Titles & Abstracts

Dr. Heinrich Dohna (Department of Biology, American University of Beirut, Lebanon)

Title: Mediterranean spread of Lessepsians: The spread of fish species from the Red Sea in the Mediterranean Sea is influenced by sea currents, human population density, temperature, and shipping.

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Abstract: The construction of the Suez Canal initiated one of the most profound manmade marine biogeographic rearrangements by connecting two marine regions that were separated for about 16 million years. To date, there have been more than a hundred so-called Lessepsian migrant fish species, i.e. fish species from the Red Sea that have become established in the Mediterranean Sea. The purpose of this study is to identify the major factors that influence how Lessepsian fish species spread in the Mediterranean. We collected first records of 117 Lessepsian migrants, divided the Mediterranean Sea into polygons, and analyzed the effect of sea currents, shipping, human population density, and temperature on the probability that a Lessepsian species is found in a polygon. Our analysis showed that when analyzing the whole Mediterranean Sea, the occurrence of Lesspsian migrants depends on sea currents, temperature and human population density. When the analysis is restricted to the Western Mediterranean Sea, the rate at which cargo vessels move between different ports becomes an important predictor for the occurrence of Lessepsian migrants. We therefore conclude that marine shipping plays a crucial role for moving Lessepsian migrants from the Eastern to the Western Mediterranean.

Roy El Hourany (Laboratoire d'Océanologie et de Géosciences, Université du Littoral Côte d'Opale, France)

Title: Exploring Phytoplankton Dynamics: Remote Sensing, Machine Learning, and Transdisciplinary Insights

Abstract: Remote sensing techniques have transformed our capacity to analyze spatio-temporal patterns using multispectral data from space, particularly when paired with in situ measurements. In this presentation, we introduce the application of machine learning techniques to unravel the complexities of environmental data, with a focus on observing the dynamics of phytoplankton community structures at high spatio-temporal resolutions. Machine learning has showcased remarkable efficacy in handling

complex multidimensional data to tackle a diverse array of topics. Here, we concentrate on leveraging an unsupervised machine learning algorithm, the self-organizing maps (SOMs), to forge connections between satellite and in-situ data. By preserving topology, we've successfully tracked phytoplankton community structures globally and regionally from space. A case study conducted in the Mediterranean Sea illuminates the significant spatio-temporal variability associated with physical and biogeochemical factors. The fusion of remote sensing and in-situ data, coupled with machine learning techniques, underscores the potential of this collaboration as a potent tool for capturing Essential Biodiversity Variables (EBVs). By enriching our comprehension of phytoplankton dynamics on a global scale, transdisciplinary studies contribute to advancing ecological and biogeochemical research in marine environments.

Sharif Jemaa and Myriam Lteif National (Council for Scientific Research, CNRS-L)

Title: Mediterranean fisheries: A focus on Lebanese artisanal fisheries and the related scientific activities

Abstract: Fisheries significantly contribute to regional food security, livelihoods, and economies, and play a vital role in ensuring a sustainable future. In the Mediterranean Sea, the overexploitation of stocks has decreased over the past decade due to several management efforts. However, most commercial species are still fished at unsustainable levels. Fisheries are an important source of livelihood for men and women and are embedded in the fabric of coastal communities. Therefore, it is necessary to ensure the sustainability of such a sector, especially in Lebanon, where many coastal residents depend on fisheries resources for food or livelihoods. The National Council for Scientific Research CNRS-L, National Centre for Marine Sciences (NCMS) has monitored fishing activities since 2015. Studies related to fish stock identification using fish otoliths, as well as, the diversity and biology of elasmobranchs along the Lebanese coast were implemented. An assessment of several fish stocks with important socioeconomic impacts has also been conducted annually at the General Fisheries Commission for the Mediterranean (GFCM) aiming for a sustainable marine ecosystem. In this context, biological data from several fish species, such as the common pandora, striped seabream, and round sardinella have been collected to better understand the key parameters that help identify the stock status. Furthermore, at the national level, several monitoring programs were implemented by the NCMS-CNRS-L in collaboration with several national stakeholders: (i) The discards monitoring program to study the discards fraction from the fisheries; (ii) The experimental trawling survey to assess the biological resources in benthic habitats to map the biodiversity and highlight the fish resources. Finally, many awareness campaigns were implemented in the framework of Blue Economy targeting fisher coops and disseminating all lessons learned in terms of using sustainable fishing gear to ensure the sustainability of this sector and a better livelihood for fishers.

Dr. Ibrahim Hoteit (Earth Science and Engineering, King Abdullah University of Science and Technology, Saudi Arabia)

Keynote talk: Climate Change: Navigating Projections, Overcoming Uncertainties, and Implementing Regional Solutions
Abstract: TBA

Specialized talk: Ocean Forecasting and Its Applications: Optimizing Operations, Enhancing Safety, and Preserving the Environment
Abstract: TBA