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The Open Science Services of the Marine Observatory W1M3A

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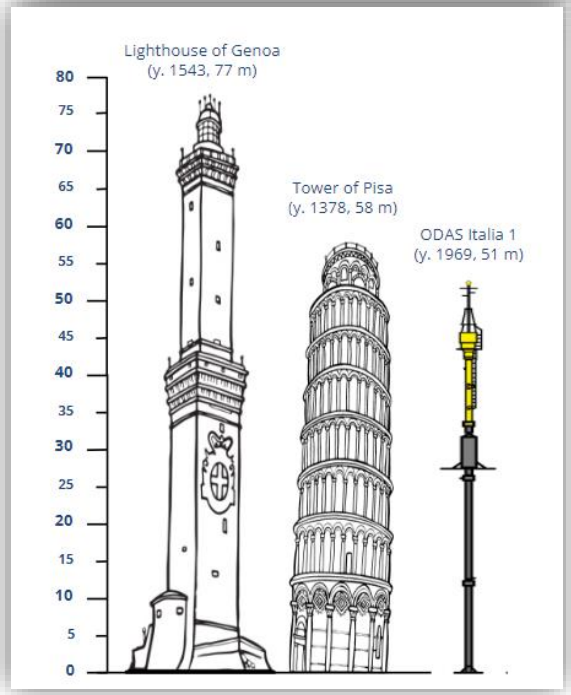
The W1M3A Observatory



The W1M3A observatory (Western 1 – Mediterranean Moored Multi-sensor Array) is moored in the Western Mediterranean Sea (at the center of the Gulf of Genoa), in the Pelagos Sanctuary.

The site is offshore, about 80 Km far from the coast of the Liguria region, on an ocean floor 1200 meters deep.

Two main installations form part of the **in-situ** component of the W1M3A research facility:

1. a **large spar buoy** (known as "ODAS Italia 1", 51 meter long and 12 tons weight) held in place permanently by a long slack mooring and collecting atmospheric and upper ocean measurements (0-40 m);
2. the **mooring line** (50-1200 m depth) hosting instruments for collecting physical measurements of the ocean interior.

Onshore facilities include

- a test site at the entrance of the Port of Genoa useful for performing short-term test deployments of instruments, calibrations, outdoor test, etc.
- an electronic laboratory which offer basic tools to set-up instruments and to perform minor electrical/electronic developments.

