



MSCA Cluster event on Mission Ocean and Waters

07 June 2022

Speakers' biographies

Panel 1: Protect and restore marine and freshwater ecosystems and biodiversity

Martin WILKES, Essex University

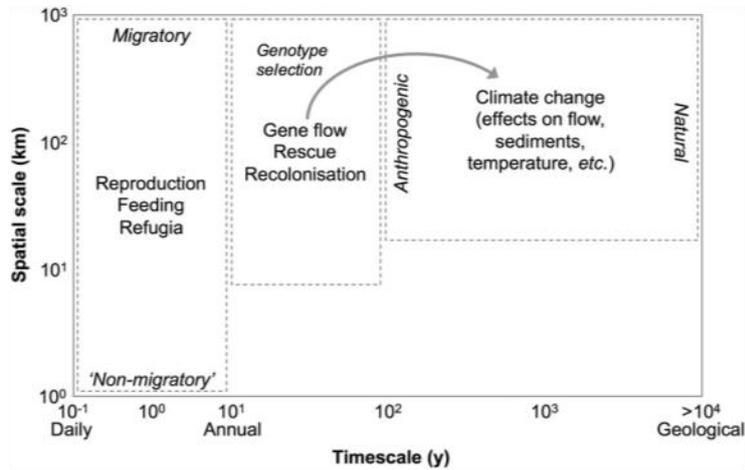


As an ecologist with a data science background, I am interested in data-driven explanations and predictions of biodiversity decline and recovery. Utilising largescale (river basin to global) datasets, ecological theory, statistical programming and high-performance computing, my mission is to support the environmental science and management communities in finding solutions to the challenges of maintaining biodiversity, food and energy production, and water security in a changing world. My research interests include ecology, biodiversity science, fisheries, environmental DNA metabarcoding, species distribution modelling, biogeography, metacommunity theory, artificial intelligence, machine learning, and research software development.

H2020-MSCA-RISE – KEEPFISH: Knowledge Exchange for Efficient Passage of Fishes in the Southern Hemisphere

The KEEPFISH project was conceived in response to a global hydropower boom and in light of the paucity of research on fish passage for species other than the iconic salmonids (e.g. salmon, trout) native to Europe and North America. The issue of fish passage and hydropower has been perceived as urgent in the Global South, where 1,000s of hydropower schemes have been planned. Fish passage is a pressing issue worldwide, with the movement of fish impeded by existing hydropower dams and numerous other barriers constructed for irrigation, flood defence, river crossings and other purposes. The KEEPFISH project stimulated interactions between researchers and practitioners internationally. Through evidence synthesis, primary research, early career researcher training and stakeholder engagement, the project has advanced the biological, engineering, education and policy aspects of fish passage. The network's major contribution has been to shift the focus of fish passage research away from "classic" migratory fishes to consider the whole aquatic community and the multiple reasons why all fishes need to move through free-flowing river systems (Figure 1).

Figure 1. The reasons why fish need to move are manifold and operate over vastly different



spatial and temporal scales than traditionally considered in fish passage science and management. From Wilkes et al., (2018).

Wilkes, M.A., Webb, J.A., Pompeu, P.S., Silva, L.G., Vowles, A.S., Baker, C.F., Franklin, P., Link, O., Habit, E.

and Kemp, P.S., 2019. Not just a migration problem: Metapopulations, habitat shifts, and gene flow are also important for fishway science and management. *River Research and Applications*, 35(10), pp.1688-1696.

Kerstin JEROSCH, Alfred Wegener Institute



Currently, I am employed as researcher at the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI), which is one of the world's leading polar research organisations and delivers significant contributions to the international research on climate, marine and coastal issues. I am

particularly interested in describing and understanding benthic habitat shifts at the Antarctic seafloor due to environmental change such as glacial retreat, temperature or sea ice changes. I look back on 20 years of national and international activities in the field of multivariate ecological and spatial modelling demonstrated by peer-reviewed publications, talks at international conferences, by reviewer activities and lectureships at the University of Bremen. I function as AWI representative in the national SCAR/IASC committee, as a core member of

the SCAR Expert Group on Antarctic Biodiversity Informatics (EG-ABI), and as coordinator of the scientific cooperation between Instituto Antártico Argentino (IAA) and the AWI.

My affinity to method establishment started with my diploma (2002) in physical geography at the Humboldt University in Berlin. In 2006, I finished my PhD on modelling biogeochemical regions of an Arctic submarine mud volcano at the Bremen University. During a two-year postdoctoral fellowship (2009-2011) at the Bedford Institute for Oceanography in Dartmouth, Canada, I investigated the ecological role of pingo-like-features on the Arctic shelf. I was always eager to get familiar with the study areas by participating or leading expeditions to the North and Baltic Sea, Arctic and Antarctic (more than 20 seagoing and land expeditions) and by becoming a scientific diver. With my DFG project (2012-16) on geochemical provinces in the Southern Ocean I contributed to the ongoing MPA Weddell Sea project. From 2014 to 2017, I acted as work package leader “Ecological Modelling” within the MSCA IRSES project IMCONet (2014-2017). Currently, I am involved in the BMBF-funded DynAMo Beagle Channel observatory project (2017-2023) in cooperation with Argentina and Chile. Since 2020 I am acting as scientific coordinator and work package leader of the MSCA project CoastCarb.

