Effect of ENSO on aerobic habitat in the South East Pacific

ALEXANDRA PAROUFFE[1]

[1] *Laboratoire d'Etudes en Géophysique et Océanographie Spatiales, Université de Toulouse, LEGOS (CNES/CNRS/IRD/UPS), Toulouse, France*

How global warming will alter marine ecosystems remains a moot point, given the many facets of pressure on species. While deoxygenation of the oceans on a global scale and surface warming pose a definite threat, on a regional scale compensatory effects may play a role. Marine heat waves also represent events that may be analogous to long-term climate pressure, but their effect on the ecosystem remains also poorly understood. Here we use the temperature dependent threshold Pcrit, the minimum oxygen partial pressure below which standard metabolic rates (SMR) cannot be sustained, to estimate the impacts of ENSO on the volume of available aerobic habitat above SMR (VPO2), for species with varying degrees of hypoxia tolerance. We estimate the anomalies of PO2 and temperature associated with the different facets of El Niño (Eastern and Central Pacific ENSO events and La Niña) in both historical and future (RCP 8.5) scenarios using the Large Ensemble of the CESM model (version 1). We explore the changes in VPO2 in the historical and future scenarios. The question we aim to address is what are the potential synergistic/antagonistic effects of changes in oxygen content and temperature on VPO2 during ENSO. We therefore explore changes in VPO2 during ENSO events, in the context of extreme EP El Nino followed by multi-year La Nina and in the context of climate change.