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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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Biographies of the teachers

Angel Borja

Director of AZTI SUMMER SCHOOL

Angel Borja studied Biology, obtained a PhD in Marine Ecology (University of the Basque Country, 1984) and is Doctor in Sciences (honoris causa) by the University of Hull (UK, 2015). He is Principal Investigator at AZTI, a private non-profit research foundation in Spain, where he has been also Head of the Department of Oceanography and Head of the Marine Environment Area. He is Distinguished Adjunct Professor, at the Faculty of Marine Sciences in the King Abdulaziz University (Saudi Arabia). His main work is making marine ecology research useful for policy-makers and managers, studying the effects of human activities on marine ecosystems, monitoring of marine waters and recovery after impact. This includes developing methodologies to assess the marine status under European directives (i.e. Water Framework Directive; Marine Strategy Framework Directive), being some of these methods used worldwide. He was member of the Scientific Committee of the European Environment Agency (2013-2020). He is author of more than 270 peer-reviewed papers (Hindex: 67), and Highly Cited Researcher 2018-2020 (Clarivate Analytics, Web of Science). Specialty Chief Editor of Frontiers in Marine Ecosystem Ecology, Associated Editor of Continental Shelf Research and Journal of Sea Research, and member of the Editorial Board of Ecological Indicators, Marine Pollution Bulletin, Heliyon and Current Opinion in Environmental Science & Health. Referee in more than 100 international journals and project evaluation agencies, is member of different advisory boards and scientific associations (ASLO, CERF, ECSA, ESP, SIBECOL), serving as chair in numerous international conferences. He has participated in more than 120 European and international projects, being the coordinator of the EU 7th FP project DEVOTES (DEVelopment Of innovative Tools for understanding marine biodiversity and assessing good Environmental Status). He has been characterized by the continuous dissemination of science and organizer of the AZTI's successful marine summer school since 2004. He was awarded with the SETAC Environment Education Award in 2017, and the Lifetime Achievement Award in the International Conference on Benthos, in 2019 (Cochin, India).

https://www.researchgate.net/profile/Angel_Borja/

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Naiara Rodriguez-Ezpeleta

June 5th 09:30-10:30
Using eDNA to monitor different ecosystem components at sea: from microbes to mammals

Naiara Rodriguez-Ezpeleta studied Biology at the University of Basque Country (Spain) and obtained a PhD in biochemistry from the University of Montréal (Canada). She worked as postdoctoral researcher at the University of Newcastle (UK) and as platform expert as CIC bioGUNE (Spain). Since 2011 she works at AZTI leading the eco-evolutionary genomics applied to marine management group. Dr. Rodriguez-Ezpeleta has over 20 years of experience in molecular ecology and evolution, population genomics, large-scale sequence data generation and analysis, and bioinformatics. She has participated in numerous international and national projects dedicated to the application of genetics for improving marine management. She is an active member of several International Commission for the Exploration of the Sea (ICES) working groups, also as Chair of three of them, and has participated in ICCAT and IOTC groups, including as Chair of the Atlantic Bluefin Tuna CKMR Technical Subgroup. She is also member of the EUROGOOS biological observation working group and of the Ocean Best Practices Omics/eDNA protocol management task team. Dr. Rodriguez-Ezpeleta has published articles in high impact journals (Current Biology, Systematic Biology, Molecular Biology and Evolution, Frontiers in Ecology and the Environment, Molecular Ecology Resources, ...) and books (Methods in Molecular Biology as author, and Bioinformatics for High Throughput Sequencing, as author and editor, among others) (H index=36; citations=5408) and has delivered over sixty oral presentations with about twenty as invited or keynote speaker. She has supervised ten master and PhD students and mentored five postdoctoral/ junior researchers.

More info: https://rodriguezezpeleta.com/

Anders Gjørwad Hagen

June 5th 11:00-12:00
Drones for mapping and monitoring benthic communities

Anders Gjørwad Hagen earned a Master's degree in biology with a specialization in fish physiology from the University of Oslo in 2007. He is currently a senior researcher and research manager for the Department for Research Infrastructure at the Norwegian Institute for Water Research (NIVA), a private non-profit research institute in Oslo, Norway. In his current role, he leads a work package in the NIVA lead project SeaBee, a Research Council of Norway-funded project that aims to establish drone-based infrastructure for scientific research. This project brings together experts from various fields to create a cohesive national network that enables the sharing and use of data collected with drones to better understand Norway's natural environment. As part of the project, Anders is responsible for establishing the physical drone infrastructure, including procuring drones and sensors. The drone data collected is used to train a machine learning algorithm, which helps to automate the data analysis process and allows researchers to work more efficiently. In addition to his work with SeaBee, Anders also leads other projects. For example, he is currently and since 2013 developing a method to gently eradicate an invasive salmon ectoparasite (Gyrodactylus salaris) using small amounts of monochloramine as treatment in infected Norwegian rivers. He also led a subsea project in 2016 that carried out comprehensive online monitoring at a depth of 150m during the construction of a counter fill near the WWII submarine U-864, which was carrying 60 tonnes of mercury when it was torpedoed and sank off the west coast of Norway.

