University of Nevada, Reno
Academy for the Environment

University of Nevada, Reno

Desert Research Institute
Center for Watersheds and
Environmental Sustainability

DRI

Compiled by: Mike Collopy, W. Wally Miller and Jim Thomas

25 Years of
Student Research at Lake Tahoe

TABLE OF CONTENTS

Photos by Jean Dixon

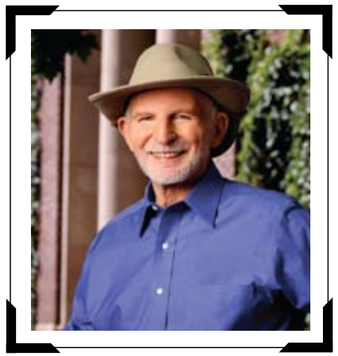
Profiles by John Trent

Design by Jodi Tenenbaum

Digital Initiatives, University of Nevada, Reno

Special thanks to Elaine Legras and Matt Forister
for compiling and editing student information

Tahoe Summit
2008



President Milton Glick

President Stephen Wells

25 years of institutional cooperation and teamwork at Lake Tahoe

"Lake Tahoe is an incredible natural attraction that draws millions of people each year. We have a shared responsibility to build on our commitments at all levels to be sure that the lake and its environs are protected. That is why I believe the collaborative efforts and partnerships that have emerged are so essential to its future" – President Bill Clinton, speaking at the first Lake Tahoe Environmental Summit in 1997.

For the Desert Research Institute (DRI) and the University of Nevada, Reno, the research agenda at Lake Tahoe has been clear. Our scientists and students have endeavored to produce the best science possible in addressing a multitude of environmental concerns at Lake Tahoe, from the lake's diminishing water clarity to watershed studies that have created a better understanding of Tahoe's forest and soil ecology. Collaboration and a strong sense of teamwork between our two institutions, as well as with a cadre of talented scientists from the University of California, Davis, have characterized these research efforts. In fact, with the opening of the state-of-the-art Tahoe Center for Environmental Sciences in 2006 at Sierra Nevada College, the research effort by scientists from these three institutions to save Lake Tahoe has never been better.

Much of the work that scientists from our two institutions have accomplished at Lake Tahoe is well known to the managers and stakeholders of Lake Tahoe. This accumulation of research has greatly enhanced the understanding of Lake Tahoe's past environmental challenges as well as the management strategies that promise to save this wonderful treasure in the future. Perhaps less well-known – but in many ways just as important – has been the research efforts of graduate students under the tutelage of faculty from DRI and the University of Nevada.

This publication, compiled by the University of Nevada's Academy for the Environment, offers a comprehensive look at many of the research projects completed by graduate students over the past 25 years. It also provides insight into the broad range of interests of DRI and Nevada students. In many of the comments from the students, you will note that they found their work at Tahoe to be invigorating and important. For many, in fact, research work done at Tahoe provided an essential first step in careers they enjoy today.

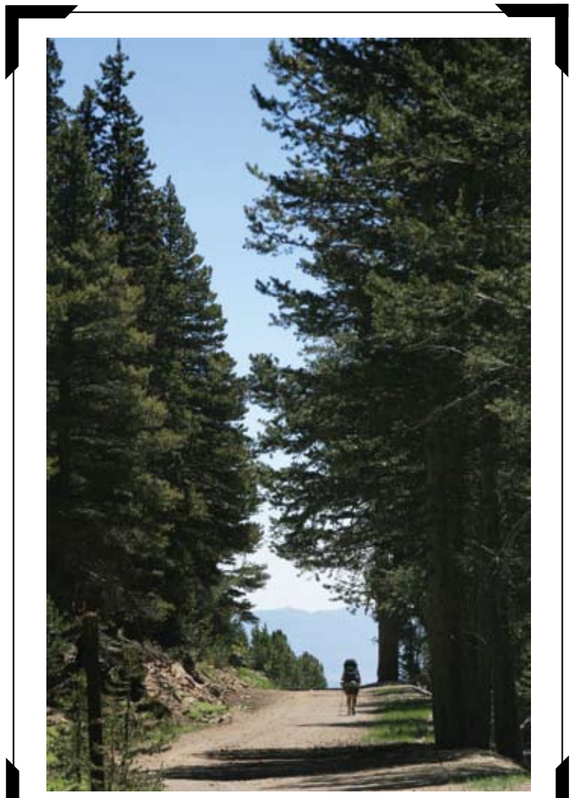
DRI and Nevada scientists, in conducting research at Tahoe, have never hesitated to collaborate in their studies at Lake Tahoe. You will notice in many of the students' descriptions of their work at Lake Tahoe, their academic advisors were often members of the faculty at DRI and Nevada. This is no accident. Multi-disciplinary approaches that have reached across both institutions actually pre-date the first Tahoe Environmental Summit by many years. That is just one reason why DRI and Nevada's research agenda at Tahoe has been so collaborative and so effective.

As the Lake Tahoe Environmental Summit enters its second decade, it is altogether fitting that this publication chooses to celebrate the research projects of our students. Several of those listed are already "second-generation" Tahoe researchers and are conducting research projects of their own at this beautiful place. The legacy of their work could prove to be the difference in this important ongoing research effort to save Lake Tahoe.

Sincerely,

Stephen Wells
President
Desert Research Institute

Milton Glick
President
University of Nevada, Reno



Graduate students: An essential component of research programs at Lake Tahoe

By Mike Collopy, W. Wally Miller and Jim Thomas

Talk to most University of Nevada, Reno (UNR) and Desert Research Institute (DRI) faculty about their research and it does not take long for them to mention how important graduate students are to their programs. They will tell you that their students are extremely bright, hard working, and provide incredibly productive insights to the research projects on which they work. These attributes clearly apply to those students who have conducted their graduate research in the Lake Tahoe Basin. In this report, we have summarized the research contributions of these "Tahoe students," and provide the reader an overview of their research findings, identify their graduate advisor and degree program, and how their graduate experience benefitted them in their career development.

The graduate degree programs through which our "Tahoe students" pass are administered by the University of Nevada, Reno, since, as a research institution, the Desert Research Institute does not administer graduate degree programs. Instead, DRI and UNR faculty work collaboratively to support and mentor graduate students through these UNR-based programs. Most of the graduate degree programs are discipline-specific and are administered by departments; however, four additional programs are interdisciplinary in nature and are administered campus-wide through the UNR Graduate School (i.e., Atmospheric Sciences; Ecology, Evolution and Conservation Biology; Environmental Sciences; and Hydrologic Sciences). Graduate students select and apply to their program of interest. The most qualified students are admitted and then mentored by UNR and DRI faculty through a master's or doctoral degree program.

