

# **International Centre for Advanced Studies on River-Sea Systems**

**DANUBIUS-RI**

**A new distributed pan-European Research Infrastructure supporting interdisciplinary  
research on river-sea systems**

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**Many of the most pressing societal challenges related to river-sea systems are multi-faceted.** Addressing these problems requires new approaches to world leading research, spanning traditional disciplines, and Research Infrastructure that:

- spans ‘catchment-to-coast’, including coastal sea
- provides innovative opportunities for cross-disciplinarity/boundary spanning
- facilitates knowledge exchange and attracts young people to science
- maximises the ‘impact’ of investments in environmental research, driving innovation
- is truly at the centre of the knowledge triangle (Research – Education – Innovation)



# History

- 1996: International Research Centre on life and earth Sciences proposed in the Danube Delta
- 2006: major international meeting in the Danube Delta introduced concept of integrated management of river-delta-sea systems
- 2011: Romanian Government started funding development of plans for International Research Centre for the Danube River-Danube Delta-Black Sea
- 2013: DANUBIUS-RI designated a Flagship Project of the EU Strategy for the Danube Region
- 2013: scope of project widened to large river-sea systems across Europe
- 2016: DANUBIUS-RI included as a new project on the ESFRI (European Strategy Forum on Research Infrastructures) Roadmap
- 2016: application for H2020 funding of Preparatory Phase



# Strategic importance

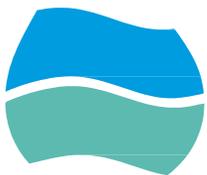
## DANUBIUS-RI:

- will gather scientists from different disciplines instead of focussing on a single, scientific discipline
- will address cross-disciplinary topics and issues related to sustainability of the river-sea system, as a single, connected and highly dynamic system of high social and economic importance
- will take interdisciplinarity and the socio-economic relevance and impact as important criteria for evaluating applications for access.

DANUBIUS-RI will be a platform for collecting, analysing, modelling and retrieving river-sea system data useful to all scientific disciplines. From data to information to knowledge to wisdom

## DANUBIUS-RI:

- will create new knowledge through consistent state-of-the-art observation, analysis and modelling, across the science, social and economic disciplines
- will enable stakeholder access to data, knowledge and concepts for more informed decision-making.



# Research questions

## How does global climate change affect river-sea systems?

- \* Physical dynamics
- \* Nutrient dynamics
- \* Biogeochemical cycles
- \* Geohazards

## How do river-sea systems respond to global climate change and increased human pressure?

- \* Vulnerability
- \* Structure/function changes
- \* Adaptation
- \* Alien species
- \* Resilience

## How do changing societal demands affect river-sea systems?

- \* Natural resources
- \* Impact on goods/services
- \* Social dynamics
- \* Sustainable development

## How to increase the effectiveness of measures for river-sea systems?

- \* Restoration of impacted systems
- \* Understanding system connectivity
- \* Enhancement of resilience



# Components

Hub (Romania)

Nodes:

Observation (UK)

Analysis (Germany)

Modelling (Italy)

Social & Economic (Netherlands)

Supersites:

Elbe Estuary (Germany)

Thames Estuary (UK)

Nestos (Greece)

Danube Delta (Romania)

Ebro-Llobregat Deltaic System (Spain)

