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Statement of Interest for GEOTRACES Atlantic Section: Solubility of aerosol iron and copper in seawater

I will propose to set up an in-line aerosol leaching apparatus to slowly leach freshly collected aerosols with large volumes of surface seawater, collected from the towed-fish pumping system. I will focus on aerosol iron and copper solubility in seawater. The portion of metals that is soluble in seawater will be determined by the difference in particulate metals between leached and unleached replicates. The first 200ml of filtered (0.4 μm) leachate will be collected to determine colloidal and truly soluble metal fractions. For comparison, I will also propose to leach duplicate samples using DI water as the leaching solution. Digestion of samples and analysis will take place at UAF. Metal concentrations will be determined using isotope dilution and ICP-MS detection. The solubility data will be used to test specific hypotheses regarding the seawater solubility of aerosol iron and copper from different sources, and the size fraction that dominates the dissolution of aerosol derived iron and copper in seawater. Leaches will require 30-50L of 0.45 μm -filtered seawater from the towed-fish pumping system. The project will require 1 berth, space on deck (forward) to set up aerosol collection devices, and ~ 2 x 6 feet of lab bench space near a sink for a laminar flow hood, pumps, and large carboys. I am also willing to assist with GoFlo subsampling.