



**OOCMUR**

OBSERVATORIO OCEANOGRÁFICO  
COSTERO DE LA REGIÓN DE MURCIA

# Coastal Oceanographic Observing System of Murcia (OOCMur)

Javier Gilabert

Technical University of Cartagena (UPCT), Spain

[javier.gilabert@upct.es](mailto:javier.gilabert@upct.es)



Nortek European Users Symposium, June 2010

- **Singular Scientific & Technological Infrastructures (ICTS)**
- **Marine ICTS in Spain**
- **The Coastal Oceanographic Observing System of Murcia**
  - **Aims**
  - **Main research topics**
  - **Singularities of the coastal area of Murcia**
  - **Observing System components**



# Coastal Oceanographic Observing System of Murcia (OOCMur)

**Is a Singular Scientific and Technological Infrastructures (ICTS) promoted by the Spanish Ministry of Science and Innovation and the Regional Government of Murcia.**

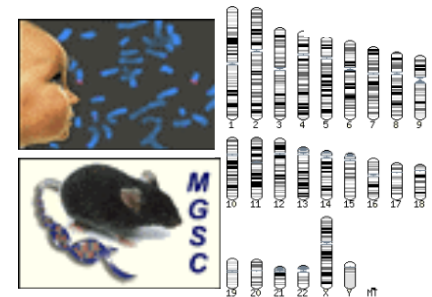


## What is an ICTS?

- *Singular Scientific and Technological Infrastructures (ICTS)*
  - **FACILITIES, RESOURCES OR SERVICES** that the scientific - technological community needs to develop research of forefront with the maximum quality.
  - **TOOLS** that provide services to the scientific - technological community

they can consist in...

1. **Big equipments** to observe, analyse and interpret phenomena of interest.
2. **Complex infrastructures** of experimentation
3. **Big infrastructures of experimentation** for the engineering and the development of new technologies applicable to diverse fields.
4. **Necessary Infrastructures** to facilitate the access of scientists to natural environments that offer unique characteristics for the research.
5. **Unique resources that permit access to data** or information with a enormous importance for the scientific and technological development, such as complete databases or natural collections,



6. **Advanced Technologies** that give an horizontal and fundamental support to all the disciplines of the science and the technology, As an example, computation resources or communication networks.



7. **Others Singular Infrastructures** of observation, experimentation or advanced services in different fields (as biomedicine, life and earth sciences, environment, social sciences and humanities)



## What are the characteristics of an ICTS?

- ***Singular and strategic character:*** unique in Spain, useful, advanced scientific and technologically, scientific technical wealth, with priority interest.
  - *It is an advanced experimental tool of forefront to the service of the scientific community and the R+D activities realized under collaboration by the different entities of the community (scientific, manufacturer, administrations, etc.) specialized in its field of activity.*

# Coastal Oceanographic Observing System of Murcia (OOCMur)

- **Objectives:** in agreement with the actual Spanish National R+D Plan and with the International Programs, including the European Framework, the ESFRI (European Strategy Forum on Research Infrastructures) Roadmap and other international Strategic Plans as the AEI (Innovative Companies Associations) of the JTIs (EU Joint Technology Initiatives) and the Technological Platforms.
- **Strategic Plan:** updated and evaluated time to time. With public access to the results and in agreement and coordination with the national and international activities.



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Coastal Oceanographic

# Coastal Oceanographic Observing System of Murcia (OOCMur)

- **Management:** autonomous, with or with out own legal personality, with own budget, administration, services and personal. In distributed infrastructures, the final management will be centralized (results, budget, access, etc.)
- **Personal:** administrative and technical personal selected with excellence criterions. If necessary, the infrastructure will ascribe temporally personal from other institutions with an incorporation planned. With and with out annexed R+D centre.
- **Financing:** sustainable, owner and MICINN, determined to the degree of objective fulfillment, evaluation of the multi-annual strategic program (including forecast of external income), economic planning, part of time dedicated to general use of the scientific community.

# Coastal Oceanographic Observing System of Murcia (OOCMur)

- ***Production and efficient utilization:*** registration of the R+D+i activities; infrastructure R+D activities, external users annexed and associated centres (projects, reports, publications, congress, patents, Technology transfer, etc.)
  - *Periodic external evaluation made by international groups of experts based in objective indicators defined in function of the research areas of the facility and its characteristics.*
- ***Leading:*** The ICTS must be considered as a reference facility in its field of research.
- ***Efficiency:*** the scientific and technological production of the facility will be in agreement with the facility size and operation and maintenance cost.



# Coastal Oceanographic Observing System of Murcia (OOCMur)

## ICTS Map + 24 New ICTS facilities





## New projects of ICTS in Marine Sciences

ICTS



### New Projects of ICTS

Oceanographic Technology Unit (UTO)

Coastal Oceanographic Observatory of Murcia (OOCMur)

Canarias Ocean Platform (PLOCAN)

International Coastal Ocean Observing and Forecasting System, Balearic Islands ICTS (OceanBIT)

Marine Advanced Research Center for environment and security (MAREAS)

### Existing Marine ICTS

### Other ICTS (engineering)

### Other programmes / initiatives

## Different development

- **Already working**
  - SOCIB (Balearic Islands)
  - PLOCAN (Canary Islands)
- **Planning phase**
  - OOCMur (Murcia)
  - MAREAS (Asturias)
  - UTO (Galicia)

## Main interest of new Marine ICTS...

- **AUVs**
  - AUV's selection, coastal zone
  - cruise plans / endurance / ranges
- **Glider facility**
  - glider selection and comparison
  - mission ranges
  - ballasting facilities
- **Moorings (coastal 50-100 m and slope 300 m):**
  - instrumentation used, comparisons
  - data transmission
  - maintenance
- **Cable nearshore facilities**, specifications, nodes, junction boxes, instrumentation to be potentially used
- **Communications tools** / data transmission / data management for coastal observatories

## Marine ICTS Network Website



The screenshot shows a Mozilla Firefox browser window displaying the RedICTS MARINAS website. The browser title is "Welcome to the RedICTS Marinas WebSite - Mozilla Firefox". The address bar shows "Welcome to the RedICTS Marina...". The website header features the RedICTS MARINAS logo and the tagline "Singular Scientific and Technological Infrastructures". A navigation menu includes "Home", "Description", "ICTS", "News", "Activites", "International experiences", "Team", and "Links". A language dropdown menu is set to "English".

