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Socio-economic impact of Environmental Research Infrastructures

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The assessment of socio-economic impact for large distributed RIs lacks well-established models

This is the case of Environmental RIs

To be considered:

Economic impact

Excellence research

Services for society

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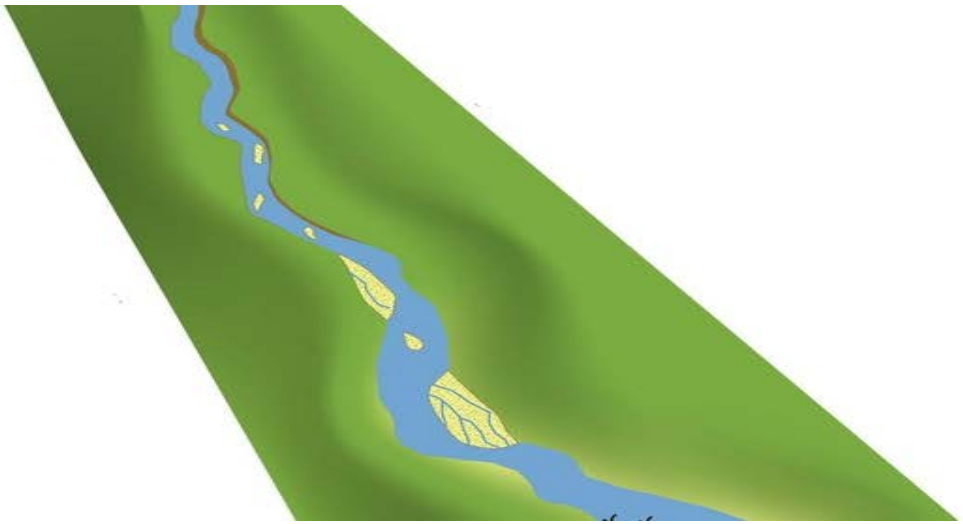
Economic Impact
The Upstream-Downstream concept

Upstream:

Investments to build the Research Infrastructure



Downstream:

Investments built on the Research Infrastructure data and services

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Economic impact

Upstream Impact:

- IAGOS instruments are developed/maintained thanks to **partnership with private companies** and research institutions.
- Investments by IAGOS to design new instruments and prepare other types of aircraft for future operation.
- New services developed and **jobs created** or at least secured thanks to IAGOS in aeronautical subcontracting companies in France (Sabena Technics, LGM) and in Germany (Enviscope, GFM).

Downstream Impact:

- IAGOS data are used by more than 500 groups of **scientists** for process studies, analysis of climatologies and trends, model & satellite validation.
- IAGOS data are used by **Copernicus** Atmospheric Services for validation of models in forecast and reanalysis; provision of real RT data for verification; new services.
- New services developed with **industry** on flight safety improvement and airport air quality assessment.

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Economic impact for ENV RIs

Upstream impact

- Investments in building the RIs
- Technical cooperation with industry in the construction phase
- Job creation

PS as supplier
Usually lower respect to other domains

Downstream impact

- Capacity building and transfer of knowledge to PS
- Technology innovation (new sensors development)
- Open new business opportunities for the local and global economy
- Excellence in research
- Services for society

PS as user
Open data/Data value
Socio-economical impact mainly with RI in operation
Societal impact needs to be quantified

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Environmental challenges now and in future

Key role for Environmental Research Infrastructures

Key role for ENV RIs

Pan-European ENV RIs are keys to:

➢ Addressing the most important challenges in environmental sciences.

➢ Integrating capabilities on air, in rivers, lakes and seas, on land, fixed or mobile, new and existing facilities, together with models for the understanding of processes.

➢ Taking advantage of Europe's diversity of landscapes, ecosystems and climates.

➢ Pushing European capacities towards deeper integration and cooperation.

➢ Providing nests for the Research – Education – Innovation triangle.

➢ Developing and improving effective and efficient technologies for mitigation and adaptation, not only as a result of climate change but also of pollution, hazards, etc.

