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EMD

EUROPEAN MARITIME DAY

IN MY COUNTRY

“A boost for sustainable sea and ocean solutions”

Project Pitches

Nominate the best ocean project with us!

Session I – Project Pitches

11:30 - 12:15 CEST

How can zero-polluted seas and oceans be achieved and their health and productivity restored?

Session II – Project Pitches

13:00 - 13:45 CEST

How can the oceans be secured as a food source in harmony with its ecosystem?

Session III – Project Pitches

13:00 - 13:45 CEST

How can offshore energy be developed and marine resources responsibly harvested?



Session I – Project Pitches

How can zero-polluted seas and oceans be achieved and their health and productivity restored?



Solutions to local challenges on marine litter

Oihane Cabezas (AZTI)

Regional models point to the coastal waters of the SE Bay of Biscay as an accumulation zone for floating marine litter. Sea-based activities are the main source of floating marine litter in this region. As a response, several initiatives have been implemented in the region, involving Spanish and French stakeholders (government, scientific community, industry, and NGOs). This pitch talks about 3 technological approaches implemented to prevent, collect, and monitor the presence of marine and riverine litter: a videometry system, an active fishing for litter approach, and long-line ropes for mussel aquaculture made of recycled fishing nets.



SEACLEAR – Cleaning the ocean floor with Autonomous Robots

Hans-Christoph Burmeister (Fraunhofer CML)

Past collection efforts have focused mostly on surface waste and only a few local efforts to gather underwater waste, always using human divers, for this reason, we developed “Seaclear” = SEarch, identificAtion and Collection of marine Litter with Autonomous Robots. When fully operational, the SeaClear system aims to detect and classify underwater litter with 80% success rate, collect it with a 90% success rate. This equals to 70% reduced cost compared to divers.



MAELSTROM – Evaluation of Marine Litter Removal technologies

Damien Sallé (Tecnalia)

MAELSTROM’s main goal is to find strategies to reduce the impacts of marine litter in costal ecosystems, by identifying accumulation hotspots and by removing the existing litter from the coastal seabed and the water column of rivers before it reaches the sea.



Macrocosme – an innovative buoy for ocean health monitoring

Julien Legrand (Ifremer)

The objective of the MACROCOSME project is to develop an innovative monitoring tool to assess the impact of anthropogenic pressure, such as produced water on the global marine ecosystem in the vicinity of offshore oil and gas platforms. This paper describes a new approach proposed to focus on biological indicators and details the technological parts of the buoy designed to support the associated sensors and to provide them with all the services needed.



Multisensor option for floating waste monitoring

Jukka Sassi (VTT)

Monitoring Multi-sensor imaging offers an interesting approach to monitor floating waste. Optical sensors collect data simultaneously from the same target area. Sensors can be mounted on drone or in fixed installation. After the data acquiring, the collected data will be combined and analysed to enable the detection of floating debris and differentiation of plastic objects from organic material. We utilised thermal infrared (TIR), hyperspectral (HS) and RGB sensors and typical household plastic products as target objects. Our results indicated that multi-imaging consisting of HS, TIR and RGB is promising method for separating floating plastic waste from organic material.



Smart Bay S. Teresa - A platform of cooperation towards carbon neutrality

Chiara Lombardi (ENEA)

Santa Teresa Bay (Gulf of La Spezia, North-West Mediterranean Sea) is a natural bay located in a highly impacted port area. ENEA is promoting the transition of the Bay towards a cooperation among research, recreational (tourism and training) and aquaculture activities, for reaching a 'carbon-neutral' bay. By means of a community-led approach, local communities are main actors of cooperative projects and engagement actions. Smart Bay hosts in situ marine observatories connected with National and International Networks and is a test site for international public and private companies aiming to develop high-tech systems for underwater monitoring.



Paving the road towards a comprehensive global plastic agreement.

