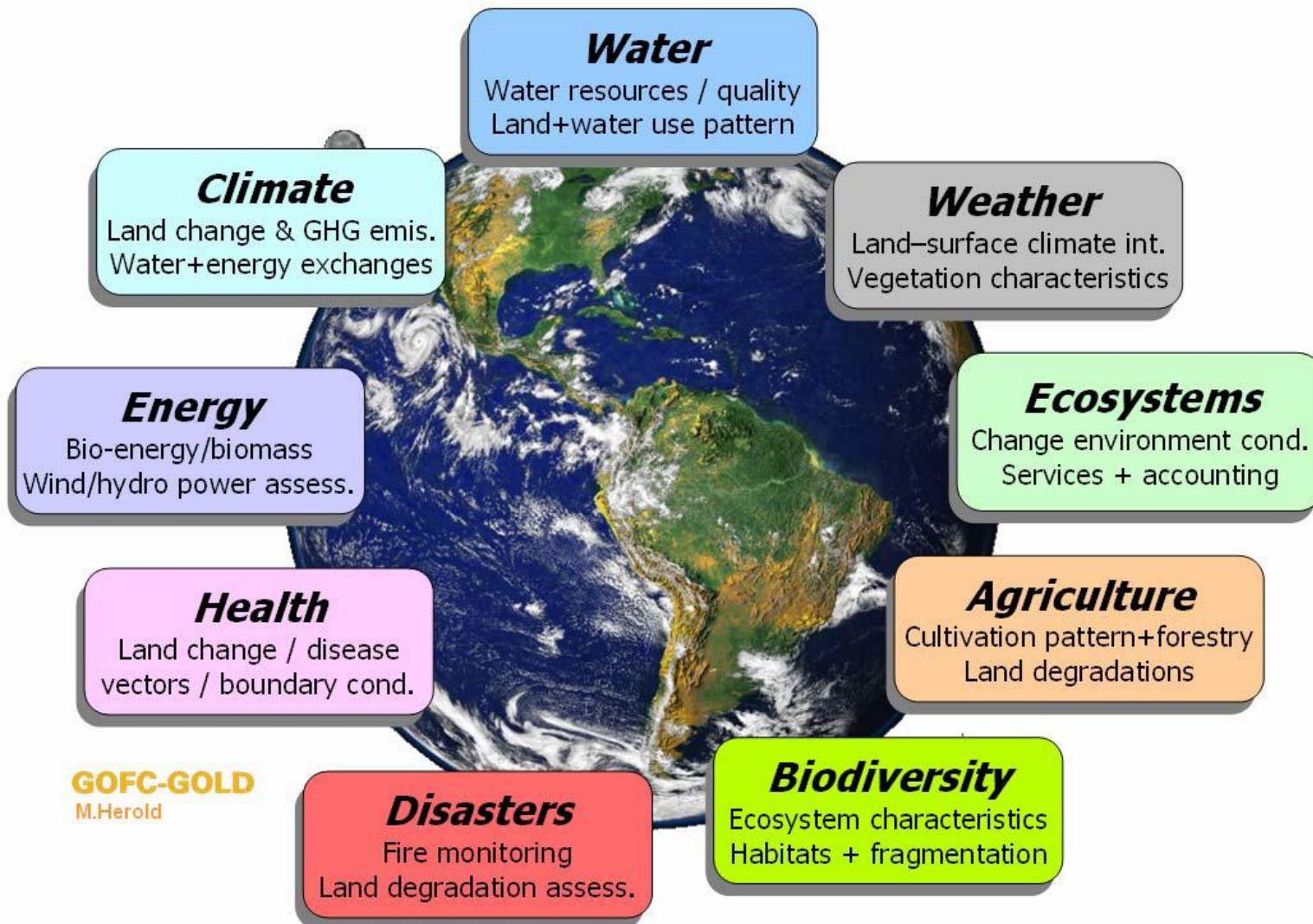


What is GEOSS/GEO

- 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.

