Ritmare (Ricerca ITaliana per il MARE)
The Italian marine research to implement the EUSAIR Strategy

Fabio Trincardi

Director of ISMAR CNR
and
Director of RITMARE

f.trincardi@ismar.cnr.it

CNR
Consiglio Nazionale delle Ricerche

A sea of challenges in the Adriatic and Ionian area
Bologna, November 17th 2015

Ministero dell'Istruzione dell'Università e Ricerca

The RITMARE community

Research Institutions: **CNR, OGS, INGV, ENEA, SZN**

University Consortia: **CoNISMa, CINFAI**

Up to 2000 researchers involved; 29,8% of which are younger than 40

RITMARE and EUSAIR

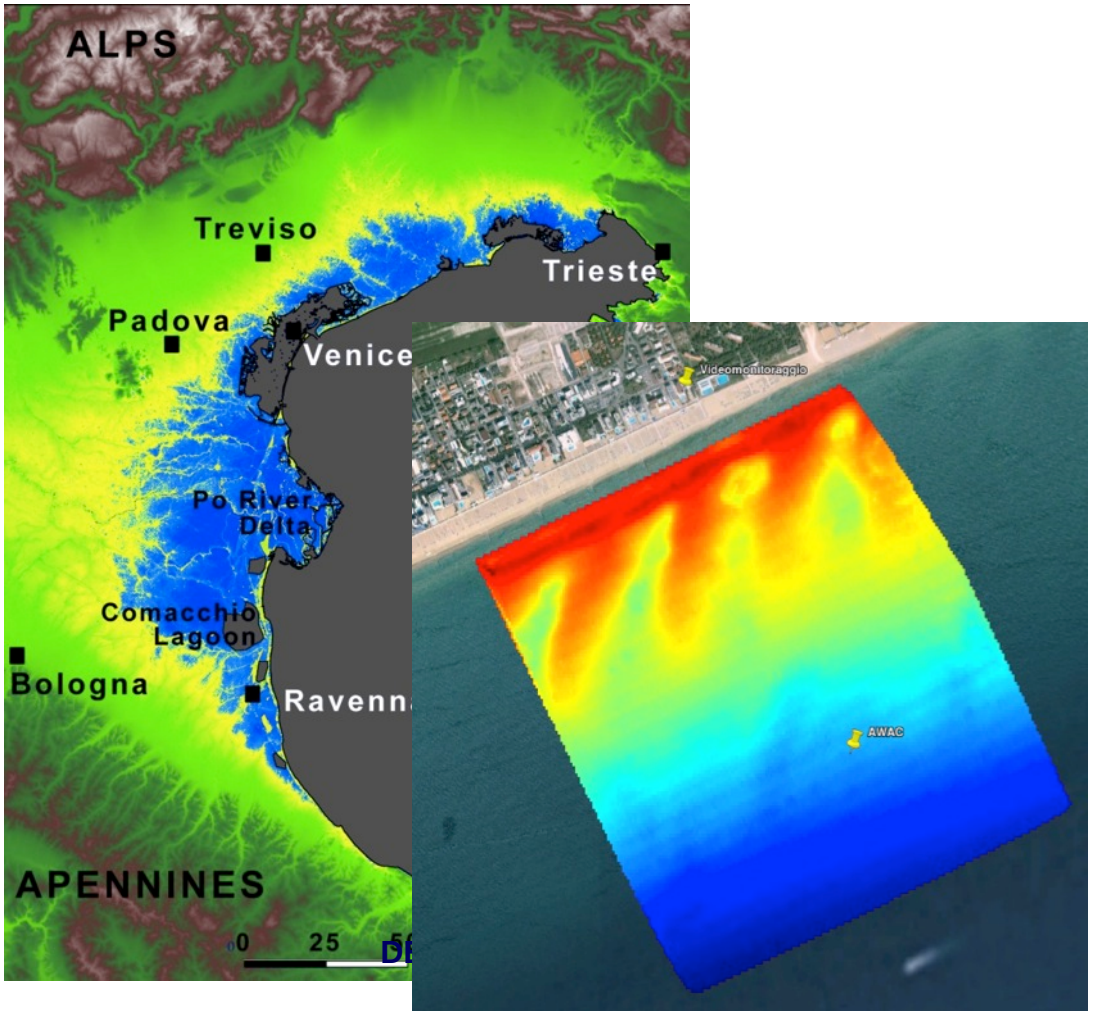
- Maritime Spatial Planning is the overarching theme (we tackle scientific questions but the main goal is to make knowledge available to decision makers)
- The uses of the Sea should be examined to define their compatibilities, potential conflicts and cumulative impacts
- Open Data: bring to the surface and open to reuse the wealth of data in the hands of research institutions to
  - Avoid duplications of data sets
  - Define actual gaps in knowledge and focus new research on those

