## Fe, Al, Mn, Zn, Cd, Cu, Co, Ni and Pb

**STATEMENT OF INTEREST – Kenneth Bruland/Geoffrey Smith, UC Santa Cruz**

a) Nature of the research to be done on the section: Our research group proposes to participate on the section between Peru and Tahiti, tentatively planned for Fall 2013. Geoffrey Smith will accompany our clean sampling van and surface clean fish sampling system (used during the initial two GEOTRACES Intercalibration Cruises and the two U.S. North Atlantic zonal sections), to collect surface samples at stations and while underway between stations. In addition to the surface water collection, an archive of vertical profile samples will be collected from each of the full-depth profiles in acid cleaned, 0.5 liter, low density, polyethylene bottles with LDPE caps that have proven to be clean for the entire array of key GEOTRACES trace metals. Post cruise analyses of the samples for a suite of key GEOTRACES dissolved trace metals including Fe, Al, Mn, Zn, Cd, Cu, and non-key elements such as Co, nickel (Ni), and lead (Pb) (some of which may become key elements) will be carried out (Biller and Bruland, 2011). A post doc will be involved in the shore-based laboratory analyses and subsequent interpretation of results. Vertical profiles of the above mentioned trace metals will be analyzed to facilitate an intercomparison study with other GEOTRACES analysts and to ensure quality control between our surface water data and the vertical profile data for the various key GEOTRACES trace metals. In addition, data on surface samples collected just prior to arrival on station and upon departure will provide an important check on the data from near surface samples collected with the GEOTRACES carousel sampling system close to the vicinity of the ship. This data will either confirm that all is well with the near surface carousel samples – or, provide a mechanism to correct the near surface data from the carousel sampling system, if necessary. It is argued that this is particularly critical on these initial U.S. GEOTRACES sections.

b) Justification of the research: The Peru to Tahiti zonal transect includes surface waters with a wide range in productivity and export production and contrasting sources. The highly productive Peru upwelling system provides one extreme and the extremely oligotrophic waters of the South Pacific subtropical gyre provide the contrasting extreme. The surface water concentration data will be complementary to studies on atmospheric input and to speciation studies. In addition, the intense oxygen minimum zone at intermediate depths in the eastern tropical South Pacific and the hydrothermal input from the East Pacific Rise provide unique additional sources of trace metals. Our data on this suite of dissolved trace metals will be complimentary to studies on speciation in these same water masses. This proposal will provide an extensive data set for investigating sources and removal processes for the key GEOTRACES trace metals. This multi-element approach will allow for extensive intercomparisons between various data sets to ensure a high quality data set emerges from this research effort.