Abstract
The partitioning of bioessential elements including carbon (C), nitrogen (N), and phosphorus (P) between organic and inorganic forms and among particulate and dissolved phases depends in part on the activities of planktonic microorganisms. In an effort to resolve regional-time series observations at Station ALOHA, the field site for the Hawaii Ocean Time-series (HOT) program, surface-water concentrations of inorganic nutrients (nitrate + nitrite + NO$_3^-$ and PO$_4^{3-}$) and organic nutrients (dissolved organic carbon, dissolved organic nitrogen and dissolved organic phosphorus) were sampled along a meridional transect from American Samoa to Honolulu, Hawaii in May 2005. This cruise provided an opportunity to evaluate spatial gradients in dissolved and particulate matter elemental composition between several open ocean biogeochemical provinces including both the North and South Pacific subtropical gyres and equatorial waters. The transition from the South Pacific Subtropical Gyre into equatorial waters was accompanied by sharp increases in the concentrations of inorganic nutrients and corresponding changes in dissolved and particulate matter concentrations and stoichiometries. In particular, surface-water concentrations of PO$_4^{3-}$ increased approximately 4-fold between 15° S and 15° N, while particulate C:P and N:P concentrations increased approximately 2-fold in the same region. In general, particulate matter CN:P ratios varied widely along the transect, with particular particle pools enriched in both C and P, and relative to P found in both the oligotrophic South and North Pacific subtropical gyres. Flow cytometric analyses of population community compositions revealed relatively constant cell abundances of Prochlorococcus with latitude, while both Synechococcus and picoeukaryote abundances increased more than 3-fold in the equatorial waters. Abundances at population community structure remained from meridional variations in nutrient availability likely dictate the resulting particulate matter stoichiometries, and ultimately constrain the composition of organic matter exported to the deep sea.

Meridional Variations in Dissolved and Particulate Matter Concentrations and Stoichiometries in the Tropical and Subtropical Pacific Ocean
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Objectives
- Regional Time-series Observations at Station ALOHA
- Evaluate Spatial Gradients in Dissolved and Particulate Matter Elemental Composition
- Assess Relationships Between Plankton Community Structure and Nutrient Availability

Eco-provinces Sampled
- South Pacific Subtropical Gyre Province
  - SPSG
  - PEGD
  - NPTG
- Pacific Equatorial Disappearance Province
  - PEGD
- North Pacific Equatorial Convergence Province
  - PNEC
- North Pacific Tropical Gyre Province
  - NPTG

Meridional Variations of Dissolved and Particulate Matter

Biogeochemical & Ecological Analysis of Complex Habitats - Between American Samoa & Hawaii (BEACH-BASH)
American Samoa to Hawaii

Bioclimatic & Ecological Analysis of Complex Habitats - Between American Samoa & Hawaii (BEACH-BASH)

Microbiology

Marine

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