RITMARE 4th Year

- Marine transport (goods, tourists) pressures and opportunities; development of new electric boats for coastal transport
- Potential and sustainability of fisheries and aquaculture
- Seabed mapping, habitat mapping, marine protected areas in the macro-region
- Scenarios of relative sea level rise, coastal erosion and vulnerability to global change, evaluation of sand reservoirs (volume and quality)
- Assessment of non renewable resources (Oil & Gas) and human impacts on shores, water column and sea floor (including marine litter)
- Marine observing system (oceanography) involving Balkan Countries and North Adriatic ecosystem observatory (ILTER network); design of Otranto Observing System

Scenarios of relative sea level rise, coastal erosion and vulnerability to global change, evaluation of sand reservoirs

- Low-land regions (North Adriatic is an example) as a whole
- Impact of RSL rise (and Relative subsidence) on the economy of the area
- Natural and anthropogenic factors controlling coastal evolution



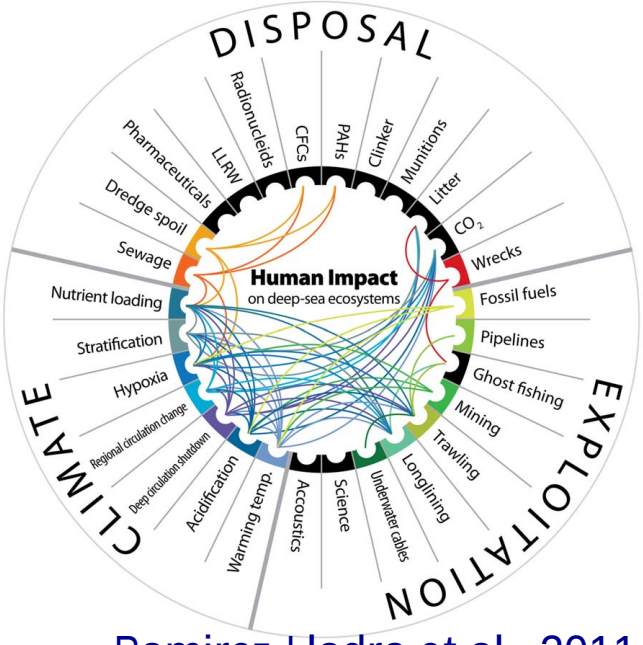
Toward the EUSAIR marine observing system

- Fixed buoys
- Re-deployable mooring stations
- Repeated transects
- Fishery observing system
- Satellite
- Radar

- Real time data transmission
- Interoperable data structures
- International Long Term Ecological Research (ILTER)
- Modeling and forecast

