

SCIENCE, POLICY, AND POLITICS: WORKING TOGETHER AT CRATER LAKE

By Jonathan B. Jarvis

Crater Lake, the central feature of Crater Lake NP, has been admired by visitors and scientists both as a spectacular and unique resource. It has been called the clearest lake in the world, a natural analog of distilled water, a scientific benchmark in limnological research, and has been attributed to have the greatest transmittance of light of all natural waters. It has, unfortunately, been the object of only limited research between 1886 and 1978.

Morphometry studies have shown Crater Lake, at 589m deep, is the deepest lake in the U.S. and the seventh deepest in the world. Formed in a caldera less than 7000 years old, it is geologically young and considered oligotrophic. Physically protected by surrounding 100m to 600m cliffs, and managerially protected by 1902 National Park designation, Crater Lake has been thought of as well preserved and protected from cultural impacts. However, research from 1978-81 (by Doug Larson) raised questions about the limnological dynamics of Crater lake. An indication of a reduction in the lake clarity quickly aroused attention from the public, political, and scientific communities. The following is an explanation of how these forces interacted to formulate the current management direction for Crater Lake and the related caldera ecosystem.

The Research Community

Past research on Crater Lake has focused on the optical properties, morphometry, geology, fisheries (stocked), temperature gradients, and plankton distribution. It has been noted that the unique features of Crater Lake such as its geothermal input and lack of surface discharge present problems in applying classical limnological knowledge.

Data gathered to this date has been inadequate to determine if observed changes are natural trends or indicators of human impact. The most significant change has been a decrease in Secchi disk transparency from an average of 36.6m in 1968-69 to an average of 29.3m in 1978-79 (Larson and Mark Forbes). Speculation relates the cause of this decrease to human influence or atmospheric deposition but it may be a natural trend.

The Public

From its time of discovery by European man in 1853, Crater Lake has held in awe all who view its deep blue vastness contrasted with the stony caldera walls. Over

500,000 visitors a year see the lake from the rim drive while 3 percent take the arduous 2 km descent to the lake level on the only access trail. Concession operated boats offer that visitor an opportunity to experience the lake from surface angles that enhance the almost bottomless blueness of the water. These experiences kindled media interest and public outcry when word spread that research indicated Crater Lake clarity was diminishing.

The Political Arena

Riding on the momentum of the 1980 State of the Parks Report, an amendment to Senate Bill S-1119 was sponsored by Rep. Denny Smith (R-Ore) in Dec. 1981, requiring a biennial report on the quality of Crater Lake over the next 10 years. The bill passed as Public Law 97-250 in Sept. 1982 and directed the Secretary of Interior to "instigate studies and investigations as to the status and trends of change of water quality of Crater Lake and to immediately implement such actions as may be necessary to assure the retention of the lake's natural pristine water quality."

Current Management Action

Crater Lake NP recognized in early 1981 that a research program was needed for the lake and consequently identified the caldera (lake) ecosystem as its primary resource project in the park Resource Man-

agement Plan. Consultation with all concerned parties and the added impetus of the supporting legislation in 1982 has helped Crater Lake NP Resource Management refine its program into a comprehensive, systematic approach to research and monitoring of Crater Lake.

A. Recognizing that inadequate information exists to interpret trends, primary emphasis has been placed on collecting baseline limnological data. Direct cause and effect research based on speculation has been thus far avoided to prevent costly outlays. However, a basic monitoring program has been designed to determine impacts of park use and management of the lake system. If degradation trends are indicated from baseline research, then future cause/effect studies will be directed toward identification of the source.

B. A professional limnologist, Dr. Douglas Larson, has been brought onto park staff on a part time basis to ensure accurate scientific data analysis and provide overall program direction.

C. An NPS seasonal employee, working towards a Master's degree at University of Oregon, began in 1982 basic chemical sampling (DO, pH, TA, SC), biological sampling (chlorophyll and phytoplankton identification and counts) and physical sampling (thermal profiles and Secchi disk depths).



The Secchi disk winks back at the camera from 20 feet of Crater Lake water

D. An on-site laboratory has been equipped with the capability of basic data analysis and sample storage.

E. A platform boat has been placed on the lake and equipped for use by Park Resource Management staff and researchers in data collection.

F. With the assistance of Oregon DEQ, Crater Lake NP has begun monitoring some parameters of air quality. Park management is seeking ways to expand the air quality program so that any correlation between lake quality degradation and atmospheric deposition can be determined.

G. Annual Crater Lake research meetings were begun in 1982 at Oregon State University to provide scientific peer review of the program, to critique research results and to advise redirection of emphasis.

H. Research results and management plans are being shared with the public by park interpretive staff.

The Crater Lake research program is still in its early stages. However, its direction is one that will identify the problem, provide new limnological insights, assist park management, and satisfy public and political interests and concerns. The program's initial success shows how a multi-disciplined constituency can work together to solve some of the problems facing our National Parks today. Ensuing articles will report the progress and results of this continuing research effort.

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