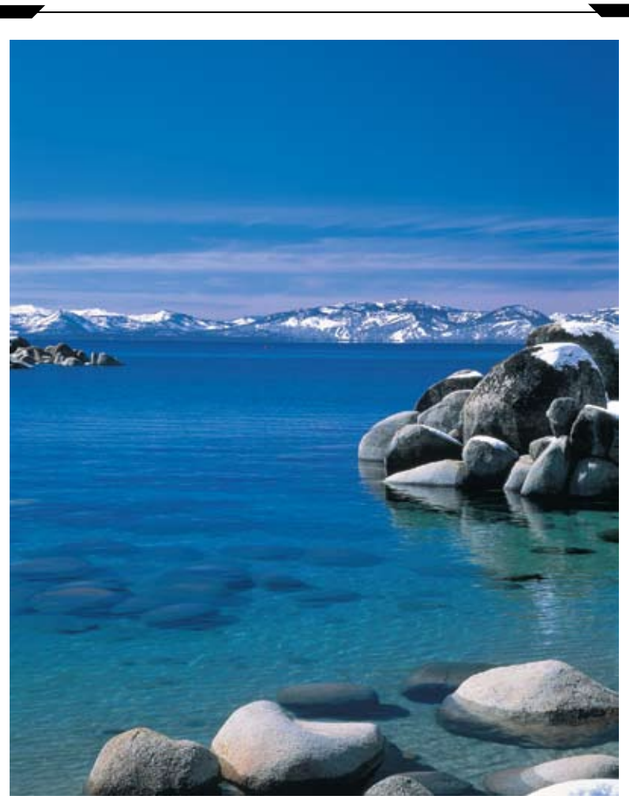
All natural resource management is inherently interdisciplinary. In today's complex world, researchers are increasingly asked to provide objective information that can be used to inform decisions by resource managers. This is particularly true in the complex management environment of Lake Tahoe. UNR and DRI faculty have a long tradition of working collaboratively to meet these needs. During their graduate programs, students also commonly work in these interdisciplinary contexts and develop a variety of skills that will serve them well throughout their careers.

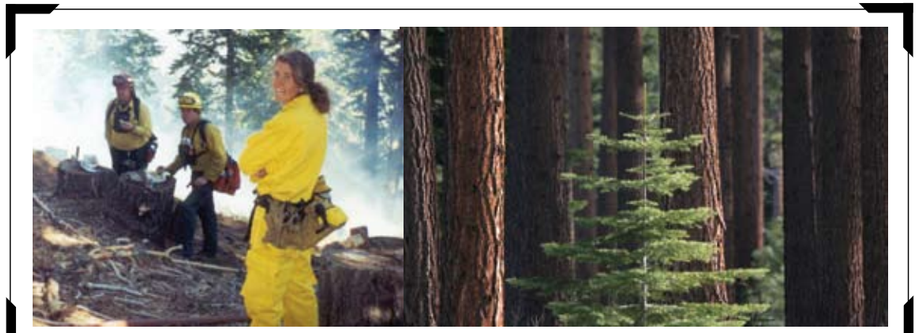
Collectively, our institutions have produced more than 100 graduates who have conducted research on issues important to the Lake Tahoe Basin. We have been able to contact many of these students and have compiled in this report their perspectives on the value of their graduate experience. Several of these graduates now occupy research positions at UNR, DRI, and other academic institutions; others have continued their graduate education at UNR or other universities. The production of high quality graduates is well recognized by federal, regional, state and local organizations, as many former students are now employed by the U.S. Geological Survey, U.S. Forest Service, U.S. Army Corps of Engineers, Tahoe Regional Planning Agency, Nevada Division of State Lands, Nevada Conservation Districts, Truckee Meadows Water Authority, Truckee Meadows Regional Planning, secondary education, and others. Past graduates also are employed by the private sector in areas such as hydrology, hydrogeology, environmental planning, and air quality management. We are very proud of both the individual and collective contributions our students have made to science in the Lake Tahoe Basin.

Many research and management challenges still face the Lake Tahoe Basin and surrounding region, and we believe both the University of Nevada, Reno, and the Desert Research Institute are well positioned to continue the outstanding research and education programs that have been ongoing for several decades. The many departmental and interdisciplinary graduate degree programs through which UNR and DRI mentor students have and continue to produce world class professionals that are making contributions in areas related to air and water quality, runoff and erosion, environmental science, forest health, natural resource management, invasive species, wildlife and biodiversity, environmental planning, and policy. We believe the focus of this year's Tahoe Summit on climate change and its effects on Lake Tahoe is timely, and that our UNR and DRI faculty and their current and future graduates are well positioned to address this and other emerging issues, and their effects on Lake Tahoe and its surrounding watersheds.

(Editor's note: Mike Collopy is executive director of the Academy for the Environment at the University of Nevada, Reno; Wally Miller is associate director for research of the Academy for the Environment; Jim Thomas is senior director of the Center for Watersheds and Environmental Sustainability at the Desert Research Institute. Combined, the three have more than 60 years of experience at Lake Tahoe.)

Profiles in Research





Jenny Briggs

Briggs finds Tahoe research a springboard to current career in education and research

Jenny Briggs comes from a long line of lovers of the outdoors. Her grandparents met on a Sierra Club high country trip in the 1930s. Briggs was taken on her first backpacking trip when she was six.

It was only natural then, that Briggs, who earned her Ph.D. from the University of Nevada, Reno's Ecology, Evolution and Conservation Biology (EECB) program in 2003, would gravitate toward a field of study that included this passion.

"When I was doing research at Tahoe I felt incredibly lucky to be hiking, camping and working in such a beautiful place, learning more every day about how its ecosystems work but also just appreciating the scenery in a completely unscientific way," said Briggs, 35, now a research ecologist for the Rocky Mountain Geographic Science Center in Denver, Colo. "I enjoyed talking with the local residents and visitors I met on the trails or at the prescribed burns about which I was studying, and hearing their perspectives about their incredible 'backyard' and its unique resources."

