

INTRODUCTION

The University of California, Davis has conducted continuous monitoring of Lake Tahoe since 1968, amassing a unique record of change for one of the world's most beautiful and vulnerable lakes.

In the UC Davis *Tahoe: State of the Lake Report*, we summarize how natural variability, long-term change and human activity have affected the lake's clarity, physics, chemistry and biology. We also present the data collected in 2016. The data shown reveal a unique record of trends and patterns—the result of natural forces and human actions that operate at time scales ranging from minutes to decades. These patterns clearly indicate that Lake Tahoe is a complex ecosystem, behaving in ways that cannot always be predicted. This was exemplified in 2016 by the decline in clarity due to a change in the algal community and the unusually cool summer water temperatures. While Lake Tahoe is unique, the forces and processes that shape it are the same as those acting in most natural ecosystems. As such, Lake Tahoe is an indicator for other systems both in the western United States and worldwide.

Our goal is to explore this complexity and to use the knowledge gained to provide the scientific underpinnings for ecosystem restoration and management actions. Choosing among those options and implementing them is the role of management agencies that need

to take into account a host of other considerations. This annual report is intended to inform non-scientists about variables that affect lake health. Previously, only one indicator of Lake Tahoe's health status was widely reported: the annual clarity (often called the Secchi depth, after the instrument used to collect the clarity data). In this report we publish many other environmental and water quality factors that all provide indications of the lake's condition.

This report sets the context for understanding the changes that are seen from year to year and those that are observed over time scales of decades. Is Lake Tahoe continuing to warm? Are the inputs of algal nutrients to the lake declining? How is the end of the drought affecting Lake Tahoe? And, of course, how do all these changes affect the lake's famous clarity? We also present updates on some of our current research. This new research results highlight some of the most exciting findings of work that is still in progress, and will be reported on fully in the months and years to come.

The data we present are the result of efforts by a great many scientists, engineers, students, and technicians who have worked at Lake Tahoe throughout the decades since sampling commenced. I would, however, like to acknowledge (in alphabetical order) the contributions of Brant Allen, Nancy Alvarez, Sudeep Chandra, Bob Coats, Richard Cobb,

Teagan Dolan, Bill Fleenor, Alex Forrest, Charles Goldman, Marcus Gabe Griffiths, Scott Hackley, Tina Hammell, Bruce Hargreaves, Alan Heyvaert, Simon Hook, Camille Jensen, Yufang Jin, Amelia Jones, Anne Liston, Patricia Maloney, George Malyj, Elisa Marini, Tom Mathis, Jasmin McInerney, Patricio Moreno, Bob Richards, Gerardo Rivera, Derek Roberts, Steve Sadro, Goloka Sahoo, Heather Segale, Katie Senft, Lidia Tanaka, Raph Townsend, Alison Toy, Denise Tran, Susan Ustin, and Shohei Watanabe to this year's report. In particular, Shohei Watanabe was responsible for most of the data analysis, and Alison Toy led the compilation of the final report.

Funding for the actual data collection and analysis has come from many sources over the decades. While many additional water quality variables could be tracked, funding ultimately limits what we measure and report on. Current funding for the long-term monitoring and analysis is provided by the Lahontan Regional Water Quality Control Board, the Tahoe Regional Planning Agency, the U.S. Geological Survey and UC Davis. Our monitoring is frequently done in collaboration with other research institutions and agencies. In particular, we would like to acknowledge the U.S. Geological Survey (USGS), the Desert Research Institute (DRI), the University of Nevada, Reno (UNR), the National Aeronautics and Space Administration

(NASA), the U.S. Forest Service (USFS), the Nevada Division of Environmental Protection (NDEP), and the Tahoe Resource Conservation District (TRCD). Some data are also collected as part of research projects funded through a variety of sources. Without these data there are many questions that could not even be asked let alone answered.

We are very proud to recognize the funding support for the actual production of this annual report from the California Tahoe Conservancy, the Lahontan Regional Water Quality Control Board, the Tahoe Fund, the Tahoe Lakefront Owners Association, the Tahoe Regional Planning Agency, the Nevada Division of Environmental Protection, the Tahoe Water Suppliers Association, Parasol, the Lake Tahoe Marina Association, and the Incline Village Waste Not Program. We sincerely thank these organizations for their dedication in supporting science to save the lake.

Sincerely,



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