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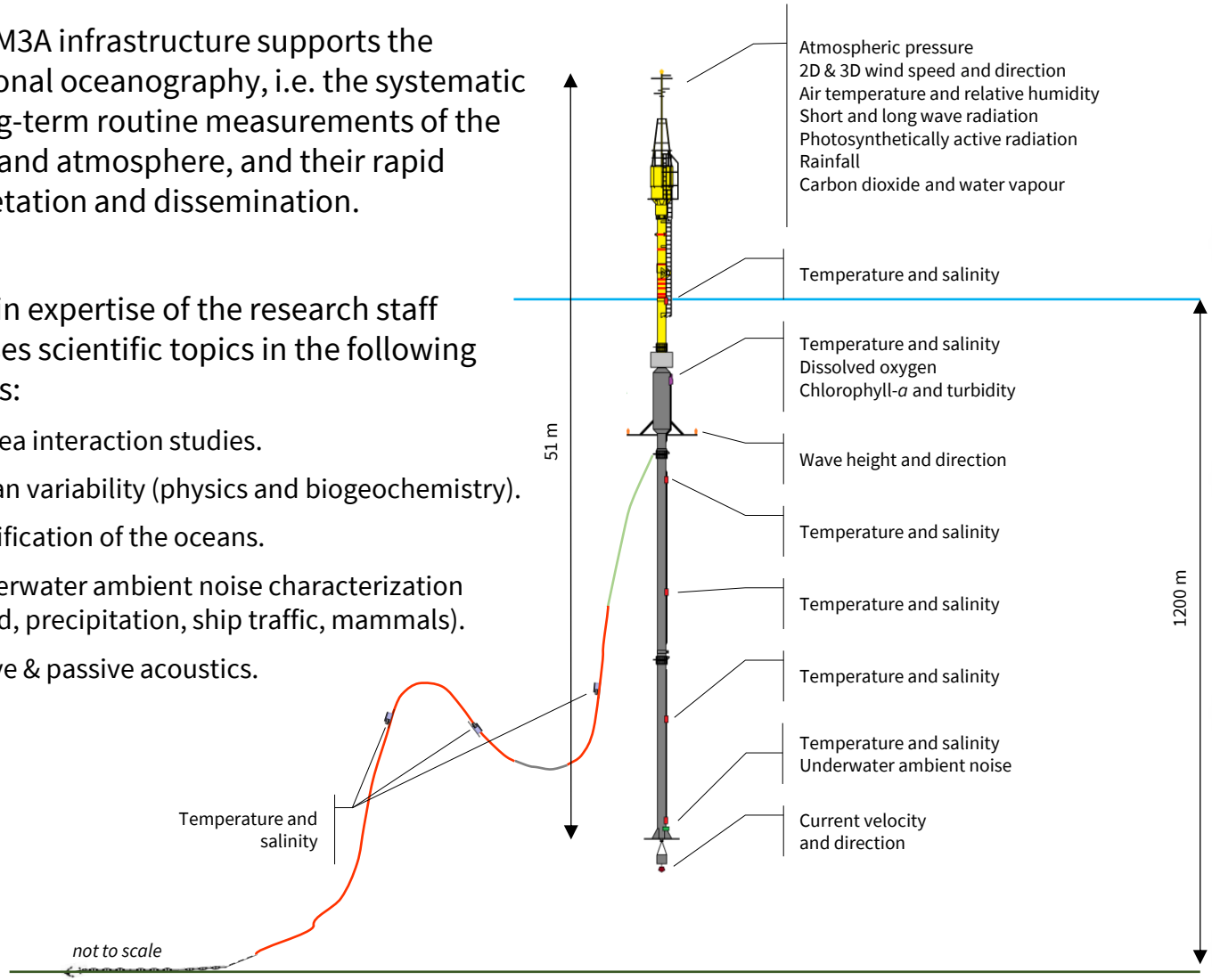
The W1M3A Observatory

The W1M3A infrastructure supports the operational oceanography, i.e. the systematic and long-term routine measurements of the oceans and atmosphere, and their rapid interpretation and dissemination.

The main expertise of the research staff addresses scientific topics in the following domains:

- Air-sea interaction studies.
- Ocean variability (physics and biogeochemistry).
- Acidification of the oceans.
- Underwater ambient noise characterization (wind, precipitation, ship traffic, mammals).
- Active & passive acoustics.



Track 1 - Marine Technology and Innovation

- Regularly update and upgrade sensors, instruments, and infrastructure to ensure they represent the latest technological advancements.
- Improving underwater communication and power supply systems for long-term monitoring.

Track 2 - Data Management and Integration

- Ensure data interoperability with global marine data networks and databases.
- Promote open-access data policies to facilitate wider scientific collaboration and innovation.

Track 3 - Biodiversity and Ecosystem Health

- Monitoring fish populations and other marine organisms using acoustic sensors and underwater cameras.

Track 4 - Interdisciplinary and Collaborative Research

- Collaborating with global marine research networks and institutions.
- Promoting citizen science and public engagement in marine research.

