

Leg 169S

Leg 169S Saanich Inlet

August 19-21, 1996 An improved understanding of the climate ocean system, and in particular the global carbon cycle, will require ultra-high-resolution studies of rapidly deposited sediments in a variety of geographic settings. Because such sites record climatic and oceanographic conditions on an annual or seasonal basis, they will allow calibration and refinement of fully ocean-coupled general circulation models as well as lead to a better appreciation of the links among oceanographic processes, temperature, rainfall, vegetation, oceanic circulation and productivity of marine organisms, such as plankton and fish. This Leg focuses on the last 10,000 years of global climate change.

During Leg 169S, ODP will core into a rapidly deposited stratigraphic sequence that promises an ultra-high-resolution record of Holocene environmental change. Sedimentation rates of approximately 780 cm/kyr are anticipated from a presumed basal age of 10-20,000 years and a sequence thickness of 100-125m.

The scientific objectives of Saanich Inlet drilling are to: 1. Obtain a detailed record of Holocene climate, oceanography, marine productivity, ecology and terrestrial vegetation; 2. Establish the frequency of earthquakes in the Cascadia convergent margin (particularly those greater than magnitude eight); 3. Advance our understanding of diagenesis in organic-rich sedimentary basins and especially the role of microbial processes. The finely laminated (varved) sediments thought to have accumulated in the inlet since deglaciation will be cored at two sites in the deeper axial region of the fjord; these two sites (at 200 and 225m water depth) have significantly different organic contents and accumulation rates. Saanich Inlet will provide an important companion to the high-resolution Site 893 drilled in Santa Barbara Basin (Leg 146) and Site 1002 drilled in Venezuela's Cariaco Basin (Leg 165).

Additionally, charcoal deposits should enable scientists to

evaluate when native populations first occupied this area and the extent of their habitation. The same deposits may also reveal the local forest fire history. The fossil fish record will demonstrate the fluctuations in the area fish populations and scientists will examine how these changes are related to human activity or due to natural causes.

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