SUMMER 2010
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UC DAVIS TAHOE ENVIRONMENTAL RESEARCH CENTER

THE TAHOE ENVIRONMENTAL RESEARCH CENTER (TERC) IS DEDICATED TO RESEARCH, EDUCATION AND PUBLIC OUTREACH ON LAKES AND THEIR SURROUNDING WATERSHEDS AND AIRSHEDS. LAKE ECOSYSTEMS INCLUDE THE PHYSICAL, BIOGEOCHEMICAL AND HUMAN ENVIRONMENTS, AND THE INTERACTIONS AMONG THEM. THE CENTER IS COMMITTED TO PROVIDING OBJECTIVE SCIENTIFIC INFORMATION FOR RESTORATION AND SUSTAINABLE USE OF THE LAKE TAHOE BASIN.

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Summer Research at the "Historic Hatchery"

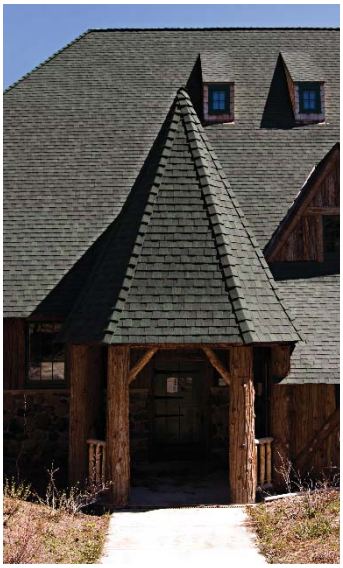
With summer here, the UC Davis Tahoe City Field Station is becoming a busy site for the TERC team.

Brant Allen, TERC boat captain and fisheries biologist, uses the hatchery daily to prepare equipment before going out on the lake. After each day on the water, he finishes his work at the field station rather than driving to the Incline Village lab. By storing his lake equipment there, Brant is able to spend more time on the lake conducting valuable research.

Scott Hackley, hydrologist, conducts most of his sampling on the West Shore. He is using the recently renovated field station as his base of operations for stream sampling. He keeps equipment, sampling bottles and water samples on site and will soon use the Tahoe City laboratory to process his periphyton (attached algae) samples.

The Stormwater Team, made up of Alan Heyvaert (Desert Research Institute), Raph Townsend, Collin Strasenburgh, and Andrea Parra, is using the field station as a staging site for their research. The field station serves as a place for equipment fabrication, calibration, and storage. They are also using the area for development of their BMP (Best Management Practices) Test Plot System. The Test Plot System is located behind the building and will be in full operation this summer.

The new Eriksson Education Center will open to the public on Saturday, July 10. See page 4 for additional details about the upcoming grand opening events.



Renovated Tahoe City Field Station and chemistry lab. Grand opening will be on Saturday, July 10 (details on page 4)

LETTER FROM THE DIRECTOR

One of the many questions emerging from the environmental disaster taking place in the Gulf of Mexico, is what are the environmental impacts of the millions of gallons of crude oil that are being spilled?

This includes not only the immediate loss of sea life and birds, but also the effect on ecosystem health and function decades into the future.

To date, the actual size of the flow is disputed. The rate at which microbes can naturally breakdown oil and dispersants is unknown.

Even more surprising, the impact of 3800 oil and gas platforms on phytoplankton, zooplankton and the entire Gulf food web under pre-spill conditions has not been quantified.

Without having information on the quantities, the processes, and the baseline conditions, determining the impact will be contentious for years to come.

While a disaster of this magnitude is unimaginable at Lake Tahoe, there has been and will continue to be environmental degradation due to what is being added to the lake.

Is Tahoe in any better position to assess the impacts of degradation or of improvements due to better land management and current pollutant control actions?