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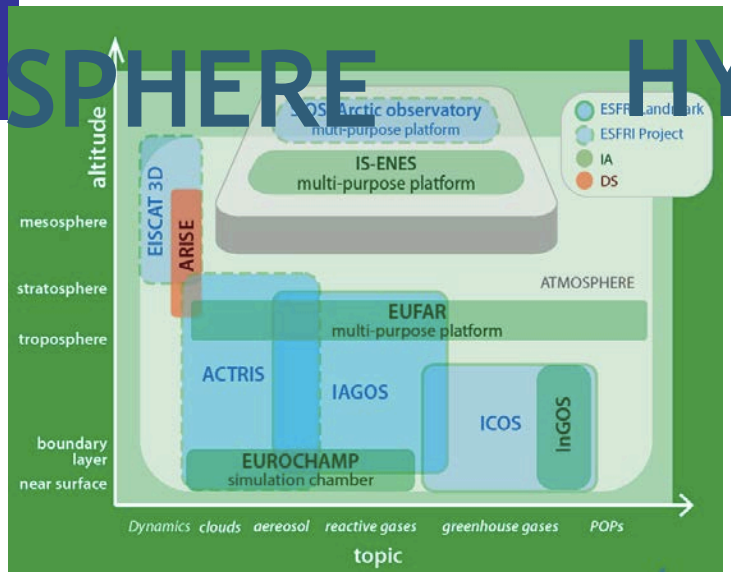
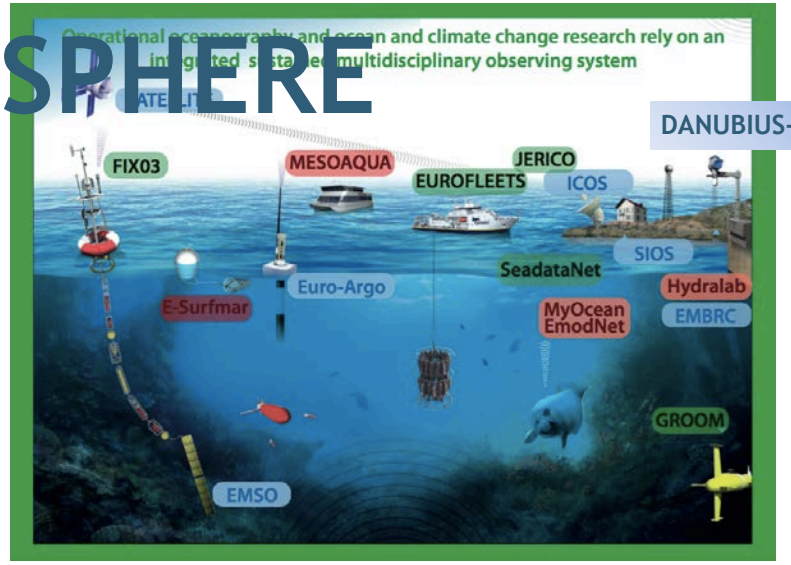
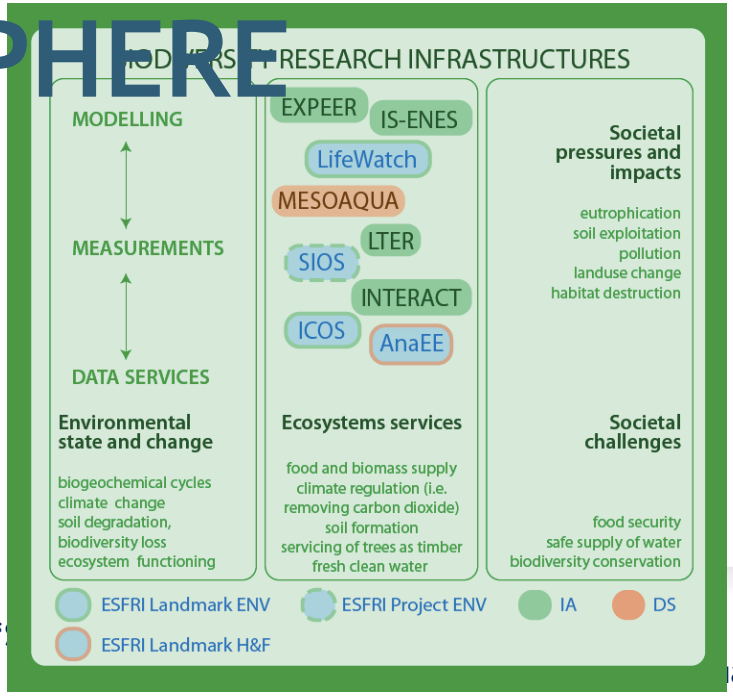
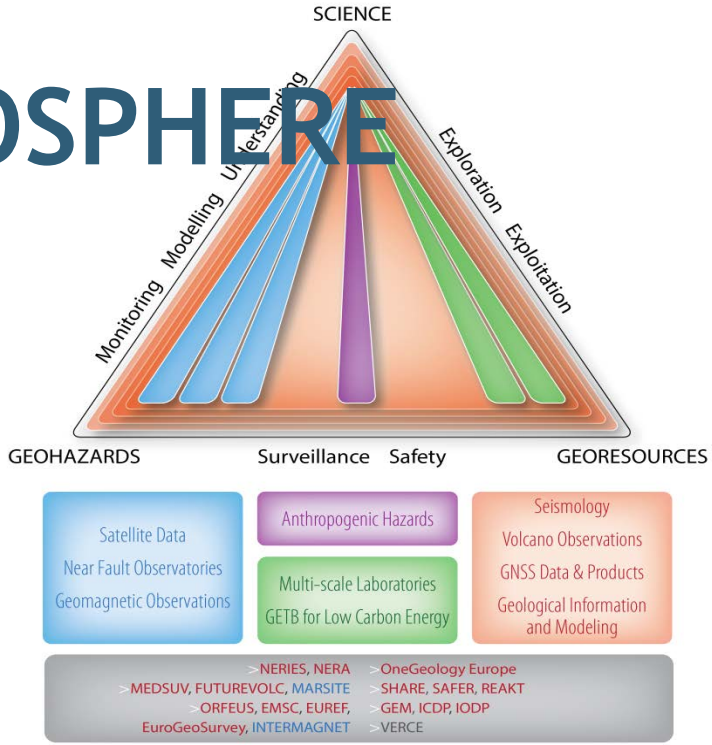
Env RIs: Societal impacts examples