H2020-MSCA-RISE – CoastCarb: Coastal ecosystem carbon balance in times of rapid glacier melt

Climate change and intensifying human resource use are causing massive changes of subAntarctic coastal systems and carbon cycling. At the same time, these systems house benthic communities of highest biomass and biodiversity, which sustain important ecosystem services and require strategic observation and management plans. Although just beginning to be appreciated by scientists and public, natural (climate mitigation) and cultural ecosystem services (e.g., local fisheries, tourism, sustainable aquaculture) are already jeopardized by the massiveness and velocity of the regional change in Southern Patagonia (SP) and at the West Antarctic Peninsula (WAP). The multidisciplinary network CoastCarb (www.coastcarb.eu, <https://twitter.com/coastcarb>) joins experts in subAntarctic coastal system ecology and ecological modelling to create a knowledge information system with open access data portal and construct dynamic ecosystem models for fjordic and estuarine environments. Specialists for ecosystem service analyze the relationships between ocean health and local stakeholders, to identify barriers and enablers of sustainable marine resource use. Terrestrial and marine

data will be considered. The focal areas along the extended and fragmented SP/WAP coastline, are intensely investigated. Data sets from recent interdisciplinary research projects of CoastCarb participants, and from the scientific core programmes at coastal stations (ARGGER Carlini-Dallmann, US Palmer, UK Rothera, PL Arctowski) will be used for knowledge compilation. The network is based on established links between German, Belgian, Dutch, British, Argentine, Chilean and US participants with new Polish and Canadian partners included. CoastCarb secondments foster capacity building in research and observation for a better understanding of complex ecosystem processes and major hazard scenarios (e.g., harmful algal bloom occurrence), and in targeted science stakeholder interactions.

Carmen GALINDO, EIT Food



Carmen is an agricultural engineer with an inquiring mind. After few years dedicated to food production herself, she jumped into the innovation arena, to support start-ups and SMEs in their product development path towards the market. This has brought her to be updated on the state of the art in several areas such as food and water technologies. Now, she runs the cross sectoral activity EIT Community Water Scarcity, focusing on finding tools and solutions for water scarcity, specially in Southern European regions. She strongly believes that through sciences, innovation and passion we can change the way we live to make this world a better place.

EIT Food - EIT Community Water Scarcity: finding innovative solutions for water scarcity in Southern Europe (EIT Cross-KIC initiative)

Through innovation, entrepreneurship, education and communication, the EIT Community Water Scarcity contributes to reducing Europe's water consumption and wastage by different economic sectors such as agriculture, food and beverage, manufacturing industries or utilities. This is achieved through different actions:

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- More than 45 individuals form our experts' community to progress on the key challenges to tackle water scarcity, with a special focus on Water Governance, Financial Schemes and Legal Enforcement.
- Over 80 water entrepreneurs will be supported for the period 2020-2022 in their scaling up processes, by giving them the tools to meet and explore collaboration options with end-users from different sectors.
- Through 9 technical workshops and 1 MooC, this initiative builds capabilities to business and individuals to ensure the environmental sustainability of any business and of our daily activities, fostering the adoption of a water saving culture among final users in Europe.

Website: <https://www.eitfood.eu/projects/water-in-south-finding-innovative-solutions-for-water-scarcity-in-southern-europe>

Project brochure: https://www.eitfood.eu/media/clc-documents/Water_Brochure_Annual_Report_2021_new_logo_final.pdf

Panel 2: Prevent and eliminate pollution

Carmen SANS MAZÓN, University of Barcelona



Dr. Carmen Sans has a degree in Chemistry (specialty in Industrial Chemistry, 1989) and a PhD in Chemical Sciences (1992) from the University of Barcelona. Since July 1997 she is Full Associate Professor at the Department of Chemical Engineering and Analytical Chemistry of the University of Barcelona. From March 2020 she is the Director of the Department of Chemical Engineering and Analytical Chemistry.

Dr. Carmen Sans directs the research group Advanced Oxidation Processes Engineering (EPOA), accredited as a quality group by the Generalitat of Catalonia (consolidated group since 2005). Her experience and interests in research are focused on the field of Environmental Engineering, mainly in advanced treatments of domestic and industrial water and its reuse for beneficial purposes such as agriculture and irrigation, potable water supplies, groundwater replenishment, industrial processes, and environmental restoration. At present she is the coordinator of the H2020-RISE-2015-690618. Previously, she coordinated another European project (FP7-PIRSES-GA-2012-318926) and several national and regional projects, all related with micropollutants removal and water reuse. She has also coordinated numerous technology transfer projects with industry (CENIT, PROFIT and an Industrial Doctorate, among others), contributing to the study at laboratory scale, pilot and demonstration plant of advanced oxidation processes for water reclamation.

