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Network of extremes in ocean eddy-resolving climate models

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Marine extreme events, such as marine heatwaves, have a disproportional impact on marine organisms and ecosystems, shaping many of their characteristics. Even though such extremes have become the focus of much research in the last few years, our understanding of the processes that give rise to extreme conditions is still relatively poor. Mesoscale processes have been shown to structure and shape extremes, but also not much is known about their role. Here we use graph theory to detect the correlation between extreme marine events and distant occurrences of atmospheric extremes in the context of mesoscale variability. The data stem from a set of mesoscale resolution model simulation results obtained from the European Eddy RIch Earth System Models (EERIE) project. Common statistical tests such as the Pearson correlation coefficient and the Granger causality will be used to build the graph object. This will permit us to build a network of different oceanographic and atmospheric variables in an attempt to detect teleconnections, such as, for example, the impact of El Niño, on the onset, persistence, and demise of extremes. Our initial networks correlate various variables, such as precipitation and sea surface temperature (SST), eddy kinetic energy and SST, and global SST variations.