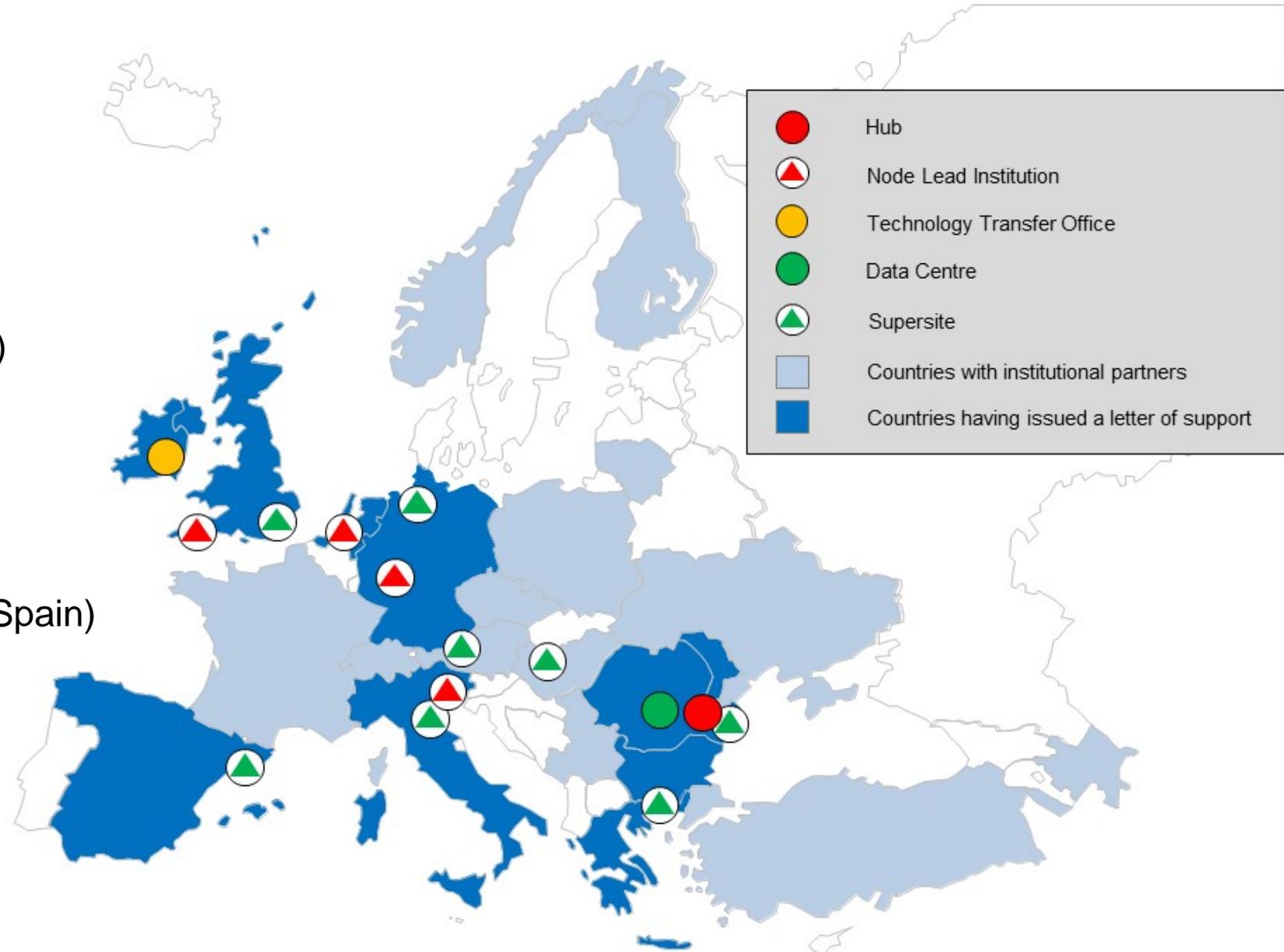
Szigetkoz (Hungary)

Po Delta-Venice Lagoon (Italy)

Lake Lunz (Austria)

Data Centre (Romania)

Technology Transfer Office (Ireland)



# Why a Research Infrastructure?

- Research Infrastructure – not a research programme nor a research institute
- Projects (including IA/I3) and network configurations are insufficient for such a complex subject - short-term funding perpetuates fragmentation
- Efficient implementation needs centralised direction, decision-making and data management
- Science programme to answer European and global challenges, giving answers to society and other strategic end users (including politicians)
- Users selected on scientific excellence of application and match of projects to DANUBIUS-RI goals
- Interdisciplinarity ensured
- Enforced scientific and technical standards, methods and protocols guaranteeing data quality and homogeneity over time and location
- Single procurement budget for whole infrastructure with common technical specifications for equipment
- Staff mobility through policy and management of human resources



# What ESFRI Roadmap gives to DANUBIUS-RI

- ESFRI Roadmap includes new Research Infrastructure projects to fill important gaps in the European research landscape
- European brand of excellence, attracting new values on funding, education, knowledge exchange and connecting science and policy
- Promotes long-term funding stability and knowledge transfer
- Procedures and monitoring ensure a constant progress
- Opportunity for ERIC status
- Synergistic relations with other ESFRI Research Infrastructures



