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 2015. 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 2015 by the record levels of in-lake nitrate concentrations and the downturn in clarity, despite greatly reduced inflows on account of drought conditions. 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 U.S. 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 account for a host of other considerations. This annual report is intended to inform non-scientists about some of the 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 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 ongoing research. These 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, Patty Arneson, Sudeep Chandra, Bob Coats, Veronica Edirveerasingam, Bill Fleenor, Alex Forrest, Emily Frey, Charles Goldman, Scott Hackley, Tina Hammell, Bruce Hargreaves, Alan Heyvaert, Simon Hook, Zach Hymanson, Amelia Jones, Camille Jensen, Daret Kehlet, Bree Lewis, Anne Liston, Patricia Maloney, George Malyj, Elisa Marini, Tom Mathis, Evan Portier, John Reuter, Bob Richards, Gerardo Rivera, Derek Roberts, Francisco Rueda, Steve Sadro, Goloka Sahoo, Naoki Saito, Heather Segale, Katie Senft, Bill Sluis, Heather Sprague, Lidia Tanaka, Raph Townsend, Alison Toy, and Shohei Watanabe to this year's 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), and the U.S. Forest Service (USFS). 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, the League to Save Lake Tahoe 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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