The US GEOTRACES Alaska-Tahiti Cruise: Letter of Intent:

Quantifying the spatial distributions of aerosol composition and air-to-sea fluxes of key trace elements

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I am interested in participating in the US GEOTRACES Alaska-Tahiti cruise and thus hoping to attend this workshop to learn more. My effort on this cruise would focus on the measurements of the spatial distributions of size-segregated aerosols and aerosol elemental composition, as they are critically important in quantifying the air-to-sea fluxes and in understanding the speciation of key micro-nutrient elements such as Fe. This effort is directly relevant to the overarching scientific objectives of the Alaska-Tahiti section stated in the US GEOTRACES: Alaska-Tahiti section planning workshop announcement. A tentative working plan is as follows:

Objectives:

1. Investigate the spatial distributions of atmospheric trace elements associated with size-segregated aerosol particles along the Alaska-Tahiti section,
2. Investigate the spatial distributions of aerosol elemental composition and morphology to explore the processes affecting the speciation and solubility of selected trace elements in the marine atmosphere,
3. Quantify the sources and air-to-sea fluxes of key trace elements to the Pacific Ocean, contributing to better understanding TEIs biogeochemical cycles.

Tasks:

1. Sampling and analysis of size-segregated aerosol particles for trace elements,
2. Sampling and analysis of individual aerosol particles for elemental composition,
3. Analysis of ionic species affecting TE's speciation and solubility,
4. Data analysis of TEs sources,
5. Simulations of the air-to-sea fluxes of TEs.

Collaborations:

This work would be carried out in collaboration with Cliff Buck and Bill Landing.

Requirement:

1. One berth is required. It will be used to support sampling of both size-segregated aerosols and individual particles and to assist additional shipboard sampling.
2. Aliquots of filter and precipitation samples are required for ionic analysis.