AlterEco: An Alternative Framework to Assess Marine Ecosystem Functioning in Shelf Seas

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A recognized global increase in the extent of shelf sea and coastal oxygen deficiency calls for an urgent need to increase the spatial and temporal measurement of oxygen and a better understanding of the processes that lead to oxygen deficiency. This need is severely impeded by the natural complexity of ecosystem functioning, the impact of a changing climate, connectivity between different regions of our shelf seas and large-scale external forcing from ocean and atmosphere. Currently, methods are severely restricted in resolving this complexity due to poor resolution in observational coverage, which calls for the development of new strategies for observing and monitoring marine ecosystem and environmental status to better enable national and regional assessments.

AlterEco is a UK based project that has been jointly funded by academic and government agencies and the WWF to address this challenge using a novel monitoring framework to deliver improved understanding of key shelf sea ecosystem drivers. This framework capitalizes on recent UK investments in marine autonomous vehicles, such as ocean gliders and wave-driven surface vehicles, and state-of-the-art chemical sensors to investigate the physical and biogeochemical functioning in the North Sea from autumn 2017 to spring 2019. The chosen area is known to undergo variable physical, chemical and biological conditioning and includes areas previously identified to experience seasonal bottom layer oxygen depletion. We will present analysis of the effectiveness of the chosen framework to meet assessments of good environmental status and will discuss the global transferability of this approach.