



Model Simulation of the Eastern Tropical South Pacific Oxygen Minimum Zone during the Holocene

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The intensification/expansion of the tropical oxygen minimum zones (OMZs), as observed during the last decades, is usually assigned to anthropogenic climate change. However, natural variability may also affect OMZ variations. To assess the amplitude of natural (millennial-scale) variability in the oxygen minimum zone in the Eastern Tropical South Pacific (ETSP), a global coupled climate-ocean biogeochemical model has been applied to the mid-Holocene (approx. 6 kyrs BP). We find that during the mid-Holocene, the ETSP OMZ may have been better ventilated than today, which is entirely due to ocean circulation effects in the model. The enhanced ventilation is overriding the effect of increased biological production which in large parts of the equatorial Pacific, is driving oxygen towards lower values. The model result is in qualitative agreement with proxy data.