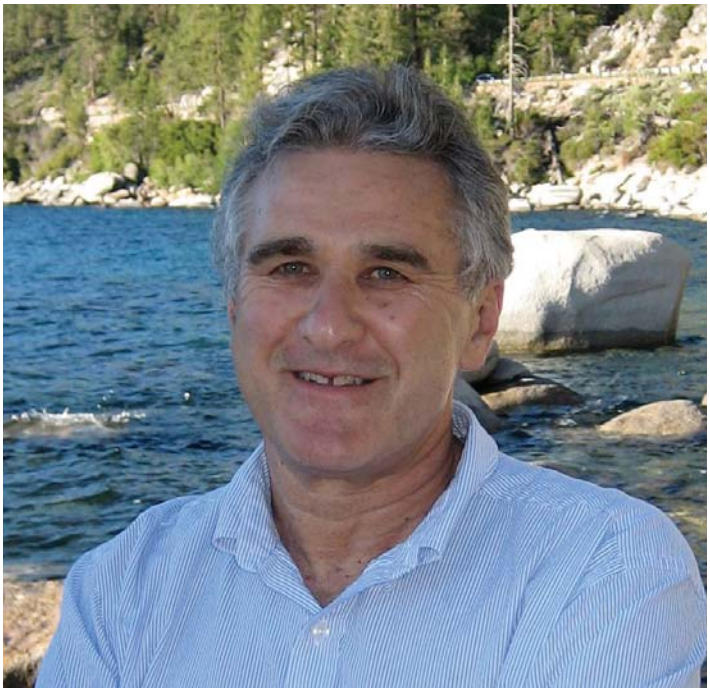
It is, for two very good reasons.

First, Tahoe has had the benefit of a long term monitoring program – for both the lake itself and for the streams that flow into it.

Without these carefully collected data amassed over many years, the argument would still be focused on whether clarity had indeed declined at all.

Without these data, we would not be able to separate the impacts of wet years and dry years from the increased pollutant load resulting from poor land management.

Equally important is that the highly sophisticated and nationally recognized Lake Tahoe TMDL program – that has used much of the available monitoring data – would not have been possible.



Geoffrey Schladow, Ph.D., Director Tahoe Environmental Research Center

Second, research institutions and agencies in the Tahoe basin have been very proactive in trying to understand the key processes that control environmental quality both in the watershed and in the lake.

How effective are the actions taken to control pollutant load? How can floodplain function be restored? What controls clarity? What should water quality and water quantity managers be doing under the specter of climate change?

Have we measured enough yet?

No! The environment by its nature is always changing, and with emerging challenges from climate change and invasive species (to name but two) changes are likely to occur faster and in different ways than we are familiar with.

In order to plan for and adapt to these changes, and to make best use of the public funds needed to restore Lake Tahoe, monitoring and research are more important now than ever.

Asian Clam

In the spring of 2008 UC Davis researchers discovered extensive beds of an invasive bivalve, the Asian clam (Corbicula fluminea) in southeastern Lake Tahoe. Plans are in motion to implement a large-scale management experiment of one acre of bottom barriers this summer. Rubber bottom barriers will be placed in the lake between July 8 and 16 by UC Davis divers.

The bottom barriers will remain in the lake, cutting off oxygen to the Asian clams, until the first week in October when they will be removed. The plots will then be monitored for one year to document recolonization. If these results prove to be favorable, this method will be used to eradicate new populations in the lake before they can establish. This research is being conducted collaboratively by UC Davis, University of Nevada-Reno, US Fish and Wildlife Service, Tahoe Regional Planning Agency, Tahoe Resource Conservation District, Nevada Division of State Lands, Nevada Division of Environmental Protection, Nevada Division of Wildlife, California State Parks, Lahontan Regional Water Quality Control Board, Incline Village General Improvement District and Tahoe Water Suppliers Association.

FUNDING UPDATE

Southern Nevada Public Lands Management Act (SNPLMA) Grants

The UC Davis Tahoe Environmental Research Center (TERC) received funding of over $2.3 million for ten research projects that started between 2006 and 2010.

Over $550,000 of that funding supported four projects in the latest round of the Southern Nevada Public Lands Management Act (SNPLMA) grants.

SNPLMA became law in October 1998 to allow the Bureau of Land Management to sell public land within a specific boundary around Las Vegas, Nevada. A special account was made available to the Secretary of the Interior to use some of the revenue from the land sales to be used in parks, trails, and natural areas, capital improvements, conservation initiatives, multi-species habitat conservation plans, environmentally sensitive land acquisition, and Lake Tahoe Restoration Act projects.

The six UC Davis TERC projects that were previously funded under this program are targeted at addressing critical questions for the restoration of Lake Tahoe and its watershed.

