

“Experiences in identifying and involving stakeholders and end-users in the floodrisk planning”



Research and Risk Awareness: the case of Venice

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Consortium for Managing Research
Activities in the Venice Lagoon

Scientific research in Venice requires a strong coordination effort

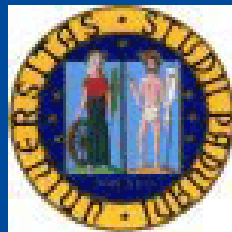


**CORILA - Consortium for Coordination
of Research Activities concerning
the Venice Lagoon System**

overseen by the Ministry of Research of Italy, is composed by the public
research entities more involved in lagoon studies



IUAV



University of
Padua



University Ca'
Foscari



NATIONAL INSTITUTE OF
OCEANOGRAPHY
AND EXPERIMENTAL GEOPHYSICS



NATIONAL RESEARCH
COUNCIL

Venice as paradigmatic case

Nature, landscape and cultural heritage conservation

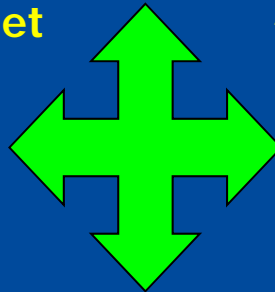
target



pressures

affected by the status of the target

"Pure" pressures, interrelated



social dimension ("city status" for Venice)

constraint

Main role of research in a complex and delicate environment



- To analyse the different components of the system and their interactions
- To identify pressures and foresee their evolution

The “acqua alta” phenomena in Venice

- “Acqua Alta” events (flooding) have **always occurred** in the millenary history of Venice, as the sea level changed in time (subsidence and eustacy). However, also the fortunes of Venice have always been connected with the sea.
- In the past (since the XIV century), the Venice's strategy included **two main different targets**:
 - Defence of the city from flooding
 - Grant access to the port
- The “**lagoon status**” has been defended by means of huge interventions, including river mouths diversion, sea walls construction, works at the lagoon-sea inlets
- “**Adaptation measures**” occurred in the city: rising of the pavements, defense of the rain cisterns for drinkable water, appropriate building techniques and schemes

Today's strategy

- stays on the same line, with some additional problems, mainly connected with pollution recovery and some additional constraints:
 - Cultural heritage conservation
(addressed by EU FD after Vienna conference, 2006)
 - Ecosystem and ecosystem services preservation

Main role for scientific research

A) Data Acquisition

B) Modeling

UNDERSTANDING AND FORESEEING
(support for planning and for immediate actions)

Short Term: Since 1970, the National Council of Research of Italy (CNR) was committed to the task of flooding forecast, now embedded in the Municipality Center for Tidal Forecasting and Early Warning Centre

Long Term: Interdisciplinary approach ecosystem based, e.g.:

- finite element hydrodynamical models
- ecological models
- morphological plan
- fishing plan

1° Dec 2008

156 cm = 100% of the city flooded





“Adaptation”

“Non-structural measures”

