



Preparatory Phase for the pan-European
Research Infrastructure DANUBIUS-RI
“The International Centre for advanced
studies on river-sea systems”

DANUBIUS-RI

The International Centre for advanced studies on river-sea systems

Making River-Sea Systems Work

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**European
Commission**

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The Societal Influence of River-Sea Systems



RIVER-ESTUARIES



CULTURAL HERITAGE



FISHING



HABITAT PRESSURES



INDUSTRIAL INFRASTRUTURE



RECREATION



NAVIGATION



CATCHMENT CHANGE



FLOODING



ENERGY



DAMS



RIVER-DELTA



DROUGHT



GEO-HAZARDS



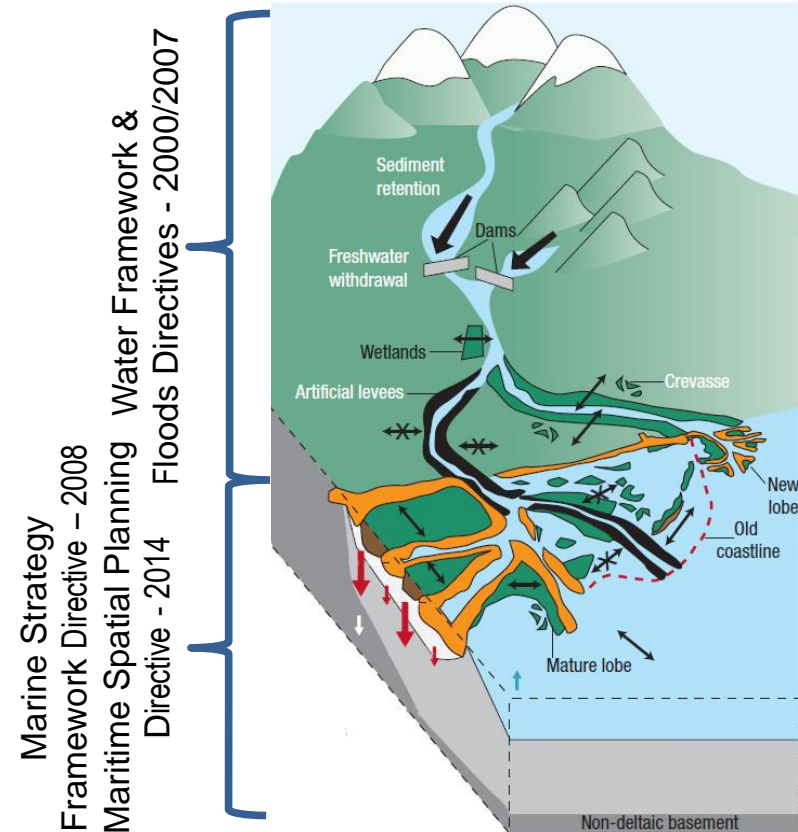
POLLUTION

The DANUBIUS-RI concept

DANUBIUS-RI aims at addressing scientifically and efficiently the sustainability of rivers, seas and coastal areas: the whole hydrological basin

The concept of DANUBIUS-RI would be difficult to achieve and maintain in any organisational scheme other than a single, centralised management (e.g. an ERIC)

...Inform future integrated water strategy frameworks



(from Day & Giosan, Nat. Geosci., 2008)

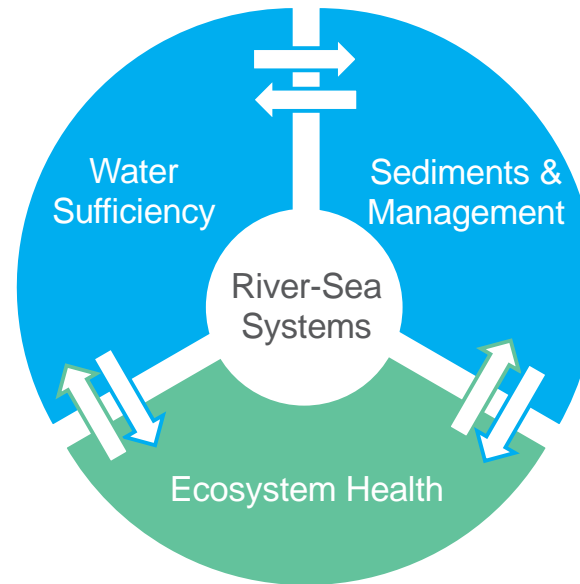
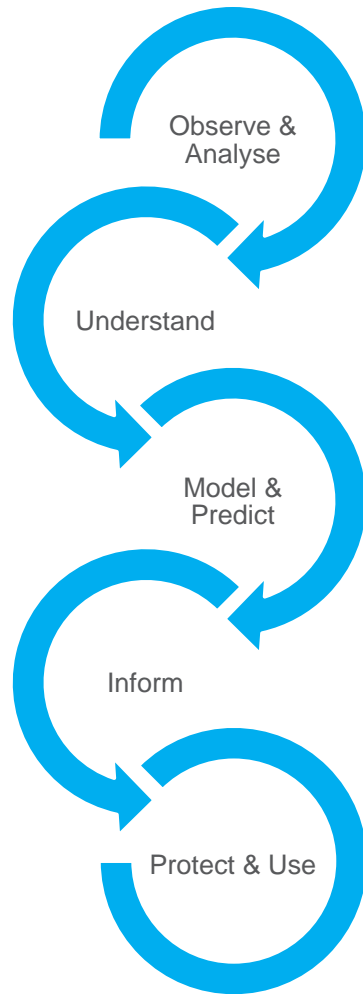