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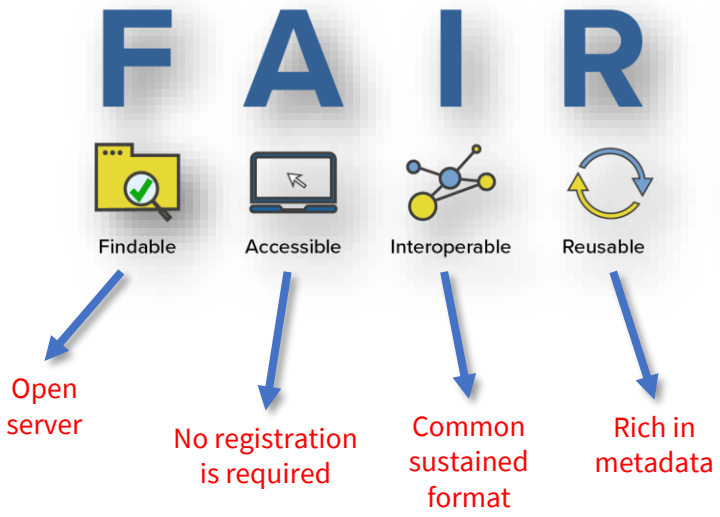
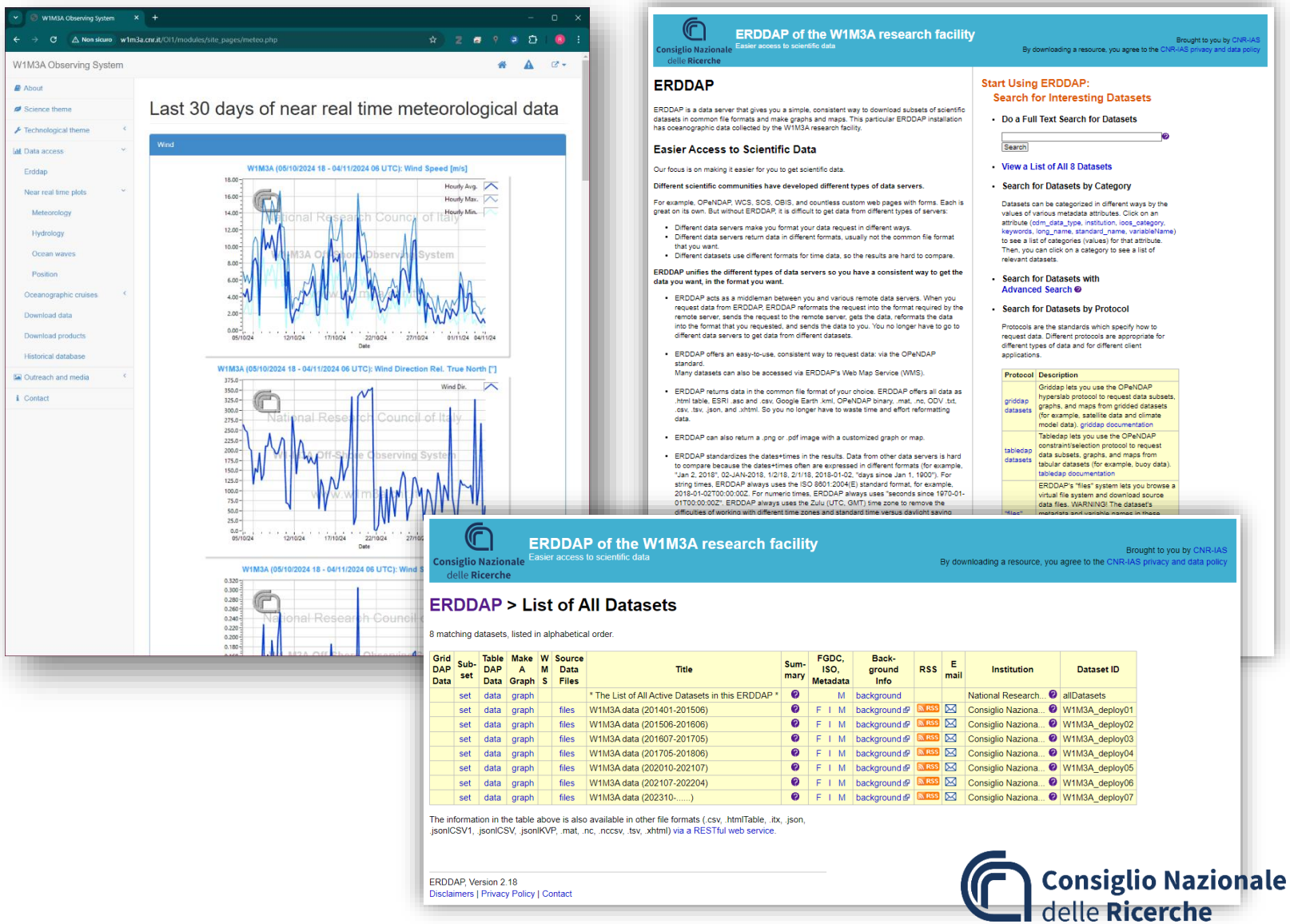
Services of the W1M3A Observatory for the Open Science: data

The W1M3A observatory provides quality-controlled near real-time data on different time-scales and formats:

1. visualization of the last 30 days of data through the portal of the observatory (www.w1m3a.cnr.it);
2. raw data into netCDF format - EMSO/OceanSITES compliant - and distribution through an ERDDAP server accessible on the portal of the infrastructure.



