**Title**: Measuring the  $\delta^{13}$ C-DIC distribution and quantifying the impact of organic matter export on  $\delta^{13}$ C, nutrients and biologically active trace metals along the Peru-Tahiti GEOTRACES section

Paul Quay, University of Washington

## **Objectives:**

1. Measure depth profiles and surface layer variability of  ${}^{13}C/{}^{12}C$  of the dissolved inorganic carbon (DIC). (The CO<sub>2</sub> extracted from these samples would be archived and available for  ${}^{14}C$ -DIC analysis.)

2. Estimate the rate of organic matter (OM) export from the surface layer using underway measurements of dissolved  $O_2/Ar$  gases.

3. Quantify the impact that air-sea  $CO_2$  gas exchange, organic matter export, remineralization and circulation have on the surface and depth distribution of  $\delta^{13}$ C-DIC, bioactive trace elements and nutrients.

## **Potential Collaborators:**

All PIs interested in the impact of organic matter export on trace element cycling.

All PIs interested in relationship between trace elements,  $\delta^{13}$ C-DIC and nutrient cycles.

## Sample Requirements:

Samples for  $\delta^{13}$ C-DIC require 250 mls of seawater to be drawn from Niskin into prepoisoned bottles. We anticipate collecting ~600 samples at all the full stations. For the underway O<sub>2</sub>/Ar measurements using a gas analysis, we would need bench space near the seawater sampling line on the ship.

## Berth Requirements:

The  $\delta^{13}$ C-DIC samples can be collected for us as the sampling is straightforward (similar to that used for DIC or <sup>14</sup>C-DIC). For the underway O<sub>2</sub>/Ar measurements, operation of the gas analyzer could be responsibility of someone not from our group, but that person should have some familiarity with instruments of this type and be easily instructed in its use and troubleshooting. Bottom line, we don't need someone on board to accomplish our sampling, as was done successfully on the second GEOTRACES cruise in the N. Atlantic.