Briggs' Tahoe research focused on regeneration of Jeffrey pine forests after prescribed and wild fires through the role of seed dispersal by animals. This area of research continues to grow in importance, particularly as the West's forested areas continue to face an onslaught of wildland fire in the coming years of this century, and, as well, as prescribed fires are used as a management tool to mitigate the potential destruction of wildfire. Briggs' research found that several species of forest rodents (chipmunks and deer mice) facilitate forest regeneration by providing "directed dispersal" of pine seeds. Although severe wildfires cause declines and changes in species composition, Briggs found that seed-dispersing animals had "re-colonized both types (prescribed burns and wildfire) of burned sites three years post-fire, and their foraging and caching behavior was not greatly altered by the fire." Her studies found that "prescribed burns appear to enhance this important ecosystem process."

"Like all fields of ecology research, my project was extremely hands-on," she added. "I set up several different experiments on dozens of sites at Tahoe and beyond that were about to be burned (in prescribed burns) that had been burned (in prescribed burns or wildfires) or were unburned and were serving as a comparison for burned areas.

"I buried literally hundreds of thousands of pine seeds at different depths and in different places in the forest floor before fires."

According to Stephen Vander Wall, professor of biology and one of Briggs' mentors at the University, her success after her Tahoe research hasn't been surprising.

Vander Wall found Briggs to be a "very enthusiastic" student with a keen mind and an excellent ability to relate well not only to her fellow researchers, but to general audiences outside the research community. Upon completing her Ph.D., Briggs obtained a post-doctoral position with the University's Biological Resources Research Center, as well as a teaching position in a science curriculum enhancement program run by the College of Education at the University and the Nevada State Science Board.

"Jenny was a TA (teaching assistant) at UNR and did an excellent job," Vander Wall said. "She has a lot of poise in front of an audience. She is also very smart, so I knew she would be a great teacher.

"Wherever she goes, I know Jenny will always make a very positive impact."

As for her experience at Tahoe, Briggs remains convinced it is a special natural resource, with special value to visitors and researchers alike.

"I'm sure I echo thousands of others in believing that the whole Tahoe basin ecosystem is an incredible national resource that is more sensitive to anthropogenic impacts than people initially realized, and it should be studied and managed as carefully as possible," she said. "I think the Tahoe basin is a site with great potential to provide a model of successful adaptive management for other regions in the U.S."

Abbey Smith

Smith takes Journalistic approach at Tahoe

Abbey Smith knew she had found a unique and, ultimately, an enriching graduate program when she enrolled in the Interactive Online Journalism Program at the University of Nevada, Reno's Reynolds School of Journalism (RSJ).

As an undergraduate at Cal Poly San Luis Obispo, Smith had majored in animal science. She had also served as a reporter and later editor at Cal Poly's student-run newspaper, the Mustang Daily.

"I had thoroughly enjoyed my somewhat curious but balanced blend of journalism and science," said Smith, who was working as director of a non-profit organization focused on natural resource conservation and education, called The River Center in northern California, when she applied to the RSJ master's program. "Traditional journalism programs didn't fully appeal to me, because they lacked the science element. When I discovered the RSJ program, I knew it was the perfect fit for me.

"It focused on journalism and science, but more importantly it sought to explore new approaches to journalism and dared us to use what we learned to affect positive change."

Smith was part of the Reynolds School's cohort of students with journalism skills who used those skills to experiment and create new forms of journalism to address specific environmental problems. One of the final products was the creation of the award-winning OurTahoe.org website, which was designed to facilitate conversation about Lake Tahoe and its many issues. Smith's research project focused on reflective participation of citizens and newspapers in public discussion, and how this aspect of community dialogue can play an influential role if it is done with accountability and responsibility.

"I'm very proud of what we accomplished," Smith, 26, said. "Not only were we able to test our ideas, but we worked in a collaborative learning environment. I feel that we were successful because we had fun with our work – also, we were connected by an inspiration for the goals of the program.

"The emphasis of my work at Tahoe was on participation in public life around environmental issues. As a cohort, I think our work highlighted the ways community members could come together to discuss and take action on issues that affect their community."

She said she was particularly proud of the fact that the group's research helped bring together a multitude of groups at Tahoe for an important exchange of ideas about environmental issues.

"A lot of research focuses on a body of knowledge that is shared and decided upon among experts," she said. "Our projects included this segment of the community as well as others, in order to generate a truly community-oriented discussion of common environmental dilemmas."

Today, as a project manager and web business analyst for the Internet Ventures Group at Swift Communications in Reno, Smith said she still relies on many of the lessons she learned while conducting research at Tahoe: "The people I met and the critical thinking tools I developed through this graduate program are directly related to the work I do every day."

Lee Tarnay

Great burritos, sleeping under the stars ... and a lot of hard work for Tarnay at Tahoe

Even now, several years removed from his time at Lake Tahoe as a graduate student conducting atmospheric research with Professor Alan Gertler of the Desert Research Institute and the University of Nevada, Reno, Lee Tarnay's recollections are a mix of the beauty of Tahoe and the scientific work that is intended to save it.

What are some of the more vivid memories for Tarnay, who graduated from the Environmental Science and Health program in December 2001?

"Sleeping … or falling asleep, I don't remember the sleeping part … under the stars at Bliss State Park on top of my truck," said Tarnay, who is an Air Resources Specialist at Yosemite National Park. "Sleeping under the stars up at the top of Blackwood Canyon. Yes, on top of my truck – a lot of those memories are tied to my old truck.

"Jumping into Tahoe on the east shore and getting vertigo as I swam 50 feet above huge boulders in water that was clearer than some of the air we've had of late. Burritos at South Lake Tahoe after a long day of driving around the lake."

If it sounds like Tarnay spent a lot of time at the lake, you're right. Much of his work centered around collecting air quality samples at various stations around the lake, in an effort to determine sources of nitrogen deposition at Tahoe – long-considered one of the keys to understanding why the lake's clarity has diminished so much over the past two decades.

Tarnay logged hundreds of miles in Tahoe Basin driving, hustling from one sample site to the next. Often, by the end of the day, he was better off simply falling asleep on top of his truck than driving home.

Yet, the hard work paid off.

"I think I was able to show that gaseous deposition was a significant source for both direct deposition to the lake, and for terrestrial deposition to its watershed," Tarnay, 36, said of his work's findings. "However, I think my research also had something to say about what was not happening, namely that direct deposition from the gases and particles measured around the lake couldn't account for the amount of nitrogen thought to be needed for the atmosphere to be the proximate driver of Tahoe's eutrophication. My measurements also helped show that the sources of that dry deposition were local (within the Tahoe Basin), with very little contribution from regional sources external to the Tahoe Basin."

