RE: US GEOTRACES GP17 Planning Workshop May 6-8, 2020; Old Dominion University

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The planned cruise track for GP17-OCE crosses unique biogeochemical regimes in the South Pacific. The proposed study area is also characterized by low concentrations of the GEOTRACES "key parameter", atmospheric aerosols (Buck et al., 2013). The flux from the atmosphere is likely low here though those rates have not been measured directly. However, the fractional solubility of aerosol TEIs like iron have been observed to be relatively high. This high solubility has been attributed to pyrogenic emissions of aerosols upwind of the South Pacific (e.g. Ito et al., 2019); a point of increasing importance if trends in fire activity persist. GP17-OCE is a unique opportunity to investigate aerosol chemistry and deposition in the region concurrently with the variety of water column measurements included in the GEOTRACES program. The potential product of these simultaneous observations is a deeper understanding of the coupled atmosphere-ocean trace element system and greater constraint on the spatial distribution of aerosols in the region. For example, atmospheric aerosol concentrations may be coupled with measurements of the radionuclide ^{7}Be to estimate atmospheric deposition rates on seasonal timescales (e.g. Buck et al., 2019; Kadko et al., 2018).

I plan to lead a proposal to collect atmospheric aerosols (bulk and size-fractionated) and wet deposition along the GP17-OCE section. My group would include Dr. Chris Marsay and a graduate student. The proposal will leverage existing US GEOTRACES sampling infrastructure currently managed by Dr. Landing at Florida State University. Samples will be made available to the community as we have done on the EPZT, Western Arctic, and PMT sections. We will also measure aerosol fractional solubility in ultrapure water, filtered surface seawater, acetic acid with reducing agent, as well as a sequential leach procedure. Thus, our results will provide constraints on estimates of soluble aerosols in the South Pacific. Pending discussions at the meeting, I am also interested in proposing work on GP17-ANT.

References:

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