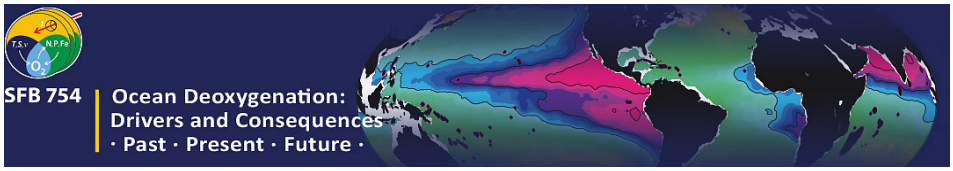

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Bacterial sulfate reduction associated with marine snow particles in the water column of the Peruvian Oxygen Minimum Zone?

During the SFB754 expedition M137 to the Peruvian Oxygen Minimum Zone, bacterial sulfate reduction activity was determined with radiotracer techniques (35S) in samples collected from the water column at four stations (74, 128, 244 and 824 m) along a 12 degree South depth transect. In order to capture pelagic sulfate reduction in marine snow, water-column particles were first accumulated on filters (Whatman Nuclepore polycarbonate track-etch membrane filters, diameter 293 mm, pore size 1 µm) using in-situ pump systems (McLane Research Laboratories, Inc.), and then filter sub-samples were incubated with in-situ water collected by CTD/Rosette. Sampling depths at each station were selected according to O2 profiles. Three redox zones were targeted at each station: (1) the shallow oxic/hypoxic transition, (2) the central OMZ, and (3) the deep hypoxic/oxic transition or (if hypoxia reached the seafloor) the zone close to the seafloor (ca. 10 m above ground). Each station was sampled with three in-situ pumps simultaneously. Results revealed detectable sulfate reduction activity only at the 74 m station. Activity was low (10-58 pmol/L/d), but distinct from control samples (2-3x average control value and >3x method detection limit) in five out of six sub-samples collected from the shallow oxic/hypoxic transition (30 m, [O2] ca. 13 µM). From the six sub-samples collected close to the seafloor (60 m, [O2] ca. 6 µM) one showed sulfate reduction activity (182 pmol/L/d), but given the lack of reproducibility, the environmental relevance of this sample is questionable. No sulfate reduction activity was detected in the central OMZ at this station (45 m, [O2] ca. 6 µM). In this poster presentation, we will compare the observed sulfate reduction activity with environmental parameters (e.g., O2, stratification, particle density, Corg) and molecular data from the four stations to discuss the following questions: Why was sulfate reduction only detectable at the 74 m station? Why was the activity concentrated at the shallow oxic/hypoxic transition (30 m)? Were other depths/stations devoid of sulfate-reducing bacteria or are sulfate-reducing bacteria present but inactive? What is the environmental relevance of the observed sulfate reduction activity?

Position

Professor

Affiliation

Department of Earth, Planetary, and Space Sciences, Department of Atmospheric and Oceanic Sciences, University of California Los Angeles, USA

Email Address

ttreude@g.ucla.edu

Are you a SFB 754 / Future Ocean member?

Yes

Primary author(s) : TREUDE, Tina (Department of Earth, Planetary, and Space Sciences, Department of Atmospheric and Oceanic Sciences, University of California Los Angeles, USA); HAMDAN, Leila (School of Ocean Science and Technology, University of Southern Mississippi, USA); GASSER, Beat (International Atomic Energy Agency, Marine Environmental Laboratory, Monaco); LEMIEUX, Sydnie (Department of Atmospheric and Oceanic Sciences, University of California Los Angeles, USA); SOMMER, Stefan (GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany)

Presenter(s) : TREUDE, Tina (Department of Earth, Planetary, and Space Sciences, Department of Atmospheric and Oceanic Sciences, University of California Los Angeles, USA)

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