The DANUBIUS-RI concept

- pan-European **Research Infrastructure (RI)** to study River-Sea Systems, comprising rivers and catchments, transitional waters (e.g. estuaries, deltas) and coastal seas
- to bring together relevant expertise and data
- to enable research based on **systems approach**, overcoming disciplinary, regional and national boundaries
- to better understand **ecosystem functions**, identify cause-effect-relationships, address grand challenges and thus sustain **ecosystem services**
- **Coordination:** GeoEcoMar, Romania
- **Consortium:** currently 29 partners in 16 countries
- **Timeline:** European Strategy Forum for Research Infrastructures (ESFRI) Roadmap 2016, Preparatory Phase until 2019 (H2020 Project DANUBIUS-PP), Implementation Phase until 2022, Operation for 20-30 years



The DANUBIUS-RI concept



The geographical distribution of the DANUBIUS-RI components

Hub (Romania)

Nodes:

Observation (UK)

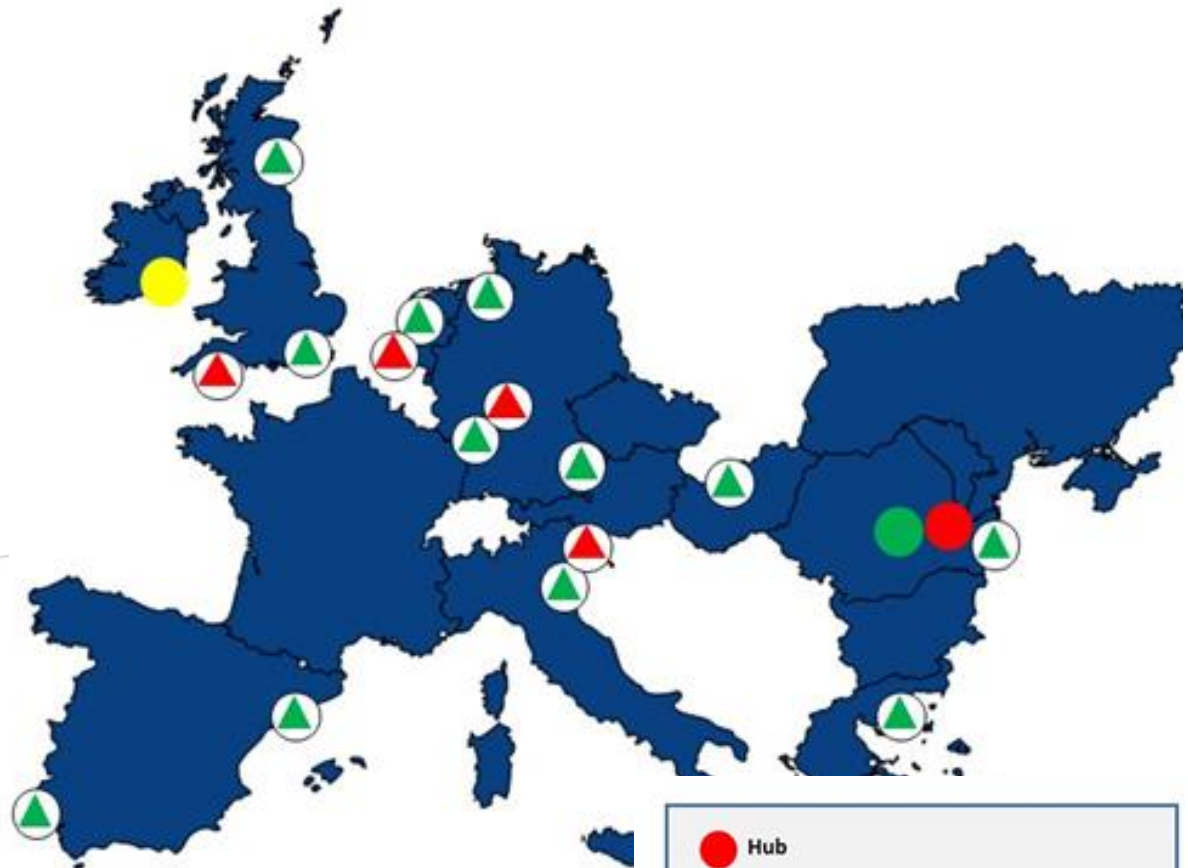
Analysis (Germany)

