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1) Mn, V, and LREEs: The determination of dissolved manganese is important because this trace element appears to play a significant role in surface ocean biological production. Also, it has a chemistry and input mechanisms similar to iron, though with a somewhat longer surface ocean residence time. In this proposed work we will determine dissolved manganese distributions (with an emphasis on surface waters and boundaries) and attempt to separate the different inputs of manganese (i.e., dust versus shelf sediment input). In the same vein, we will examine V and the light rare earths (to determine the Ce anomaly) since redox signals associated with these elements may lead insight both into Mn sources as well as sources of other trace elements.

2) Ga: The determination of dissolved gallium is important because this trace element is similar to aluminum in its sources (mainly mineral aerosols) and geochemistry, though the slight differences lead to a fractionation of the two elements and hence a potentially valuable source of process-related information. In particular, in the North Pacific we observed the surface water Ga/Al ratio to increase with increasing chlorophyll.

3) H₂O₂: In two of the IOC cruises, my group determined H₂O₂ distributions. This reactive species is known or thought to play an important role in the surface ocean cycling of iron, manganese, and some other trace elements. **IF there is interest by other investigators**, we would be willing to determine hydrogen peroxide in underway surface water samples and shallow profiles to allow a comparison with metal concentrations/speciation over a broad ocean area. Additionally, we could determine rates of processes affecting hydrogen peroxide concentrations. Note that I am unlikely to propose this part of the work without collaborative interest by other investigators.