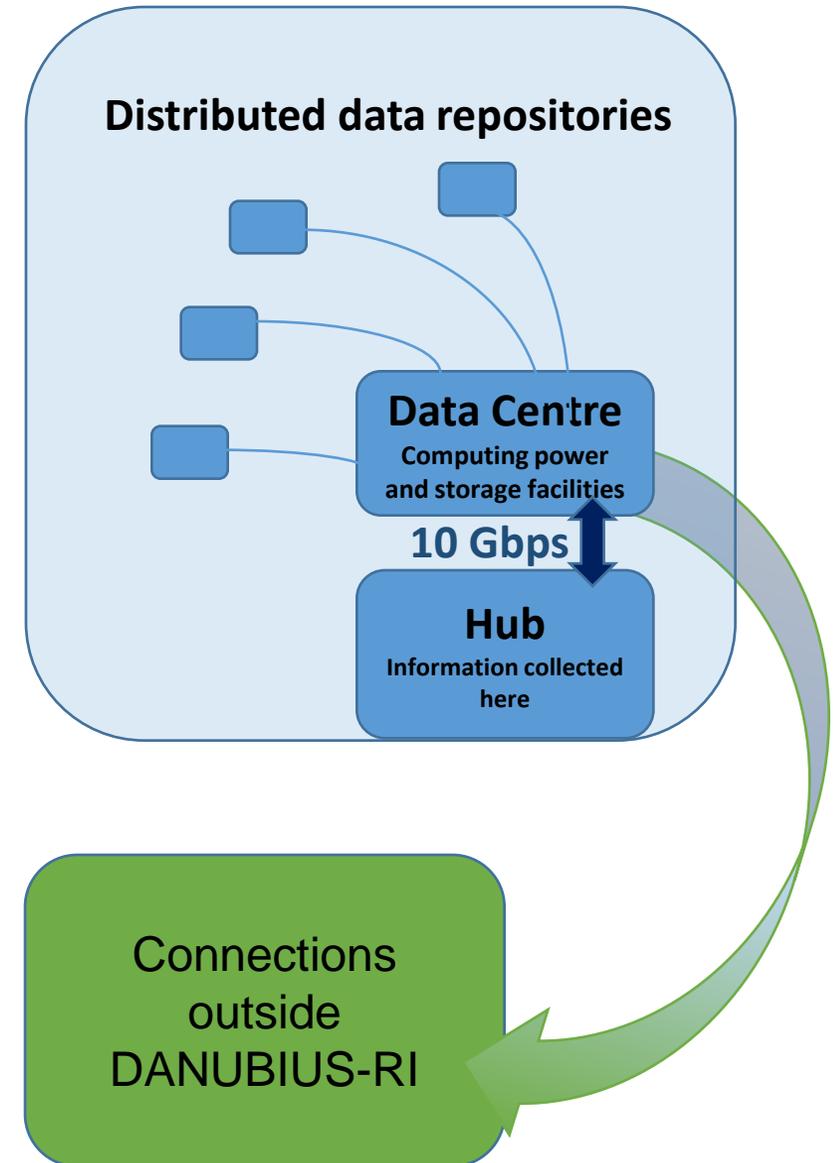
# DANUBIUS Commons

- Set of harmonised:
  - methods
  - protocols
  - instruments
  - data acquisition
  - management
- Implemented across DANUBIUS-RI to guarantee the quality and consistency of scientific output
- Kept under continual review
- Avoidance of 'over definition'



# Data sources

- Digital data from:
  - remote sensing
  - automatic stations (real time and periodic downloading)
  - cruises
  - computer models
  - physical, sedimentological, chemical, biological and ecotoxicological analyses
- Non digital data (eg biota samples, sediments, DNA)
- Research data stored, processed and made available (open access) to participants and public
- Digital and non-digital data at distributed data repositories but data information collected by Data Centre



# Access and data use

- DANUBIUS-RI will apply an ‘open access’ policy based on competition and selection of proposals evaluated on their scientific excellence and social and economic relevance
- Aim to develop *common standards* and *open access* to data and the *harmonisation of data requirements* in particular related to European Strategies
- Data for research purposes will be free, while organisations using data for commercial uses will be charged
- Measures of the success of DANUBIUS-RI will be its impact and the extent to which the data and information developed are both accessible and used by society (at social, economic and policy level)



# DANUBIUS-RI beyond Europe

Although DANUBIUS-RI is starting as a European project, the issues and challenges are worldwide and we are building collaborations globally. We already have links with organisations in:

Asean countries (Mekong River-Delta-Sea System)

China

India

Morocco

USA

... and fast expanding...



# Lessons for research in the Black Sea region

- Need for interdisciplinary research for river-delta/estuary-sea systems
- Progress in dealing with the pressing and extremely complicated problems of river-sea systems can be made only by treating them at a basin scale (including coastal sea)
- Excellent and open data are essential for excellent research and for understanding processes at the basin scale
- There is already best practice in the NW Black Sea - and collaboration is open to researchers and academia from all around the Black and Caspian Sea regions. Institutional and political support are essential for collaboration
- The DANUBIUS Commons is a brand of excellence and should be adopted by those who wish to collaborate, as a quality standard



**Thank you for your attention**

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