Modelling (Italy)

Social & Economic (Netherlands)

Data Centre (Romania)

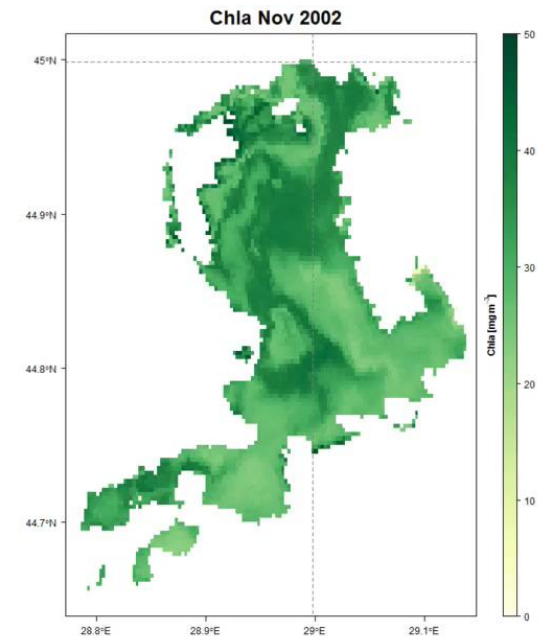
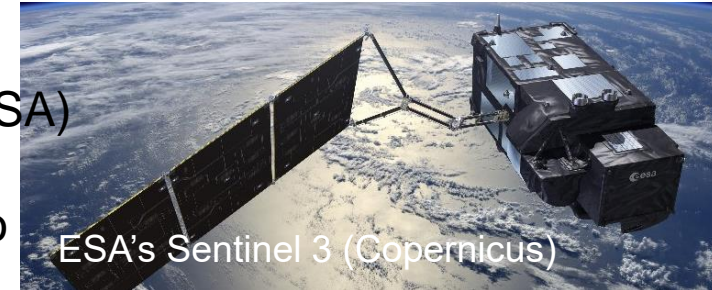
Technology Transfer Office (Ireland)



- Hub
- ▲ Node Lead Institution
- Technology Transfer Office
- Data Centre
- ▲ Supersite
- Consortium partners