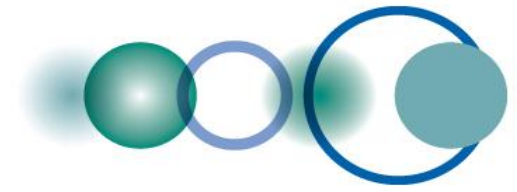


GEO societal benefit areas



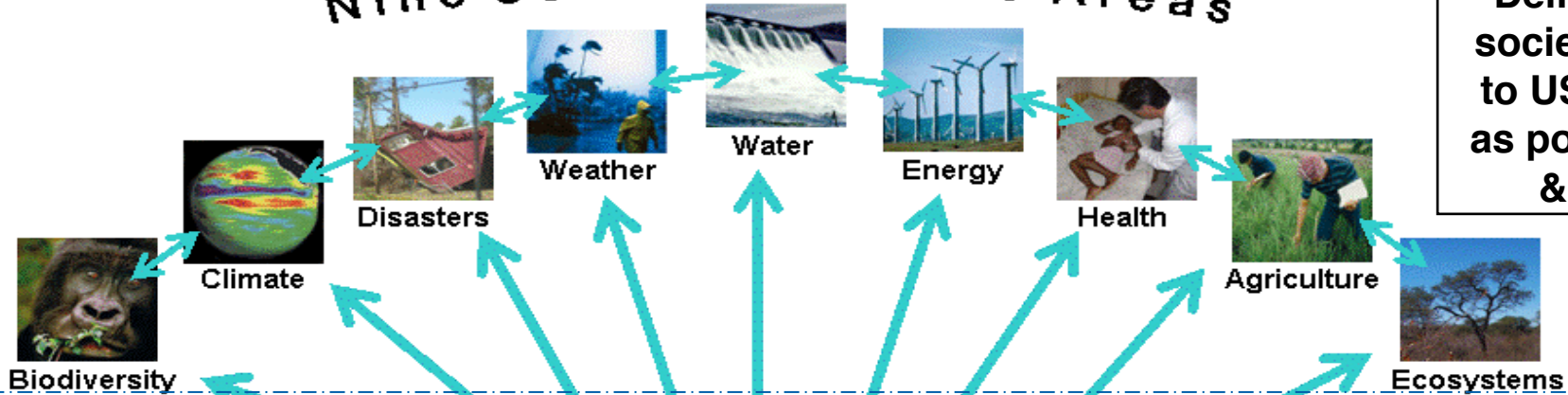
GOFC-GOLD
M.Herold

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

Nine Societal Benefit Areas



Delivers major societal benefits to USERS, such as policy makers & citizens

Provides improved interoperability

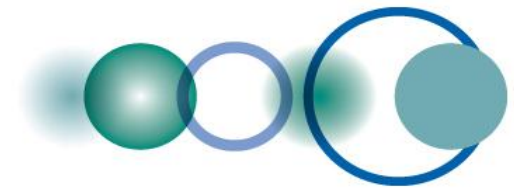
Delivers trusted data & information

Is "Open", in accordance with DSP

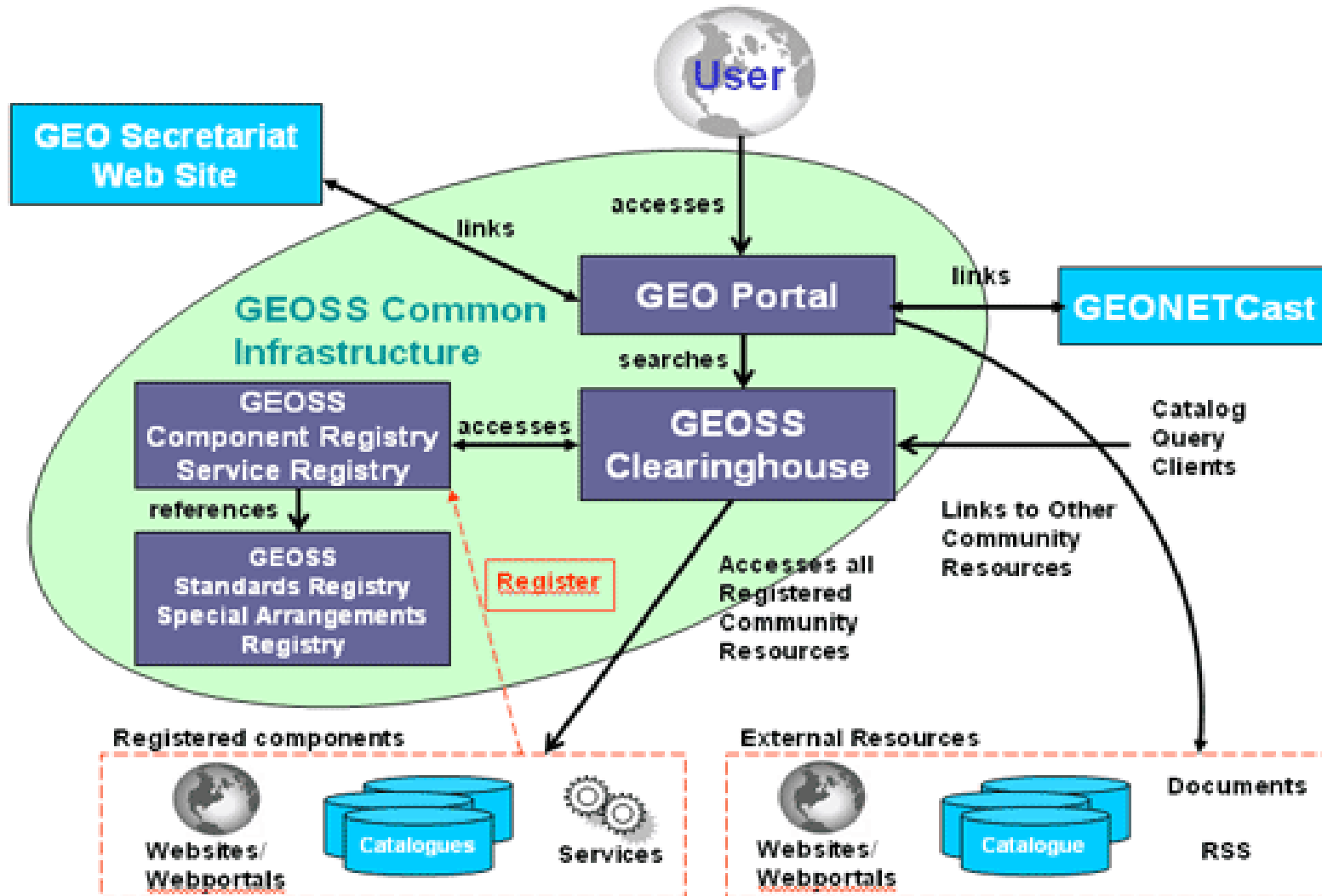
Enables GEOSS resources to be readily discovered and accessed

