Observational data-driven model to understand onset and decline of marine heatwaves in the Mediterranean

Amélie Simon[1], Etienne Pauthenet[1]

[1]Univ Brest CNRS Ifremer IRD, Laboratoire d'Océanographie Physique et Spatiale (LOPS), Brest, France

Abstract

Marine heatwaves (MHWs) are unusually high ocean temperatures that last for weeks to months. Even if relatively short, these extreme events have devastating effects on fisheries, aquaculture, and tourism, especially in the Mediterranean Sea. Yet too little is known about the physical processes at play, and therefore our capacity to transform the management of the socio-economic impacts of MHWs. In this study, we aim to understand the key variables explaining both the onset and decline of individual MHWs in the Mediterranean. We derived daily mean intensities of MHWs using a satellite dataset of sea-surface temperature from 1982 to 2024. A data-driven model (Unet) is implemented to predict MHWs from a set of atmospheric variables.