A) passive

B) active

Defence's weakness remediation





The ICPSM of the Venice Municipality



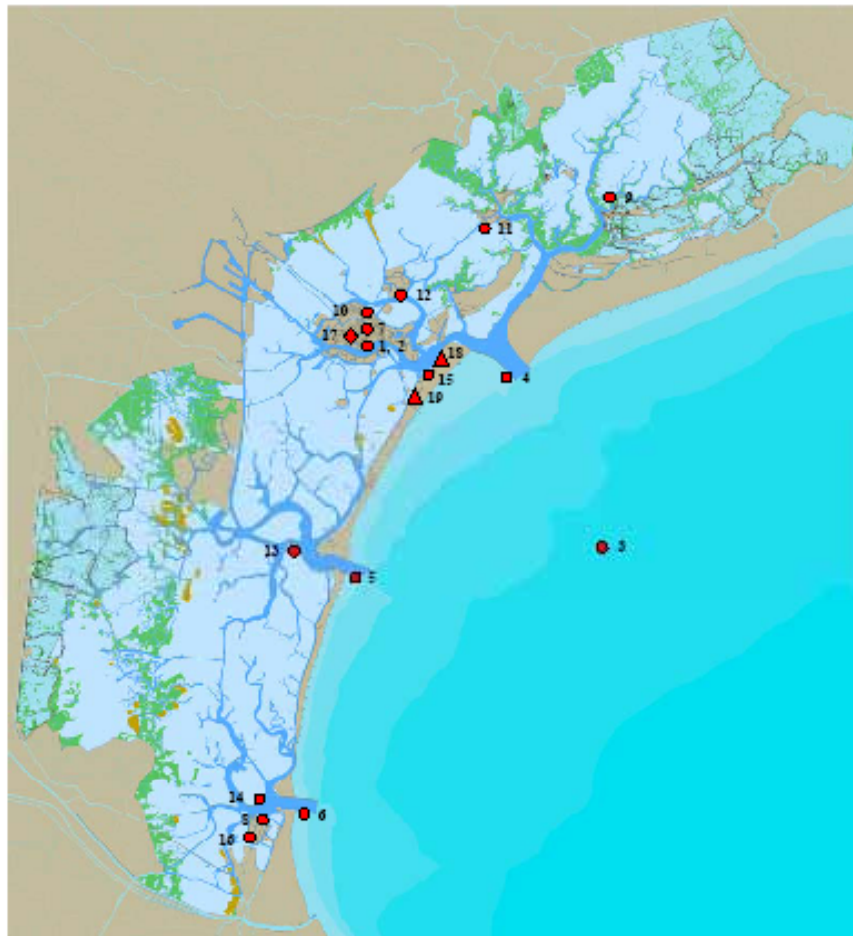
The ICPSM - Istituzione Centro Previsioni e Segnalazioni Maree (Tidal Forecasting and Early Warning Centre) is an office of the Venice Municipality, founded in 1980 to inform and alert the city in case of high-water events.

Tasks of the ICPSM are:

- **observation** of sea level and weather parameters
- sea level **forecast**
- **information** and **alarm** to the city in case of 'high water'



The monitoring network



◆ **Central station:** ICPSM offices

▲ **Repeaters:** S. Nicolò di Lido,
Casinò Lido

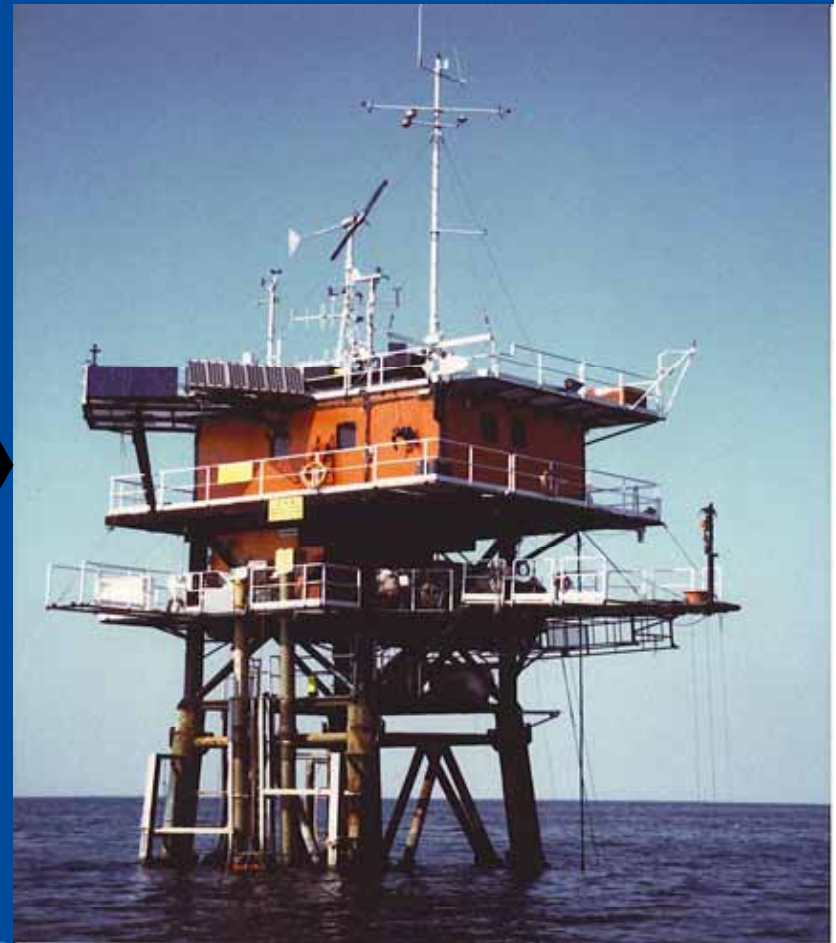
● **Measurement stations:**
10 stations in the inner Lagoon
5 stations at the inlets
1 station in the Adriatic Sea