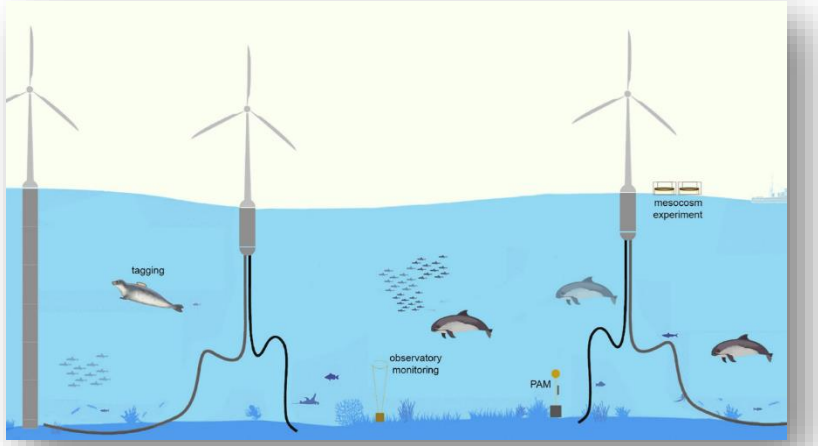


GenOAweek, November 7, 2024

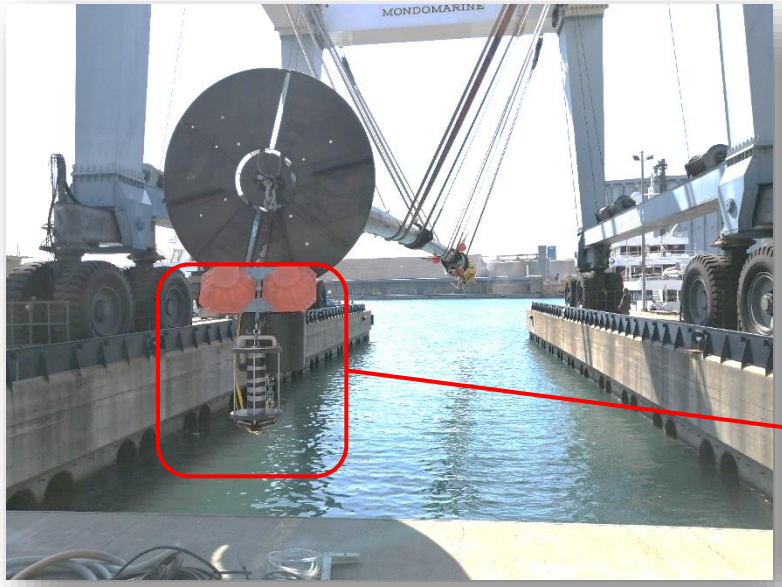
Services of the W1M3A Observatory for the Open Science: data

The project aims at quantifying key features of radiated noise from fixed and floating offshore wind farms, to increase understanding and simulate cumulative effect of clusters on radiated noise, helping to identify sensitive habitats in cross-basin soundscapes.

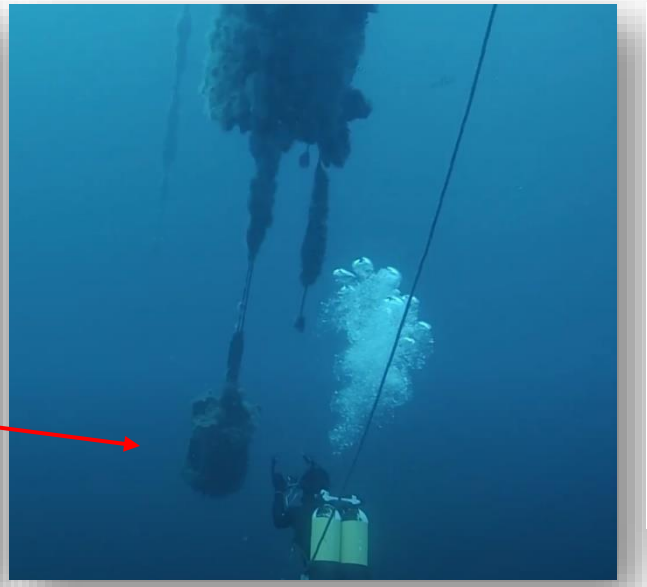
From the biological perspective, the project identifies spatial and qualitative use of offshore wind by top predators and study the impacts of the related noise on zooplankton behaviour.