H2020-MSCA-RISE – KNOWPEC: Knowledge for pesticides control

Every year, tons of pesticides are released to the environment for crops protection and production. Although the most toxic pesticides are banned in the EU countries, their use is still widespread in developing countries. Many of those pesticides are extremely toxic like organochlorines, organophosphates, carbamates, etc and they are spread indiscriminately and without any control. These practices have led to establish important risks in human and

environmental health, although further research is needed to directly relate the occurrence of pesticides and its consequences.

KNOWPEC, Knowledge for pesticides control, is a transnational research network between Europe and Latin America institutions focused on the challenge of unwanted pesticides in the environment. KNOWPEC wants to identify the occurrence and fate of banned and toxic pesticides in drinking and natural waters in agricultural areas of Latin America where knowledge on occurrence and risk is scarce. KNOWPEC wants to assess the environmental and potential human risks of the pesticides detected, and to provide solutions for both reducing pollution at source and remediating contaminated water.

KNOWPEC is contributing to the knowledge of pesticide pollution in potable and natural waters in selected Latin America locations providing typical (or exemplary) cases of widespread agricultural practices and ecological regions. This, together with the application of knowledge from a network of experts in chemical analysis, environmental toxicity and risk assessment, and innovative water treatment technologies in training future specialists, will contribute to safeguarding drinking water supplies and providing solutions for sustainable food production, and a sustainable environment. (<http://h2020-rise-knowpec.com/>).

Berta BONET, University of Birmingham



I am a researcher in aquatic ecology and ecotoxicology interested in how stress (anthropogenic and/or environmental) affect aquatic ecosystems performance (i.e. water quality) currently and in the next years taking into account the effects related to global change, such as the global warming and the extreme hydrological events. My research has been always multidisciplinary, with a foundation in aquatic ecology and ecotoxicology, working with freshwater microbial communities (biofilms) and classical biological endpoints (e.g. photosynthesis) to understand the effects of pollutants on freshwater ecosystems. Moreover, I use innovative biological parameters to study the effects of pollutants on

biofilms, such as (i) antioxidant enzyme activities and metabolites to understand the biofilm capacity to overcome the toxic effects, and (ii) extracellular enzyme activities to elucidate the effect of pollutants in the nutrient re-cycling, in order to understand how biofilm ecosystems services are affected. Moreover, I have included molecular analyses (sequencing), thus covering all aspects of potential effects of pollutants on biofilms, thereby enabling a holistic understanding of pollutant effects: from molecular, to functional and structural levels.

At present, I am working at the Blanes Centre for Advanced Studies (CEAB), a research institute belonging to the Higher Council of Scientific Investigations (CSIC), an institution depending upon the Spanish Ministry of Economy and Competitiveness. I am involved in different projects assessing the effects of pollutants - priority pollutants and plastics - on fluvial ecosystems. I was awarded a Marie Curie Independent Fellowship (MC-IF) allowing me to start independent research at the University of Birmingham (UoB), combining aquatic ecotoxicology and global change effects, which I named *globalecotoxicology*. Throughout my project, *NanoTox*, I investigated the effect of silver engineered nanomaterials on fluvial biofilms under current and enhanced (due to global warming) temperatures. I completed my PhD through a Spanish Ministry fellowship at the University of Girona (UdG) (Catalonia, Spain). After my PhD, I worked as a lecturer at UdG, did a short post-doc at Eawag (Switzerland) working with silver nanoparticles and biofilm, and as a European Erasmus+ project manager at the UdG.

My research is international in scope since global change and pollution are omnipresent and increasing globally. My research line is built substantially on the foundation established in my past work, understanding how stress (anthropogenic and/or environmental) affects aquatic ecosystem performance, with the ultimate aim of improving risk assessment and ensuring excellent ecosystem, and consequently human, health.

H2020-MSCA-IF – NanoToX: Does climate change enhance the nanoparticle toxicity of freshwater biofilms?

Aquatic ecosystems are threatened by multiple environmental stressors including pollutants and climate change. Considerable progress has been made in understanding the environmental

impact of many stressors in recent years, yet new, potentially powerful, toxicants such as engineered nanoparticles (ENPs) continue to emerge in aquatic systems and their effects on these ecosystems remain poorly understood. The release of ENPs into the environment is accelerating, and as the global climate warms, the combined effects of both stressors (ENP + temperature increase) could have significant consequences for aquatic life. As a major step into understanding the climate change-enhanced environmental impacts of ENPs in aquatic ecosystems, we focus on the responses of fluvial biofilms -microbial consortia that drive aquatic primary production and respiration and thus, control nutrient conditions - as key points of ENP entry in to aquatic food webs.