Observed parameters:

- sea level
- meteorological parameters:
air pressure, wind velocity and
direction, humidity, temperature...

Real time acquisition, with frequency
of 5 minutes

The Oceanographic Platform "Acqua Alta" (ISMAR-CNR)



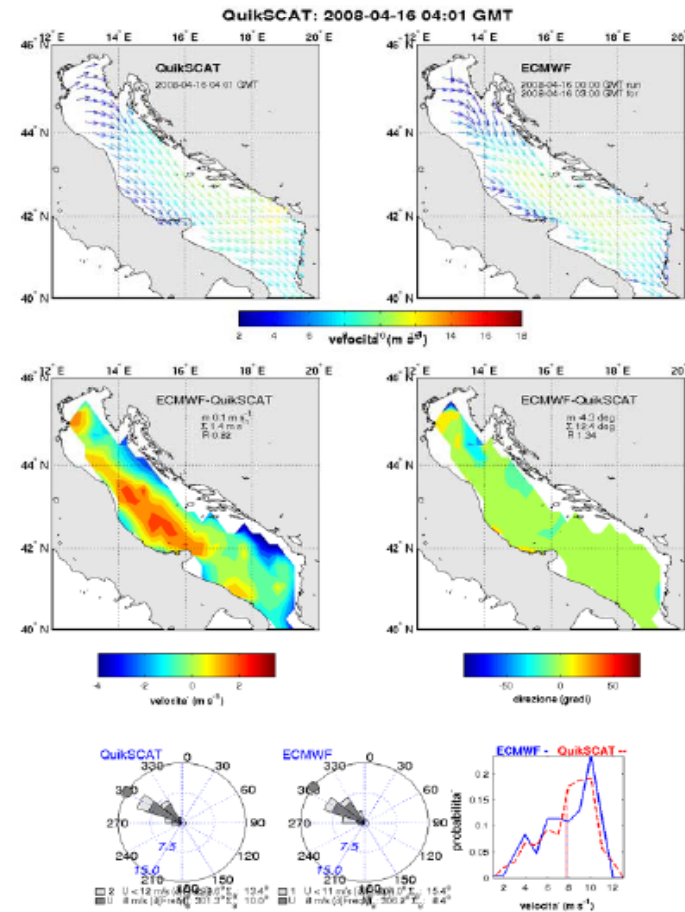
Data from satellite

Satellite wind (QuikSCAT and ASCAT)

In collaboration with ISAC-CNR of Padua, ICPSM receives in near-real time satellite wind data from:

- QuikSCAT (NASA)
- ASCAT (EUMETSAT)

A comparison with modelled winds from ECMWF is done. Some statistical analysis are computed.