Gertler, an internationally renowned atmospheric scientist known for his gentle, caring personality and good sense of humor, still remains one of Tarnay's important influences.

"I remember how to work fast, work hard, and work efficiently, while still keeping the eye on the scientific objective and its place in the bigger picture," Tarnay said of collaborating with Gertler. "He always did all of this with a sense of humor to boot, and there is no one better at it, or smarter at it. When it's time to get stuff done, I still pretend I've got two more hours before I walk upstairs to show him a product. These lessons have served me well in this job, which is really an amalgam of two or three jobs."

"This job" for Tarnay includes working hand-in-hand with Yosemite's fire management team to make sure that smoke impacts from fires have minimal impacts locally and regionally. More generally, Tarnay said that his work in Yosemite "gives me the opportunity to inject the scientific perspective into policy and take part in the crafting and testing of policies relevant from local to national scales, which is fun."

Doug Boyle

For Boyle, Tahoe graduate work a springboard to current career

Doug Boyle's route to his graduate work at Lake Tahoe was a circuitous one, leading from his teenage years spent growing up in Reno to Aerospace Engineering studies at USC to time spent as a civil engineer with the El Dorado County Department of Transportation in nearby Pollock Pines, Calif.

Throughout it all, and continuing to this day with his work as an associate research professor at the Desert Research Institute, Lake Tahoe has never been far from his mind and his work.

"Lake Tahoe is a special place that attracts a significant amount of interest from the public, research scientists, agencies and politicians," Boyle, 42, said. "I have noticed that, in general, people with interests in Lake Tahoe are in support of preserving and improving the environment within the basin.

"They also realize that any progress will require cooperation, collaboration, financial commitment and the best science and management practices available. The public, agencies and politicians are looking to the research community to help with many issues at Lake Tahoe and it is critical that we continue to respond to the challenges in a collaborative and cooperative manner."

Boyle's graduate work, performed under the tutelage of John Warwick, executive director of the Division of Hydrologic Sciences at the Desert Research Institute and interim director of the Hydrologic Sciences Graduate Program at the University of Nevada, focused on peak streamflow and flow volume in the Incline Creek watershed near Incline Village.

Boyle originally wanted to compare and estimate streamflow peak and volume based on snowmelt rather than rainfall, but, "I felt that demonstrating this would require a considerable amount of time and effort and might be beyond the scope of an M.S. thesis project."

Boyle found a happy medium by testing the current prescribed methods for estimating design streamflow peaks and volumes with actual precipitation and streamflow data. His study found that prescribed methodology resulted in significant over-predictions of the observed streamflow peaks and volumes resulting from rainfall events. His study also explored simple alternatives to the prescribed methodology.

As with many initial graduate studies efforts, Boyle was quickly hooked, developing a keen interest in hydrologic modeling, model parameter estimation and model evaluation. He spent the next five years completing his Ph.D. studies at the University of Arizona before returning to Reno as a postdoctoral research fellow at the Desert Research Institute.

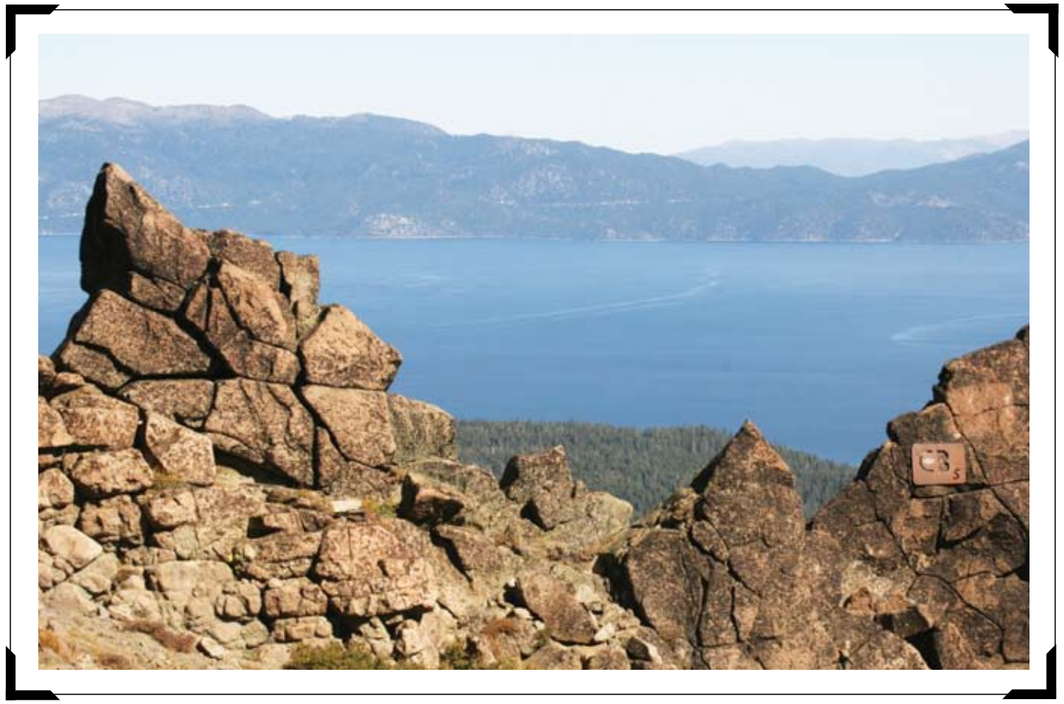
Today, Boyle continues to do research at Tahoe. His area of research is one of Tahoe's most important, particularly as scientists continue to grapple with the question of the impact that Tahoe receives in natural inputs from its many upper watershed streams and creeks.

"Most of my current research involves the development and improvement of hydrologic models for seasonal streamflow forecasting related to water supply issues," said Boyle, who is in his second year in one of the Lake Tahoe scientific community's most important efforts, the Tahoe Science Consortium Peer Review Committee. "I teach one or two graduate courses at UNR each year that are related to hydrologic modeling and snow hydrology."

And with each course, Boyle added, he can't help but encourage his students to follow a similar path – one that points science to Tahoe.

"In each course, I try to include a project related to a watershed in or near the Lake Tahoe basin," he said.

