Box 9.2. Continued

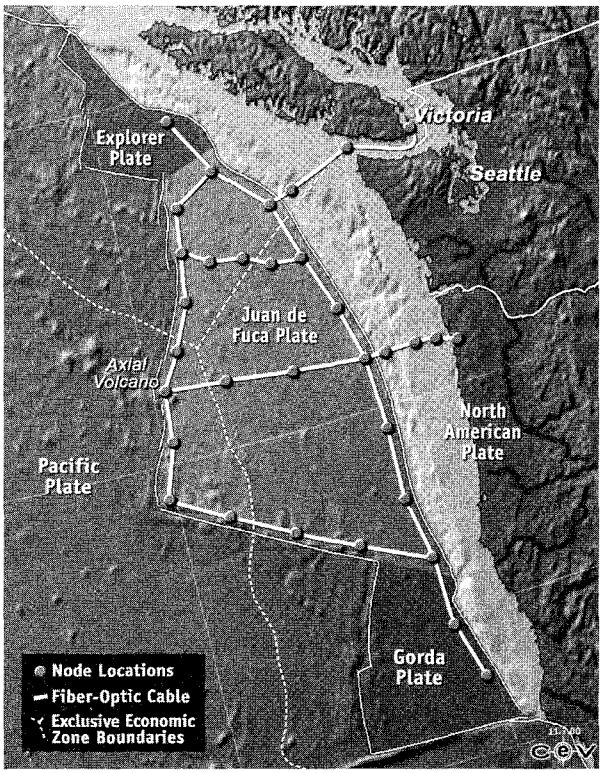


**Figure BX9.2.** An example of a generic NEPTUNE experimental site, draped over Axial Volcano and based on the New Millenium Observatory of the National Atmospheric and Oceanic Administration/ Pacific Marine Environmental Laboratory. Developed for NEPTUNE by the Center for Environmental Visualization, University of Washington.

great opportunities to many areas of marine science, a broad spectrum of scientific studies is currently envisioned as part of the observatory network. Science working groups have identified the major scientific issues that NEPTUNE could address:

## SEISMOLOGY AND GEODYNAMICS

The study area includes all major types of oceanic plate boundaries, including the Cascadia Subduction Zone. There is interest in understanding earthquake behavior associated with these boundaries, which lie near the major population centers of Vancouver, Seattle, and Portland.

## RIDGE-CREST PROCESSES

NEPTUNE will enable continuous, controllable experiments over periods of years, and seafloor-based robotic vehicles that can be rapidly deployed (within hours). These will be used to monitor, observe, and record seismic or eruptive events to establish the specific nature of links and variations between geological, physical, chemical, and biological processes at active mid-ocean ridges. Among other things, this will allow optimal sampling of high-temperature microbes expelled from the deepest portions of active volcanoes during eruptions.