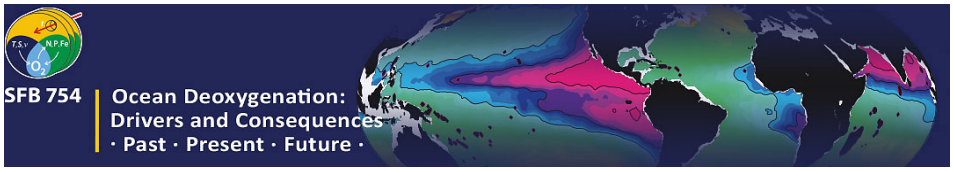


Contribution ID : **113** Type : **Poster**

# Mesoscale ventilation of oxygen minimum zones in a global high resolution climate model

The global oxygen concentration in the ocean is expected to decrease as the ocean warms due to anthropogenic release of carbon dioxide. However, the fate of tropical oxygen minimum zones (OMZs) is less clear. Observations show an expansion of the OMZ while earth system models and proxy studies suggest longer-term variability with substantial uncertainty about trends in OMZ volume.Recent studies showed that this uncertainty arises since the extent of the OMZ is controlled by the small difference between large contributions from solubility, biological consumption, and ventilation, all of which are likely to be affected by a changing climate, but on possibly different spatial and temporal scales.

Due to the sluggish circulation away from the equator, mesoscale eddies are expected to play a major role in supplying oxygen to tropical OMZs. A comprehensive assessment of the effect of eddies from observations is however difficult, due to sparse coverage at the subsurface. Here, we present results from a high resolution, global coupled climate-model (GFDL CM2.6) with a simplified biogeochemical model (miniBLING). We examine the large scale and eddy components of the flow and analyze the role of eddies in oxygen transport, with a focus on OMZs in the Atlantic and Pacific. We find that eddy ventilation plays a dominant role in ventilation below the OMZ core. Results are compared with existing estimates and the relative contribution of eddy advection and diffusion will be discussed.

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**Track Classification :** 03 Ventilation and Oxygen Supply