Student Projects



ATMOSPHERIC SCIENCES

Student Name:
Julide Koracin

Major Professor and Institutional Affiliation:
Dr. Alan Gertler, Desert Research Institute

Graduate Program:
Atmospheric Sciences

Graduation Date:
December 2004

Title of Research Project:
A Numerical Modeling Study to Identify Sources of HNO3 in the Lake Tahoe Basin

Key Findings of Research Project:
Simulations of nitric acid (HNO3) plume were performed for the selected cases in summer 2000. The terrain of simulations included the major out-of-basin emission sources, such as the Sacramento Valley and the San Francisco Bay Area, as well as the in-basin emissions. The results indicated that there is pollutant transport from the Sacramento Valley and the San Francisco Bay Area to the Lake Tahoe Basin; however the amount of nitric acid transported from outside of the basin is much less than that from in-basin sources. In order to better quantify these contributions, additional study is needed on long-term transport effects.

Value of Graduate Degree in Career Development:
The degree has provided essential experience in my career.

Current Position:
Assistant Research Professor, Desert Research Institute

Publications from Graduate Research:
Koracin, J., 2004. The Development and Application of Atmospheric Modeling Systems to Determine the Environmental Impact of Regional Scale and Local Emissions on Complex Mountain Terrain and Coastal-Urban Areas, Ph.D. dissertation, University of Nevada, Reno.

Gertler, W. A., Bytnerowicz, A., Cahill, T.A., Arbaugh, M., Cliff, S., Kahyaoglu-Koracin, J., Tarnay, L. 2006. Local Air Pollutants Threaten Lake Tahoe's Clarity. California Agriculture 60(2), 53-58.

Student Name:
Dongzi Zhu

Major Professor and Institutional Affiliation:
Dr. Hampden Kuhns, Desert Research Institute

Graduate Program:
Atmospheric Sciences

Graduation Date:
December 2008

Title of Research Project:
Spatial and Seasonal Emissions of Road Dust in the Lake Tahoe Basin

Key Findings of Research Project:
This study found that road dust emissions increased by a factor of five between the summer season and winter time when traction control material was applied to the roads after snow events. For both winter and summer, road dust emission factors showed a decreasing trend with the travel speed of the road. The highest summertime and wintertime emission factors were observed on very low traffic volume roads on the west side of the lake. These roads were composed of either a 3/8-inch gravel material or had degraded asphalt. The principal factors influencing road dust emissions in the basin are season, vehicle speed (or road type), road condition, road grade, and proximity to other high emitting roads. Combined with a traffic volume model, an analysis of the total emissions from the road sections surveyed indicated that urban areas (in particular, South Lake Tahoe) had the highest emitting roads in the basin.

Value of Graduate Degree in Career Development:
My graduate degree has played a significant role in career development.

Current Position:
Graduate Research Assistant, Desert Research Institute

Publications from Graduate Research:
D. Zhu, H. D. Kuhns, S. Brown, J. A. Gillies, V. Etyemezian, A. W. Gertler. Spatial and Seasonal Emissions of Road Dust in the Lake Tahoe Basin. Presented at the 101th Air Waste and Management Association Annual Conference, Portland, OR. 2008.

Li, W., Collins, J.F, Durbin, T.D., Huai, T., Ayala, A., Full, G., Mazzoleni, C., Nussbaum, N.J., Obrist, D., Zhu, D., Kuhns, H.D., Moosmüller, H. Detection of Gasoline Vehicles with Gross PM Emissions. SAE Technical Paper Series, SP-2089, 2007-01-1113. 2007.

BIOLOGY

Student Name:
Student Name: Mark S. Enders

Major Professor and Institutional Affiliation:
Dr. Stephen B. Vander Wall, Department of Biology, University of Nevada, Reno

Graduate Program:
Master of Science, Biology

Graduation Date:
Expected May 2009

Title of Research Project:
Determining the fate of seeds found in black bear (Ursus americanus) scat

Key Findings of Research Project:
Deer mice (Peromyscus maniculatus) removed seeds from black bear scat and scatter-hoarded them in the forest floor. Some seed types experienced better germination if removed from bear scat in this manner, indicating that secondary seed dispersal by rodents is more beneficial to some plants than primary seed dispersal by black bears alone.

Value of Graduate Degree in Career Development:
I am not finished with my graduate degree, so I have yet to begin developing a career. I do, however, hope that this research will propel me into a good Ph.D. program.

Current Position:
Graduate Student, Reno, Nevada

Publications from Graduate Research:
Not finished with graduate research.

Student Name:
Elaine Legras

Major Professor and Institutional Affiliation:
Dr. Stephen Vander Wall, Department of Biology, University of Nevada, Reno

Graduate Program:
Master of Science Degree in Biology

Graduation Date:
Spring 2008

Title of Research Project:
Microhabitat is Critical for Sugar Pine Seedling Emergence and Survival in a Xeric Jeffrey Pine Dominated Forest

Key Findings of Research Project:
More Jeffrey pine seedlings survived on the xeric east slope of the Carson Range than sugar pine seedlings and the presence of litter on the soil surface slightly hindered emergence of seedlings of both species. Sugar pine seedling survival can be increased with the addition of water and/or by planting seedlings or seeds on the north side of a manzanita shrub. Jeffrey pine seedling survival can be increased, also with the addition of water, but by planting on the north side of a bitterbrush shrub. Nurse plants are critical for pine seedling survival. Without shrubs, seedling survival drops to below 1 percent. Therefore, microhabitat is a significant factor in determining success or failure in rehabilitation efforts after disturbance.

Value of Graduate Degree in Career Development:
My thesis research spurred intellectual curiosity which prompted me to enter the Ecology, Evolution and Conservation Biology, Ph.D. program at UNR. My thesis taught me self-discipline, organizational skills, and a greater ability to "think outside of the box." It will no doubt contribute to my skills in future projects involving forest dynamics.

Current Position:
Ph.D. student in Ecology, Evolution, and Conservation Biology program at the University of Nevada, Reno

Publications from Graduate Research (include thesis/dissertation):
VanderWall, Stephen B., Elaine C.H. Hager, Kellie M. Kuhn. 2005. Pilfering of stored seeds and the relative costs of scatter-hoarding versus larder-hoarding in yellow pine chipmunks. Western North American Naturalist 65(2): 248.