ICOS Integrated Carbon Observation System	→	Crucial information for decarbonisation and Climate Change mitigation.
IAGOS In-service Aircraft for a Global Observing System	→	Assessment of airport air quality and aviation impact
ACTRIS Aerosols, Clouds, and Trace gases Research Infrastructure	→	Climate Change and Air Quality data
EPOS European Plate Observing System	→	IT innovation for a better risk management of environmental hazards
EURO-ARGO European contribution to the international Argo Programme	→	Support the implementation of the EU Marine Policy









MOSPHERE

HYDROSPHERE

DANUBIUS-R

OSPHERE

GEOSPHERE

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ary 2018, Bologna

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Env RI landscape

Environment is a complex system with different components (atmosphere, ocean, land, solid-Earth, biodiversity and ecosystems; and all strongly linked and interdependent) and a multidisciplinary approach is requested.

All the RIs in the environmental domain are distributed, as expected by nature reflecting the diversity of the geographical areas.

It is expected that a better coordination and integration of the data and services provided by the single RIs would improve the societal impact. This activity is ongoing in the ENVRIplus project.

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ENV RIs: Link to other domains

Energy - Environmental impact of Energy Supply and Consumption

- Specific instruments development for wind Energy and solar Energy application
- Carbon capture and storage verification
- Geothermal heating

H&F - Natural and anthropogenic environmental changes impact on food and health

- Food security, aquaculture, Environmental medicine – water quality
- Air quality and impact on health; air quality and extreme weather events and impact on agriculture
- Marine environmental risk and marine food
- Vectors for diseases and parasites, ecosystem impacts on/from agriculture and aquaculture. Genomics and non-human biobanks

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ENV RIs: Link to other domains

PSE

Technological development;
Physical process studies of the environmental/Earth system;
Space-Earth physics

SCI

Natural and anthropogenic environmental changes impact on society
air quality and climate change impact on cultural heritage; impact on life

DIGIT

High Performance Computing for
- Climate models
- Large volume data processing

e-Tools
- VRE (specific ENV applications)
- data interoperability
- data access/curation/.....

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Summary

➢ Lacking of well-established models for the assessment of socio-economic impact of ENV RIs

➢ For the economic impact, downstream impact is more relevant for ENV RIs . PS as supplier, user, customer

➢ Time is an important factor: RIs services have to be full developed in order to have impact

➢ Value of the data

➢ Societal impact very relevant: needs to be quantified

➢ Societal impact is expected to increase with the increase of the interoperability of data and services of the ENV Ris

➢ A stronger impact is expected with the proper link of ENV RIs data and services to other disciplines

Acknowledgments

ENVRI community, al the ESFRI ENV RIs, ESFRI ENV SWG