- Predicting and Managing Changes in Near-Shore Water Quality: This research will improve understanding of the spread of invasive species and periphyton (attached algae) in the near-shore zone to help develop scientifically sound management strategies and thresholds.
- Using Remote Sensing to Monitor Water Quality: This study will put in place a system to quantify changes in water clarity measurements over the entire lake.
- Water Quality Modeling Toolbox for Pollutant Reduction: The modeling tools developed by researchers will facilitate technology transfer to basin users, create conceptual and operational linkages between individual models, and update the watershed model to better address the critical issue of wildfire and pollutant runoff.
- Potential of Floodplains to Retain Fine Sediments: This research will quantify the potential for Trout Creek and other flood plains to retain fine sediments by using different models.
- Implications of Climate Change for Design of Best Management Practices: This research is examining how climate change will affect the future clarity of Lake Tahoe and Best Management Practice (BMP) effectiveness by applying multiple computer models.
- Measuring the Ability of Floodplains to Treat Urban Runoff: This project will measure the mechanisms and the efficiency of fine particle removal from urban storm water using floodplains.

Four additional UC Davis TERC projects will be funded beginning in 2010:

- Tahoe Regional Stormwater Monitoring Program: Investigation of Fine Particles in Lake Tahoe Urban Runoff
- Potential for Pathogen Growth, Fecal Indicator Growth and Phosphorus Release under Clam Removal Barriers in the Lake Tahoe Basin
- Natural and Human Limitations to Asian Clam Distribution and Recolonization – Factors that Impact the Management and Control in Lake Tahoe
- The Tahoe Climate Information Management (TahoeClim) System

UPCOMING EVENTS

Children's Environmental Science Day

Mark your calendar for Saturday, July 10 from 1-4 p.m. for the eleventh annual Children's Environmental Science Day.

This free community event for children (ages 6+) and their families includes over 40 hands-on science activities designed to create an awareness of the unique ecology of Lake Tahoe and teach about the various areas of environmental science.

Come see our new education center exhibits and take the opportunity to join in interactive games, get up close with fish and zooplankton from Lake Tahoe, learn about wetlands, get your face painted with native wildlife, test the water quality of a stream, visit with local scientists, tour the historic fish hatchery and research lab, eat free ice-cream, see a live-animal presentation and much more! This event is perfect for families or groups with kids ages 6 and up with an interest in the environment, nature, science and discovery. We can't wait to see you there!

For additional details or to volunteer please contact Leanne Burns at (775) 881-7560, ext. 7474 or lkburns@ucdavis.edu.

Eriksson Education Center Grand Opening

Following Children's Environmental Science Day, celebrate the Grand Opening of the new Eriksson Education Center and Demonstration Garden with an Open House from 4 - 6 p.m. Visitors will be treated to tours, live music, and refreshments. UC Davis researchers and staff will also be on hand to discuss the history of the fish hatchery and the future of Lake Tahoe research.

The Eriksson Education Center will house exhibits, including an interactive touch-screen that allows visitors to view historic video footage of the hatchery in operation. The touch-screen exhibit will also include interactive games such as the Life Cycle Quiz and Species ID game.

Beginning on July 10, the Eriksson Education Center will be open for tours on Saturdays from 1 – 5 p.m. through Labor Day. Additional tour times are available upon request. Contact (775) 881-7566 or tercinfo@ucdavis.edu to schedule a tour.

Docent Volunteers Needed

The UC Davis Tahoe Environmental Research Center is calling all motivated individuals who are enthusiastic about educating the public about our historic fish hatchery, Tahoe's native plants and animals, research conducted at Lake Tahoe, and efforts to protect the lake's clarity and ecosystem. Two training sessions will be held at the Tahoe City Field Station on June 26 or on June 30 from 1:00-4:00 p.m. For more information, contact Heather Foslund (775) 881-7560, ext. 7483, or hfoslund@ucdavis.edu.

Children's Environmental Science Day provides a great opportunity for kids ages 6 and up to learn about environmental science and Tahoe ecology

Garden Volunteers Needed

We are also looking for community volunteers to help prepare the new garden at the Tahoe City Field Station. Community workdays will be held on June 28, 30 and July 1, 12 and August 12. For more information please contact Heather Foslund, (775) 881-7560 ext. 7483 or hfoslund@ucdavis.edu.

Mark Your Calendars

Volunteer Docent Training Sessions for Eriksson Education Center: June 26 or June 30, 1—4 p.m.