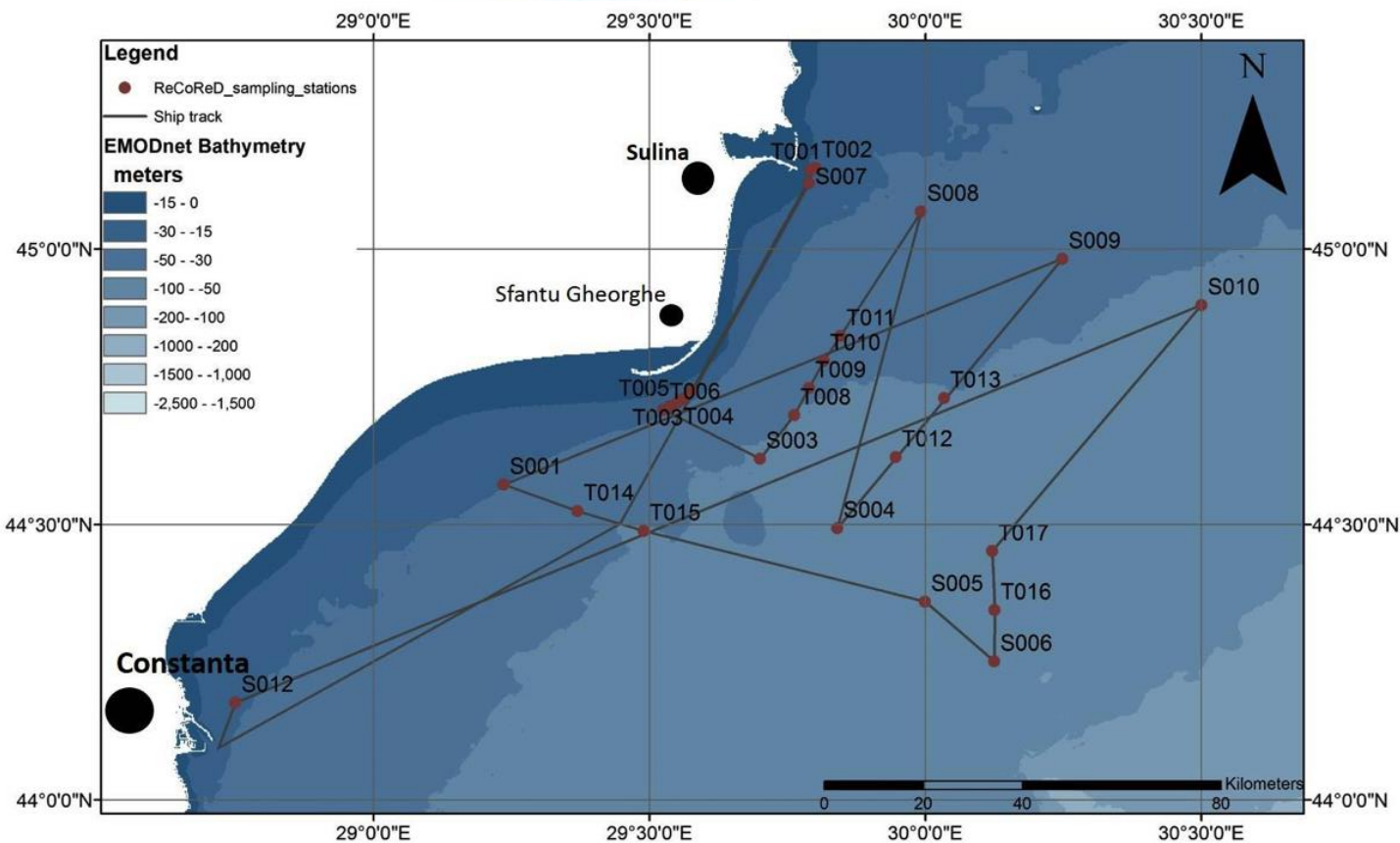
The Observation Node

- Capitalising on the new generation satellites (ESA)
- Deployment of in-situ sensor networks
- Provide real / near real observation capability to address societal challenges
 - Water Quality
 - Emerging Pollutants
 - Biogeochemical cycling
 - Land cover
- Responsible for:
 - Standardisation of instrumented Buoys and sampling across supersites
 - Calibration
 - Training
- Validate EO data including citizen science and promoting environmental stewardship



10 year MERIS time series
(Razelm Lagoon)