The central goal of NanoTox was to elucidate how much river warming will affect fluvial biofilms at genetic, metabolic/functional and structural levels, and how the presence of environmental concentrations of ENPs may further stress the biofilm communities. The combination of multiple stressors (increased temperature and ENP) affected fluvial biofilms performance. The objective was achieved through an innovative, interdisciplinary approach using an array of methods from the fields of ecotoxicology (ecology and toxics), molecular, functional ecology and nanotechnology. We found that combined exposure to elevated temperature and silver nanoparticles led to increased cell death in the biofilms of our outdoor artificial streams and a reduction of the surrounding protective matrix, as well as enhancing the toxicity of silver sulfide nanoparticles currently considered to be of low biological risk. As biofilms contribute to essential ecosystem services, such as water quality and nutrient recycling, European environment legislation (e.g. WFD 2000/60/EC) about water monitoring should include and prioritise biofilm health and strategies to utilise biofilms for monitoring and remediation since there is a strong connection between healthy ecosystems and human health. In fact, our data on the combined impacts of particulate pollution and global warming on fluvial biofilm structure and function indicate an urgent need to review freshwater monitoring guidelines. It is extremely important to not only monitor water physicochemistry to assess and manage freshwater systems (risk assessment), but also to include biological analyses of ecosystem functioning, which are crucial to understand if a system is polluted and how it is affected. The interdisciplinary project is a major first step in opening a new research line in globalecotoxicology, focussing specifically on biofilms as entry points to the food web and assessing ENP impacts, as well as other pollutants such as plastics, under future global change scenarios. NanoTox project results therefore provide valuable information to

underpin current updates to European legislation, ENP industry and will address social challenges and support the achievement of Sustainable development goal 6 in providing clean water for all.

Joao FRIAS, Marine and Freshwater Research Centre, Atlantic Technological University



Dr João Frias is a marine litter and microplastic pollution researcher at the Marine and Freshwater Research Centre (MFRC) of the Atlantic Technological University (ATU), based in Galway, in the west coast of Ireland.

With a background in Environmental Engineering, he has been working on the field of plastic marine pollution since 2008, focusing on sources, pathways and impacts on wildlife and ecosystems.

He is currently working on the JPI Oceans funded project MicroplastiX, which focuses on the effects of weathering, biofouling, and degradation and how these accelerate fragmentation of microplastics under environmental conditions. For more details on his projects, please visit <http://mfrc-gmit.ie/meet-the-team/dr-joao-frias/>

H2020-MSCA-COFUND – CAROLINE: Managing for Microplastics: baselines to inform policy stakeholders

The IMP.act project - Managing for Microplastics: A Baseline to inform policy stakeholders, gathered baseline data on surface waters, sediment, and biota, using ecosystem-based approaches to Galway Bay and its environs.

This project aimed at developing long-term management plans for the region, while addressing descriptor 10 of the Marine Strategy Framework Directive (MSFD). Baseline data on surface waters (<https://doi.org/10.1016/j.marpolbul.2020.111361>), sediment and biota (<https://doi.org/10.1016/j.scitotenv.2021.148278>), alongside with other relevant data

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(<https://doi.org/10.1016/j.scitotenv.2022.154036>), is often used to engage with other stakeholders, particularly policy makers working on monitoring programmes in Ireland.

The project produced outreach and dissemination materials for the general public, as well as a booklet on perceptions of the public on marine litter and microplastic pollution in Ireland, all available in the deliverable section of the project website at <https://www.joaofrias.com/impact-project>.

Vitor Manuel VASCONCELOS, Interdisciplinary Centre of Marine and Environmental Research (CIIMAR)



Vitor Vasconcelos, PhD in Biology at Faculty of Sciences of Porto University (FCUP), Porto, Portugal. Full Professor FCUP - and since 2013 director of the Interdisciplinary Center of Marine and Environmental Research (CIIMAR – www2.ciimar.up.pt), a research institution that comprises more than 450 researchers, having research, technological transfer, support to public policy and science outreach in marine and environmental sciences as the main activities. Since March 2019 member of the executive board of the BlueBio Alliance, the Portuguese network of the marine bioresources and blue biotech value chain. Member of the Scientific Committee of the National Museum of Natural History, Paris, France. Leader of BBE – Blue Biotechnology and Ecotoxicology group at CIIMAR, formed nowadays by 45 researchers of all degrees. Director of the PhD course on Marine Biotechnology and Aquaculture of the Porto and Minho Universities. Co-Director of the MSc course on Environmental Contamination and Toxicology of the University of Porto. Responsible for the LEGE culture collection comprising more than 1400 strains of cyanobacteria and microalgae. Published 450 papers on international peer reviewed journals and 15 book chapters (h index 51). Granted 6 M euros in national projects and 4.5 M euros in international projects in the last 10 years. Coordinates currently 2 H2020 projects: an ERA CHAIR – Bluebio4Future on Marine Bioengineering and a RISE project in Marine Toxins - EMERTOX. Organized or participated as a member of the

scientific committee in 35 international conferences. Reviewed 650 scientific papers of SCI journals, being Editor of the journals *Toxins* and *Environmental Science and Pollution Research* and member of editorial board of the journal *Marine Drugs* and *Heliyon*.