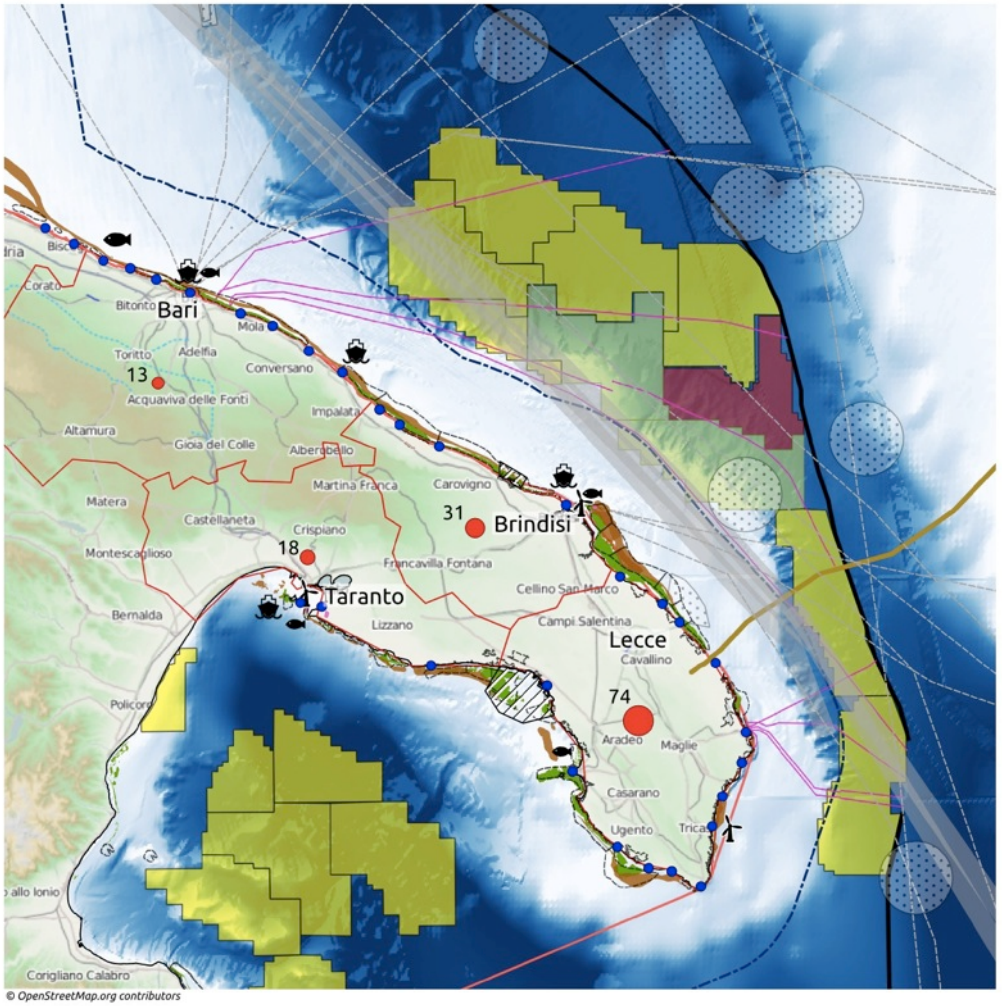
The sea floor and its uses

- **Exploitation of goods**
  - Mining
  - Fish Trawling
- **Area of waste disposal**
  - Dumping (legal and illegal)
  - Littering
- **Interface for further exploitation**
  - Foundation for infrastructures (oil rigs, wind farms)
  - Pavement for global networks (pipelines, cables)



Ramirez-Llodra et al., 2011

Compatibility, conflicts and potential synergies between the uses of the sea and the marine ecosystems