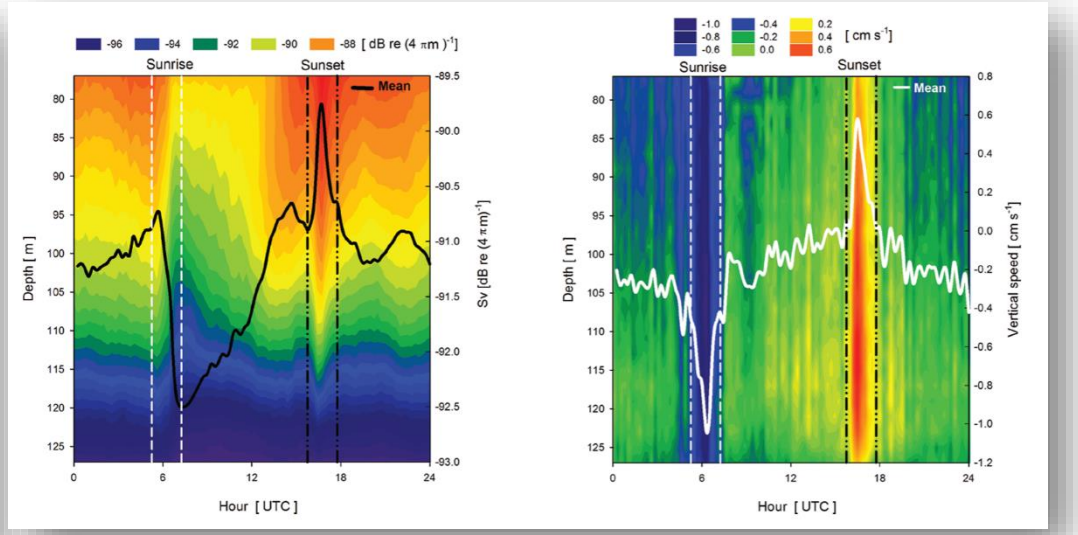
Deployment on the W1M3A observatory



Data acquisition & HDF5 formatting



Data analysis



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Services of the W1M3A Observatory for the Open Science: TNA

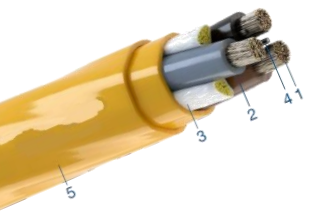
Sea trials for biofouling of a dynamic umbilical (SEASNAKE)

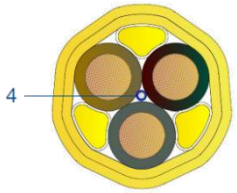
ERIC-EMSO, 2023-ongoing
Users: Research Institutes of Sweden (RISE, SE), NKT (SE), I-Tech (SE)

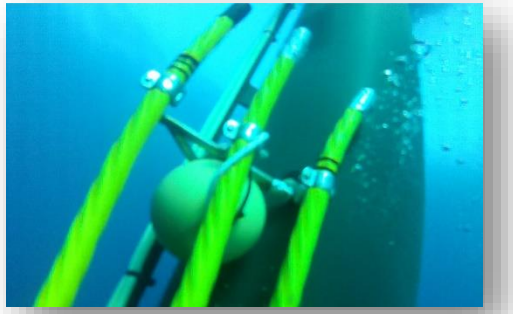
Validate materials durability, corrosion, and biofouling of an innovative dynamic umbilical cable with a sheath of polyurethane during long-term exposition at sea under different oceanographic stressors/conditions.