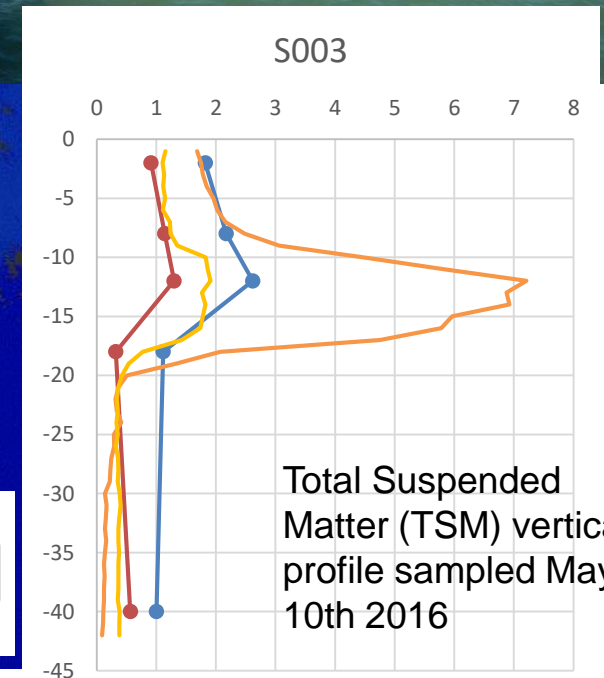
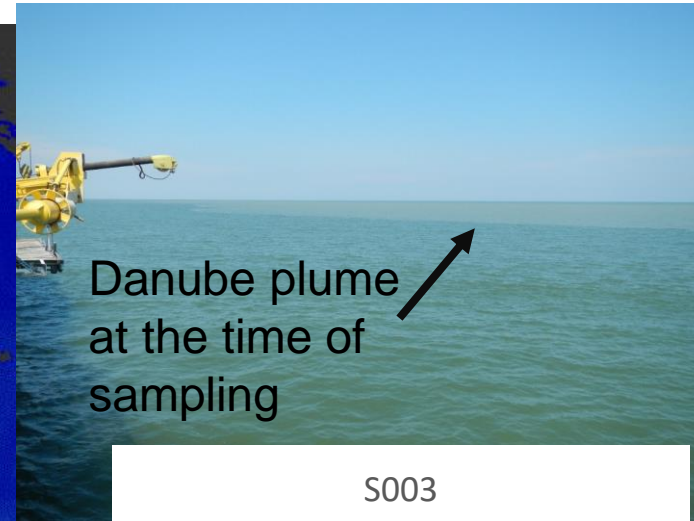
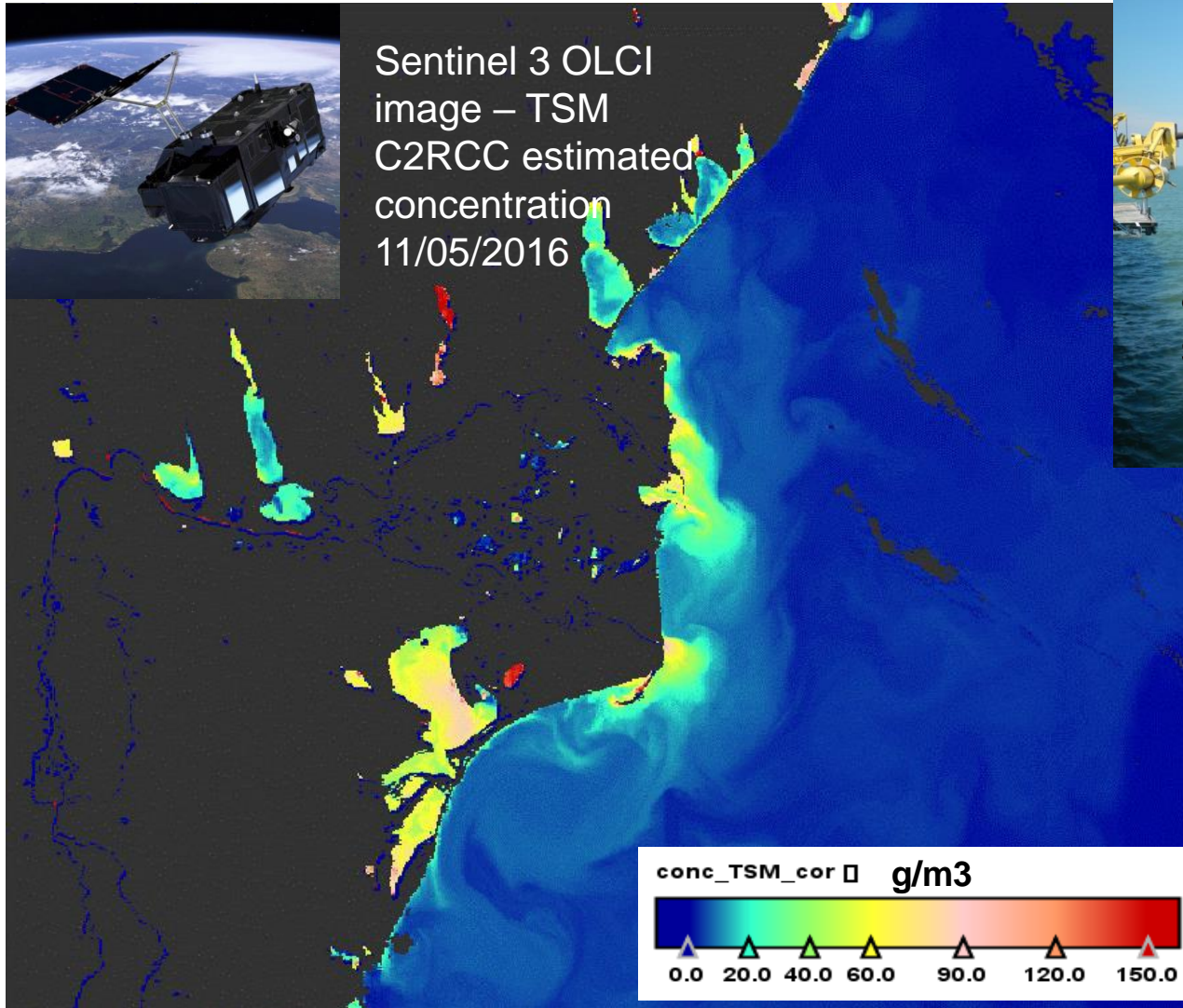
Sediment fluxes transfer to the Black Sea – Danube plume