Student Name:
Julie Roth

Major Professor and Institutional Affiliation:
Dr. Stephen Vander Wall, Department of Biology, University of Nevada, Reno

Graduate Program:
General Biology

Graduation Date:
December 2001

Title of Research Project:
Importance of primary and secondary seed dispersal of Sierra bush chinquapin (Fagaceae) by scatter-hoarding rodents

Key Findings of Research Project:
Seed dispersal often occurs in two or more discrete stages, but the effects of the latter stages of dispersal on successful recruitment have seldom been measured. We investigated the relative contributions of primary and secondary seed dispersal of Sierrabush chinquapin (Castanopsis sempervirens; Fagaceae) to seedling establishment. Rodents (mostly yellow pine chipmunks, Tamias amoenus) harvested chinquapin nuts rapidly during a three-week period starting in mid-August and scatterhoarded most nuts (81 percent) in the ground. Most initial (primary) caches contained one nut (range 5 1–5 nuts) buried 10–23 millimeters deep within 46 meters of source shrubs. Rodents subsequently retrieved 95 percent of these nuts and reached at least 33 percent elsewhere (secondary caches), at lower densities and up to 64 meters from source plants. By winter, 41 percent and 21 percent of nuts harvested from shrubs remained in scatter caches in 1999 and 2000, respectively. Only 10 caches (four primary and six secondary caches) present in winter 1999 (7.8 percent), and no caches from winter 2000, produced seedlings the following spring. All seedlings died during the first growing season because of rodent grazing and desiccation. Despite low seedling survival in this study, chinquapin appears to be dependent upon scatterhoarding rodents for seedling recruitment. Secondary dispersal is an important aspect of chinquapin dispersal. Secondary caches contributed more to chinquapin seedling recruitment than primary caches; 2.5 percent of primary caches and 5.6 percent of secondary caches produced seedlings. This study suggests that, for propagules that move repeatedly during dispersal, a clear understanding of the dynamics of seed dispersal can be gained only by following seed movements, determining the transition probabilities between different stages of dispersal, and assessing the contribution of each stage of seed dispersal to plant recruitment.

Value of Graduate Degree in Career Development:
My graduate degree provided me with a solid foundation in the scientific method, a process which I found to have many and broad applications in my career with the U.S. Forest Service. Additionally, the critical thinking, analytical, and written communication skills developed during graduate school are my most valued skills as a biologist.

Current Position:
Wildlife Biologist, USDA Forest Service, South Lake Tahoe, California; starting August 2008, Wildlife Biologist, EDAW, Inc., South Lake Tahoe, California

Publications from Graduate Research:
Roth, J.K. and S.B. Vander Wall. 2005. Primary and secondary seed dispersal of bush chinquapin (Fagaceae) by scatterhoarding rodents. Ecology 86(9): 2428-2439.

ECOLOGY, EVOLUTION AND CONSERVATION BIOLOGY

Student Name:
Alyson Andreasen

Major Professor and Institutional Affiliation:
Dr. William Longland & Dr. Kelley Stewart, Department of Natural Resources and Environmental Science

Graduate Program:
Ecology, Evolution and Conservation Biology

Graduation Date:
TBD

Title of Research Project:
Combining landscape genetics and behavioral ecology to model source-sink metapopulation dynamics of mountain lions in Nevada

Key Findings of Research Project:
No findings to date

Value of Graduate Degree in Career Development:
N/A

Current Position:
Teaching assistant/research assistant at the University of Nevada, Reno

Student Name:
Jon Beckmann

Major Professor and Institutional Affiliation:
Dr. Joel Berger, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Ecology, Evolution and Conservation Biology

Graduation Date:
2002

Title of Research Project:
Changing dynamics of a population of black bears (Ursus americanus): causes and consequences

Key Findings of Research Project:
See publications below.

Value of Graduate Degree in Career Development:
High

Current Position:
Research Ecologist, Wildlife Conservation Society

Publications from Graduate Research:
Beckmann, J. P., and J. Berger. 2003. Using black bears (Ursus americanus) to test ideal-free distribution models experimentally. Journal of Mammalogy 84(2):594-606.

Beckmann, J. P., and C. W. Lackey. 2004. Are desert basins effective barriers to movements of relocated black bears (Ursus americanus)? Western North American Naturalist 64(2):269-272.

Beckmann, J. P., and J. Berger. 2003. Rapid ecological and behavioural changes in carnivores: the responses of black bears (Ursus americanus) to altered food. Journal of Zoology 261(2):207-212.

Beckmann, J. P., C. W. Lackey, and J. Berger. 2004. Evaluation of deterrent techniques and dogs to alter behavior of 'nuisance' black bears (Ursus americanus). Wildlife Society Bulletin 32(4):1141-1146.

Student Name:
Jenny Briggs

Major Professor and Institutional Affiliation:
Dr. Stephen Vander Wall, Department of Biology, University of Nevada, Reno

Graduate Program:
Ecology, Evolution, and Conservation Biology

Graduation Date:
May 2003

Title of Research Project:
Regeneration of Jeffrey pine forests after prescribed and wild fires: the role of seed dispersal by animals

Key Findings of Research Project:
Several species of forest rodents (chipmunks and deer mice) facilitate forest regeneration by providing "directed dispersal" of pine seeds. They do this by burying seeds in shallow caches in microsites that are favorable for seed germination and seedling establishment. Low-intensity prescribed fires caused short-term (one to two years) declines in forest rodent communities. More severe wildfires caused longer declines and changes in species composition. However, seed-dispersing animals had re-colonized both types of burned sites three years post fire, and their foraging and caching behavior was not greatly altered by the fire. Seeds buried before fires, especially in patches of exposed soil, generally survived and produced healthy seedlings, but seeds on the forest floor were destroyed. After fires, seeds buried in ash fared surprisingly well. All these lines of evidence suggest that dispersal of pine seeds by forest rodents is often more effective than dispersal by wind, and is particularly beneficial after low-intensity, patchy fire. The implication for forest management is that prescribed burns appear to enhance this important ecosystem process.

Value of Graduate Degree in Career Development:
After completing my Ph.D., I obtained a post-doctoral position with the Biological Resources Research Center at UNR, as well as a teaching position in a Science Curriculum Enhancement program run by the College of Education at UNR and the Nevada State Science Board. I later taught both upper- and lower-division Biology courses at California State University, Northridge; the University of Nevada, Las Vegas; and Pasadena City College. I also worked as a Field Ecologist for the Irvine Ranch Conservancy in Orange County, Calif. In all of these positions, my Ph.D. was a considerable asset (and usually a requirement for obtaining the job) because I was expected to design my own research projects and/or academic curricula, and to supervise research or teaching assistants.

