



CT14C-0864 - Dissolved Organic Phosphorus (DOP) Distributions in the Eastern Indian Ocean and Subtropical South Pacific Ocean



Monday, 17 February 2020



16:00 - 18:00



SDCC - Poster Hall C-D

Abstract

Significant rates of export production and nitrogen fixation occur in oligotrophic gyres in spite of low inorganic nutrient concentrations in surface waters. Prior work suggests that dissolved organic nitrogen (DON) and dissolved organic phosphorus (DOP) are important nutrient sources when inorganic nutrients are scarce. In particular, DOP has been shown to be an important P source for diazotrophs, which may be better suited to using low concentrations of organic vs. inorganic P. Prior modeling work has also suggested that DOP is important for supporting export production in oligotrophic gyres. However, validation of such models is limited by the number of upper ocean DOP concentration measurements, especially in the South Pacific and Indian Oceans. Here, we present measurements of DOP concentration from the 2016 GO-SHIP I08S and I09N meridional transect in Eastern Indian Ocean, and DON and DOP concentration measurements from the 2017 GO-SHIP P06 zonal transect in the subtropical South Pacific Ocean. Together with DOC and DON concentration measurements from prior occupations of the same GO-SHIP lines we evaluated changes in euphotic zone DOC:DON:DOP stoichiometry. Stoichiometry changes across these two transects are used to infer regions of preferential DON and/or DOP production and consumption. Specifically, north of 36 °S in the Indian Ocean an increase in DOC:DON and DOC:DOP concentration ratios, from 11:1 to 14:1 and 118:1 to 190:1, respectively, are observed. Similarly, west of 136 °W in the South Pacific Ocean significant increases in DOC:DOP and DON:DOP concentration ratios are observed, from 224:1 to 398:1 and 21:1 to 39:1, respectively. These stoichiometric shifts in upper ocean DOC:DON:DOP concentration ratios are considered in the context of ocean circulation, especially upwelling patterns in the Indian and eastern Pacific Oceans, as well as prior observations of the distribution of nitrogen fixation, especially in the western tropical South Pacific.

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[Dissolved Organic Phosphorus Utilization by *Synechococcus*](#)
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[Dynamics of dissolved organic carbon in the northern Indian Ocean](#)
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