Sediment fluxes transfer to the Black Sea – Danube plume



Sentinel 3 OLCI
image – TSM
C2RCC estimated
concentration
11/05/2016



The DANUBIUS-RI concept

2016

- Entry ESFRI Roadmap



2016 - 2019

- H2020 Project
- Preparatory Phase for DANUBIUS-RI
- 4 Mio. € (Grant Agreement No. 739562)



2019 - 2021

- Implementation Phase

2022 ~ 2050

- Operational Phase
- Life Span: 20-30 years



ESFRI - European Strategy Forum on Research Infrastructures

- established in 2002, with a mandate from the EU Council;
- to support a coherent and strategy-led approach to policy-making on research infrastructures in Europe;
- to facilitate multilateral initiatives leading to the better use and development of research infrastructures, at EU and international level.

Links with other ESFRI projects

- potential for collaboration and symbiosis with other ESFRI Research Infrastructures
- letters of support already received from:
 - EMSO (European Multidisciplinary Seafloor and Water Column Observatory)
 - EPOS (European Plate Observatory System)
 - ICOS (Integrated Carbon Observation System)
 - Lifewatch (E-Science European Infrastructure for Biodiversity and Ecosystem Research)



Thank you

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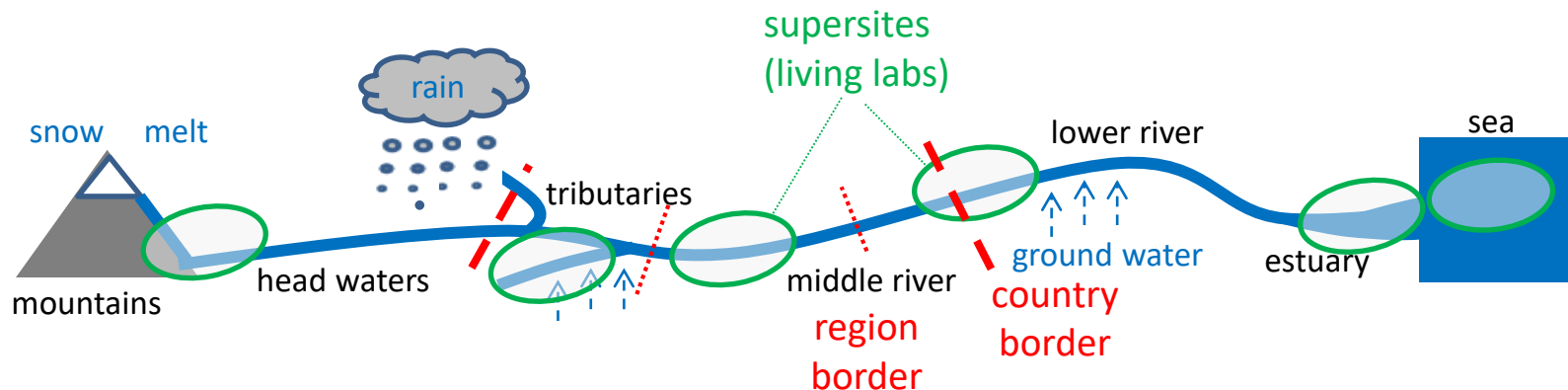


follow @DANUBIUS-PP

Three pressing issues

Large River Sea Systems require:

- Better mechanistic understanding of the fluvial continuum from catchment to coast, exploiting data streams that are consistent both spatially and temporally
- Holistic approaches to characterise, understand and manage effectively the conflicting demands (with high socio-economic values)
- Evaluation of the preconditioned natural forces of change acting on river-seas systems to assess the ability to absorb man-induced perturbations and extreme events for effective management and the avoidance of tipping points



from compartmental research ➡ to integrative thinking