



OBSEA

EXPANDABLE SEAFLOOR OBSERVATORY

Maintenance Operations in the OBSEA observatory



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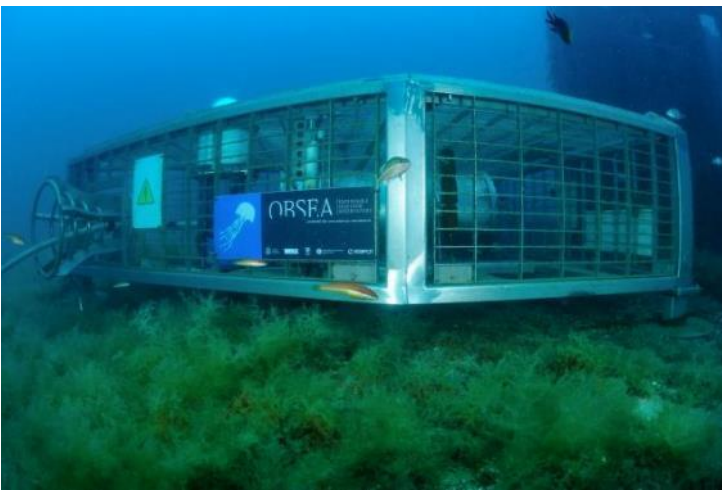
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Maintenance Operations in the OBSEA observatory

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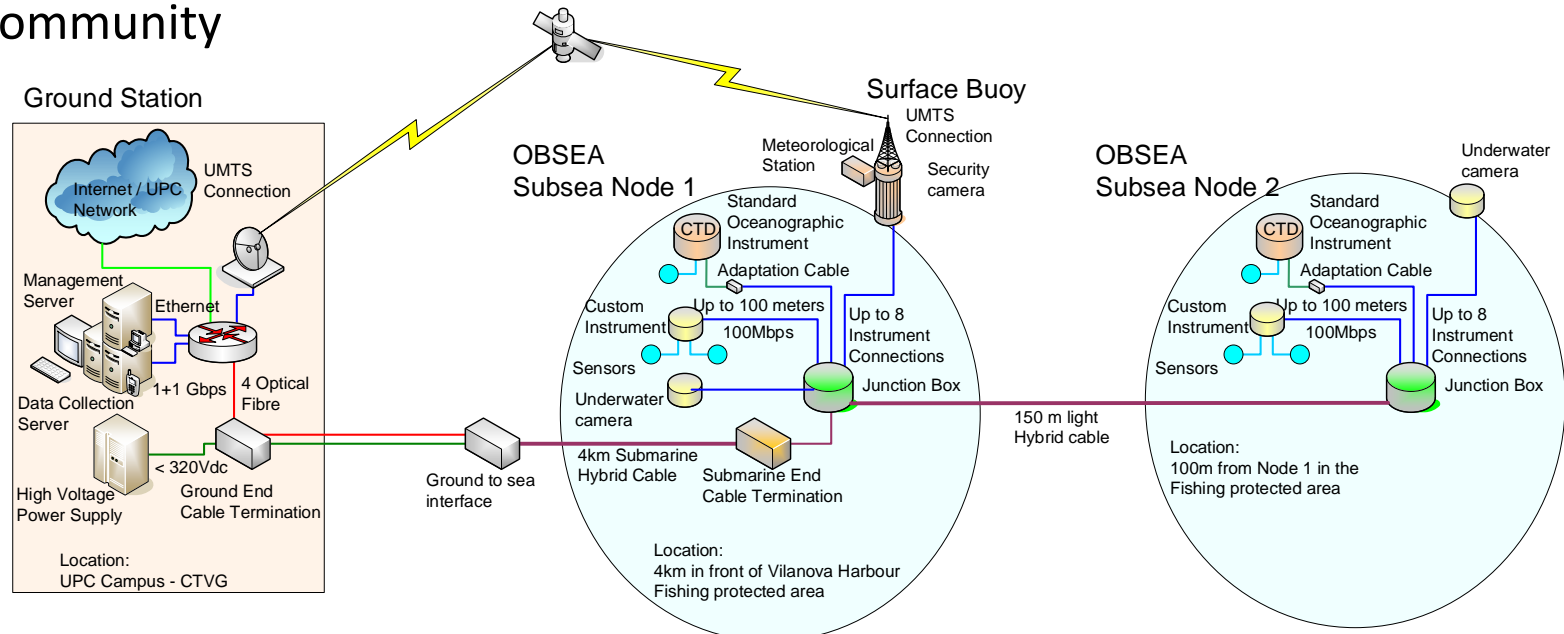
- Introduction to OBSEA observatory
 - Location
 - Instrumentation
- Maintenance operations in the OBSEA
 - Small operations carried by our scientific divers team
 - Big operations with commercial divers



