

Abstract:

Oxygen sustains life in the ocean. Present observational evidence suggests its declining trend globally in the scenario of climate change. The number of eutrophication-driven hypoxic areas have spread exponentially since the 1960s in the coastal ocean, which is becoming one of the key stressors on marine ecosystem. The global extent of hypoxia was well documented, and its threats to ecosystem services as well. However, much remains unknown referring to the DOM quality and microbial availability along oxygen gradients in water column of coastal ocean. We present here a monthly time-series observations of DOM quality, bacterial respiration rate, molecular composition and their potential linkage along oxygen gradients. The result shows that the organic sulfur compounds, with high molecular weight and degradation degree, accumulated with decreasing bottom-water oxygen concentrations. These organic sulfur compounds were independent of water depth and chlorophyll a, which indicated that the variation of microbial degradation might play an important role along oxygen gradients. The lower oxygen level could create conditions conducive to inhibiting the microbial degradation of these organic sulfur compounds and its accumulation eventually. Unveiling the relationship between oxygen level and DOM quality will facilitate elucidating the impact of deoxygenation on microbial DOM degradation and the carbon sequestration involved in.