Represents a COLOSSAL investment by GEO Members & PO in EO systems

Earth Observations



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



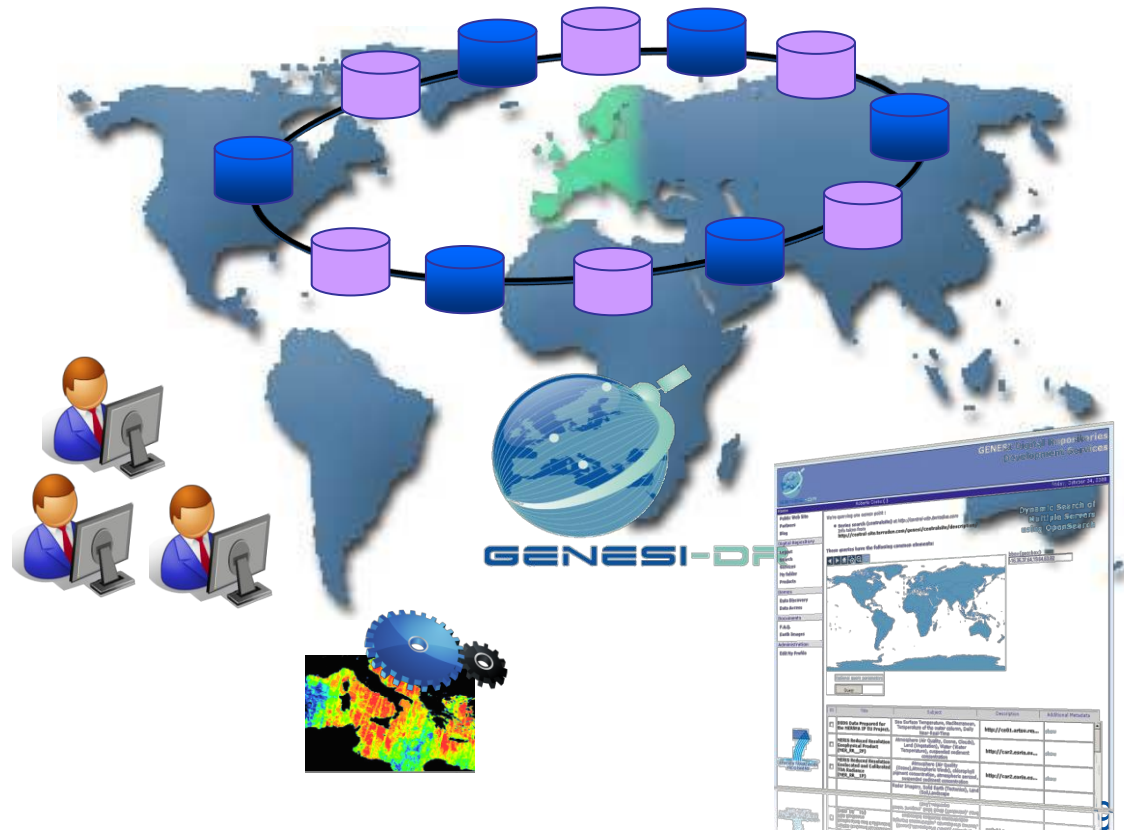
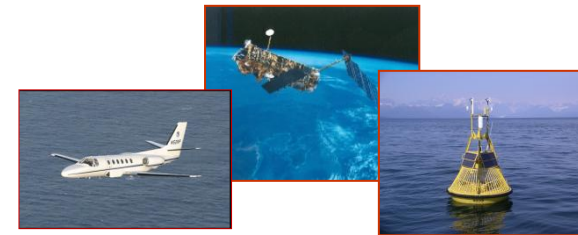
The achievements of the predecessor: **GENESI-DR**

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

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

allowing:

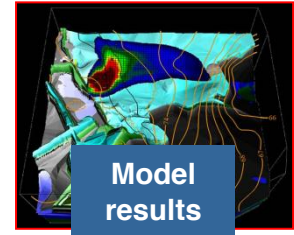
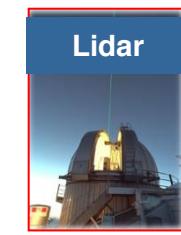
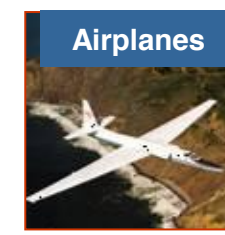
- Easy and fast access to **heterogeneous data** (airborne, in situ, satellite) to authorized users (following provider's policies);
- Effective data and **service discovery** capabilities through the same interface in a transparent and homogeneous way;
- **On demand processing** capabilities;
- Easy 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-DR

