MODELLING THE EASTERN TROPICAL SOUTH PACIFIC OXYGEN MINIMUM ZONE

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Abstract

The Humboldt Upwelling system is one of the most productive systems in the world ocean, due to the upward transport of nutrient-rich deeper waters driven by equatorward coastal winds. This upwelling system, which is embedded in the Eastern Tropical South Pacific oxygen minimum zone, is strongly sensitive to changing in environmental conditions. Climate related-fluctuations such as the El Niño Southern Oscillation, induce variability in plankton productivity, in water column redox-conditions as well as in the vertical extent of oxygen-poor waters. These changes in water column biogeochemistry are likely to drive changes in the export of organic matter, which in turn could affect the sedimentary dynamics and their interactions with the marine productivity and oxygen levels. Understanding these feedbacks is crucial to better predict the future changes in marine productivity as well as their potential social and ecological impacts. For instance, benthic nitrogen fluxes were simulated realistically in the Humboldt Upwelling. The next step in this project will be to investigate the potential feedback of benthic phosphorus and iron dynamics on biological productivity and nutrient cycle