OBSEA fundamentals

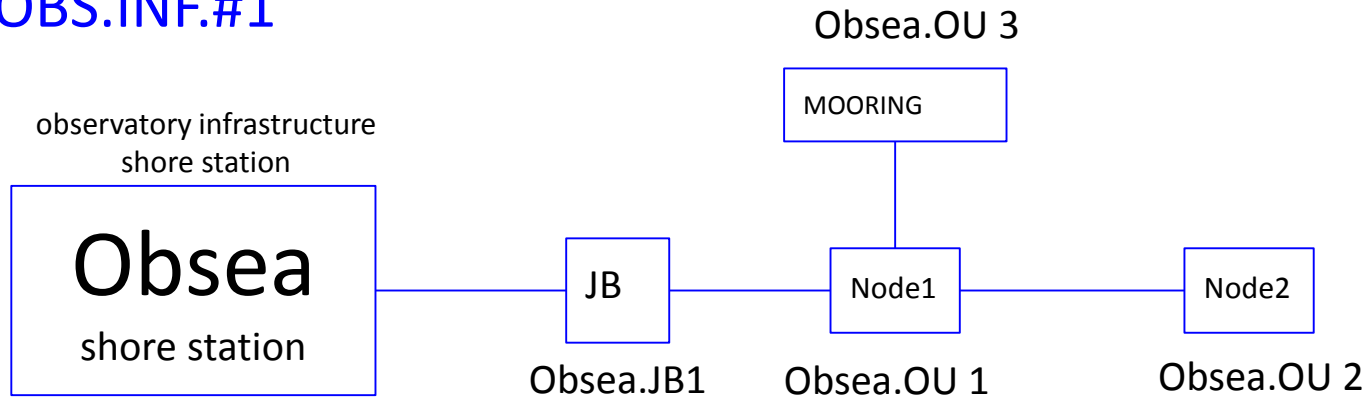
Who are we?

- OBSEA is a project whose objective was to install a cabled seafloor observatory 4 kilometers away from the Vilanova i la Geltru coast in a fishing protected area.
- The objective of this project is to have a test-bed for the development of oceanographic instrumentation and at the same time to have an observatory that provides valuable information to the scientific community



