"Cumulative effects of multiple human pressures at sea and their impacts on ecosystem components: a practical application for environmental status assessment"

Dates

2nd – 4th June

Venue

AZTI
Herrera Kaia Portualdea, z/g
20110-Gipuzkoa (Spain)
(Very close to Donostia-San Sebastián)

Co-funded by the European Union
UK Research and Innovation
Supporting project: GES4SEAS, a Horizon Europe project

Introduction

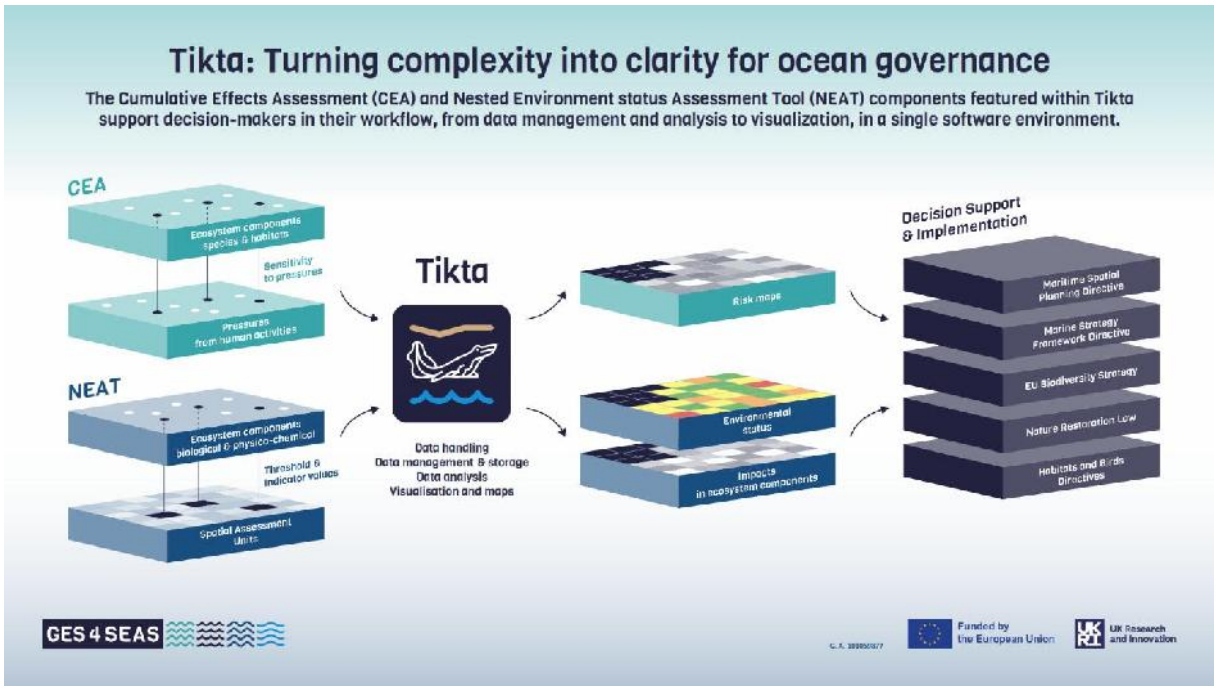
Since 2004, AZTI annually organizes an international 'Summer School' on marine research related cutting-edge topics, always trying to bridge the gap between research, policy and society. The course is taught by around 10 teachers and attended by around 40-60 students that join from 15-20 countries each year.

In 2024, coinciding with the 20th edition of the school, the EU4Ocean Coalition Awards (European Commission) honored this Summer School initiative with the MakeEUBlue Award 2024 for the Best Professional Organisation initiative, recognizing its significant contribution to ocean literacy. This award was presented at the European Maritime Day (31st May 2024) in Svendborg (Denmark).

While being organized by AZTI, most years the summer school has been organized back-to-back with European projects, such as GES4SEAS, Obama-Next, Marine SABRES, GlobalHAB, as well as other organizations (e.g. Euromarine, EEAcademy, European Environment Agency -EEA-, Frontiers in Marine Science). The last four editions have been organized in the framework of several Horizon Europe projects. This 2026 edition is supported by the Horizon Europe project GES4SEAS (www.ges4seas.eu).