Batimetria (m)
- 100
- 200
- 500
- 1000

Limiti marittimi
- Linea di base
- Acque territoriali
- Piattaforma continentale

Foul Areas

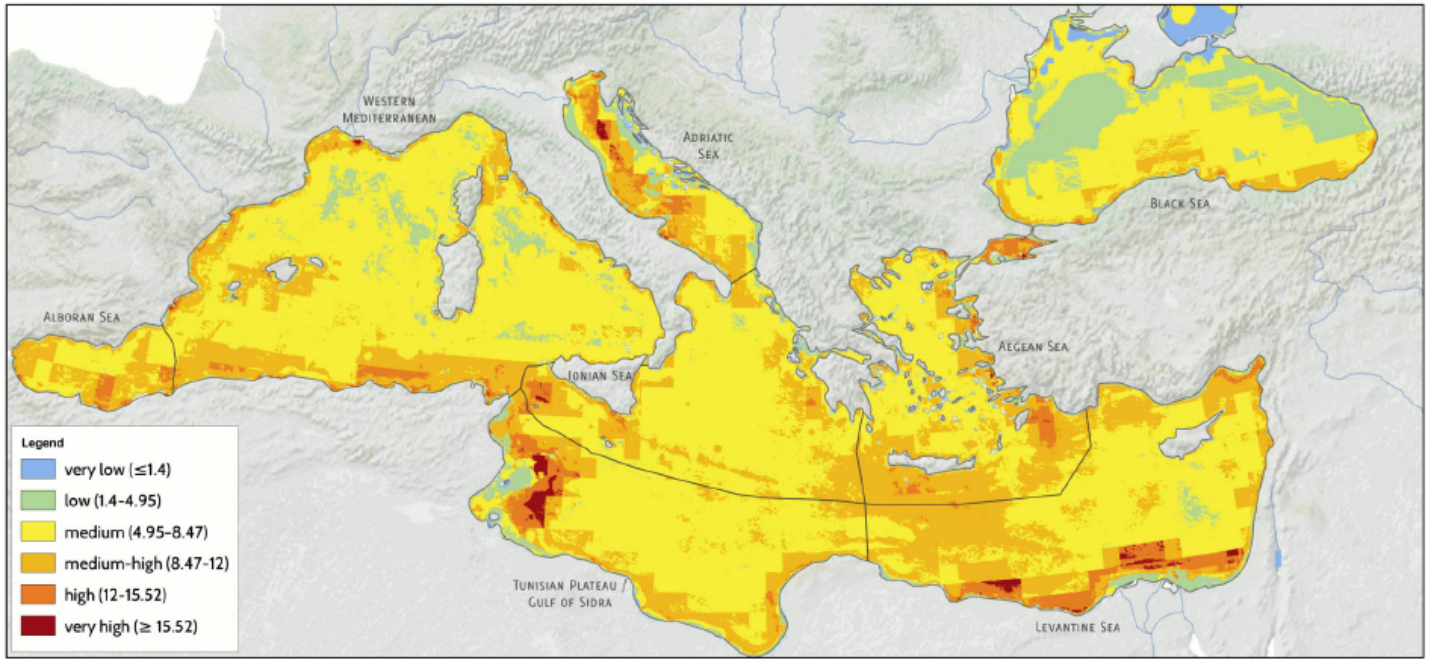
Posti letto per km²

Aree protette e habitat di pregio
- Aree Marine Protette Nazionali
- Aree Natura 2000
- Habitat coralligeni
- Praterie di Fanerogame

ADRIPLAN
ADRiatic Ionian maritime spatial PLANning

Project co financed by the European Union (DG MARE)

Assessment of non renewable resources (Oil & Gas) and human impacts on shores, water column and sea floor (including marine litter)



(Micheli et al., 2013)

- ü Stressor maps and intensity
- ü Ecosystems/Habitat maps
- ü Vulnerability weight

Driver categories (22 drivers):