**Welcome**

El Ministerio de Ciencia e Innovación (MICINN) ha puesto en marcha, a través de una Acción Complementaria coordinada por el Instituto Español de Oceanografía (IEO), una red de Infraestructuras Científicas y Tecnológicas Singulares (ICTS) marinas. Su objetivo es impulsar el intercambio y desarrollo conjunto de metodologías y herramientas en el área del conocimiento compartido por las diferentes ICTS marinas y otros agentes, públicos y privados, favoreciendo una máxima transparencia hacia y desde la comunidad científica. Se pretende evitar redundancias y ganar en competitividad, asegurando mayor multidisciplinariedad y capacidad de difusión de los resultados.



**News**

- España explora los fondos marinos del Caribe**  
20/04/2009  
Un equipo multidisciplinar liderado por expertos de la Universidad Complutense de Madrid (UCM) ha comenzado una exploración... [+]
- Los vigilantes del mar**  
20/04/2009  
Dos boyas aportan datos en tiempo real con información meteorológica, oceanográfica y de calidad de las aguas, con un... [+]
- Universidades, Empresa e Investigación propone intensificar la coordinación nacional en materia de investigación científica**  
20/04/2009  
El Ministerio de Ciencia e Innovación acepta la propuesta murciana para aumentar el trabajo común entre los órganos de... [+]
- El "Hespérides" recorrerá mares de todo el mundo para estudiar el cambio climático**  
18/04/2009  
XX aniversario de la investigación antártica El buque antártico de apoyo se puede visitar hoy y mañana y la

**Where we are**



**Upcoming events**

- 16-06-09 Event SUSTAINABLE OCEAN SUMMIT [+]
- 09-07-09 Event MARE Conference 2009 [+]
- 07-09-09 Event COASTAL DYNAMICS 2009 [+]
- 14-09-09 Event Coastal Processes 2009 [+]

Terminado

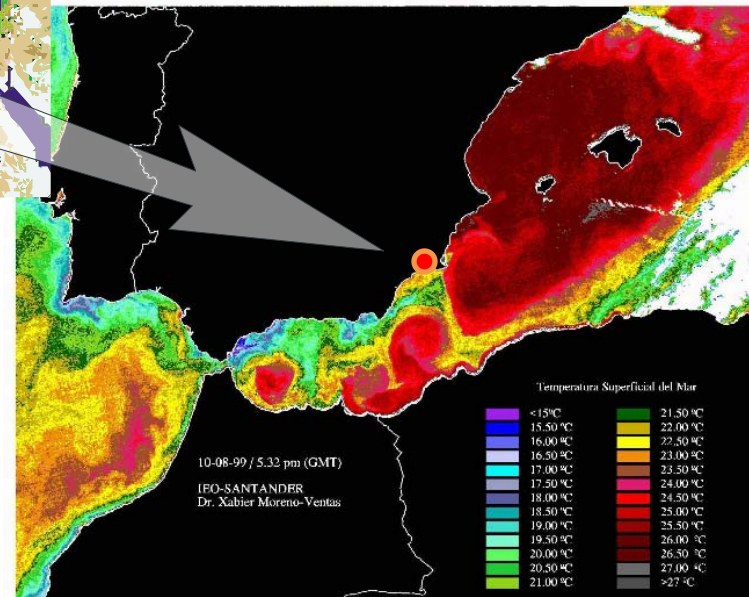
Inicio | Contacos - Mi... | Welcome to th... | Presentaciones | 2 Microsoft O... | 3 Microsoft O... | Microsoft Excel... | Dibujo - Paint | ES | 12:25



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# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Location



## Main Target

- Create a **base of work** for researchers in southern Mediterranean and worldwide interested in oceanographic and biological processes linked to **climate change consequences on biodiversity, coastal lagoon processes and ecosystem responses to human impacts**
- Provide facilities and services for **technological developments** in oceanography
- Contribute to the **generation of regular and long time series of data** linked in observation networks to forecast and prevent the consequences of climate change on biodiversity and coastal processes.



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# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Main Research Topics

**Technological  
development**

**Oceanographic and  
Ecological processes**

**Hydrodynamic and  
Ecosystem modeling**



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# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Research Topics

### Tecnological innovation and development

- (AVs, ROVs, Gliders)
- Marine instruments (MEMs, Computer vision)
- Sensors networks for oceanographic survey
- Submarine communications
- Underwater acoustic



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# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Research Topics

### Ecological processes

- Biodiversity and functioning of marine ecosystems
- Population genetics and oceanic genomics
- Biological invasions and effects on ecosystems
- Spatial-temporal scales and processes affecting connectivity in marine ecosystems
- Development of indicators for the observation and monitoring of climate change
- Coastal lagoon processes
- Long term series generation of key ecological variables and index



