

# Ocean Climate Dynamics and Marine Biota

## Canyon Processes and Dynamics – Barkley Canyon

The proposal being developed for the Barkley Canyon area will focus on the effects of canyons on continental margin circulation and productivity. Specific focus will be on canyon-induced changes to; (1) the seasonally variable wind-forced shelf-break current and California Undercurrent over the slope; (2) diel to interannual migration patterns in zooplankton and their relationship to fish aggregation ; and, (3) sediment transport through gravity resedimentation phenomena down the canyon. Real time identification of upwelling events, and the regional effects of canyons, and their association with other meteorological and oceanographic phenomena, will be a significant aim of the experiment. Observational data will be incorporated into fully three-dimensional operational oceanographic circulations models of the currents and water properties upstream, within and downstream of the canyon. Results from the physical models will be used to drive ecosystem models examining trophic interaction dynamics from plankton to fish.

The observations will entail installation of upward-looking ADCPs at 3 to 4 sites along the rim of the canyon, possibly augmented with profiling CTDs, transmissometers, acoustic profilers, and optical backscatter instruments as well as instrumentation near the axis of the canyon to detect turbidity current events. The NEPTUNE observations will be embedded within a broader array of conventional moorings north and south of the canyon. Once the program is established, a submission will be made to NSERC to fund a study of upstream topographic vorticity generation and its downstream impact on canyon dynamics.

The data assimilated into the operational numerical models will support oil spill trajectory prediction and Search and Rescue activities along the coast.