

The distribution of dissolved iron and nutrients across a South Pacific zonal section.

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Here we present dissolved iron (Fe) and nutrient results for a GEOTRACES zonal section stretching from Australia to South America. Along the Australian-New Zealand (ANZ) leg, dissolved Fe [DFe] and nutrient concentrations were generally low, with nitrate supply being the key nutrient controlling production. Along the US leg, the surface nutrient concentrations were an order of magnitude higher whereas [DFe] were comparable except close to the South American margin where [DFe] was elevated. Modelling of the [DFe] depth profiles indicates that the depth of the ferricline is sensitive to the rate of particulate Fe regeneration, the rate of DFe scavenging, and the input flux of atmospheric dust; under high dust input conditions the ratio of Fe scavenging to Fe regeneration is much higher than under low dust input conditions. The shape of the [DFe] depth profile also varied depends on the rate of Fe regeneration. The model also predicts a minimum in [DFe] for the upper water column, which is consistent with what was observed. The depth at which this minimum occurred varied, and was not always coupled to the depth of the chlorophyll maximum. Finally, atmospheric Fe supply dominated (50-95%) Fe input into the euphotic zone across the ANZ section.