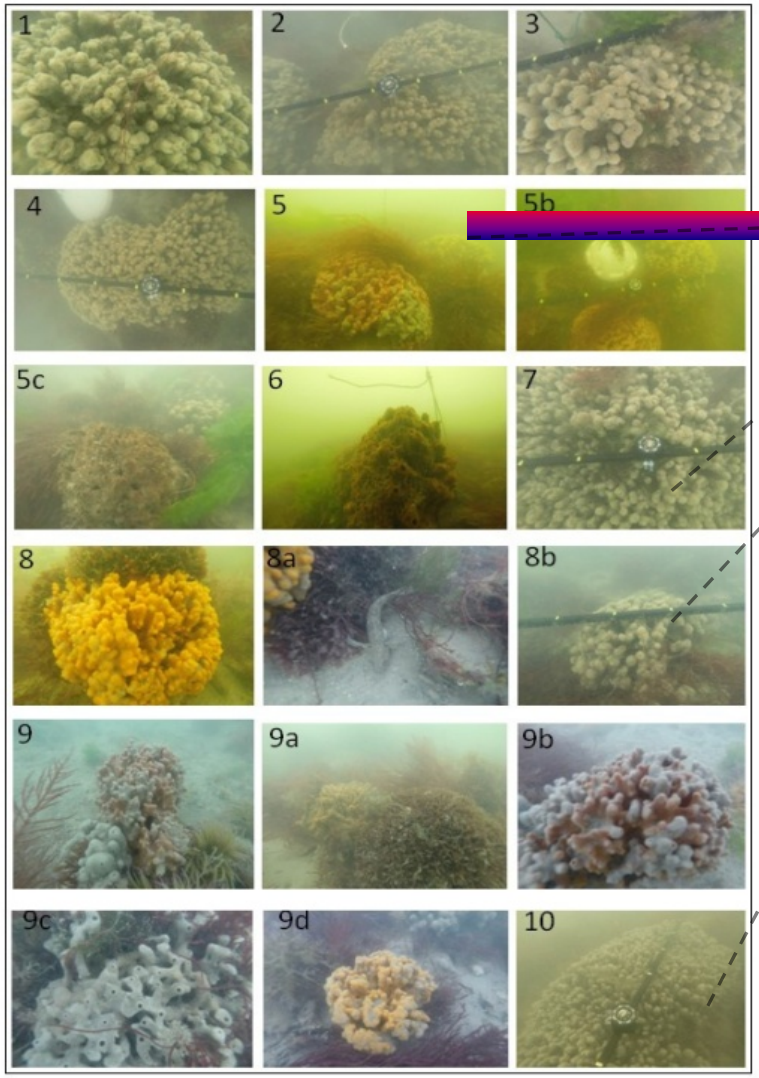
- Climate
- Fishing
- Sea-based drivers (commercial shipping, invasive species, oil spills and oil rigs)
- Land-based drivers (nutrient input, organic pollution, urban runoff, risk of hypoxia and coastal population density)

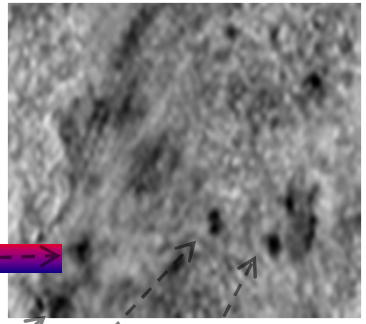
Potential and sustainability of fisheries and aquaculture

- the increasing awareness of the ecological dimension of the fisheries forces to change from the classical objective to protect only the commercial stocks to the new one to protect also the environment and the communities in which the life cycles of commercial species occur…
- this new approach implies the need to include space into fisheries sciences and improve spatial based approach to fisheries management by controlling catch in critical areas

Main nurseries of hake off the Italian coasts. Nurseries in the Adriatic Sea and the Strait of Sicily are located in international waters

Seabed mapping, habitat mapping, marine protected areas in the macro-region





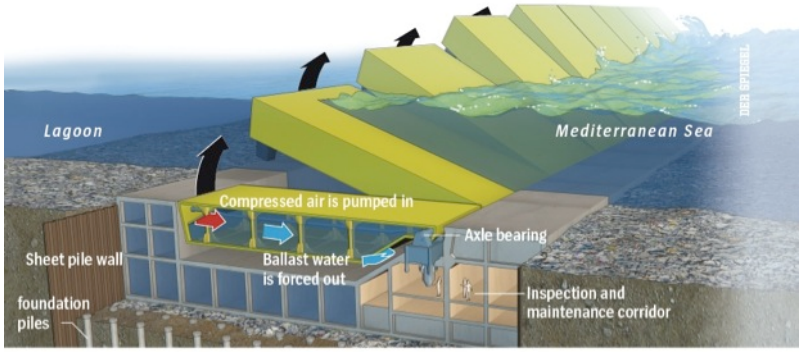
The very shallow water frontier:
Lagoon channel in extremely shallow water investigated in detail (5 and 20 cm grids) with accurately positioned ground-truth data

