## 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 over that period. We also present the data collected in 2010. 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 days to decades. These patterns tell us that Lake Tahoe is a complex ecosystem, behaving in ways we don't always expect. This was never truer than in this last year. While Lake Tahoe is unique, the forces and processes that shape it are the same as those acting in all natural ecosystems. As such, Lake Tahoe is an analog for other systems both in the western US and worldwide.

Our role is to explore this complexity and to use our advancing knowledge to suggest options for ecosystem restoration and management. Choosing among those options and implementing them is the role of those outside the scientific community and needs to take account of a host of other considerations. This annual report is intended to inform non-scientists about the most important variables that affect lake health. Until recently, only one indicator of Lake Tahoe's health status was widely used: 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 indicators 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 a time scale of decades: Was Lake Tahoe warmer or cooler than the historical record last year? Are the inputs of algal nutrients to the lake declining? How much are invasive species affecting Lake Tahoe? And, of course, how do all these changes affect the lake's famous clarity?

The data we present are the result of efforts by a great many scientists, 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 Veronica Alumbaugh, Brant Allen, Nancy Alvarez, Stephen Andrews, Patty Arneson, Sudeep Chandra, Bob Coats, Bill Fleenor, Alex Forrest, Allison Gamble, Charles Goldman, Scott Hackley, Tina Hammell, Alan Heyvaert, Simon Hook, Debbie Hunter, Peter Hunter, Anne Liston, George Malyj, Dan Nover, Andrea Parra, Kristin Reardon, John Reuter, Bob Richards, Heather Segale, Steve Sesma, Nicole Shaw, Travis Shuler, Todd Steissberg, Collin Strasenburgh, Raph Townsend, Katie Webb and Monika Winder, to this year's report.

Funding for the actual data collection and analysis comes from many sources. While many additional water quality variables could be tracked, funding ultimately limits what we measure. 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. Forest Service, 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 National Aeronautics and Space Administration (NASA), the Desert Research Institute (DRI), and the University of Nevada, Reno (UNR). 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.

This year we are featuring a review of the clarity of Lake Tahoe. Recent trends in clarity and other key variables are suggesting that the transparency of the lake's water is increasingly being influenced by a new set of factors. While the clarity data alone tells us that things are changing, it is only through the analysis of other data that we can understand what is driving the change in clarity. While there are never enough data to remove all uncertainty, this year more than ever, the value of long term monitoring data should be clear to all.

Part of the cost for the production of Tahoe: State of the Lake Report this year was provided through a gift by the Tahoe Fund. We gratefully acknowledge that gift and the role that private sector giving has to play at Lake Tahoe.

Sincerely,

Geoffrey Schladow, director

UC Davis Tahoe Environmental Research Center
291 Country Club Drive
Incline Village, NV 89451

gschladow@ucdavis.edu

(775) 881-7560, ext. 7563