Annexe 1: OCEAN SCIENCES INSTITUTE POLICY

The Ocean Science Institute brings together a wide range of interdisciplinary scientists, engineers, students, political and business stakeholders with the following objectives and challenges:

OCEAN SCIENCE INSTITUTE OBJECTIVES

The Ocean Sciences Institute coordinates education, capacity building and research excellence actions aimed at achieving the following objectives:

Objective 1: Enhance Interdisciplinary science contributing to the digital blue transition of the ocean and water knowledge system to better understand, observe and forecast the health and risks to our hydrosphere and coastal areas.

Objective 2: Create an international ocean literacy coalition, building on our common heritage and contributing to improved governance and decision making processes.

Objective 3: Promote science supporting sustainable blue economy solutions for circularity and climate neutrality.

Objective 4: Encourage research excellence to regenerate oceans and end pollution through monitoring assessment and effective implementation of innovative prevention, elimination and remediation measures from source to sea.

Objective 5. Support the piloting and test of ground breaking research to effectively govern, monitor protect and restore ocean biodiversity under adverse climate and anthropogenic pressures

These objectives are directly linked to achieving the Starfish Mission targets (Horizon Europe programme) and address the 4 Ocean Sciences Institute challenges.

OCEAN SCIENCE CHALLENGES

CHALLENGE 1. Improving knowledge and communication of present and past dynamics of the ecosystems, impact of climate change, vulnerability, resilience to natural and anthropogenic pressures, forecast changes, services and mitigation:

1.1. Understanding the dynamics of the Ocean and ecosystems' functioning

1.2. Understanding pollution and climate impacts

1.3 Understanding Ocean-Atmosphere interactions

1.4.Forecasting the relationship between the ocean dynamics, biodiversity and ecosystems' functioning and services

1.5 Adapting to climate change and definition of mitigation measures

1.6 Evaluating accurately long term (past, present and future) ocean resources and ecosystems

1.7 Reversing the long term overexploitation of the marine ecosystems

CHALLENGE 2. Effective risk management and protection of coastal areas:

2.1 Reducing the threat on coastal ecosystems and the negative effects on human-related activities

2.2. Evaluating, communicating and reducing the coastal risks of pollution

2.3. Forecasting coastal erosion and submersion for integrated coastal zone management

2.4. Improved decision support systems for sustainable Port and maritime management

2.5 Improved governance through scientifically informed MSP and MPA and improved juridical procedures

2.6 Improved international collaborations through better communication and understanding of cultural and historical contexts.

CHALLENGE 3. Contribution to the creation of a digital twin of our oceans through accessible and interoperable ocean science data and observation systems:

3.1. Advancing marine and maritime Intelligent robotics systems

3.2. Tailor-made sensors and platforms, embedding AI to observe the ocean and its biodiversity

3.3. Intelligent maritime and offshore security and safety systems

3.4. Modelling of Ocean dynamics & intelligent forecasting oceanic variables

3.5. Big data Passive acoustics for long term and large-scale ocean monitoring

3.6. Advancing Trajectography, tracking and automatic monitoring systems

CHALLENGE 4. Innovations in Marine engineering, Blue growth businesses, and governance based on an ocean literate society :

4.1. Promote the engineering of maritime transport and offshore structure as well as those related to Marine Renewable Energies (MRE). Hydrodynamics and flows, wave and wave studies, optimization of energy performance, materials, durability of offshore structures, offshore wind

4.2 Promote public-private partnerships to overcome some obstacles of new activities including new sensors for pollutants, bioremediation measures, as well as new processes (for plastics and emerging contaminants) retention in wastewater treatment plans, satellite data services.

4.3. Establish strategies to encourage and facilitate cluster development in the Ocean, in pollution, green material development, data science, through federation of research/industry.

4.4. Provide scenarios of environmental changes, investigating the impact of ecological changes to people, of alternative socio economics development pathways and blue growth.

4.5. Pilot innovative methods for citizen and stakeholder engagement, open science, ocean literacy and advocacy.