Sponges could be detected and high biodiversity was documented

RITMARE and EUSAIR: 2 “key” case studies

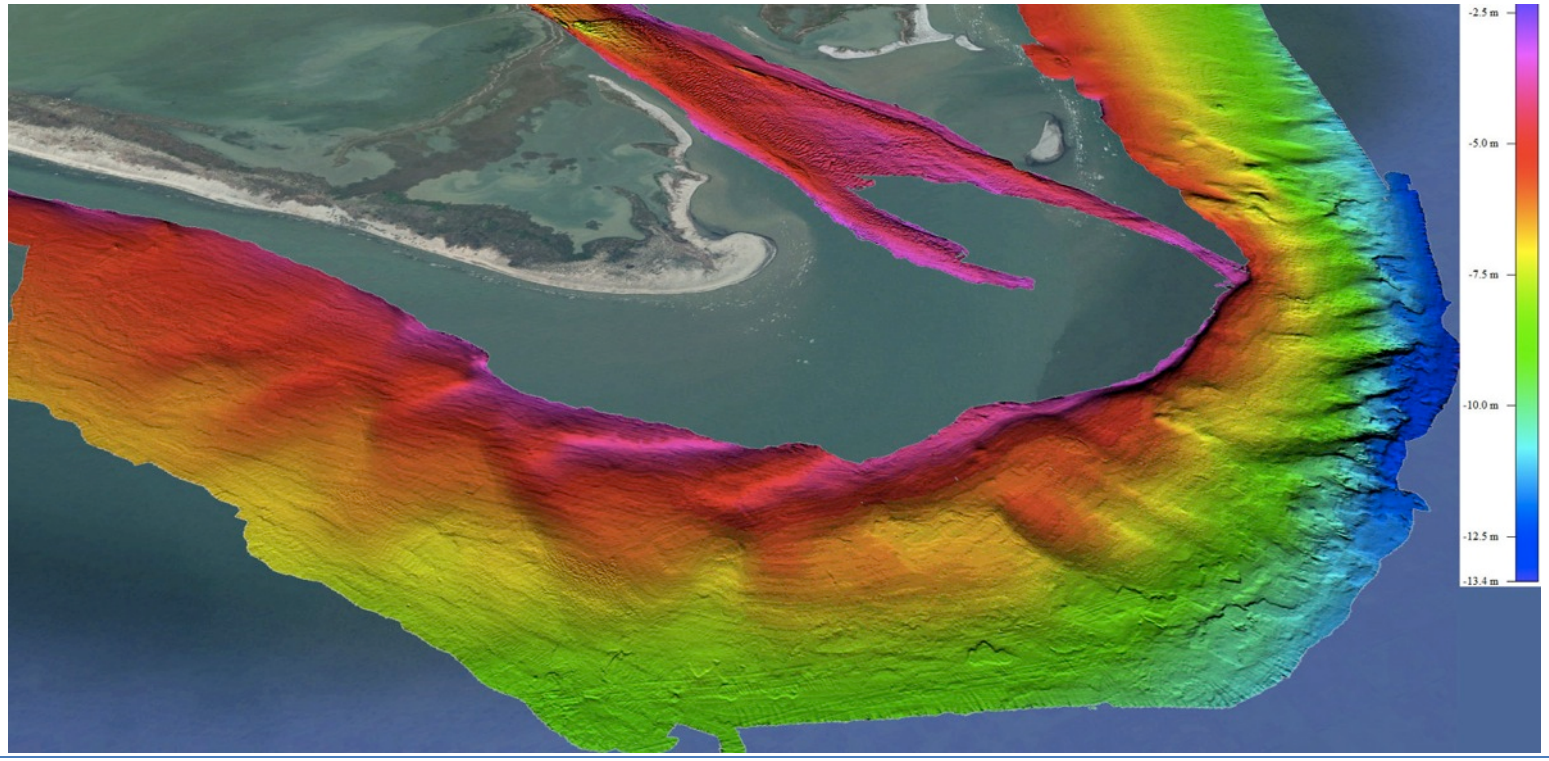
- Venice Lagoon, the first large REGULATED lagoon worldwide;
- no plan exists to monitor the cumulative impacts of the MOSE closures (what if closures are closely-spaced or even continuous over several days?)