For my current position, a Ph.D. and several years of research experience were required. Both the topic of my dissertation research (fire ecology in the eastern Sierra) and my experience in interdisciplinary, multi-agency collaborative projects in the Reno-Tahoe area are very relevant to my current work as a Research Ecologist with the Rocky Mountain Geographic Science Center of the U.S. Geological Survey. I'm designing studies assessing the impacts of large-scale forest disturbances (insect epidemics and fire) on ecosystem services and management alternatives. My Ph.D. from the EECB program and my work in the Tahoe basin have been excellent preparation for my subsequent career in education and research.

Current Position:
Research Ecologist, Rocky Mountain Geographic Science Center, U. S. Geological Survey, Denver, Colorado.

Publications and Graduate Research:
Briggs, J.S., S.B. Vander Wall, and S.H. Jenkins. 2008. Forest rodents provide directed dispersal of Jeffrey pine (Pinus jeffreyi). Accepted for publication 4/20/07: Ecology.

Briggs, J.S. and S.B. Vander Wall. 2004. Substrate type affects caching and pilferage of pine seeds by chipmunks. Behavioral Ecology 15 (4): 666-672

Briggs, J.S. 2003. Regeneration of Jeffrey pine forests after prescribed and wild fires: the role of seed dispersal by animals. Ph.D. dissertation, University of Nevada, Reno. 153 pp.

Student Name:
Cynthia Downs

Primary Investigator and Institutional Affiliation:
Dr. Stephen Vander Wall, Department of Biology, University of Nevada, Reno

Graduate Program:
Ecology, Evolution and Conservation Biology

Title of Research Project:
The role of associative learning and olfaction in seed discovery by yellow pine chipmunks.

Key Findings of Research Project:
Scatter-hoarding animals store food items to be used later when food is scarce. However, other individuals can pilfer food stores because caches are not usually defended. We set out to test how associative learning (the linking together of a response, in this case food, with previously unrelated signal) contributes to foraging success of pilferers searching for scatter-hoarded food. We established a seed-removal experiment to test the following hypotheses in the field: that (1) rodents will learn recurring objects faster than they will learn distinctive objects, and that (2) rodents will learn man-made objects faster than they will learn natural objects. Results concerning learning were difficult to interpret because of a storm event during the study. The pattern of seed removal suggests that high relative humidity events (storm systems) provided sufficient moisture to increase seed odor, facilitated olfaction by rodents, and increased the rate of seed removal. We tested this hypothesis in a laboratory experiment using eight wild caught yellow pine chipmunks (Tamias amoenus) and five relative humidity (RH) levels: ~17%, ~27%, ~50%, ~75%, or ~95%. Foraging success at 17-75% relative humidity was not different from random, but during the 95% relative humidity trial seed recovery was significantly higher than random. These results support the hypotheses that high relative humidity facilitates discovery of buried seeds, and with higher foraging success, associative learning of cache markers can occur. In this way, seed recovery by spatial memory may also be facilitated by high humidity.

Value of Graduate Degree in Career Development:
I am working towards becoming a professor. This research has provided me with an opportunity to experience the research side of academics. It has also provided me with ample opportunities to write grants, a necessary part of academics.

Current Position:
Ph.D. student at University of Nevada, Reno

Publications from Graduate Research:
Vander Wall, S.B., Downs, C.J., Enders, M., Waitman, B.A. (in press) Do yellow-pine chipmunks recover their own caches? Western North American Naturalist.

Downs, C.J., Vander Wall, S.B. (complete manuscript being revised for Journal of Mammalogy) High humidity increases foraging success and yellow-pine chipmunks.

Poster: Downs, C.J., Vander Wall, S.B. (2008) Relative humidity increases pilfering success in chipmunks. Society for Integrative and Comparative Biology 2008 Annual Meeting, San Antonio, Texas.

Heather Mathewson

Student Name:
Heather Mathewson

Co-advisors:
Dr. Peter Brussard, Department of Biology, University of Nevada, Reno and Dr. Michael Morrison, Department of Wildlife & Fisheries Science, Texas A&M University

Graduate Program:
Ecology, Evolution and Conservation Biology

Graduation Date:
December 2008

Title of Research Project:
Multiple limiting factors affecting willow flycatcher population demographics at four regions in the central Sierra Nevada, 1997-2007.

Key Findings of Research Project:
The population of willow flycatchers has declined significantly in the Lake Tahoe Basin in the last 11 years. The number of territories monitored declined from 12 territories in 1997 to only three in 2007. Nests were located until 2007 when no females returned to the sites. Compared to other study sites, willow flycatcher nests in the basin experience higher parasitism by brown-headed cowbirds.

Value of Graduate Degree in Career Development:
I am pursuing research and teaching in the future so the skills I gained while working on my Ph.D. at UNR are crucial for development of my career. Specifically, I gained skills pertaining to project management and leadership, student advising, and research design and analysis. While working at sites in Tahoe, I have learned management skills while supervising several field assistants at multiple locations. I also have learned how to coordinate field efforts with multiple entities because the willow flycatcher is of interest to several agencies. I have had the opportunity to help advise several graduate students working in the area and several undergraduate students worked with me on independent projects and class credits. I have learned several techniques for surveying and monitoring rare species as well as the proper tools for analyzing such data.

Current Position:
Ph.D. candidate, EECB, University of Nevada, Reno

Student Name:
Susan Merideth

Major Professor and Institutional Affiliation:
Dr. Peter Brussard, Department of Biology,
University of Nevada, Reno

Graduate Program:
Ecology, Evolution and Conservation Biology

Graduation Date:
Fall 2008

Title of Research Project:
Impacts of urban development, anthropogenic disturbance and habitat condition on small mammal community and population dynamics in the Lake Tahoe Basin

Key Findings of Research Project:
My current research is focused on understanding how forest-associated small mammals are responding to urban development and anthropogenic disturbance in the Lake Tahoe Basin. I am asking questions about how urbanization, human-associated disturbance, and habitat structure are impacting small mammal community patterns and population dynamics. At the community-level, I am identifying key associations between these environmental factors and patterns of small mammal abundance, species richness, and species turnover. At the species-level, I am identifying the key habitat associations of the most abundant forest-dwelling small mammals in this region, chipmunks and squirrels, and asking what is the relative role of specific habitat features versus urbanization in influencing these associations. I am also using multi-year capture-recapture data to estimate population parameters, including survival and dispersal probability (emigration), to better understand how habitat and urbanization are related to population dynamics that ultimately influence long-term population stability and persistence in these important forest species.

