

The role of transient redox species in trace element Biogeochemical Cycles

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In the last decade a number of key discoveries have been made regarding the role of low abundance, transient chemical species, principally redox active, that are kinetically labile and enable shuttling between more stable chemical species[1]. Developments in analytical techniques and approaches have revealed new insights into S chemistry, with cryptic S cycles in the Peruvian oxygen minimum zone[2] and between diatom derived sulfonates and marine bacteria [3]. Reactive oxygen species (ROS) such as O₂⁻ and H₂O₂ have also been shown to be biologically produced by marine bacteria [4, 5] and these species play an important role in trace metal redox cycling [6] and distribution [7] in the ocean.

This presentation will present a brief overview of this emerging field with a focus on recent data on the links between transient ROS, iodine, trace metals and primary productivity in the South Pacific Gyre and oxygen minimum zones of the South Pacific and North Atlantic.

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[2]Canfield, D.E., et al. 2010.*Science*, 330: 1375-1378.

[3]Durham, B.P., et al. 2015.*Proceedings of the National Academy of Sciences*, 112: 453-457.

[4]Diaz, J.M., et al. 2013.*Science*, 340: 1223-1226.

[5]Rose, A.L., et al. 2010.*Limnology And Oceanography*, 55: 1521-1536.

[6]Heller, M.I. and P.L. Croot. 2010.*Environmental Science & Technology*, 44: 191-196 DOI: 10.1021/es901766r.

[7]Wuttig, K., M.I. Heller, and P.L. Croot. 2013.*Environmental Science & Technology*, 47: 10249-10256.