The ICPSM and the public

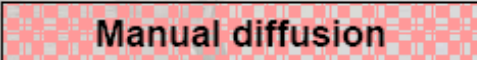
Daily activity

-  Web page
-  Graphic Displays
-  Media
-  Automatic faxes and sms
-  Automatic answering device

High water activity

-  Call Manager
-  Sms (about 23.000 users)
-  Alarm System
-  Telephone Alarms

 Automatic diffusion

 Manual diffusion



Alarm system



A net of 23 sirens, placed on the principal Venice Lagoon islands, alarms the population 3 or 4 hours before a predicted tide of 110 cm or higher

ACUSTIC alarm

The sirens



First alert



110 cm



120 cm



130 cm



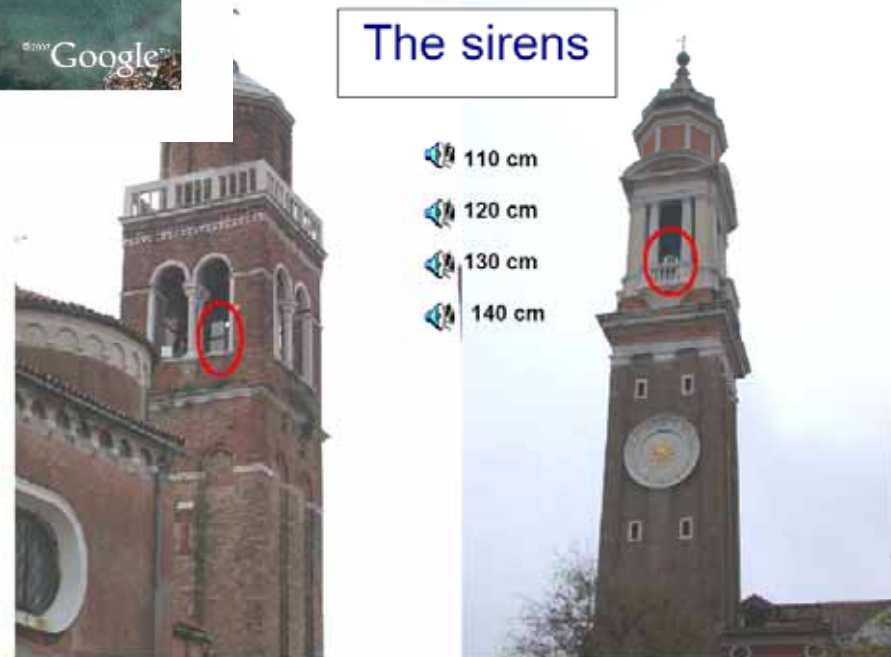
140 cm

110 cm

120 cm

130 cm

140 cm



Monitoring the environmental impacts

CORILA is entrusted by the Venice Water Authority, Italian Ministry of Infrastructures, to monitor the environmental impacts during the construction of the MOSE

CORILA is seen as an independent and competent organisation, able to monitor the works, reducing the risk of environmental damaging and therefore assuring the public opinion



Venice as a laboratory

Venice is a study site in many European Projects:



SPICOSA - Science and Policy Integration for Coastal System Assessment

FP6, IP-Integrated Project, Integrated Coastal Zone Management –ICZM
SPICOSA aims to create a self-evolving, operational research approach framework for the assessment of policy options for the sustainable management of coastal zone systems. It supports the implementation of existing EU Directives and ICZM good practices.



THESEUS - Innovative technologies for safer European coasts in a changing climate - FP7, Integrated Project

THESEUS will examine the application of innovative combined coastal mitigation and adaptation technologies generally aiming at delivering a safe (or low-risk) coast for human use/development and healthy coastal habitats as sea levels rise and climate changes.

PEGASO- People for Ecosystem based Governance in Assessing Sustainable Development of Ocean and Coast

FP7, Collaborative Project - Large-scale integrating project

Venice as a laboratory also for risk prevention



KULTURISK - Knowledge-based approach to develop a cULTUre of Risk prevention

The KULTURisk project aims at developing a culture of risk prevention by means of a comprehensive demonstration of the benefits of prevention measures. In order to demonstrate the advantages of prevention options, an original methodology will be developed, applied and validated using specific European case studies, including transboundary areas.



International Strategy for Disaster Reduction

United Nation 2010-2011 Campaign "Making Cities Resilient. My City is Getting Ready"



United Nations
International Strategy for Disaster Reduction

Making Cities Resilient **My City is Getting Ready**

