



Cell enumeration in low activity sub-seafloor sediments of the South Pacific gyre

A. Puschell (1), J. Harder (1), F. Widdel (1)

(1) Department of Microbiology, Max Planck Institute for Marine Microbiology, Celsiusstrasse 1, 28359 Bremen, Germany

The South Pacific gyre is home to the most oxidized and oligotrophic sediments of the world's oceans. Conditions such as low biological productivity, lack of inputs from terrigenous and hydrothermal sources, and a shallow calcite compensation depth have attributed to the low rate of sedimentation in this area. Primary production and surface chlorophyll concentration are lower here than in any other part of the ocean. In December 2006, a six week IODP Site Survey on the R/V Roger Revelle transected this area and collected samples for microbiological research. The objectives of this cruise were to survey broad characteristics of the sub-seafloor habitat in this region and to document metabolic activities, composition, and biomass of microbial communities in low activity sub-seafloor sediments. Sediment was collected using a piston core and a multi-core at 11 sites. Pelagic red clay was the dominant sediment in this region and many of the cores had large manganese nodules at the surface. Microscopy samples were taken at 0.5 m depth intervals throughout the piston core and 5 cm intervals throughout the multi-core. Systematic direct counting of morphologically intact prokaryotes was done using the DNA stain acridine orange (AODC). The proportion of living Bacteria and Archea was determined using CARD-FISH, which specifically targets rRNA. These analyses allow for the estimation of biomass and a first glimpse into the microbial diversity within these low activity sediments.