H2020-MSCA-RISE – EMERTOX: Emergent Marine Toxins in the North Atlantic and the Mediterranean

EMERTOX aims at mapping the actual situation in emergent marine toxins and the producing organisms, developing new approaches to assess their occurrence and predicting the possible future scenarios in the framework of global warming. EMERTOX will advance research and innovation in the area of emerging marine toxins and will potentiate the cross-sectorial transfer of knowledge and to enhance skills and expertise of the seconded staff. The partnership will support the successful implementation of the project by planning several secondments, will organize and take part in training, workshops, seminars and conferences, aimed to share knowledge, acquiring new skills and career development for the involved staff members. Each secondment will provide benefits to both the seconded staff member - who would acquire and/or transfer new knowledge – and to the host organization, which would establish new networks, reinforce cooperation, and will be exposed to innovative and internationalization drives

The partnership, formed by a multidisciplinary team, will produce a joint research and innovation project that will exploit the complementary expertise of the participants and will create synergies among them. The main objectives are:

- to assess the current situation on potentially harmful algae and bacteria and the relevant emerging toxins in 10 countries belonging to different but geographically connected areas (Mediterranean Sea and North Atlantic, including Caribbean Sea);
- to develop innovative approaches to sample, and analyze the producing organisms and their toxins by chemical and biological



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methods including immunoassays and sensors;

- to estimate different future scenarios based on molecular data (routes of dispersion) and modelling.

Website: <https://emertox.eu/>

Bert van Bavel, Norwegian Institute for Water Research (NIVA)



Professor Bert van Bavel is a chief scientist at the Norwegian Institute for Water Research (NIVA) and internationally leading researcher in the field of chemical analysis of environmental pollutants and quality control. He is the co-author of more than 300 publications in environmental chemistry including several key articles on brominated flame retardants, organic fluorine compounds, microplastics in the environment and QA/QC. He has

worked for UNEP as an expert leading UN laboratory inspection to assess existing capacity and building needs to analyze POPs in developing countries. He has led numerous national and international projects and EU projects, most recently he is coordinator of the EU project EUROqCHARM (European Quality Controlled Harmonization Assuring Reproducible Monitoring and Assessment of Plastic Pollution), interlaboratory comparison studies on microplastics for the QASIMEME program and Norway's national monitoring of microplastic in the Norwegian environment. He is furthermore a board member of the NORMAN network and Norway's representative of ISO technical committee 147/SC 2JWG 1.

H2020 Connecting economic and environmental gains – EUROqCHARM: EUROpean quality Controlled Harmonization Assuring Reproducible Monitoring and assessment of plastic pollution

Plastic pollution has become a global environmental and societal concern in recent years. Numerous protocols have been developed to monitor plastic debris, but these are rarely comparable. This has hindered gathering of knowledge regarding pollution sources, development of monitoring programmes and risk assessments and implementation of

mitigation measures. To develop long-term solutions to reduce plastic pollution, it is essential to establish harmonised methodologies. EUROqCHARM will address this by critically reviewing state-of-the-art analytical methods and, taking harmonisation one step further, validating them through an interlaboratory comparison (ILC) study. This will bring together prominent laboratories in environmental plastics analysis and will produce certified reference materials to be marketed for at least three of the four target matrices (water, soil/sediment, biota, air), during and after project completion.

EUROqCHARM recognises that harmonisation for large scale monitoring requires flexibility, comparability and reliability. We will identify Reproducible Analytical Pipelines (RAP), resulting in a catalogue of RAP procedures for nano-, micro- and macro-plastics for the four target matrices. Each RAP will be validated in terms of Technology Readiness Level to decide if further validation is needed (by ILC).

Blueprints for standards, recommendations for policy and legislation and support for the establishment of acceptable reference levels and environmental targets will be given. This will include a roadmap for harmonised data collection and management, where policy analysis and coherence will be integral parts. To maximise impact, EUROqCHARM will also establish and consolidate an operational network for plastic monitoring, stimulating Transnational Joint Actions built on existing and future European and international initiatives.

The multi-stakeholder composition of EUROqCHARM puts the group in a unique position to achieve these ambitious goals.

Website: www.euroqcharm.eu

Panel 3: Sustainable, climate-neutral and circular blue economy

David MARCH; The University Of Exeter



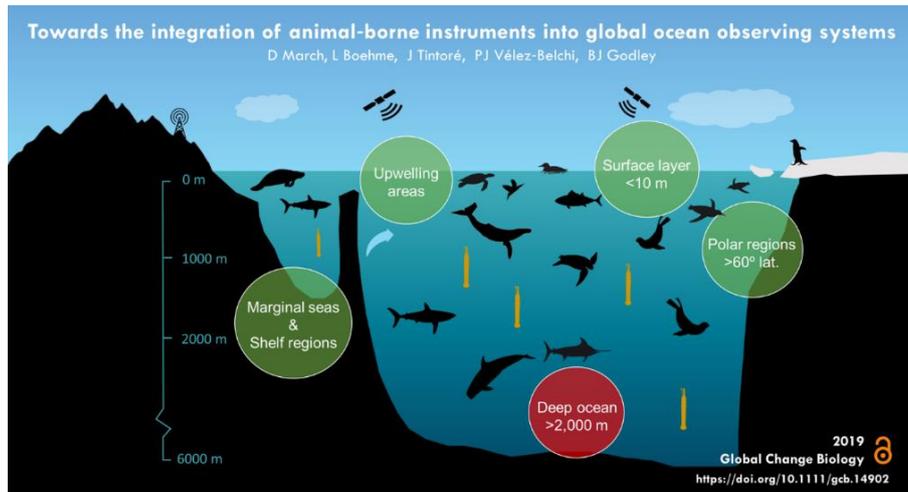
Dr. David March is Distinguished Researcher at the University of Valencia and Honorary Lecturer at the University of Exeter. His research focuses on integrated approaches to address animal-human interactions, with a major interest in spatial ecology, movement analysis and marine spatial planning. Throughout his career, Dr. March has