## Research Topics

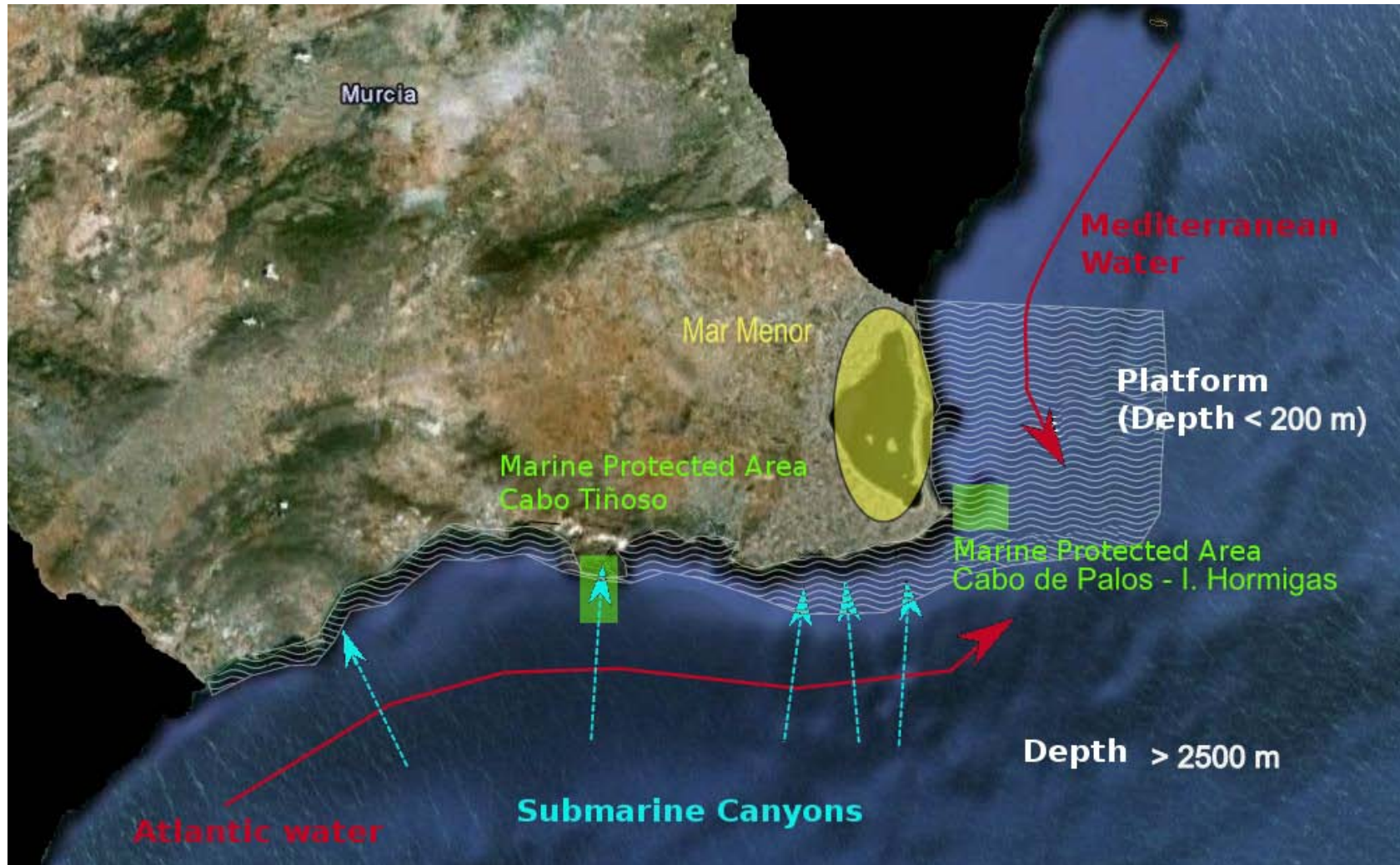
### Hydrodynamic and ecological modeling

- 3D Hydrodynamic modeling at different scales.
- Ecosystem modeling, “*spillover*”, exploitation of biological resources, connectivity, etc.
- Climate change consequences modeling
- Applications to technological developments (acoustic, computer vision, remote sensing, coastal activities, urban and industrial wastes, ...)



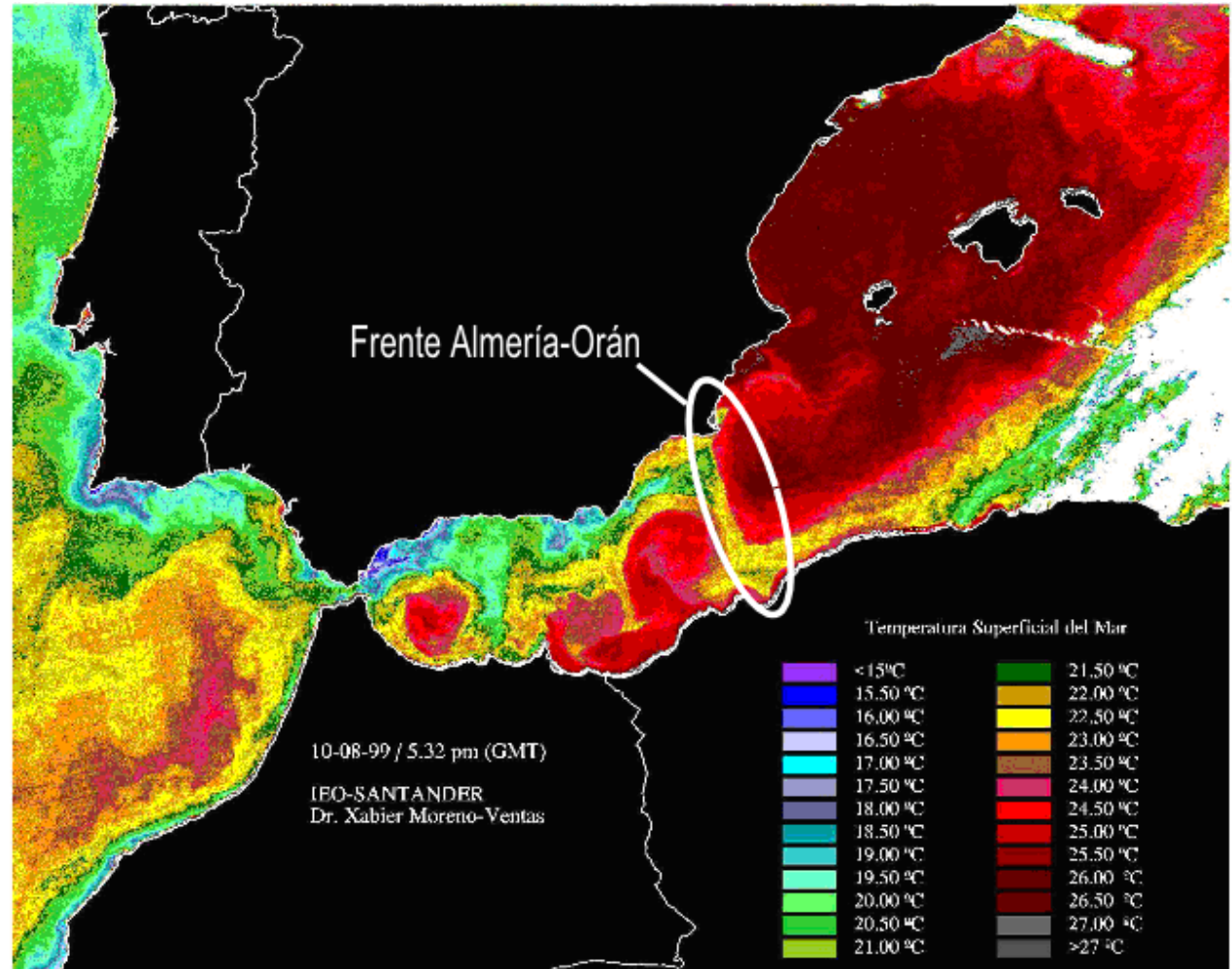
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## Singularities of Coastal Area of Murcia