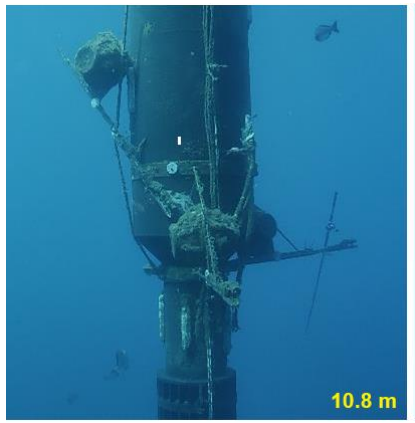
The objectives of the project are to :

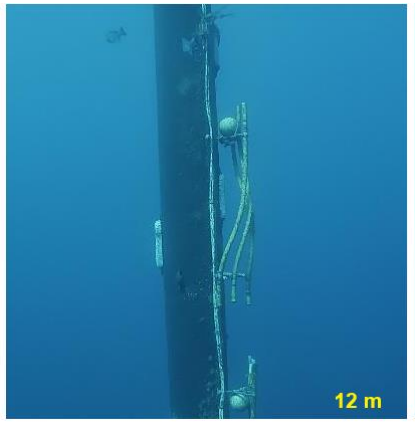
- validate materials durability, corrosion, and biofouling of an innovative dynamic umbilical cable with a sheath of polyurethane during long-term exposition at sea under different oceanographic stressors/conditions;
- prove the effectiveness of antifouling painting upon the cables during the deployment;
- support the development of a coherent protocol for testing innovative materials for underwater cables.