Community Volunteer Demo Garden Work Days: June 28, 30, July 1, 12 and Aug. 12

July 10, 2010—Children's Environmental Science Day (1-4 p.m.) Tahoe City Field Station

July 10, 2010—Grand Opening/Open House (4-6 p.m.) Tahoe City Field Station

August 5 and 6, 2010—Butterflies and Butterfly Gardening in the Tahoe Basin, with Dr. Art Shapiro

August 31, 2010—Alternative Energy Home, with Ben Solomon

FEATURED STAFF

Patricia Maloney

Patricia Maloney is a forest biologist who studies forest dynamics in the Tahoe Basin. Maloney joined the Tahoe Environmental Research Center team in late 2008. She earned her Ph.D. in plant pathology from UC Davis and continued her post doctoral work as a project scientist until moving up to Tahoe.

A major focus of Dr. Maloney's research is White Pine Blister Rust, which infects five-needle white pine trees in California and throughout western North America.

Maloney studies the effects of this non-native pathogen on Sugar Pine, Western White Pine, and White Bark Pine in the Tahoe Basin. She is interested in Mountain Pine Beetle activity as well, because all three native pines are host to this invasive beetle.

Maloney also looks at climate change and how human dynamics play a role in the survival and resilience of Tahoe's native pine species. These investigations will provide new insights on the adaptability of Tahoe's pine species as the basin changes. Her work will help interpret how drought tolerant these pines are, as well as how forest dynamics are linked to other ecosystem processes such as soil stabilization, the protraction of snow melt, fire systems, and other watershed processes that all ultimately affect the clarity of Lake Tahoe.

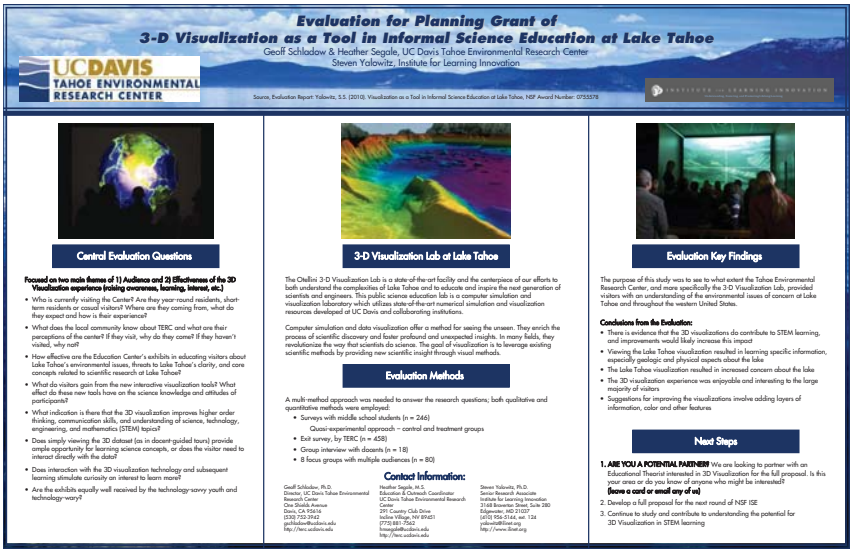
Dr. Maloney can be contacted at pemaloney @ucdavis.edu.

Patricia Maloney works to maintain the health of the Tahoe Basin forests

EDUCATION AND OUTREACH

Making the Case for Informal Science Education

Geoff Schladow, TERC director, and Heather Segale, education and outreach coordinator, attended the National Science Foundation "Informal Science Education Summit 2010" in Washington DC in March. The Summit focused on making the case for informal science education and sharing information about emerging areas in informal science education.



TERC research poster was on display at NSF "Informal Science Education Summit 2010"

TERC currently has an NSF-funded project for 3D Visualization as a Tool for Learning Informal Science and is working on a full-scale development project with the UC Berkeley Lawrence Hall of Science, Oregon State University and the Institute for Learning Innovation.

TERC provides informal learning experiences for approximately 9,000 visitors and students each year. A recent National Research Council report points to evidence that participation in informal science learning can promote informed civic engagement on science-related issues such as local environmental concerns. For additional information about the TERC science education programs, visit http://terc.ucdavis.edu/education_outreach/educationoutreach.html.

GIVING TO THE TAHOE ENVIRONMENTAL RESEARCH CENTER

Charitable gifts to the Tahoe Environmental Research Center provide crucial support for research, teaching and public outreach that helps promote understanding and conservation of the Lake Tahoe Basin and other lake systems. Your gift helps ensure the Center's continued excellence in restoring Lake Tahoe and other lakes around the world - now and for generations to come. Thank you!

☐ **YES**, I wish to support the Tahoe Environmental Research Center with the gift amount shown below.

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