## Singularities of Coastal Area of Murcia





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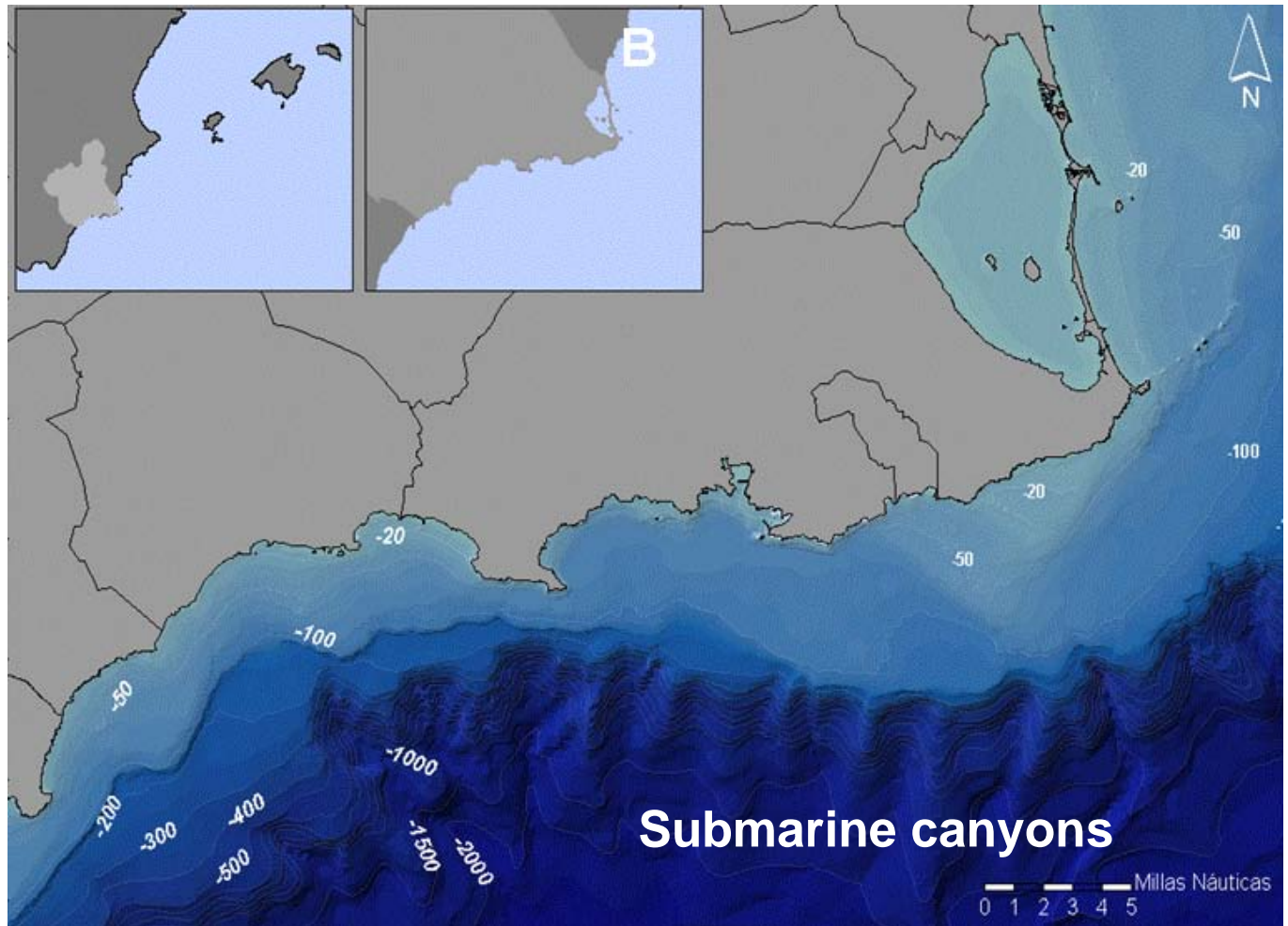
# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Singularities of Coastal Area of Murcia





