

Spirit Lake Water Management Studied

Public concern that large releases of Spirit Lake water will threaten domestic water supplies, fish, and other valuable downstream resources in the Mount St. Helens (WA) area led to the recent publication of an Army Corps of Engineers study, *Water Quality Investigations – Spirit Lake Stabilization Project*, a 74-page document (NPPEN-HH-R), complete with 18 figures (some in full color) and 16 tables.

Specific evidence of severe water quality degradation in the lake included (1) total depletion of dissolved oxygen during summer months; (2) substantial generation of methane in lake bottom sediments; (3) high concentrations of phenolic compounds; (4) extremely discolored (blackish) water; and (5) an abundance of various reduced elements, including iron, manganese, and sulfur. These reduced metals gave rise to chemotrophic bacteria in aggregations two or three orders of magnitude above those reported for lakes unaffected by the eruption. *Legionella* sp., a pathogenic bacterium, was found in significant concentrations, and was given as the cause of a puzzling respiratory illness which had been contracted by several scientists working in the Spirit Lake vicinity.

Study objective was to provide a water quality assessment of the various alternatives for stabilizing Spirit Lake, which presently presents the potential for failure of the natural debris dam restraining the lake's outflow. The study describes the baseline limnological characteristics of Spirit Lake and the changes leading to lake recovery, considers the public health significance of bacteria in the lake and in alternative receiving waters, and evaluates the potential for stream channel disturbance by streamflow augmentation from the lake.

A limited number of the reports is available at no cost from the U.S. Army Corps, P.O. Box 2946, Portland, OR 97208.