The GES4SEAS project, launched in 2022, focuses on cutting-edge research in the field of marine biodiversity and environmental status, developing tools to support the monitoring and assessment of ocean health. However, the success of these innovative tools depends on their use and recognition of the benefits they bring in assessing the status of marine biodiversity, for which training end users and interested audiences (e.g., scientists, managers, media, etc.) is needed.

Currently, different policies and directives require monitoring and assessing the status of marine waters in Europe (e.g., Water Framework Directive, Marine Strategy Framework Directive (MSFD), Habitats and Birds Directives, Biodiversity Strategy, Nature Restoration Law, etc.). In this context, GES4SEAS has developed a free software, called Tikta, designed to assess impact risks from cumulative pressures on ecosystem components, evaluate environmental status (sensu MSFD) and support both spatial and non-spatial customized analyses. It includes data/metadata management, a spatial analysis framework and visualization of results (maps and tables). To this end, Tikta currently includes two main assessment methods: (1) CEA: Cumulative Effects Assessment; and (2) NEAT: Nested Environmental status Assessment Tool.



The GES4SEAS CEA assessment method integrated in Tikta performs assessments of risks coming from cumulative human activities and pressures on ecosystem components, by combining spatial data of these elements, together with sensitivity information of ecosystem components to pressures. This could be used in reporting for the Maritime Spatial Planning Directive, as well as in other marine studies about risks coming from human pressures.

The NEAT assessment method integrated in Tikta performs environmental status assessments, using indicator results applied to various levels of spatial assessment units, habitats and ecosystem components. The assessment aggregates this information at different thematic and spatial levels (e.g., the Marine Reporting Units of the MSFD, or the subregional or regional level). The method is customizable to assess the environmental status of the seas with respect to different needs such as those of the MSFD guidance.

Hence, the **main objective of the summer school is to introduce and provide hands-on training with Tikta, focusing on its use for assessment and reporting under different directives and Regional Seas Conventions**. To achieve this objective, we have organized the school in **three days**, **sharing the experiences from scientists participating in GES4SEAS**.
The course is **open to early career scientists, senior scientists wanting to learn new things, managers and policy-makers, targeting representatives from consultancies, research centres, competent authorities and experts from Member States, Regional Seas Conventions, Eionet, etc.**

After the course, the **attendees will be able to use Tikta software, in assessing the risks coming from multiple pressures at sea, as well as in assessing the environmental status under the MSFD guidance.**

Registration procedure

There is **no registration fee**, all coffee breaks and lunches on the 2nd and 3rd of June are covered by the organization.
The maximum number of attendees is limited to 30 to ensure meaningful hands-on practice.
Applicants are requested to **submit a motivation letter including a short bio** (maximum 200 words) **when registering**. It is expected that attendees will have some knowledge about GIS use, as well as some knowledge about MSFD assessment.
Selected applicants will be informed on the 15th of March at the latest.

Attendees must **bring their own computers with the Tikta software pre-installed** (guidance will be provided before the school).
Attendees are welcome to bring their own datasets, but prepared examples will be provided by the organization to facilitate the running of the training.

Register **HERE**

Structure of the sessions

- 9:00 to 11:00 Course
- 11:00 to 11:30 Coffee break
- 11:30 to 13:30 Course
- 13:30 to 14:30 Lunch at AZTI
- 14:30 to 17:30 Course
- Note: on the third day (4th June), the school will finish at 13:30 and no lunch will be provided

Contents of the sessions

- **2nd June, morning**:
  Introduction to Tikta (around 30 minutes)
  Preparation of data (around 30 minutes)
  Linkage frameworks (between activities, pressures, ecosystem components, etc.) (30 minutes)
  This will include a complete example to best visualize how Tikta works.
- **2nd June, afternoon and 3rd June, morning**:
  CEA presentation (around 30 minutes)
  Hands-on training using a pre-defined example. Also, we will include the possibility that the attendees do not at all follow our approach and we would like to be able to show that also other approaches can be implemented with Tikta, using their own data.
- **3rd June, afternoon and 4th June, morning:**
  NEAT presentation (around 30 minutes)
  Hands-on training using a pre-defined example. Also, we will include the possibility that the attendees do not at all follow our approach and we would like to be able to show that also other approaches can be implemented with Tikta, using their own data.