## Singularities of Coastal Area of Murcia





## Singularities of Coastal Area of Murcia





## Observing System Components

**Deep Water Buoys**

**Underwater Vehicles  
AUVs, Gliders, TUVs**

**Shallow Water Buoys**

**Radar HF**

**Mobile Buoys**

**Cabled Nodes**

## Deep Water Buoys

### Atmosphere

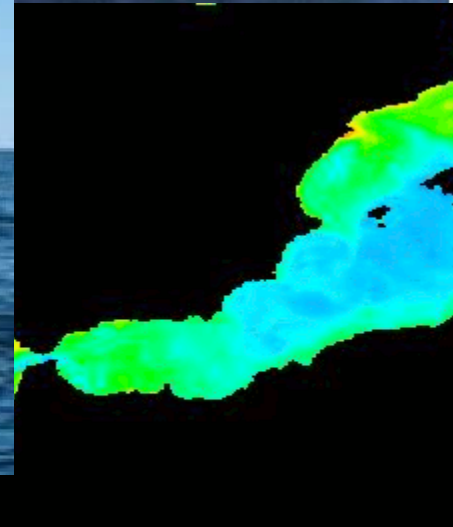
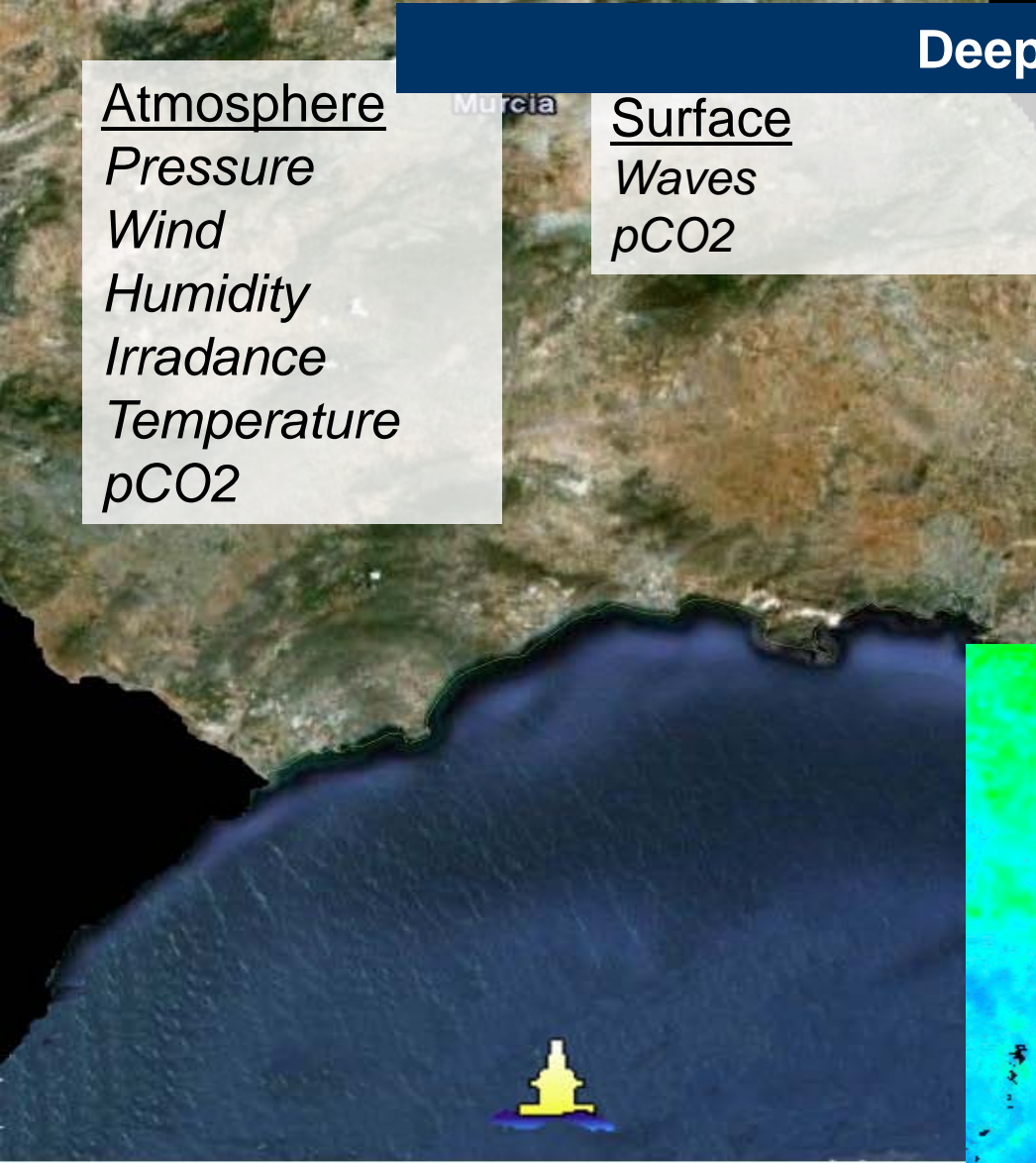
*Pressure*  
*Wind*  
*Humidity*  
*Irradance*  
*Temperature*  
*pCO<sub>2</sub>*

