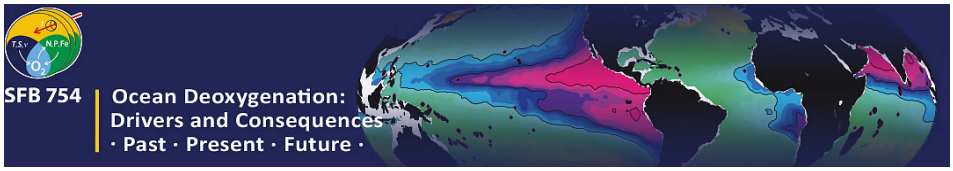

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Sinking organic matter fluxes and remineralization attenuation in the Peruvian oxygen minimum zone

Wednesday, 5 September 2018 14:45 (15)

One of the impacts of climate change on the oceans is the reduction in dissolved oxygen concentrations in seawater (termed 'deoxygenation') as less oxygen dissolves in warmer waters and enhanced oceanic stratification reduces oxygen supply to the ocean interior. Expansion and intensification of the tropical oxygen minimum zones (OMZs) as a result of ocean deoxygenation in turn may affect the remineralization processes such as oxygen consumption rates and the biogeochemical cycling of carbon, nitrogen, and phosphorus. Important to the carbon, nitrogen, and phosphorus biogeochemical cycling is the attenuation of particulate organic matter (POM) fluxes with depth and within the core of OMZs. However, quantification of oxygen consumption rates in OMZs is difficult and knowledge of particle fluxes is currently lacking in the Peruvian OMZ.
To gain better understanding of the remineralization processes in the Peruvian OMZ, we applied the tracer 234Th that allows a quantitative assessment of the POM fluxes and their roles in oxygen consumption. We will present profiles of total 234Th and dissolved 238U collected along four transects at 11°S, 12°S, 14°S and 16°S during two SFB 754 cruises M136 and M138 off the coast of Peru. Fluxes of organic carbon, nitrogen and phosphorus of large particulates (> 51 µm) will be determined using the 234Th fluxes and the ratios of particulate organic carbon, nitrogen and phosphorus to 234Th. We will access flux attenuation, and evaluate the contribution of sinking particles to organic matter supply and oxygen consumption.

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