developed a deep expertise in ocean observing systems and new marine technologies for monitoring human pressures and marine species across multiple taxa. Dr. March has been involved on the development of marine spatial data infrastructures and marine management tools to support the implementation of European policies such the Marine Strategy Framework Directive.

H2020-MSCA-IF – MOVEMED: Linking Human Mobility and Marine Megafauna Movement in the Mediterranean Sea for a better integration of Blue Growth

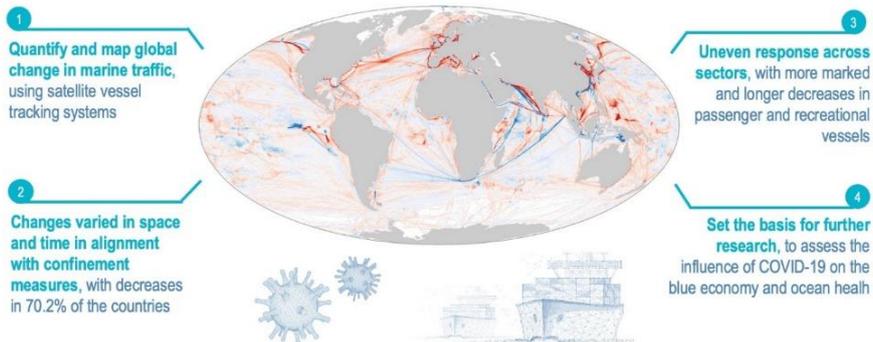
The MOVEMED project investigates the dynamics and links between human mobility and marine megafauna movement using a computationally intensive data-driven approach. Data collected come from electronic monitoring systems and earth observations, which now allow an unprecedented opportunity to simultaneously monitor marine animal movement, ship-based activities and the marine environment. Analyses of animal-borne instruments have revealed the potential of marine megafauna to support global ocean observing systems. Linking such information with environmental data offers new possibilities to determine dynamic areas of ecological importance to support conservation management. MOVEMED project has contributed in mapping the global change of marine traffic during the COVID-19 pandemic and assess its temporal variability at a fine-scale in one of the most affected regions, the Mediterranean Sea. Overall, results derived from the project have major implications for ocean climate research, fisheries management and conservation management.

Website: www.dmarch.info/project/movemed/



TRACKING THE GLOBAL REDUCTION OF MARINE TRAFFIC DURING THE COVID-19 PANDEMIC

March D, Metcalfe K, Tintoré J, Godley BJ (2021) *Nature Communications*



Yuzhu LI, Technical University of Denmark



Dr. Yuzhu (Pearl) Li is currently Assistant Professor at the National University of Singapore and is a former Marie Skłodowska-Curie Actions (MSCA) Fellow at the Technical University of Denmark (2019-2021). She received her PhD in Offshore and Subsea Technology from the University of Stavanger in Norway in 2019 and her M.Eng. in Ocean and Naval Architecture Engineering from the Memorial University of Newfoundland in Canada in 2016. Her research European Research Executive Agency (REA)

focuses on many aspects of ocean and coastal engineering, including: wave hydrodynamics, sediment transport, fluid-structure-seabed interaction, seabed liquefaction, and ocean turbulence modelling, with particular focus on computational fluid dynamics modelling and numerical investigation of ocean/coastal engineering problems. She currently serves as an Editorial Advisory Board member of the OpenFOAM® Journal and is a regular topic organizer at the annual International Conference on Ocean, Offshore & Arctic Engineering (OMAE).