Murcia

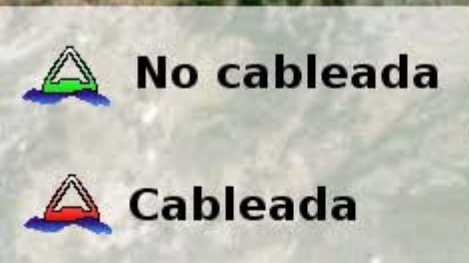
### Surface

*Waves*  
*pCO<sub>2</sub>*

### Water column



## Shallow Water Buoys



Murcia

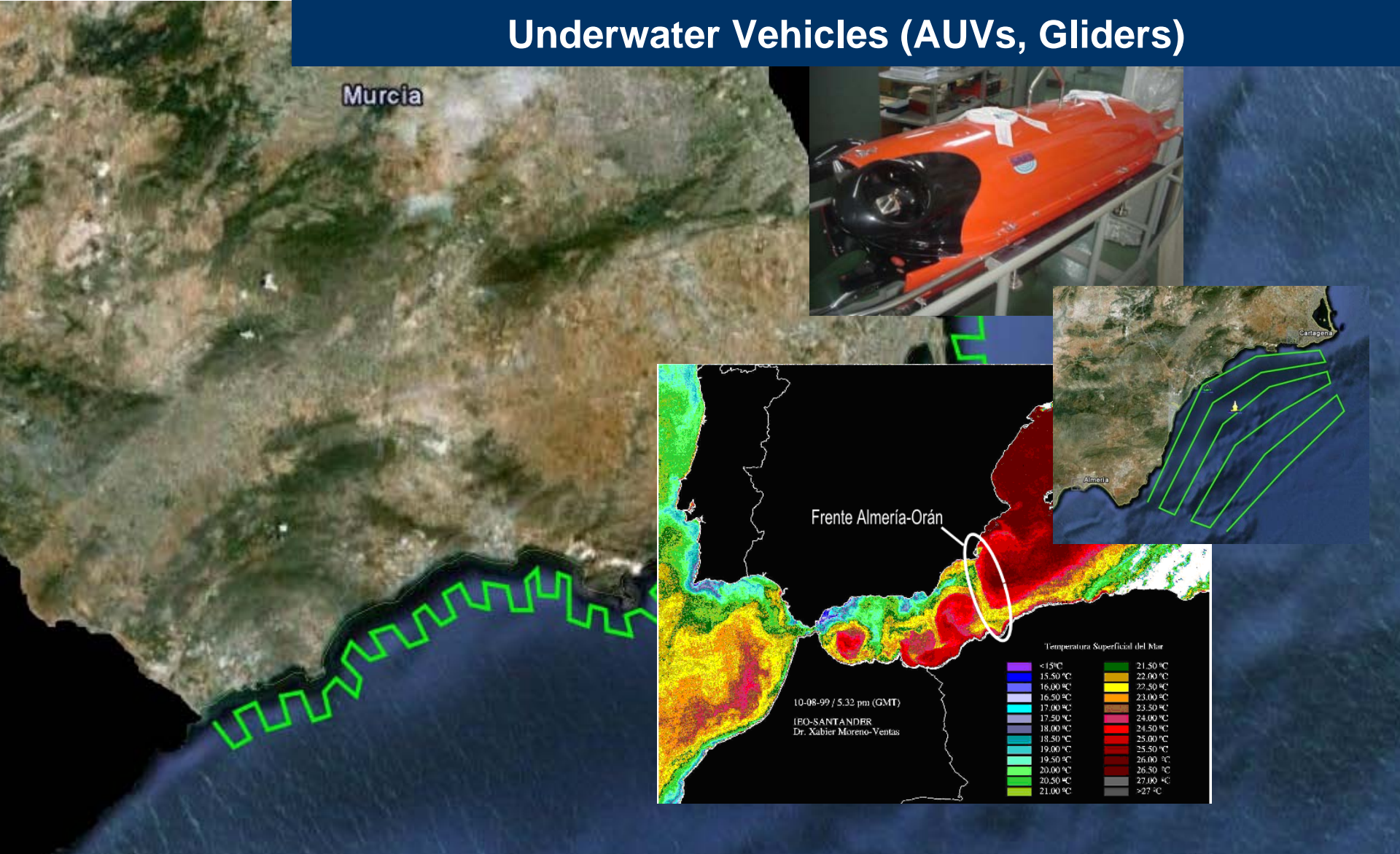




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# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Underwater Vehicles (AUVs, Gliders)

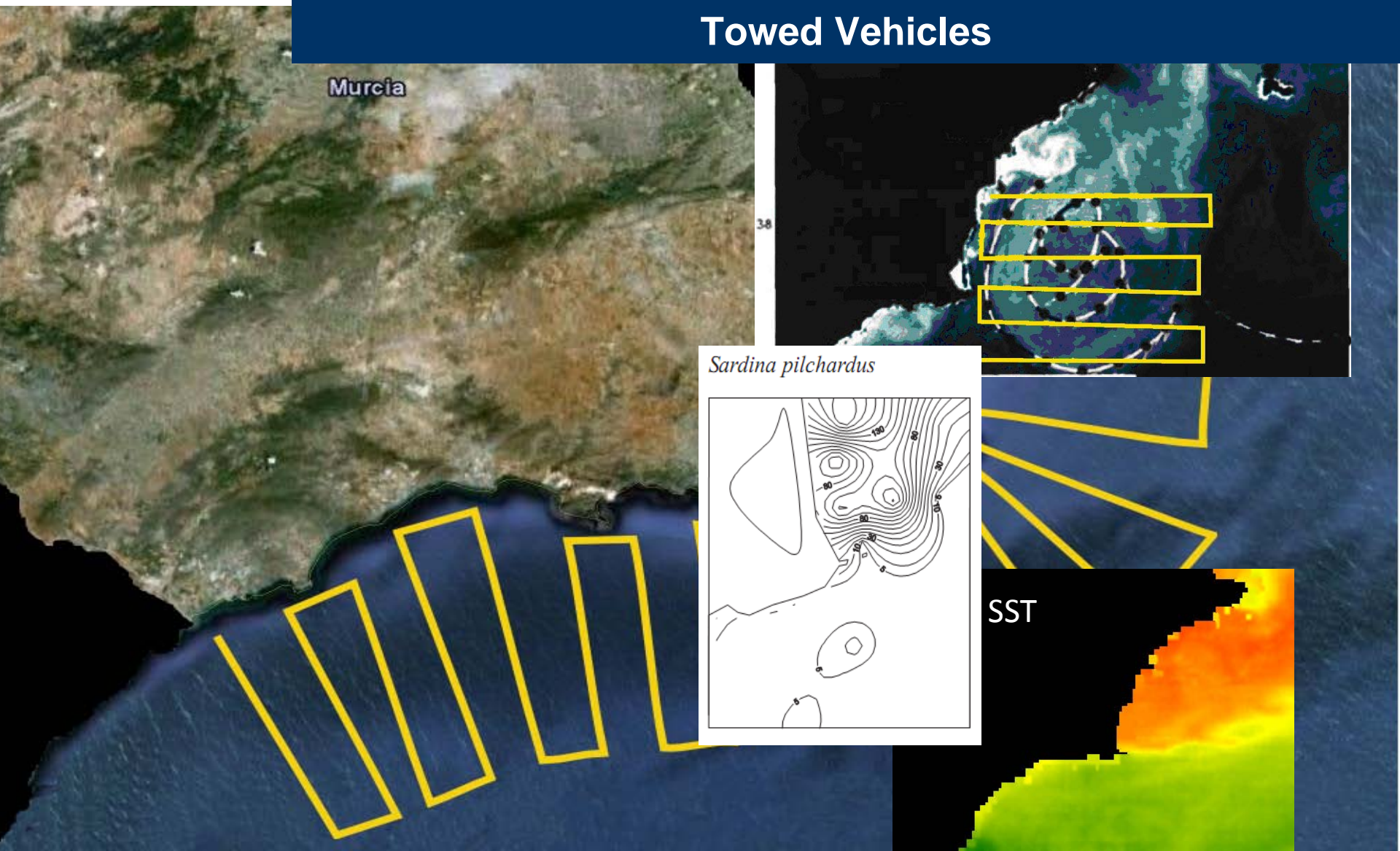




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# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Towed Vehicles