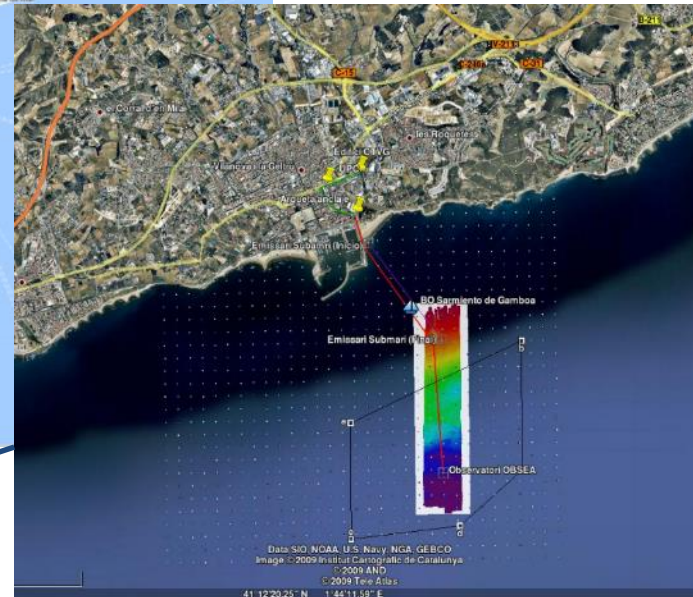
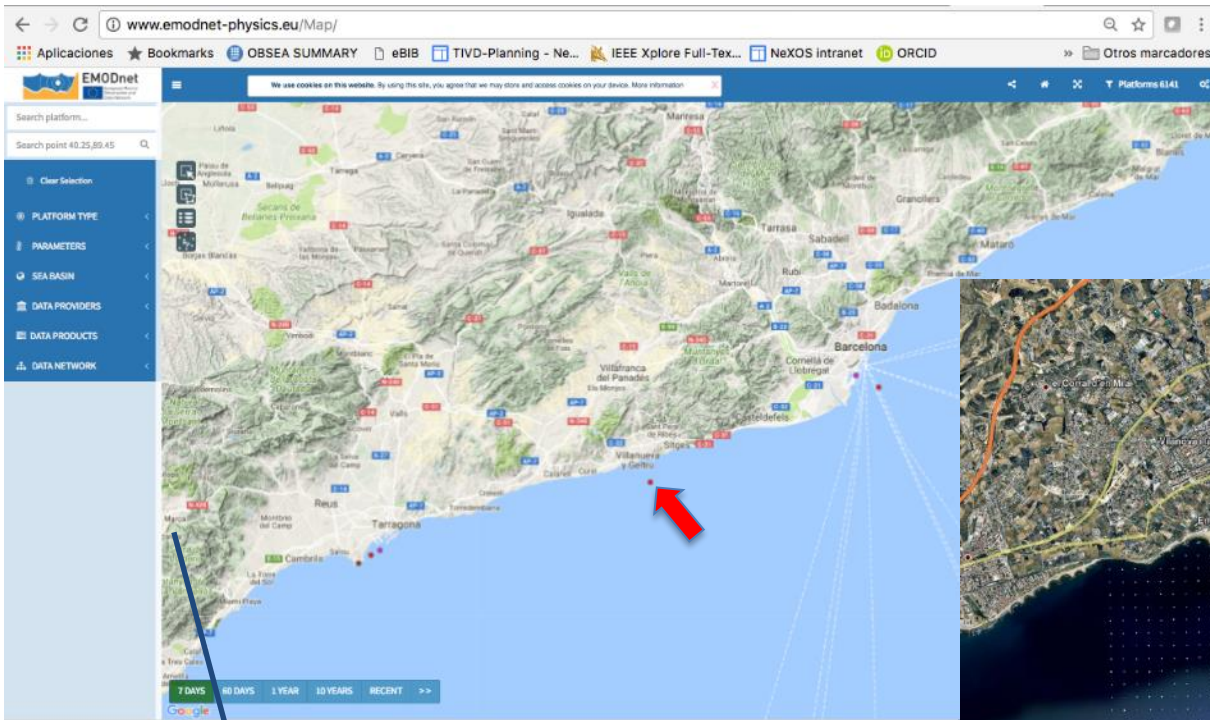
EMSO OBSEA Simplified schema

OBS.INF.#1



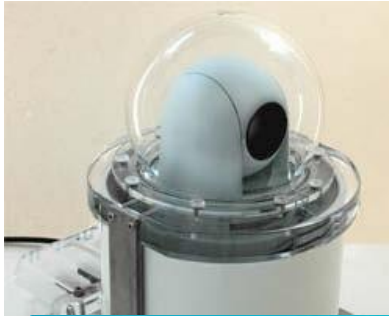
RF=Regional Facility
OBS.INF.=Observatory Infrastructure
OU=Observing Unit
JB=Junction Box