The current deployment topology

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



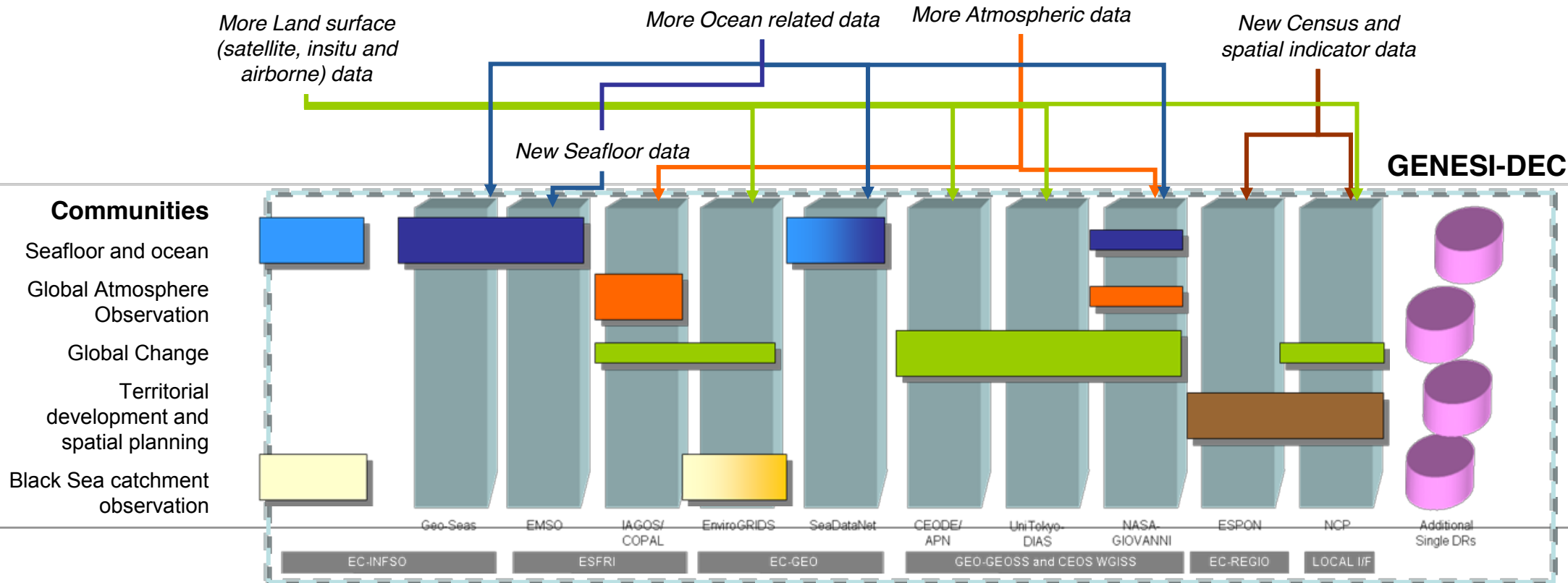
- **GENESI-DR** has successfully set up many collaborations with projects and organizations:
 - **GRID and Research Infrastructures**, e.g. EGEE, SEADATANET, Cyclops, SEE-GRID-SCI, Metafor..