Emily Cowan (SINTEF)

Our oceans are drowning in plastic and in need of a globally binding agreement to successfully mitigate the crisis. As part of the Research Council of Norway's project entitled PLASTICENE, scientists can follow the upcoming highly anticipated negotiations expected to begin on such a treaty at the United Nations Environmental Assembly (UNEA) 5.2 in February 2022. Using event ethnography methodology researchers can acquire data by mapping narratives from the interventions at the negotiations. An agreement on this scale can arguably only be achieved through a cross disciplinary nature by involving industry, governance, stakeholders, and citizens a sea at the negotiating table.

Session II – Project Pitches

How can the oceans be secured as a food source in harmony with its ecosystem?



Towards sustainable offshore aquaculture in the Basque coast (SE Bay of Biscay)

Izaskun Zorita (AZTI)

In recent years, due to the decline of fishing activity in the Basque Country, offshore aquaculture has been recognized as a potential solution to diversify marine production, avoid coastal problems and minimize impacts. AZTI currently has two experimental sites for pilot aquaculture studies, a longline in offshore waters and a raft in a protected area. Studies conducted over the last 10 years have validated the technical, biological and environmental feasibility of the installation and production of mussels (*Mytilus galloprovincialis*) in open waters, but there is an interest in the diversification of low-trophic level species and the use of sustainable materials.



The B-Blue project: Blue biotechnologies to support the transition to a circular management of the blue bio-resources

Cristian Chiavetta (ENEA)

The B-Blue project, led by ENEA, aims at gathering the key actors of the Mediterranean Blue Biotechnologies (BBt) sector and increase their coordination in order to unlock the innovation potential in the field. The exploitation of marine bio-resources through biotechnological solutions is a field with massive potential for innovation & economic growth, but it is a relatively young discipline, so opportunities & key enabling factors need a coordination. In B-Blue 10 partners with proved experience in the Blue Bioeconomy and more than 300 Med stakeholders from SMEs, research centers, public authorities & business support organizations are working together to create the Med BBt community.



The role of blue food in future sustainable diets

Friederike Ziegler (RISE)

Seafood research and contract work at RISE focuses on assessing the environmental performance of seafood supply chains both from fisheries and aquaculture. The goal is to identify best practice and improve production and sourcing strategies. I will talk about our work with SINTEF Ocean on Norwegian seafood products and how the findings have led to a focus on developing and using novel feed components. Last year, we started a research center on Sweden together with academic and industry partners: Blue Food-center for future seafood. Recently, our work in the seafood area has expanded into consumer science, nutrition and looked into the properties of seaweed as a potential food ingredient.



AUVs for aquaculture monitoring

Bas Binnerts (TNO)

Within the Algaedemo project TNO investigates the technical performance and value of Autonomous Underwater Vehicles (AUVs) for monitoring seaweed growth and the influence of seaweed on the environment. Because AUVs are able to operate throughout the water column, they are able to acquire spatially diverse data close to the seabed and seaweed, thus improving data quality. Current navigation capabilities of COTS AUVs do however not meet the requirements to safely navigate in close vicinity of the seaweed. TNO is developing technology that will enable future AUVs to safely and effectively acquire data in offshore seaweed farms.



Fish metabolism studies for safe food

Prof. Christian Schlechtriem (Fraunhofer IME)

Fish feed that is used in commercial fish farming already contains a significant proportion of vegetable raw materials. It is therefore important to understand the potential for pesticide residue transfer into edible tissues from farmed fish. In the EU, fish metabolism studies are required as part of the regulatory approval of pesticides if treated crops are used as raw material in fish feed and there is a risk of residues being carried over to edible tissues. Fraunhofer IME, together with representatives from regulatory authorities and the industry, developed a test concept for carrying out fish metabolism studies.



