

Deep-Sea Ecosystem Dynamics

Benthic Boundary Layer Biology and Material Flux

We propose to utilize the NEPTUNE infrastructure to address how the benthic fauna responds to the flux of organic material to the seafloor, from the continental shelf to the abyssal plain, as a function of topographic features, and how this response varies daily, weekly, seasonally and with secular variation in the California Current system. Specifically, does temporal variability in the upper ocean have profound consequences for deep sea communities, and how are these consequences mediated by the quality and quantity of sinking material? The study would establish 5 field sites at the Vancouver Island margin, designed to address depth, latitudinal and topography-depth related variability in material flux and faunal response.

The study will specifically focus on carbon transfer from the water column to the deep sea, and its fate among benthopelagic, epibenthic and benthic fauna, as well as bioturbation effects on sediment fluxes/effluxes and changes in sediment oxygenation and carbon remineralization. Depending on the interests of geochemists, this work could also address the fate of contaminants such as organo-chlorines and mercury. We therefore propose three closely linked projects, described below, that focus on deep-sea benthos: (1) benthic community response to organic flux (2) the influence of variability in the flux of organic material on the benthopelagic zooplankton community and larval supply, and (3) the influence of bioturbation on the fate of organic material.