Accumulated impacts of environmental extreme events on Mediterranean Marine Ecosystems

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As the frequency and intensity of extreme events, such as Marine Heatwaves (MHW), is projected to increase in the coming years, understanding how they may affect marine ecosystems jointly is essential to ensure efficient management and conservation of marine resources and preservation of ecosystem services. In this study we use high-resolution data of abiotic properties of the ocean (such as temperature, primary production, oxygen, and salinity) from a Global Mercator Ocean Reanalysis product to detect acute changes in environmental variables and identify historical extreme compound events in the Western Mediterranean Sea. We then analyze how these historical extreme events may have induced changes in the marine ecosystem using a spatiotemporal modelling approach. We drive an available Ecospace model representing the Western Mediterranean Sea with high-resolution data to quantify changes in the overall ecosystem structure and functioning. We analyze changes in distributions, biomasses and landings of a wide range of marine organisms of the marine food web to assess the ecological and socioeconomic effects.