LOCATION



INSTRUMENTATION

IP Cameras



ADCPs



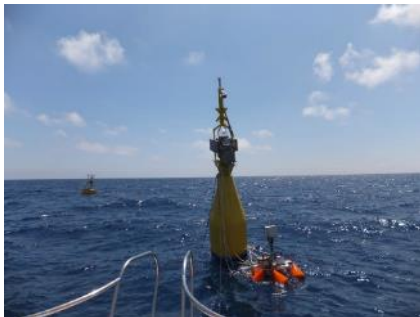
CTD



Hydrophone



Buoy with Camera & Meteo Station



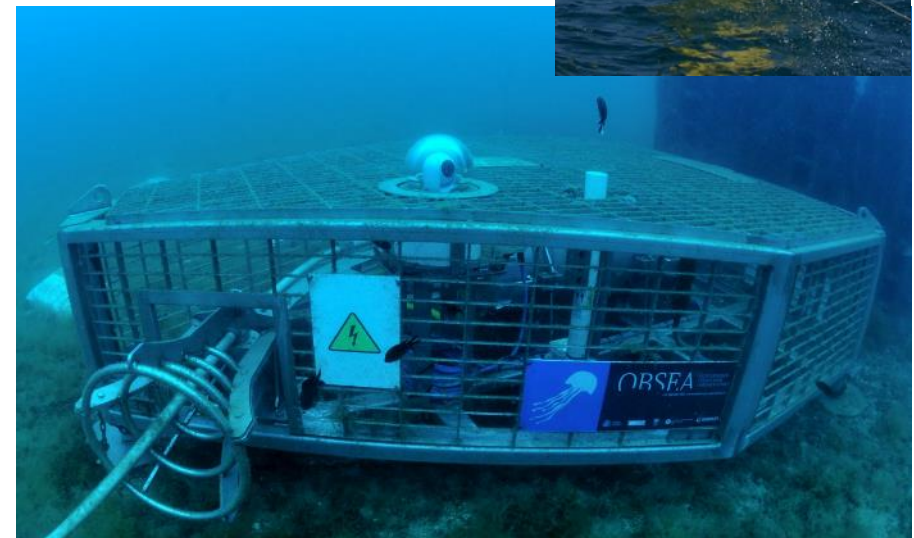
& More...



Current status of the Observatory

- Position: 41.1819°N 1.7524°E
- Type: cabled bottom and buoy
- Payload-parameters: PTZ camera, CTD, Hydrophone, Doopler Waves and Current meter, Seismometer, Buoy with Meteo and other temporal experiments
- **People involved: SARTI research group (UPC)**

Obsea subsea node and buoy



services that
could be supplied

Deployment of instruments in the Observatory

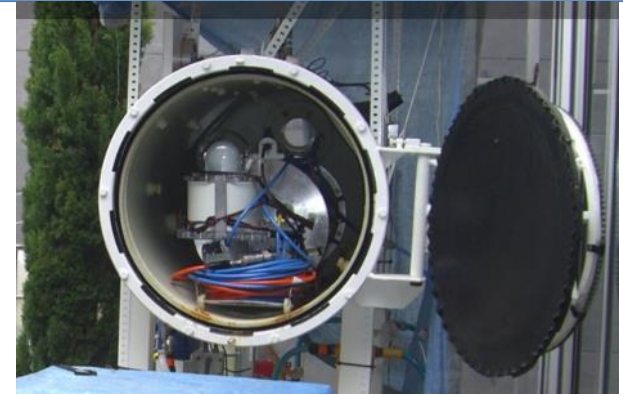
Operating Scheme/Schematic

- Pre-deployment
- Deployment
- Maintenance on the field
- Recover



Pre-deployment procedures

- **Design issues**
 - Fill the OBSEA Instrument Data Sheet (OIDS)
 - Prepare OBSEA connection cables
 - Installation of the data receiving software on a test computer or specific server
 - Connectivity test to OBSEA network
- **Programming maintenance/service issues (periodic/after failure)**
 - Visual Inspections
 - Instrument deploy and recovery operations
 - Emergency actions
- **Calibration issues**
 - Program of calibration operations
- **Preparations**
 - Instrument mounting for test in hyperbaric chamber
 - Validation of the instrument in the on shore laboratory
- **Equipment**
 - Preparation and review of the instrument brackets and anchoring parts
 - Preparation for deployment