- RITMARE aims to project a "smart" observing system to monitor the entire ecosystem and its reaction to the MOSE use (knowing that water in Venice is cleaned solely by the tidal currents)

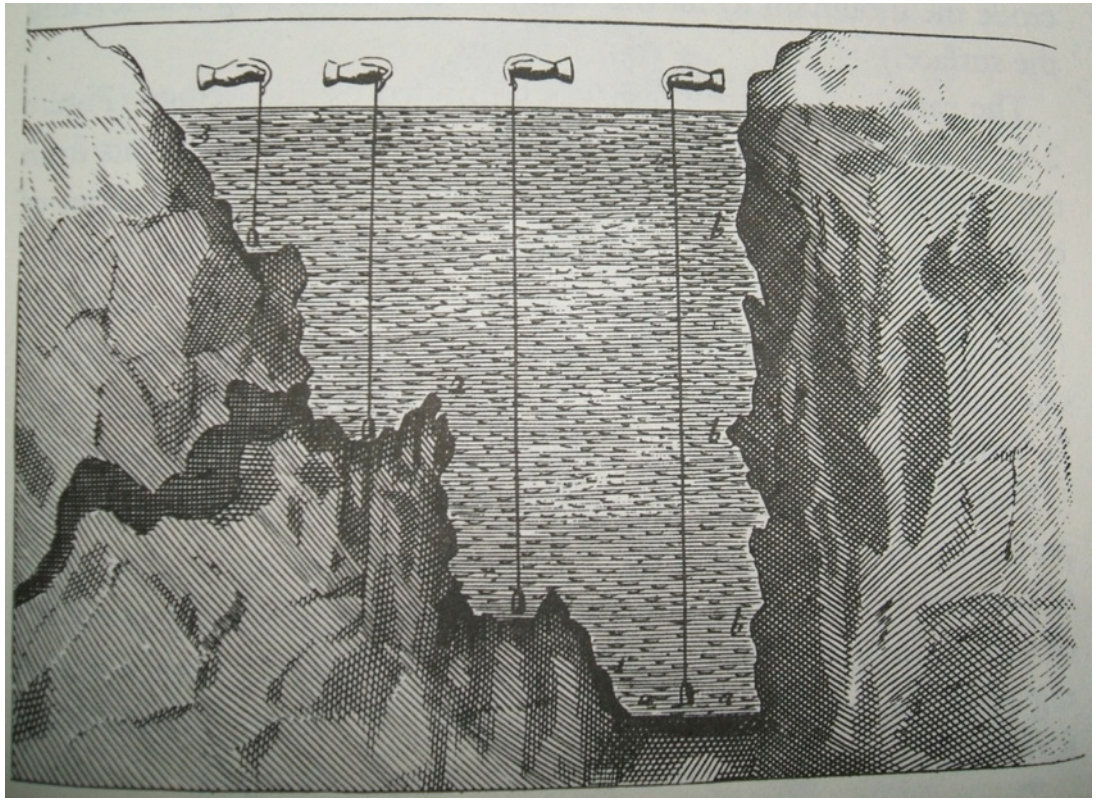


RITMARE and EUSAIR: 2 “key” case studies

- Po Delta is now a Natura site of UNESCO
- Need to integrate and make available the research done so far
- Ideal site to implement new approaches to ecosystems study and to monitor impacts of natural and anthropogenic events



Thank You for your attention



"...it would be of very good use to have natural maps of the earth [...] every Prince should have such a draught of his own country and dominions..."

Thomas Burnet, Telluris Theoria Sacra (1684-1689)