Control of invasive species in Lake Tahoe remains a struggle

By Geoff Schladow, Heather Segale, Allison Gamble and Andrea Wilkins

Research efforts to control invasive aquatic species from around the world continue to threaten the Lake Tahoe Basin. Work to identify the most effective mechanisms for controlling the populations of Asian clams continues. Current projects are focused on controlling the spread of the Asian clam population in Emerald Bay. Researchers are working collaboratively to experiment with different methods of eradication.

Research is also being done in the southern part of the lake on Curlyleaf pondweed. Curlyleaf pondweed is an invasive aquatic weed that is increasing in density in Lake Tahoe. It reproduces via vegetative shoots called turions, which are extremely resilient and hard to kill. Researchers are working on identifying possible means for controlling the spread and reproduction of this invasive species using bottom barriers of several materials (jute, rubber, and polyethylene). Three sets of these barriers are currently out in Lake Tahoe.

Scientists continue to discover new things about

Lake Tahoe.
Photo/LTN

Post-doctoral researcher Allison Gamble is also studying the effects of Mysis shrimp on Tahoe's food web. Mysis were deliberately introduced into Lake Tahoe in the 1960s. Mysis are a big predator on smaller zooplankton, and also an important food source for fish. They undertake a diel (within 24-hours) vertical migration every night, where they migrate from the bottom of the lake to close to the surface, one of the longest vertical migrations in nature. If we scaled the Mysis to the size of a human, it would be equivalent to moving 50 miles (or 1,700 laps of a pool) vertically up and back down in a single night.

Gamble is comparing the historical densities of Mysis shrimp to current densities in Lake Tahoe, Emerald Bay, Fallen Leaf Lake, and Donner Lake, and addressing how ecosystem characteristics influence food web dynamics. Her research will provide new insights into the evolving Tahoe food web.

PARASOL

The lake was buzzing with scientists from around the world at Tahoe for a weeklong research project called "PARASOL" (PARticulates And SOlutes in Lakes). Scientists and students from TERC, the EPA National Health and Environmental Effects Research Laboratory in Duluth, and the University of Kyoto completed a circumnavigation of the lake, taking measurements of all the physical properties and the suspended particles and organisms that comprise the lake's ecosystems. These measurements will allow us to know how the near shore water quality changes around the lake.

In addition, the team devoted extra effort to studying conditions in Marla Bay and Emerald Bay. The work was exhausting, often starting before 6am, and usually ending well after dark. TERC supporters allowed research vessels to be

moored at their private docks around the lake, saving valuable time and gas.

Hundreds of samples went from lake to the lab all week.

The data from this project is still being analyzed at Tahoe, Davis, DRI, Duluth and Kyoto.

Microbial plankton survey

Three weeks following PARASOL, a new group of collaborators filled TERC's laboratories to conduct a preliminary survey of the microbial plankton of Lake Tahoe. This time the visitors were from Laval University in Quebec, and UC Santa Cruz. Most of what lives in Lake Tahoe is invisible, and it has only been in the last few years that tools such as flow cytometry and DNA sequencing have allowed us to see this hidden world and learn about how it is impacting the features of the lake that we do see. The results of this experiment are being used as the basis of new proposals to the National Science Foundation.

Input of sediment

TERC post-doctoral researcher Alexander Forrest and graduate student Paul Stumpner deployed a current-measuring instrument in Lake Ohau in New Zealand in November 2011. This collaborative project with Richard Levy of GNS Science will provide information on the input of sediment to this glacial lake. What we have learned at Lake Tahoe is being applied in many parts of the world. Conversely, what we learn in New Zealand will help us to better understand Lake Tahoe.

Geoff Schladow, Heather Segale, Allison Gamble and Andrea Wilkins are with the UC Davis Tahoe Environmental Research Center.