

RESEARCH ABSTRACT

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**Study Title:** Post eruption studies of ecological recovery of lakes and rivers in the blast zone of Mount St. Helens

**Key Words:** chemical aquatic organic inorganic stream  
lake Spirit Lake recovery bacteria nutrients  
dissolved oxygen water quality archives

**Abstract:** This study concentrates on the effects of the May 1980 eruption on Spirit Lake. During and subsequent to the eruption, Spirit Lake received debris avalanche material, timber and other forest vegetation, pyroclastic flows, mudflows, ashfall, and geothermal waters.

This disturbance increased lake water temperatures and concentrations of inorganic chemicals and organic matter. During summer and fall of 1980 lake bacteria populations increased to a high of  $4.2 \times 10^8$  cells/ml, dissolved oxygen was completely depleted, and concentrations of iron, manganese, and sulphur increased dramatically.

Chemical and bacterial concentrations began to decrease and dissolved oxygen returned to lake waters in fall 1980. The lake recovered significantly by 1982 with specific regard to dissolved oxygen. The return of dissolved oxygen to lake waters provided for diverse and large communities of aquatic flora and fauna only two years after the eruption. Recovery of Spirit Lake continues. As of 1986 concentrations of most chemical elements have diminished, some reaching close to pre-eruption levels; lake clarity has improved from less than one meter visibility in 1980 to at least 20 meters; the phytoplankton community has recovered to at least 135 species.

**Type of Measurement(s):** Dissolved oxygen (mg/l) and temperature ( $^{\circ}$ C) were measured at depths throughout the lake profile. Water samples collected at lake surface were tested for concentrations of several chemical elements and compounds (mg/l or micrograms/l).

**Frequency of Measurement(s):** Lake waters were sampled several times per season in 1980,1981,1983-1986, and once in September 1989.

**Data Storage:** All data has been published (Larson et al. 1987). Data is also on floppy disk in ASCII in personal possession.

**Long-term plans:** Data available for collaborative efforts: No further research is planned by the Army Corps of Engineers. Doug Larson is available and willing to assist with future studies.