ResearchGate Profile: https://www.researchgate.net/profile/Anders-Hagen-2

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Sophie Pitois

June 5th 12:00-13:00
Use of imaging and artificial intelligence for monitoring pelagic communities

Sophie Pitois graduated in 1997, with a PhD on freshwater eutrophication. Her area of expertise has since then evolved and since starting at Cefas in 2003, her focus has been on the role of zooplankton in the marine ecosystem and its influence on fisheries. She has experience in the analysis of long-term time series and in 2005 was awarded an associate researcher grant with SAHFOS, as a result of collaboration and gained knowledge of CPR data. Sophie's research includes studies on the impact of climate change on zooplankton, early life stages of fish, and the recruitment of commercial marine fish species and the development of Individual Based models; as well as gelatinous plankton, including the spread of non-native species and their impact on invaded ecosystems. Sophie's current work area focuses on developing cost-effective monitoring tools for pelagic habitats; in particular for zooplankton, as this is a critical component of the marine food web and a major gap in zooplankton data has been identified to fulfill requirements of policy and associated monitoring programmes. More recently Sophie has developed an interest in optimising monitoring techniques, with a specific interest on zooplankton, to fill a recognised data gap in this specific component of pelagic ecosystems. Her current area of work is around the automatization of ship-based instrumentation to collect, analyse this pelagic data continuously, and integrate the information from several sources before making the result available in near real-time. A specific focus is on developing the Plankton Imager, an automated real-time high speed colour line scan-based imaging ship-based instrument, that can take pictures of zooplankton continuously from water passing through it and pumped continuously as the ship is underway. The ability to collect high frequency data opens a new area of marine science with associated challenges and Sophie is currently investigating the possibility of applying AI techniques in "big data" analytics to integrate this multimodal information for a more holistic approach to our understanding of ecosystem functioning, and evaluation of marine environment status.

Dr Gerjan Piet

June 6th 09:00-10:00
A spatial Cumulative Impacts Assessment to guide Ecosystem-based Management

Dr Gerjan Piet of WMR (Wageningen UR) has been working for some 25 years on the development of the knowledge base to support environmental assessments and ecosystem-based management of maritime activities, all aimed at a sustainable exploitation of the marine environment. He is the author of more than 60 publications in peer-reviewed journals and has participated in and coordinated several EU-funded projects that involve operationalizing policy, indicators, environmental risk assessments, sustainable exploitation and the development of management strategies and their evaluation. He has been a member of the European Topic Centre on inland, coastal and marine waters (ETC-ICM) of the European Environment Agency (EEA) and member or (has been) chair of several STECF and ICES working groups, all aimed at developing the knowledge base to support various marine conventions with sustainability at their core, including the Marine Strategy Framework Directive, the EU Biodiversity Strategy, Common Fisheries Policy and Birds and Habitat Directives. His expertise revolves around the issue of sustainable exploitation of the marine environment spanning the whole breadth from data collection, indicator development and application, environmental risk-based assessments (e.g. Cumulative Impacts Assessments) and operationalizing integrated ecosystem-based management approaches including maritime spatial planning.

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Samuli Korpinen

June 6th 10:00-11:00
Assessing multiple pressures using methods developed for EEA

Samuli Korpinen has ~25 years' experience in marine ecology. He works currently as a Research Manager in Finnish Environment Institute, coordinating research for Finland's marine strategy, incl. state of the marine environment assessments and marine monitoring programmes. While Samuli's PhD and early research focused much on ecological processes in marine littoral zone, his recent interests focus to understanding impacts of human pressures and methodological aspects of carrying out marine state and impact assessments. He got interested in cumulative impact assessments and integrated state assessments while working for the Baltic Sea Marine Environment Protection Commission (HELCOM), which resulted in the first holistic assessment of a regional sea assessment in the world. This was followed by coordination work towards a core set of Baltic Sea indicators which were adopted by the ten contracting parties and have since been the basis of HELCOM assessments. European Environment Agency (EEA) adopted the HELCOM assessment tools which led to a long-lasting development work for EEA under the European Topic Centre on Inland, Coastal and Marine waters (ETC-ICM) and still continues under the ETC Biodiversity and Ecosystems. The state and pressure assessment methodologies are still topical as EU aims to assess the effectiveness of the Nature Restoration Law and estimate the condition of the ecosystem services under the Biodiversity Strategy.