Digitalization and Robotics in Aquaculture

Herman Bjørn Amundsen (SINTEF)

As salmon farm sites are moved further offshore and to more exposed locations, working conditions are increasingly challenging. Farmers therefore aim to automate unmanned underwater vehicle (UUV) operations to facilitate safer working conditions and increased precision in finfish farming. In the CHANGE project, advanced control strategies for UUVs operating autonomously in fish farms will be developed, where the UUVs must operate within deformable structures and in the presence of animals. The project will develop new knowledge on the interaction of UUVs and fish, with the aim of enabling the UUVs to adapt their actions to avoid negatively impacting the fish.

Session III – Project Pitches

How can offshore energy be developed and marine resources responsibly harvested?



OceanACT – A Portuguese Atlantic lab for future ocean technologies

Mário Alberto Vieira (+Atlantic CoLAB)

The OceanACT initiative aims to promote and manage the offshore testing infrastructures existent in Portugal. This initiative intends to attract new technology developers from the Blue Economy to the country, by providing them the necessary support throughout their demonstration processes, in order to shorten their time to market. The promoters of the initiative include +Atlantic Colab, CEIIA, Fórum Oceano, INESC TEC and WavEC.



Forecasting ocean energy in the Mediterranean Sea

Massimiliano Palma (ENEA)

Two operational forecasting systems have been developed by the ENEA-CLIM laboratory. The innovative high-resolution ($1/48^\circ$) ocean circulation model of the Mediterranean Sea-Black Sea system (MITO) includes the main tidal effects and increases its resolution to several hundred meters in both the Mediterranean straits. Operative wave forecasts complement the ocean circulation forecast, providing basin-wide information on wave parameters at $1/32^\circ$ resolution which is further increased over interesting areas along the Italian coast. The integrated system MITO + wave models represents an invaluable instrument for the design, testing and operative management of marine energy converters in the Mediterranean.



Geophysical site characterization: Ultra-high resolution multichannel seismics

Gabriela Sierra Lombera (Fraunhofer IWES)

The soil and underground conditions must be investigated when planning the exact sites of individual wind turbines within a planned offshore wind farm. The Fraunhofer IWES employs acoustic methods to characterize the subsurface, thereby contributing to efficient and cost-effective planning. In order to study the underground, the experts in the Subsurface Investigations department employ a multichannel seismic measuring system tailored specifically to the requirements of the North Sea and Baltic Sea. The seismic results are ultimately used to produce a subsurface model, which can be used to compile a risk analysis for the development project. This method makes it possible to reduce uncertainties in the subsurface significantly, thereby lowering the risk during project development. This cost reduction has an immediate effect and therefore promotes the advancement of wind energy.



BiMEP – Learning by doing?

Yago Torre-Enciso (Tecnalia)

Learning by doing is needed for the development of MRE. Test sites are the perfect solution for that: acquired know-how on testing, deep knowledge of seabed and sea climate, “easy” way to obtain the permits... But, is it all what it’s needed?”



Wave impacts – science advances and applications

Alan Tassin (Ifremer)

Water waves and offshore wind are a great source of renewable energy which motivates a prolific Research and Development activity. The development of off-shore renewable energy technologies such as wave energy converters and floating wind turbines leads to new challenges for designers. In terms of hydrodynamics, this has led us to the development of innovative experimental approaches in order to improve our understanding of wave impact problems: high-speed tracking of the wetted surface with transparent mock-ups, high resolution wave field measurements with stereo-video and complex instrumented (segmented) models.



Material challenges from surface to deep sea – advanced monitoring and material solutions

Pauliina Rajala (VTT)

Subsea environment is a challenge for materials in applications where long term reliable operation is needed, whether in shallow or in deep sea. In our research we tackle corrosion and material performance and biofouling challenges to develop advanced monitoring techniques suitable for subsea applications from shallow to deep. Monitoring combined to modelling approaches will facilitate safe and responsible utilization of off shore and deep sea resources. In addition to material performance monitoring, our approach may be used to monitor the environmental conditions at deep sea raw materials extraction sites.

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Photo acknowledgments

- 1 iStock
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