 - The GENESI-DR has contributed to the **e-IRG (e-Infrastructure Reflection Group)** Report on Interoperability 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

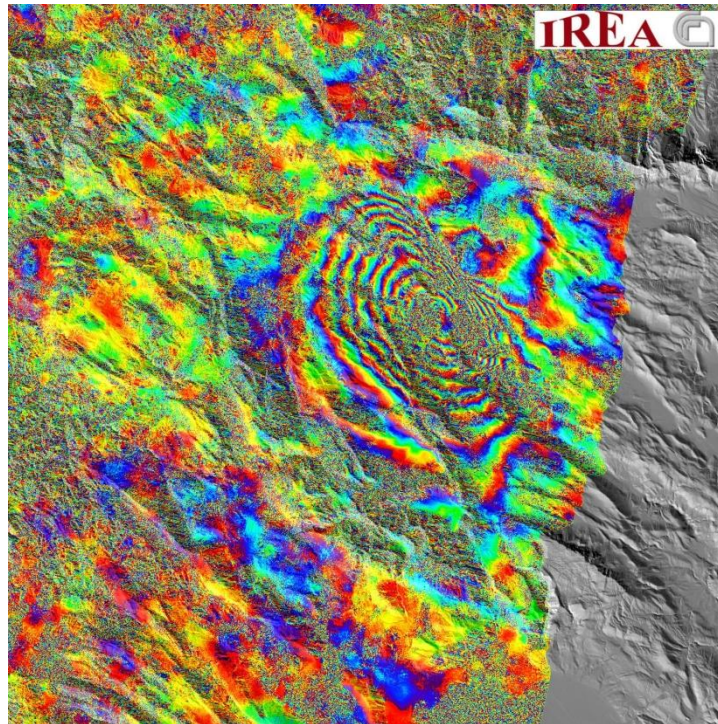
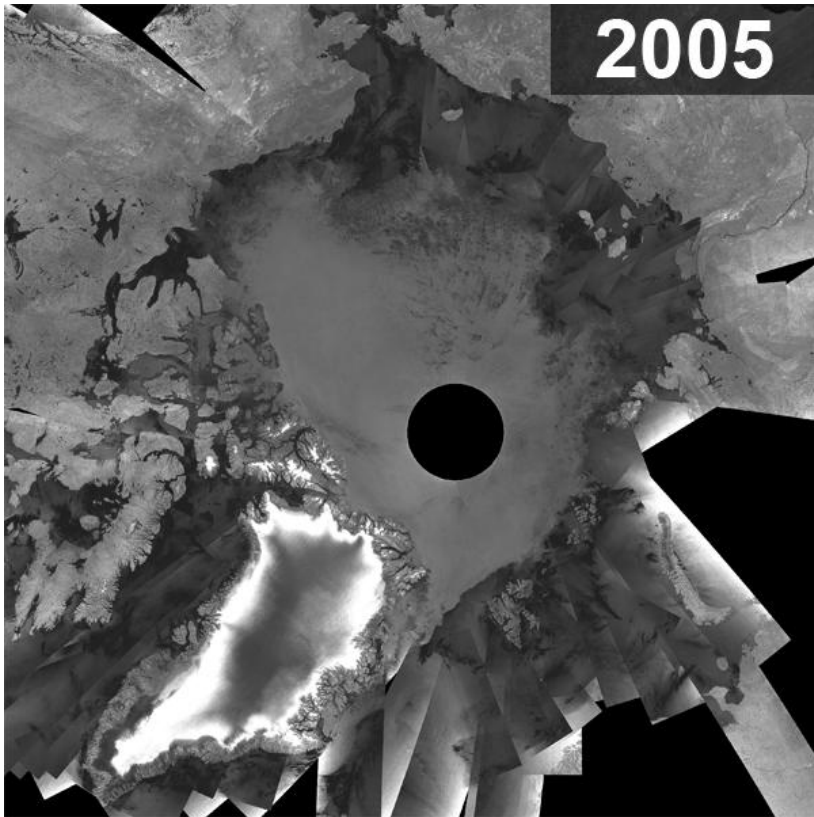
GENESI-DEC:

