GEOTRACES South Pacific (Peru to Tahiti) Letter of Intent (15 Feb. 2012)

Proposed title:

"Distribution of ^{210}Po and ^{210}Pb across contrasting zones during the GEOTRACES transect of the South Pacific Ocean"

Proposed collaborative PI's:

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1) Research goals and relevance to the overall objectives of the section:
The ^{210}Po and ^{210}Pb natural radionuclides have long been exploited to quantify the flux and cycling of key trace elements at ocean interfaces. Our intent is to continue ^{210}Po and ^{210}Pb measurements in dissolved and particulate phases along the GEOTRACES South Pacific transect. The goal will be to quantify biogeochemical processes of key trace elements across important ocean zones. Relevant is the distribution of ^{210}Po and ^{210}Pb targeted to include: 1) the Peru upwelling leading to major oxygen deficient/ denitrification zones, 2) the large hydrothermal plume originating from the East Pacific Rise, and 3) across diverse ocean production from upwelling waters off Peru to the largely oligotrophic region of the southeast Pacific Ocean.

2) Sample requirements:
1) Filtered 20-L samples in vertical profile at the super stations,
2) Particulate aliquots collected at the same super stations depths using large-volume in-situ filtration system (equivalent to 100-200 L),
3) Aliquot of the >51 micron particulate samples from the same large-volume filtrations (equivalent to ~200 L)
4) Aliquots of the large volume aerosol samples (~20 SCM).

3) Berth requirements
One berth is required for the field sampling of either water or pumped particulate samples. As in past with limited berths, we can share these sampling duties with other participating pumped or large volume radionuclide groups.

4) Anticipated collaboration and synergies:
Groups complimentary to ^{210}Po-^{210}Pb short term radiometric modeling include:
1) Circulation of waters with coastal or benthic origin (e.g. Ra $^{224, 226, 228}$)
2) Particle scavenging and remineralization (e.g. Ra ^{228}/Th^{228})
3) Export carbon production (e.g. Th^{234})
4) Atmospheric scavenging and deposition (e.g. Be ^{7})