

## **IODP Expedition 329: Subseafloor Life in the South Pacific Gyre**

### **Site U1366 Summary**

The scientific objectives at Site U1366 are (1) to document the habitats, metabolic activities, genetic composition and biomass of microbial communities in subseafloor sediment with very low total activity, (2) to test how oceanographic factors control variation in sedimentary habitats, activities and communities from gyre center to gyre margin, (3) to quantify the extent to which these sedimentary communities may be supplied with electron donors by water radiolysis, (4) to assess from porewater chemistry how basement habitats and potential activities vary in the underlying basalt with crust age and sediment thickness (from ridge crest to abyssal plain).

Site U1366, at 5127 m water depth, is located in ocean crust formed during the Cretaceous Normal Superchron (CNS). The complete sedimentary succession, from seafloor to underlying basalt, was recovered by APC in Hole U1366F. Partial successions, from seafloor to various depths, were also recovered from Holes U1366B through U1366E.

### **Principal Results**

The sediment at Site U1366 is primarily clay. It is assigned to two lithologic units: zeolitic metalliferous pelagic clay (Unit I) and metalliferous clay (Unit II). The principal components of the sediment are smectite, mica-group members, phillipsite and red-brown to yellow-brown semi-opaque oxide (RSO). Manganese nodules are relatively common at the seafloor and at depth in Unit I. The nodules generally produce peaks in natural gamma radiation and magnetic susceptibility. Both clay and zeolite exhibit overall trends of decreasing abundance with increasing depth.

Cell counts are much lower than at the same sediment depths in all sites previously cored by scientific ocean drilling. They do not exhibit any consistent trend with depth. Dissolved oxygen, nitrate and phosphate are present deep in the column.

A wide range of microbiology experiments was initiated shipboard. Experiments on major microbial processes and experiments for enumeration of viable microbes were initiated at selected depths ranging from near the sediment-water interface to nearly 50 m into the basaltic basement. Subsamples for post-cruise molecular assays and microbiological experiments were routinely taken from all of the distinct lithologic units.