- 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

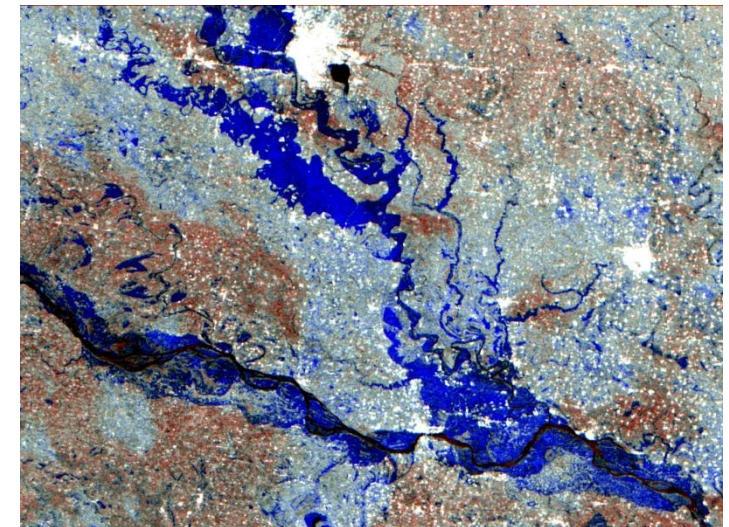


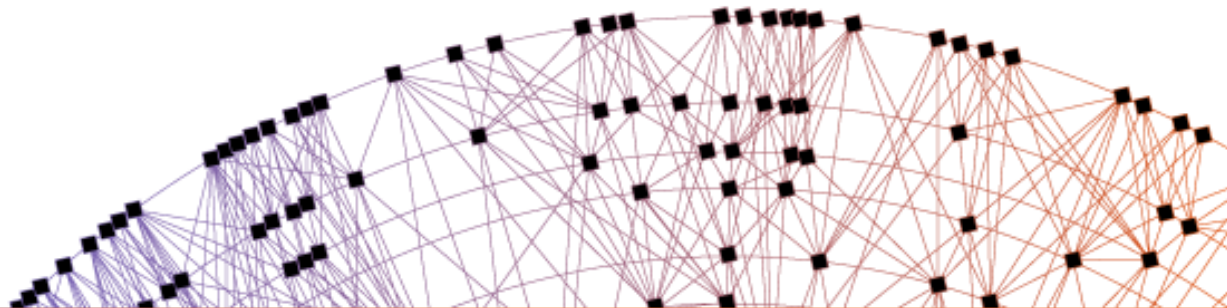
April 2009 - Few hours after the earthquake it was possible to produce the interferogram analysing in parallel timeseries of Envisat Satellite products

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!

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