Iratxe Menchaca

June 6th 11:30-12:30
Assessing the status of marine systems using NEAT

Iratxe Menchaca 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 (potential environmental impacts assessment of marine renewable energies) 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.

https://www.researchgate.net/profile/Iratxe-Menchaca

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Liz Talbot

June 6th 12:30-13:30
Climate modelling as a decision support tool for marine spatial planning and biodiversity conservation

Liz Talbot is PhD from the University of Southampton, she is a marine ecologist based at Plymouth Marine Laboratory. Her research interests are primarily focused on bridging small and large scale process understanding, to deliver whole-ecosystem solutions for oceans experiencing global change. Her PhD work included modelling the impacts of anthropogenic stressors on the physiologies of a number of different invertebrate species. Current projects are more policy focused, using ocean climate change modelling as a decision support tool for marine spatial planning in order to support climate change adaptation in nature conservation and maritime sectors.

Maria C. Uyarra

June 6th 15:00-18:00
Workshop on science communication for cumulative effects assessment

Maria C. Uyarra studied Biology at the University of Navarra (Spain). She then obtained an MSc in Applied Ecology and Conservation and a PhD in management of tourism for conservation of coral reefs at the University of East Anglia (UK) and carried out postdoctoral contracts with the CIEE Research Station (Bonaire) and Simon Fraser University (Canada). With more than 20 years of experience working on ecological, social and economic research, she is an interdisciplinary researcher. 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 = 19) 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.

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Miguel C. Leal

June 6th 15:00-18:00
Workshop on science communication for cumulative effects assessment

Miguel C. Leal graduated in Biology in 2007 (University of Lisbon, Portugal), completed the Master of Science in Marine Ecology in 2009 in the same university, and obtained the PhD degree in Biology in 2014 (University of Aveiro, Portugal, in collaboration with the University of Georgia, U.S.A.). Before becoming and entrepreneur and founding Science Crunchers® (in 2017), Miguel participated in 10+ international research projects. Thus far, Miguel has authored over 70 international peer-reviewed publications (Hindex: 28 Scopus), 6 book chapters, 2 reports for international agencies, and 2 science dissemination books. He i salso na Associate Editor of the Journal of the World Aquaculture Society (WAS), and serves in several strategic and communication committees of the WAS. At Science Crunchers®, Miguel is an all-rounder defining the company's strategy and objectives, coordinating and overseeing the teams' work and helping ensure the quality of the deliverables. Under Miguel's leadership, Science Crunchers® has successfully completed more than 300 projects until 2023 and grew a solid, diverse and very international client portfolio. Science Crunchers® is the communication partner of four Horizon Europe projects associated with ocean sciences and aquaculture (GES4SEAS, OBAMA-NEXT, MPA-EUROPE, and IGNITION).

Torsten Berg

June 7th 09:00-11:00
Towards a unifying framework for assessing 'cumulative effects' and 'environmental status'

Torsten Berg studied physical oceanography and Biology at the University of Kiel (Germany). He obtained a diploma in marine biology in 1998. For over 20 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. During the EU project DEVOTES (2012–2016), he was co-developing the Nested Environmental status Assessment Tool NEAT. 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 a number of years as taxonomical expert in marine macrozoobenthos from the Baltic and the North Sea. 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, biodiversity and sustainable ecosystems.

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Ciarán Murray

June 7th 09:00-11:00
Towards a unifying framework for assessing 'cumulative effects' and 'environmental status'

Ciarán Murray 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.

Tiziana Luisetti

June 7th 11:30-12:30
Ecosystem services mapping and assessment

Tiziana Luisetti studied economics in Italy concluded with a research degree thesis investigating the philosophical roots of economics and the emerging new branches of economics; she then chose to specialise in environmental economics with a master at the University of East Anglia (UEA) and an interdisciplinary PhD research. Tiziana has fifteen-year research experience (h-index: 20; citations: 1949 – Google Scholar) specialising in coastal and marine ecosystem services valuation, management, and natural capital accounting. Currently, she is a principal environmental economist at Cefas where she leads Cefas' environmental economics and social science strategy, and where she provides and coordinate socio-economic advice to the Department of Environment Food and Rural Affairs (Defra). Tiziana is also honorary senior lecturer at UEA, where she supervises post-graduate students and teaches whenever required, research fellow at the Centre for Social and Economic Research on the Global Environment (CSERGE) and leads the Marine Systems and Society theme at the Collaborative Centre for the Sustainable Use of the Seas (CCSUS) - Cefas and UEA. Tiziana is interested in inter- and intra-disciplinary research working mostly with marine biogeochemists and ecologists, and social scientists. Her current research focuses primarily on blue carbon and biodiversity, but also on cultural services, food security, and marine litter, within a sustainable development perspective for policy design and decision making. Tiziana co-leads the IMBeR Working Group on Blue Carbon and participated to several EU Projects (e.g., KnowSeas and DEVOTES) leading the economic research in CleanAtlantic (Interreg Atlantic Area), and currently co-leading the Ecological, Social and Economic Valuation WP in MARBEFES.

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