Professors

Ángel Borja AZTI (Spain). Ángel Borja is PhD in Biology (1984, Basque Country University, Spain); Doctor in Sciences (Honoris Causa) (2015, Hull University, UK). Principal Investigator at AZTI (Spain, 1985). Distinguished Adjunct Professor (King Abdulaziz University, Saudi Arabia, 2020-2022). ORCID number: 0000-0003-1601-2025. His main work is making marine ecology research useful for policy-makers and managers, studying the effects of human activities on marine ecosystems, the recovery of marine systems after impact, protection and conservation of the ocean, effects of climate change on coasts and marine waters, monitoring and assessment of marine status, under European directives (i.e. Water Framework Directive; Marine Strategy Framework Directive), as well as integrative methods under the ecosystem-approach. The assessment methods he has developed, together with his team, are used worldwide, contributing to conserve and protect the ocean (e.g. AMBI, M-AMBI, AFI, NEAT, etc.). Author of >450 papers (Hindex: 84, SCOPUS; 100, Google Scholar), Highly Cited Researcher 2018-2022 (Web of Science) and 2019-2024 (Scopus). He is Chief Editor of Frontiers in Ocean Sustainability and Associate Editor of Continental Shelf Research, and member of the editorial board of Ecological Indicators, Marine Pollution Bulletin, and Current Opinion in Environmental Science & Health. He has chaired/organized >55 international conferences/sessions, being key-note speaker in >100 international conferences. He has participated in more than 120 European and international projects, leading some of them (currently GES4SEAS). He was awarded with the European SETAC Environment Education Award (2017), the Life-Time Achievement Award, by the International Conference on Benthos (Cochin, India, 2019), and the MakeEUBlue Award for the summer school he organizes annually since 2004 (EU Commission, 2024). He has supervised or mentored 22 PhD students, from Spain, Italy, Portugal, Mexico, Iran, Saudi Arabia, and China. He was member of the Scientific Committee of the European Environment Agency (2013-2020), and currently is member of next Advisory Boards: International Center for Environmental Management of Enclosed Coastal Seas (EMECS, Japan); Institute of Oceanography (HCMR, Greece); SustainMare (German Marine Research Alliance); Mission inter-estuaires (French Agency for Biodiversity); and Marine and Environmental Sciences Centre – MARE, Portugal

Iratxe Menchaca AZTI (Spain). She is PhD in Marine Biology from the University of the Basque Country (Spain), focused on ecotoxicology as a tool for marine and estuarine sediment integrative assessment. She started her career as marine researcher in the Marine Research Division of AZTI (Spain) in 2010. She has worked in the development of environmental quality guidelines in the context of European Directives (MSFD, WFD), in coastal and estuarine monitoring, in marine quality assessment, environmental impact assessment (i.e., dredging activities, marine renewable energies, water treatment plants…) and shellfish resource management. She participated in the first assessment for the MSFD (Borja et al., 2011), in the European project DEVOTES, and she has participated in the development of NEAT tool, applying it to many ecoregions, then, she has participated in several projects dedicated to this: MEDCIS, MEDREGION, M3C, etc. Moreover, she participates on the following selected European/framework contracts/projects: EMODnet (II-III) (Human activities), GES4SEAS, SafeWAVE and MarinePlan. She has participated in the publication of several papers around the MSFD, GES and monitoring. She has participated in more than 20 communications for International Scientific Symposiums and Congresses, being the speaker of more than 10 oral presentations.