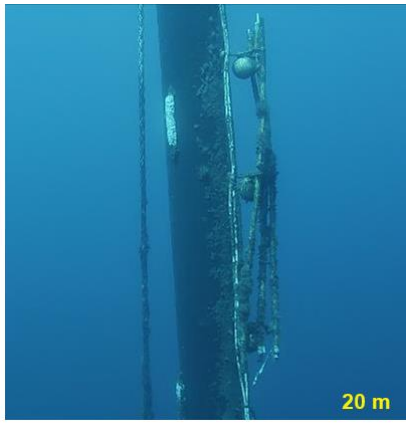


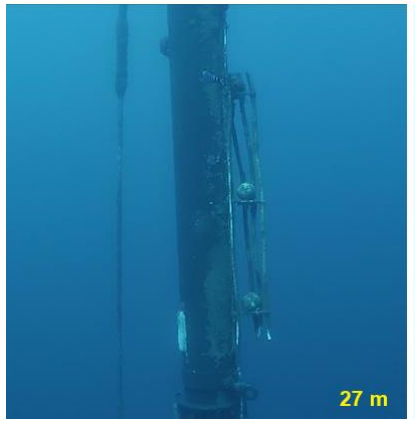


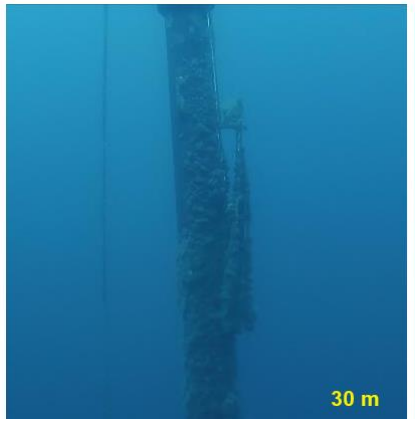


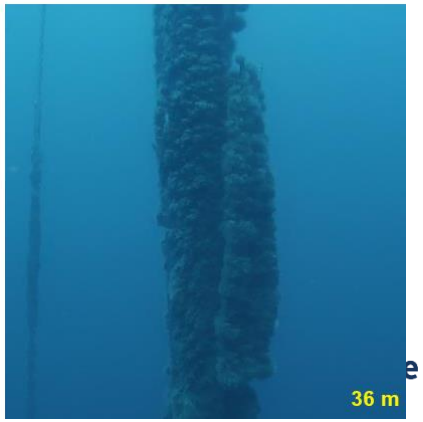












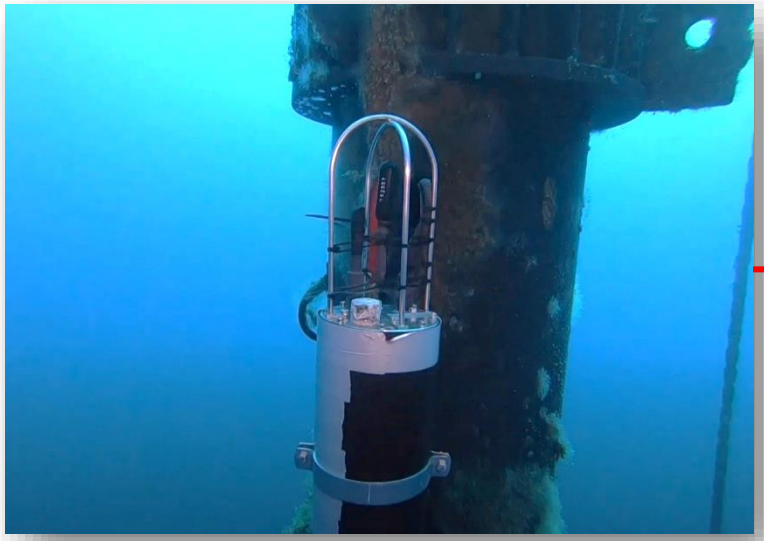
Services of the W1M3A Observatory for the Open Science: TNA

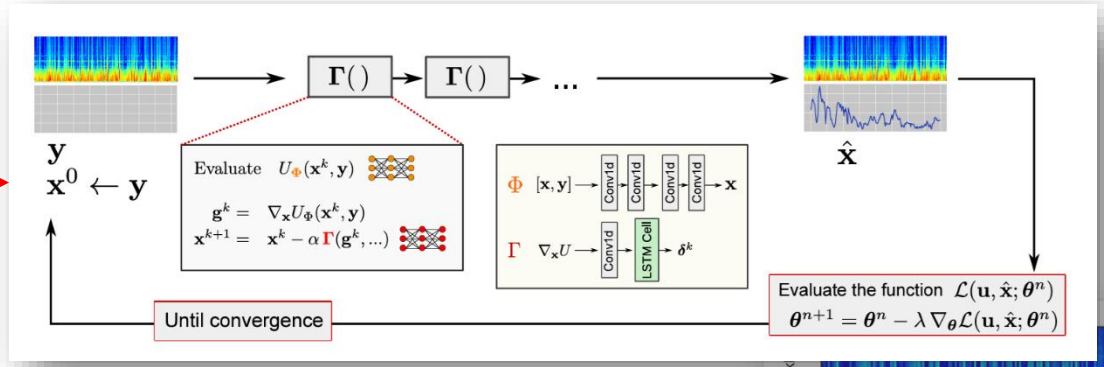
Project funded by the European Commission within the Horizon 2020 Programme (2014-2020)
Grant Agreement No. 101008724

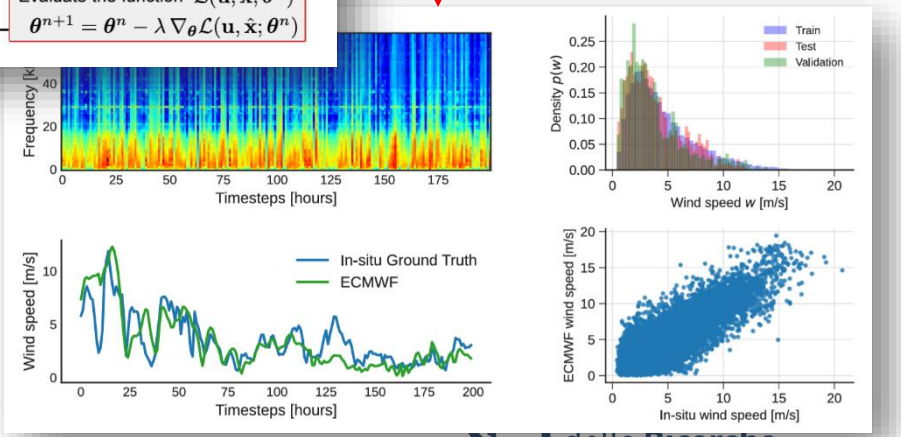
ocean Wind EstimATes witH dEep learning algorithms in a multi-modal approach (WEATHER)

Metrology for Integrated marine maNagement and Knowledge-transfer nEtwork (MINKE - GA ID 101008724), 2023 – ongoing
User: ENSTA Bretagne (FR)

Develop a deep learning-based framework in a multi-modal approach consisting of the fusion of heterogeneous (i.e., meteorological, acoustic, remote-sensed) data to estimate wind speed over open ocean.







Grazie per l’attenzione!

Western Mediterranean research facility
W1M3A

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