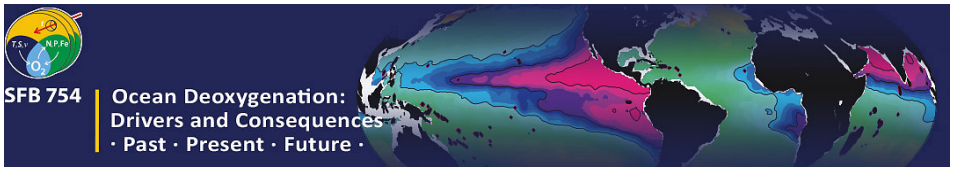

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Intra-seasonal variability of the eastern boundary circulation off Peru and biogeochemical consequence

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Dissolved oxygen (O_2) and nutrient concentrations at the continental margin of the eastern tropical south Pacific (ETSP) exhibit elevated intra-seasonal, seasonal and inter-annual variability. Here, we discuss the impact of remotely forced and locally generated intra-seasonal variability of the eastern boundary circulation at 12°S. Data from a multi-cruise physical and biogeochemical measurement program conducted during the declining phase of the 2017 Coastal El Niño event between April and June (austral autumn) are used.
Upper ocean temperatures were anomalously high and during the latter cruises the oxycline was displaced downward compared with previous observations in austral summer 2008/09 and 2012/13. We observed the offshore propagation of a freshly generated eddy and an associated phase of weak poleward flow. After the reestablishing of the poleward Peru-Chile Undercurrent (PCUC) the passage of a remotely-generated downwelling coastal trapped wave (CTW) causes an intensification of poleward velocities exceeding 50 cm s^{-1}. Warm temperature anomalies persisted during the intensified PCUC while sea surface temperature anomalies declined after the peak of the Coastal El Niño event. During the period of PCUC acceleration, nitrate concentrations increased while the nitrogen deficit became reduced. This suggests the advection of water less affected by anoxic biogeochemistry whereas during the period of weak poleward flow the water was biogeochemically altered more. The upper boundary of anoxic water was displaced downward increasing the depth range where bottom waters were ventilated while nitrite was depleted concurrently.
We will analyze the different response of temperature, nutrients, and O2 to the varying circulation and discuss the implications for the biogeochemical element cycling in the water column and the sediments.

Position

PhD Candidate

Affiliation

GEOMAR Helmholtz Centre for Ocean Research Kiel

Email Address

jluedke@geomar.de

Are you a SFB 754 / Future Ocean member?

Yes

Primary author(s) : LÜDKE, Jan (GEOMAR Helmholtz Centre for Ocean Research Kiel)

Co-author(s) : CLEMENS, David (GEOMAR Helmholtz Centre for Ocean Research Kiel); Dr DENGLER, Marcus (GEOMAR - Helmholtz Centre Ocean Research Kiel); Dr KRAHMANN, Gerd (GEOMAR Helmholtz Centre for

Ocean Research Kiel); Dr SCHMIDTKO, Sunke (GEOMAR); SOMMER, Stefan (GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany); Dr THOMSEN, Sören (LOCEAN-IPSL); Prof. VISBECK, Martin (Geomar)

Presenter(s) : LÜDKE, Jan (GEOMAR Helmholtz Centre for Ocean Research Kiel)

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