María C. Uyarra AZTI (Spain). She studied Biology at the University of Navarra (Spain). She holds an MSc in Applied Ecology and Conservation and a PhD in management of tourism for conservation of coral reefs (University East Anglia, UK) and carried out postdoctoral contracts with the CIEE Research Station (Bonaire) and Simon Fraser University (Canada). She has more than 20 years of experience working interdisciplinary research. She worked as a consultant and in 2011, she joined AZTI, a private non-profit research foundation (Spain). Since then, she works as a senior researcher in the department of Environmental Management of Marine and Coastal Areas. Her aim is to provide a holistic view to different topics in marine research by exploring them from different disciplines´ perspectives. Since she joined AZTI, she has worked either as a manager or a participant in EU funded projects in the following topics: the implementation of the Marine Strategy Framework Directive, marine ecosystem services, marine recreational activities, marine litter, aquaculture, marine renewable energies, ocean literacy, etc. Recognizing the importance of science communication, she is member of the EuroGOOS ocean literacy working groups, REEDUCAMAR ocean literacy platform, and leads ocean literacy actions within several EU funded projects. She is co-author of more than 40 scientific articles, several books and book chapters (H index = 27) and editor of a special issue in Frontiers in Marine Science, for which she received the Frontiers Spotlight Runner-up Award. She also collaborates with the University Menendez Pelayo as professor for Aquatic Systems, and the University of the Basque Country as a Member of the Sustainability Committee for the Summer School Programme.

Torsten Berg MariLim (Germany). He studied physical oceanography and Biology at the Unversity of Kiel (Germany). He obtained a diploma in marine biology in 1998. For over 25 years, he is now working for the German consultancy and research company MariLim aquatic research. He has a long-time experience in leading, developing and performing environmental assessments, monitoring programmes and research projects. He developed the German MarBIT assessment system for the evaluation of benthic fauna within the EU Water Framework Directive (WFD). During his work for the WFD, he was leading the Baltic Geographical Intercalibration Group on intercalibration and harmonisation of WFD assessment systems within the Baltic member states of the EU. For the regional seas convention in the Baltic Sea (HELCOM), he has developed the CumI indicator to assess the risk of cumulative impact from physical pressures on benthic biotopes and supported the German national MSFD assessment for benthic biotopes. During the EU project DEVOTES (2012–2016), he was co-developing the Nested Environmental status Assessment Tool NEAT. This work is now continued in the EU project GES4SEAS

(2022–2026) where he leads the development of the integrative Tikta application. On the practical side, he has extensive knowledge of sampling and survey techniques and the analysis of macrozoobenthos and marine biotope data. He has worked as a taxonomical expert in marine macrozoobenthos from the Baltic and the North Sea for a number of years. His additional long-term experience in software development and databases, geographic information systems (GIS) and statistical data analysis made it a perfect fit to combine all these fields and use the knowledge to help push marine science forward for the benefit of nature conservation and the protection of biodiversity and sustainable ecosystems.

Jesper Andersen NIVA (Denmark).

Ciaran Murray NIVA (Denmark). He has an M.Sc. (Engineering) from Imperial College, London (UK) but has been living in Denmark for more than 20 years. His work on development of assessment tools started around 15 years ago, almost as a sideline, while working at DHI, a Danish environmental research and consultancy company, where he spent 6 years applying their tools for high resolution 3D modelling of aquatic ecosystems in a range of studies, from small Danish lakes to large-scale international environmental impact assessments. After completing a Ph.D in marine ecology at Aarhus University (Denmark) in 2015, he joined NIVA Denmark in 2016. Since then, work with assessment tools has become a full-time job. In cooperation with some of the many of the talented people here teaching at this summer school, he has developed assessment tools for national authorities (Swedish Agency for Marine and Water Management), regional seas conventions (HELCOM, the Black Sea convention), and for the European Environment Agency (EEA). His work covers two types of assessment: (i) integrated assessment of environmental status i.e. is the status “good” or “not good”? e.g. with respect to eutrophication, biodiversity, contamination by hazardous substances, and to marine litter (ii) assessment of the combined (cumulative) effects (or impacts) of multiple pressures on ecosystems. He is currently contributing to the GES4SEAS project on development of a unifying framework for all types of assessment.

More information

AZTI Summer School Director and GES4SEAS project coordinator:
Ángel Borja. AZTI – aborja@azti.es
AZTI Summer School technical secretariat
Meritxel González Intaxusti. AZTI – meritxel.gonzalez@azti.es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