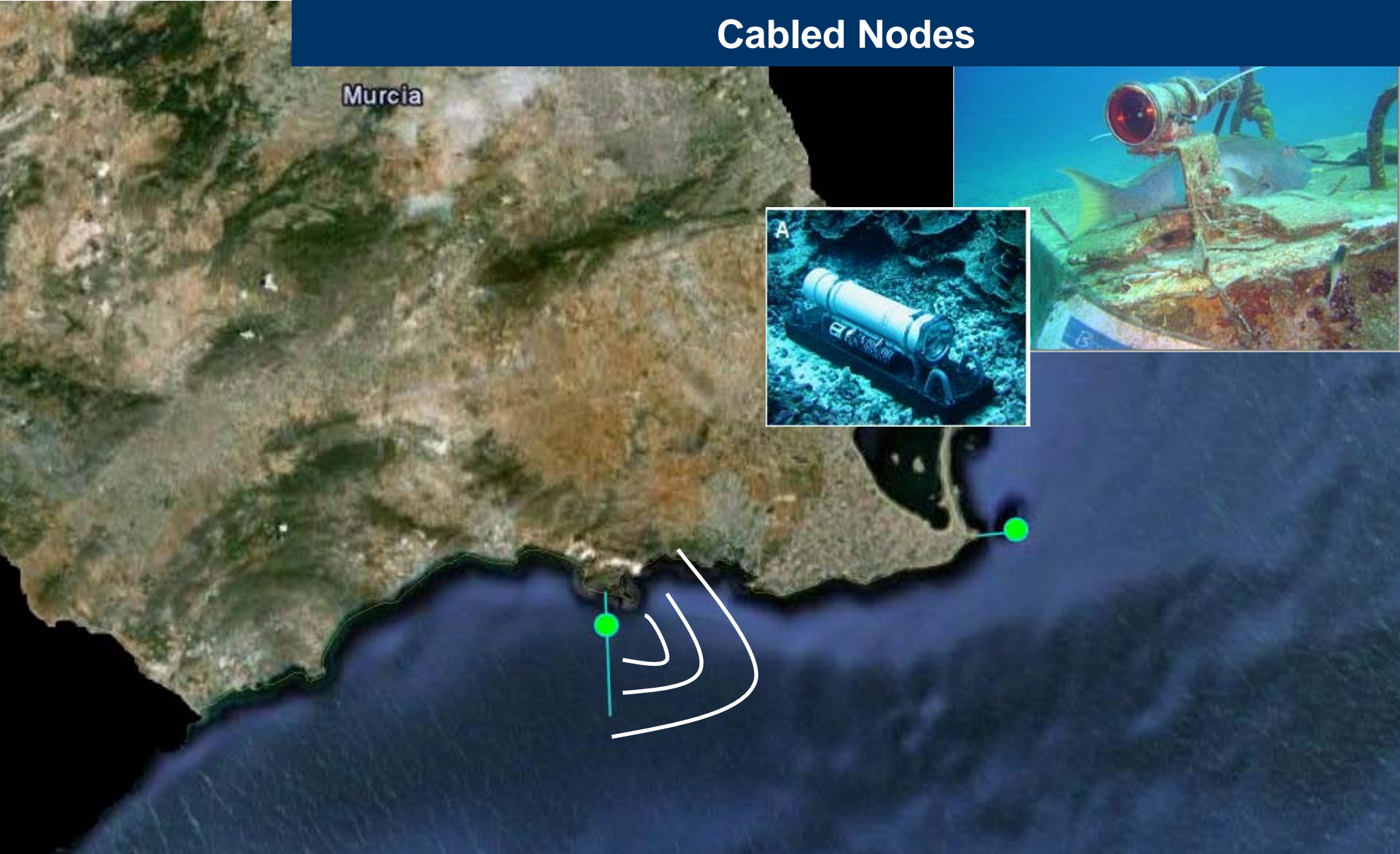




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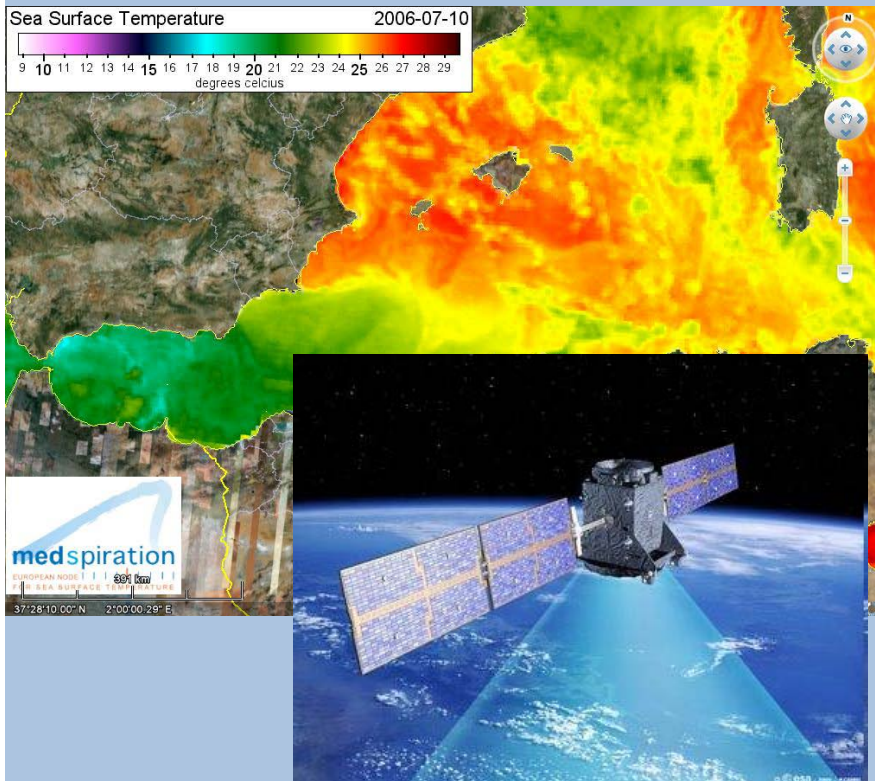
# Coastal Oceanographic Observing System of Murcia (OOCMur)