H2020-MSCA-COFUND – COFUNDfellowsDTU SUBSEA: SimUlating Breaking waves and SEDiment trAnsport with stabilized turbulence models

Coastal and offshore regions around Europe provide valuable natural resources such as wind, wave, and tidal energies and also wildlife habitat and aquatic products. However, due to both natural and human factors, coastal and offshore regions are under serious threat from both the surface and the bottom of the sea. At the sea surface, coastal and offshore regions can experience high wave impact loads, particularly breaking waves that can yield large hydrodynamic loads on coastal and offshore structures and affect their performances and fatigue life. Meanwhile, at the sea bottom, erosive long-shore sediment transport continually threatens the coastal regions causing coastline recession. Besides natural factors (expected to worsen due to pending climate change), a lack in the ability to accurately predict and simulate such threats, combined with a lack of managerial coordination between national and regional scales, leave the present coastal protection schemes far from optimal. The MSCA project SUBSEA aimed to take a significant step forward in the ability to accurately model the hydrodynamics of breaking waves and the morphological sediment transport processes beneath. Upon finishing the project, SUBSEA has delivered a turbulence model that achieved unprecedented accuracy in simulating the whole breaking wave process (Li et al. 2022 <https://doi.org/10.1017/jfm.2022.92>). The model is to be applied to investigate problems of great practical/societal interest in ocean and the coast e.g. interaction of extreme waves with structures, detailed transport of sediments and pollutants (e.g. microplastics), and sea bed/shoreline morphology due to sea-level rise.

Martin ZIMMER, Leibniz Centre for Tropical Marine Research



Martin Zimmer studied Biology, with a major in Zoology and Ecology in Cologne and obtained his doctoral degree (Dr. rer. nat.) in the Faculty of Mathematics and Natural Sciences of the Albertus-Magnus University of Cologne, Germany, within the field of Terrestrial Ecology (1998). After a postdoc (1998-1999) in Evolutionary Ecology at the Department for Ecology and Didactics of Biology of the Heinrich-Heine-University, Düsseldorf, Germany, he started working on coastal and intertidal ecosystems (2000-2009; Christian-Albrechts-University, Kiel, Germany) and habilitated in Zoology and Ecology (2004). During his time in Kiel, he built the basis of his current research focus on soft-sediment vegetated coastal ecosystems, including saltmarshes, seagrass meadows and mangrove forests. As a senior scientist, he joined the Department of Ecology & Evolution of the Paris-Lodron-University Salzburg, Austria, and led the topic of Terrestrial Animal Ecology in research and teaching (2010-2014). In 2014, Zimmer received a call to Bremen University as Professor of Mangrove Ecology. In Bremen, he currently leads the research group of Mangrove Ecology of the Leibniz Centre for Tropical Marine Research, ZMT. Since 2019, he serves as Head of Ecology Department at ZMT. His research and teaching activities focus on providing ecological knowledge to support the protection, sustainable use and (re-)establishment of tropical coastal vegetated ecosystems worldwide.

H2020-MSCA-RISE – PADDLE: Planning in A liquiD world with tropical StakEs: solutions from an EU-Africa-Brazil perspective

Marine environments are subject to growing pressures as traffic, increasing demand and changing land-use of coastal areas, seabed exploitation, dredging or mining, fishing, tourism, development of renewable energies, etc. Sustainably managed oceans and seas can contribute to economic growth and employment, and will allow the international community to meet its

global targets, including the reduction of poverty and hunger as detailed in the global 2030 Sustainable Development Agenda. Thus, marine environments are considered opportunities for future growth not only in Europe, but also in bordering marine areas like the tropical Atlantic. As a consequence, new frameworks will be increasingly needed to regulate and optimize the range of feasible uses of marine areas and resources. Marine Spatial Planning (MSP) aims at reconciling human uses and conservation, and offers an attractive setting to combine different uses of marine resources within a single area.

There is an urgent and critical need for research on the application of MSP in tropical areas. The research should critically address the fact that the policy framework originally designed for the European Union (EU) may not fit the specificities of Southern countries. PADDLE brings together internationally renowned researchers and actors, from countries bordering the tropical Atlantic and from the EU, to create a network and a collaborative platform, which will build theory and methods for pertinent MSP in tropical areas. This interdisciplinary team will be a pillar of knowledge-based MSP by providing critical analyses of the tools and methods used, and by designing innovative approaches to efficient MSP. PADDLE is creating the first North-South interdisciplinary consortium on MSP in the tropics, highlighting opportunities and limits of tropical MSP and producing toolboxes for a broad range of stakeholders.

<https://www-ium.univ-brest.fr/paddle/>

Konstantinos GARDIKIS, APIVITA



Dr Konstantinos Gardikis is Research and Development Director in APIVITA SA. His work involves the development of innovative final products and raw materials for cosmetics and nutritional supplements, their regulatory consolidation and the management of research programs and IP.

He has studied Pharmacy in the Pharmacy School of the University of Athens. He has obtained a MSc in Industrial Pharmacy and a PhD in Pharmaceutical Nanotechnology, focusing on physical

chemistry, from the University of Athens.

He is inventor or co-inventor of 7 patent families, has published more than 35 articles in peer-reviewed scientific journals, 3 chapters in international scientific books and has many oral and written presentations in international congresses.

He has performed postgraduate research in various scientific organizations: National Hellenic Research Foundation, Academy of Athens, Centre National de Recherche Scientifique - Grenoble, France, Università degli Studi di Milano – Italy e.t.c.

He has participated as Project coordinator or Project leader in 18 international scientific programs of a total budget of 37 million euro, among which Horizon 2020, FP7 and Leonardo da Vinci.

