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AZTI Summer School 2023

Joint action from GES4SEAS, OBAMA-NEXT, BiOcean5D, ACTNOW and MARBEFES projects

**Innovative and practical
tools for monitoring and
assessing multiple
human pressures
affecting biodiversity in
marine systems**

Aquarium of San Sebastian
(Spain)

5th to 7th June 2023

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Introduction to the course

Since 2004, AZTI annually organizes an international 'Summer School' on marine research related cutting-edge topics, always trying to bridge the gap between research, policy and society. The course is taught by about 5-10 speakers and attended by around 40-60 students that join from 10-15 countries each year. Some years we have organized the school back-to-back with European projects, such as DEVOTES, MARS, SOPHIE, GlobalHAB, as well as other organizations (e.g. Euromarine, EEAcademy, European Environment Agency -EEA-, Frontiers in Marine Science). This year, the school is organized by AZTI, in the framework of several Horizon Europe projects (GES4SEAS, OBAMA-NEXT, BiOcean5D, ACTNOW and MARBEFES), under the topic of "Innovative and Practical Tools for Monitoring and Assessing multiple human pressures affecting biodiversity in marine systems". All these projects have started in 2022-2023 and are dealing with marine biodiversity, developing tools which will help in monitoring and assessing the ocean. These tools will serve to obtain knowledge, helping policy-makers to take informed management decisions in protecting, conserving and restoring marine biodiversity, ensuring the long-term delivering of ecosystem services.

Human activities at sea (e.g. fishing, shipping, extraction of materials, renewable energies, marine constructions, oil and gas exploration) and coastal areas (e.g. agriculture, industry, tourism, etc.) have expanded considerably, leading to an increased level of pressures and subsequent degradation of ocean health which ultimately affects human health. Despite the efforts of the Sustainable Blue Economy and the Green Deal to minimize the impacts of human activities at sea, maritime activities, and therefore their pressures and impacts, are likely to continue increase, driven by human demands. Examples of such activities include aquaculture, tourism, renewable energy, biotechnology, and seabed mining. Although these activities should be regulated and planned through the implementation of the Maritime Spatial Planning Directive (MSPD; Directive 2014/89/EU), the single

and cumulative impacts from these activities will add to those posed by already existing activities, and may translate to impacts on human welfare. The cumulative impacts from the human activities and pressures are further enhanced by the effects of climate change, which are altering marine ecosystems, with dramatic effects on biodiversity and habitats worldwide, as highlighted by IPBES and IPCC.

Hence, there is a need to ensure that multiple marine and coastal human activities are carried out in a sustainable manner to achieve the goals of the Biodiversity Strategy for 2030 (COM(2020)380), Good Environmental Status under the Marine Strategy Framework Directive (MSFD; Directive 2008/56/EC), and the favorable conservation status of vulnerable habitats and species (Birds and Habitats Directives (BHD; 92/43/EEC)), and ultimately contribute to the United Nations Decade of Ocean Science for Sustainable Development (2021-2030) and the Sustainable Development Goals (SDGs). This will contribute to guarantee the maintenance of the provision of marine and coastal ecosystem services, under a background of climate change, which in turn, will allow mitigation and adaptation to it, increasing the resilience of marine and societal systems.

Hence, the main objective of the school is to present the innovative tools that are already practically used in monitoring the ocean, and the tools used to assess the cumulative effects of multiple pressures, as well as the status of the ocean and the ecosystem services it provides.

Contents of the course

/ Monday, June 5th 2023

- **09:00 - 09:30 Introduction to the course**
Angel Borja, AZTI, Spain
- **09:30 - 10:30 Using eDNA to monitor different ecosystem components at sea: from microbes to mammals**
Naiara Rodríguez-Ezpeleta, AZTI, Spain.
Project BiOcean5D
- **10:30 - 11:00 Coffee break**
- **11:00 - 12:00 Drones for mapping and monitoring benthic communities**
Anders Gjørwad Hagen, NIVA, Norway.
Project OBAMA-NEXT
- **12:00 - 13:00 Use of imaging and artificial intelligence for monitoring pelagic communities**
Sophie Pitois, CEFAS, UK.
Project OBAMA-NEXT
- **13:00-13:30 Additional questions from the audience**

/ Tuesday, June 6th 2023

- **9:00 - 10:00 A spatial Cumulative Impacts Assessment to guide Ecosystem-based Management**
GerJan Piet, WUR, Netherlands.
Project GES4SEAS
- **10:00 - 11:00 Assessing multiple pressures using methods developed for EEA**
Samuli Korpinen, SYKE, Finland.
Project GES4SEAS
- **11:00 - 11:30 Coffee break**
- **11:30 - 12:30 Assessing the status of marine systems using NEAT**
Iratxe Mentxaka, AZTI, Spain.
Project GES4SEAS
- **12:30 - 13:30 Climate modelling as a decision support tool for marine spatial planning and biodiversity conservation**
Liz Talbot, Plymouth Marine Laboratory, UK.
Project ACTNOW
- **13:30 - 15:00 Lunch break**
- **15:00 - 18:00 Workshop on science communication for cumulative effects assessments**
Communicating science to different audiences, infographics, etc.), linked to the summer school topic (with examples on pressures, assessment, ecosystem services, etc.)
Miguel Leal, Science Crunchers, Portugal
María C. Uyarra, AZTI, Spain
Projects GES4SEAS and OBAMA-NEXT
- **19:00 Pintxos and drinks at the restaurant in the Aquarium**

Contents of the course

/ Wednesday, June 7th 2023

- **09:00 - 10:00 Towards a unifying framework for assessing 'cumulative effects' and 'environmental status' Part 1: Where we are - Concepts and the GES4SEAS approach**
Torsten Berg, MariLim, Germany, and Ciaran Murray, NIVA, Denmark.
Project GES4SEAS
- **10:00 - 11:00 Towards a unifying framework for assessing 'cumulative effects' and 'environmental status' Part 2: Where we are going - Testing and improving the GES4SEAS approach**
Torsten Berg, MariLim, Germany, and Ciaran Murray, NIVA, Denmark.
Project GES4SEAS
- **11:00 - 11:30 Coffee break**
- **11:30 - 12:30 Ecosystem services mapping and assessment**
Tiziana Luisetti, CEFAS, UK.
Project MARBEFES
- **12:30 - 13:30 Summary and Looking forward together**
Summary of the school and discussion with all participants, -professors and attendees-, chaired by Angel Borja.

Supported by



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