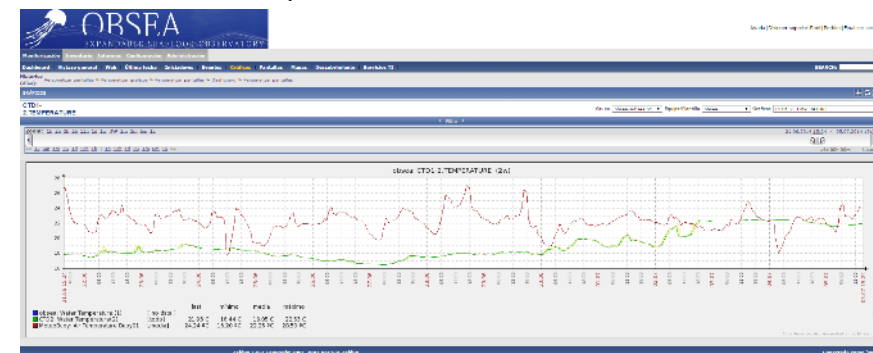
Deployment procedures

- Means (R/V, ship?, divers, ROV?)
 - Small operations (Instrument deployments up to 100kg)
 - 1 small boat (7,5m) available on demand
 - Team of specialized divers familiarized with the observatory
 - Big operations
 - Subcontract of professional diving company with technical ship
- Maintenance on board
 - Simple maintenance operations can be done on board by the divers team
 - Usually maintenance of instruments is done on shore due to the proximity of the coast
- Testing/Validation
 - Test after deployment can be done during the diving operation thanks to the visual communication between divers and on the shore team
- Deployment procedures
 - Preparation day before:
 - Pre-deployment briefing: definition of land and divers teams tasks
 - Check of instruments to deploy and support material
 - Operation Day
 - Phone coordination between diving team and on shore team
 - Underwater operation and real time validation check
 - On site validation after deployment



On the field procedures

- Data transfer
 - Real time communication with the instrument through OBSEA cabled network
 - Communication using UDP or TCP/IP
- Surveys
 - Visual inspection every 3 to 8 weeks
 - Particular inspection as required by the instrument
- Emergencies
 - Access to the observatory in two working days
 - Day 1: Preparation of material, contact boat, filling air compressed bottles
 - Day 2: Off shore maintenance operation
- Data post processing
 - Data received is stored in raw mode (as it gets from the instrument) and inserted in a SQL database
 - Real Time Data published in the OBSEA website
 - On demand historic data through a web interface
 - RTQC monitors data quality
 - Alarm system detects missing data



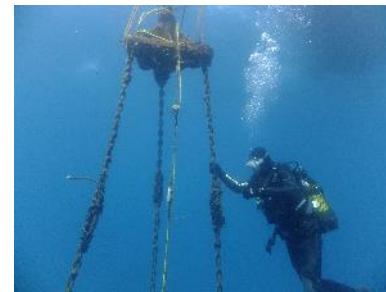
Post-deployment procedures

- Recover of the instrument
- Soft cleaning
- Data download
- Packing and returning to the owner



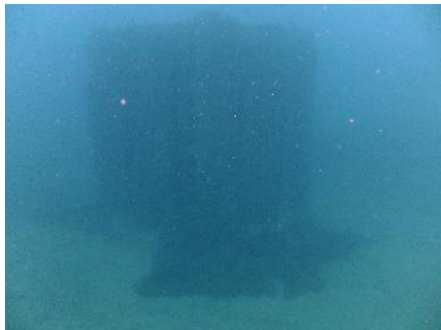
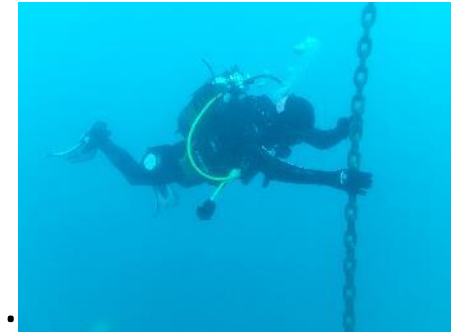
Standard maintenance operation

- Day before
 - Briefing with the divers team, boat captain and other people involved.
 - Minimum of 1 dive team with 3 divers or 2 diver couples and one captain
 - Maximum of 6 divers 1 captain and 2 collaborators
 - Preparation of diving material, instruments to deploy, tools, etc.
- Day of the operation
 - Transportation to the boat & Preparation of equipment
 - Review of checklists and operation procedures
 - Trip to the OBSEA
 - Maintenance operations in the surface buoy
 - 1 or 2 dives of 1 or 2 dive couples
 - If required, some tests or procedures between dives
 - Come back to land, cleaning and storing of equipment
- Day after
 - Cleaning of recovered instruments and additional tests



Inspection points

- General visual inspection
 - Buoy chains and intermediate floats
 - Zinc anodes in buoy tail, chains, cable buoy-obsea.
 - Inspections of the surroundings for detection of foreign objects
 - Inspection of anodes, cables and connectors of obsea structure
 - Camera cleaning
 - Inspection of instruments outside the structure: AWAC, seismometer, other



Thanks for your attention