## Cabled Nodes

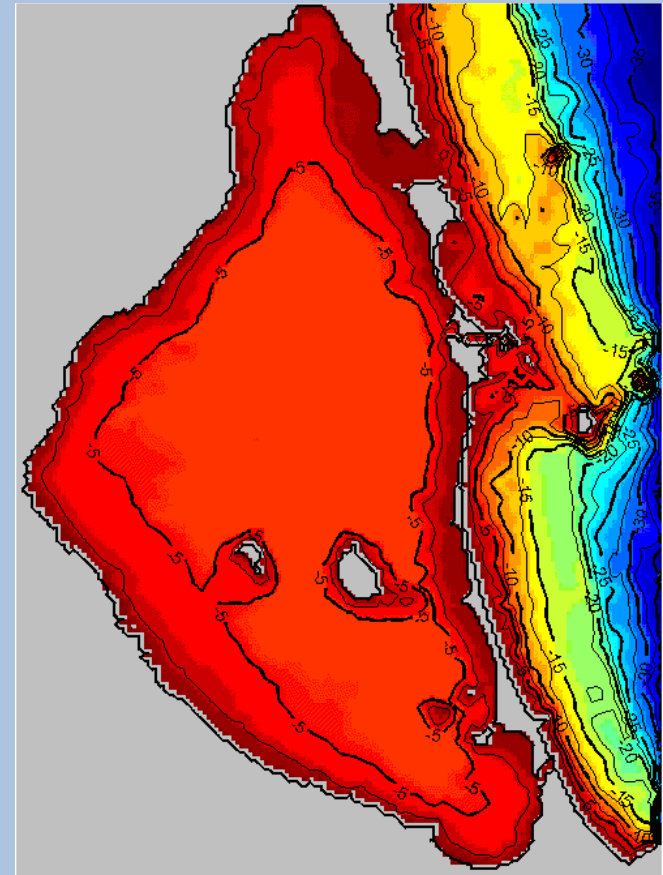


## Other Sources of Data

### Satellites

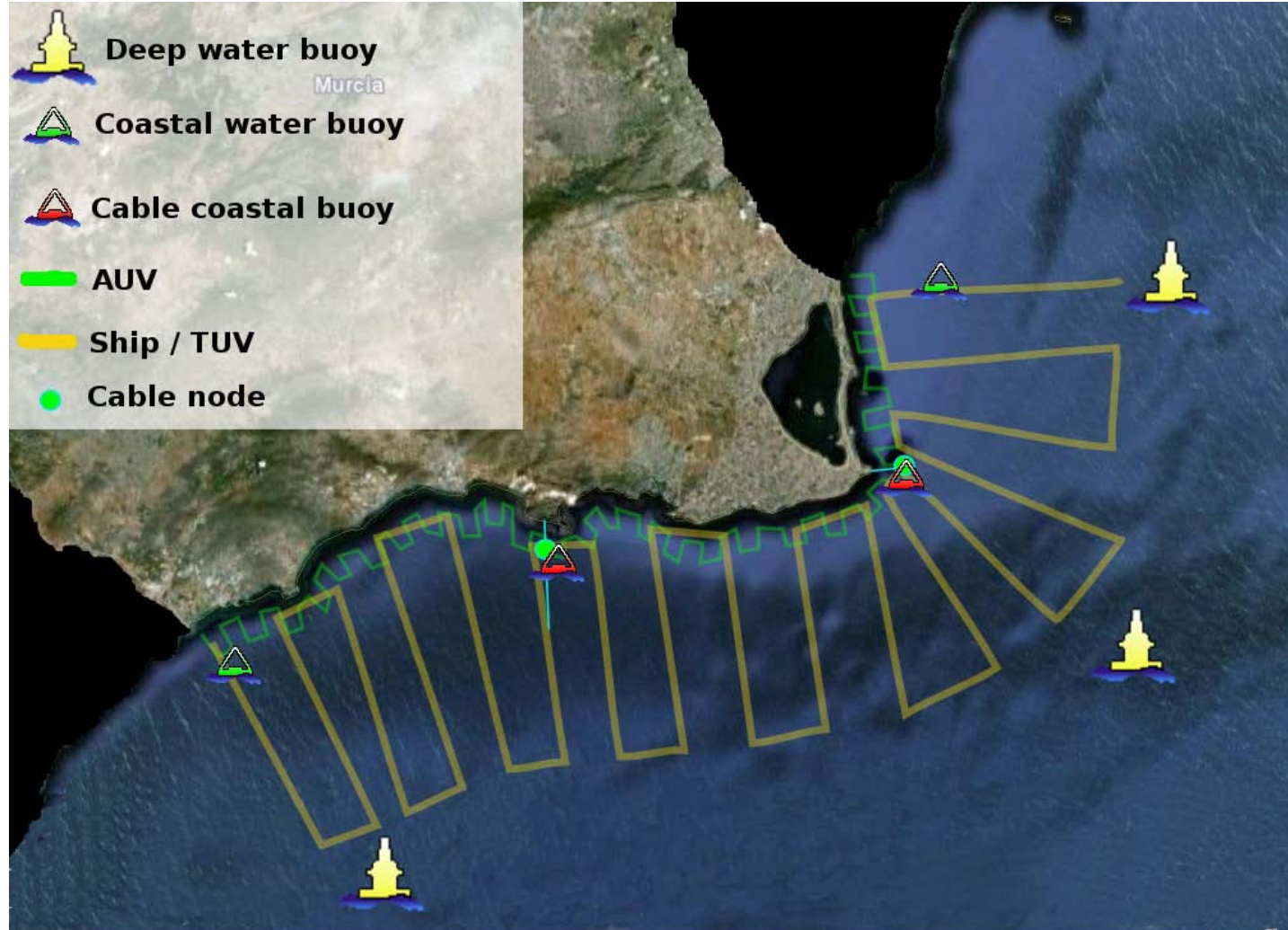


### Numerical Models





## Observing System Components





# Coastal Oceanographic Observing System of Murcia (OOCMur)

Thanks to INNOVA Oceanografía Litoral  
Nortek AS

**Thank you for your attention**



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