He has been member of organizing committees of international congresses and workshops, reviewer of scientific journals, he has been awarded three innovation awards and has lectured at MSc programs of the Medical School of Athens, Pharmacy Schools of Athens, Thessaloniki and Patras, Agricultural School of Athens, at the laboratories of Pharmaceutical Technology and Cosmetology of the Pharmacy School of Athens e.t.c. He has obtained 4 national and international scholarships.

He works in parallel as a music composer and performer.

H2020-MSCA-RISE – ALGAE4A-B: Development of Microalgae-based novel high added-value products for the Cosmetic and Aquaculture industry

EU RISE Project "AlgaeA-B" investigated the huge potential from microalgae diversity towards aquaculture and cosmetics.

The goal was to exploit microalgae diversity as a source for state-of-the art high-added-value biomolecules. The diversification of microalgae biomass production towards two independent applications helped the microalgae industry to gain access to alternative markets in an uncertain, highly competitive and fast changing commercial environment, where the abundance of raw materials is compromised.

The project combined both basic and applied multidisciplinary research in the fields of “—omics” technologies, biochemistry, and applied biotechnology in order to:

- a) Develop and optimize low input and application-based microalgae culture systems,
- b) Develop ”-omics” resources for both microalgae and fish,
- c) Develop downstream processing of high value-added products from microalgae, with an emphasis on polysaccharides, proteins, enzymes, and antioxidants,
- d) Develop, formulate, and evaluate in vitro a new range of cosmetic ingredients and nutraceutical products for aquaculture.

The implementation of this project offered the opportunity to the industrial partners to translate scientific research into well-defined knowledge-based end products and analytical tools and provided a platform for transfer of knowledge and training between academic, commercial partners and society.

The AlgaeA-B project with a total budget of 972 000 € was coordinated by the National Center for Scientific Research (CNRS, France) and involved experts from academia and industry: Agricultural University Of Athens (Greece), Fitoplancton Marino, S.L. (Spain), Apivita (Greece), Instituto Andaluz De Investigacion y Formacion Agraria Pesquera Alimentaria (IFAPA, Spain), Centro de Ciências do Mar do Algarve (CCMAR, Portugal) and Biopolis S.L., (Spain). More information on the project can be found here: <http://www.algae4ab.eu/>

Biswajit BASU, Trinity College Dublin



Biswajit Basu is a Professor in the School of Engineering at Trinity College Dublin Ireland. He holds a PhD in Engineering and a Dr. rer. Nat. in Mathematical Physics. He has also held several other positions such as Visiting Scholar and Visiting Professor at Rice University USA, Guest Professor at Aalborg University Denmark, Senior Marie Curie Fellow at Plaxis BV

Netherlands and Distinguished Guest Professor at Tongji University China.

Prof Basu' current research focuses on oceanic flow modelling and simulation, offshore renewable energy and algorithms for quantum computing. He is an internationally acclaimed researcher with expertise in nonlinear hydrodynamics, time-frequency analysis and signal processing, stochastic dynamics and control.

He has published over 250 peer reviewed papers of which about 160 are in internationally reputed journals. He has advised over 29 PhD students and 9 Post-doctoral researchers and currently leads a team of 7 researchers. He is or has been an Editor/Associate Editor or a member of Editorial board of prestigious journals such as Journal of Structural Engineering, American Society of Civil Engineers; Journal of Sustainable Energy, IEEE; Journal of Multi-body Dynamics, Institution of Mechanical Engineers UK; Structural Control and Health Monitoring. He has been involved in several EU and nationally funded research projects on energy, mostly focusing on ocean and renewables (such as NOTES, SYSWIND, INDICATE, UMBRELLA, EINSTEIN, ICONN).

H2020-MSCA-ITN – ICONN project: European Industrial Doctorate On Offshore Wind And Wave Energy

The project ICONN is a unique European industrial doctorate initiative to meet the current and future demand for highly skilled offshore wind and wave energy engineers by developing and improving European capacity in the design, development, and performance optimization for offshore wind and wave energy infrastructures. This project is an innovative R&D venture to investigate the dynamics and new methods of controlling ocean energy devices including wind-wave devices. The consortium is comprised of the



PIs, Prof Biswajit Basu, Trinity College Dublin, Ireland; Prof Søren R. K. Nielsen, Aalborg University, Denmark; Prof Jens Peter Kjøfoed and Dr Sarah Thomas from Floating Power Plant, Denmark. The Marie Curie fellows trained in this programme are Giacomo Politi, Tao

European Research Executive Agency (REA)

Marie Skłodowska Curie Actions

Sun and Pilar Heras; who are currently working for Ampyx Power, Queen Mary University in London as a post-doc and DNV respectively. The project has led to some key publications, and some new control algorithms and technologies such as multi-objective controllers with physical constraints, stochastic controllers with constraints and time-frequency controllers for non-linear devices. These developments can play an important role in ascertaining the safe and reliable operation of the ocean energy devices and lower the LCOE.

The collaboration in this project has continued with TCD and FPP still exploring further avenues into modelling of oceans to investigate the effect of complex 3D nonlinear currents and wave-current interactions on offshore renewable energy devices.