Value of Graduate Degree in Career Development:
I plan to continue conducting research in the Sierra Nevada after completing my dissertation at UNR. Working in the Lake Tahoe Basin has greatly increased my knowledge and appreciation of this unique region that is at a pivotal point in terms of land management and development. I am particularly interested in questions related to population dynamics, especially how habitat and other environmental factors influence movement patterns and gene flow. I intend to continue to contribute to our scientific understanding of native biota in a way that informs management decisions.

Current Position:
Ph.D. Candidate, University of Nevada, Reno

Publications from Graduate Research
Manley, P.N.; McIntyre, K.K.; Schlesinger, M.D.; Campbell, L.A.; Merideth, S.; Murphy, D.D. In press. Use of FIA grid-based animal population data to develop an Index of Ecological Diversity. In: McRoberts, R., ed. Eighth annual Forest Inventory and Analysis Symposium, 16-19 October, Monterey, California. General Technical Report NRS-GTR. Newtown Square, PA; U.S.

Manley, P.N., D.D. Murphy, M.D. Schlesinger, L.A. Campbell, S. Merideth, M.P. Sanford, K.E. Heckmann, and S.A. Parks. 2007. The role of urban forests in conserving and restoring biological diversity in the Lake Tahoe basin. Draft Final Report to USFS Lake Tahoe Basin Management Unit, Tahoe Regional Planning Agency, and Nevada Division of State Lands.

P.N. Manley, D.D. Murphy, L.A. Campbell, K.E. Heckman, S. Merideth, M. Sanford, and M.D. Schlesinger. 2007. Multi-taxonomic patterns and thresholds of biological diversity along a gradient of human development. 2006 Lake Tahoe Special Edition: Science as a Tool in Lake Tahoe Basin Management - Lake Tahoe Science Plan Special Workshop, held October 18-20, 2006 at the Tahoe Center for Environmental Sciences, Sierra Nevada College, Incline Village, Nevada. Journal of the Nevada Water Resources Association 4(1): 83.

P.N. Manley, K.K. McIntyre, M.D. Schlesinger, and S. Merideth. 2007. Indicators of biological diversity in Lake Tahoe forests. 2006 Lake Tahoe Special Edition: Science as a Tool in Lake Tahoe Basin Management - Lake Tahoe Science Plan Special Workshop, held October 18-20, 2006 at the Tahoe Center for Environmental Sciences, Sierra Nevada College, Incline Village, Nevada. Journal of the Nevada Water Resources Association 4(1): 85.

Manley, P.N., D.D. Murphy, L.A. Campbell, K.E. Heckmann, S. Merideth, S.A. Parks, M.P. Sanford, and M.D. Schlesinger. 2006. Biotic diversity interfaces with urbanization in the Lake Tahoe Basin. California Agriculture 60(2): 59-64.

T. Will Richardson

Student Name:
T. Will Richardson

Major Professor and Institutional Affiliation:
Dr. Dennis D. Murphy, Department of Biology,
University of Nevada, Reno

Graduate Program:
Ecology, Evolution, and Conservation Biology

Graduation Date:
August 2007

Title of Research Project:
Avian Use, Nest-Site Selection, and Nesting Success in Sierra Nevada Aspen

Key Findings of Research Project:
Pure, mature aspen (Populus tremuloides) were best for avian species richness and abundance. Aspen bark may be a barrier to small mammalian nest predators. Conifer density predicted presence of suspected nest predators in aspen stands. Near-nest conifer density was negatively correlated with avian nest success. Among tree-nesting birds, nest placement in aspen trees increased probability of nest success. Differences in predation may be affecting nest-site selection relative to tree species but not conifer density.

Value of Graduate Degree in Career Development:
See current position, below

Current Position:
Post-Doctoral Researcher, Department of Biology,
University of Nevada, Reno

Publications from Graduate Research
Richardson, T. W., Gardali, T., and S. H. Jenkins. 2008. Effects of video camera monitoring on nesting success: a meta-analysis. Accepted to Journal of Wildlife Management.

Richardson, T.W. 2007. Avian Use, Nest-site Selection, and Nesting Success in Sierra Nevada Aspen., Ph.D. Dissertation. University of Nevada, Reno.

Richardson, T. W. and S. B. VanderWall. 2007. Yellow pine chipmunks cannot climb quaking aspens: implications for avian nest site selection. Western North American Naturalist 67: 251-257.

Richardson, T.W. and S.K. Heath. 2004. Effects of conifers on aspen-breeding bird communities in the Sierra Nevada. Transactions of the Western Section of the Wildlife Society 39: 68-81.

Richardson, T.W. 2003. First records of Black-backed Woodpecker (Picoides arcticus) nesting in Nevada. Great Basin Birds 6: 52-55.

Student Name:
Monte P. Sanford

Major Professor and Institutional Affiliation:
Dr. Peter Brussard and Dr. Dennis Murphy, Department of Biology, University of Nevada, Reno

Graduate Program:
Ecology, Evolution and Conservation Biology

Graduation Date:
December 2007

Title of Research Project:
Effects of Urban Development on Ant Communities: Implications for Ecosystem Services and Management

Key Findings of Research Project:
Research that connects the effects of urbanization on biodiversity and ecosystem services is lacking. Ants perform multifarious ecological functions that stabilize ecosystems and contribute to a number of ecosystem services. We studied responses of ant communities to urbanization in the Lake Tahoe basin by sampling sites along a gradient of urban land development. We sampled ant communities, measured vegetation characteristics, quantified human activities, and evaluated ant-community responses by grouping ants into service-providing units (SPUs), defined as a group of organisms and their populations that perform specific ecosystem services, to provide an understanding of urbanization impacts on biodiversity and their delivery of ecosystem services. Species richness and abundance peaked at intermediate levels of urban development, as did the richness of three types of ant SPUs (aerators, decomposers, and compilers). Aerator and decomposer ants significantly declined in abundance with increasing land development, whereas compiler ants significantly increased in abundance with increasing land development. Competing models frequently demonstrated that precipitation was frequently among the strongest influences on ant community structure; however, urban development and/or human activities also had a strong, negative influence on ants, appearing in most models with $\Delta AICc < 2$ for species richness and abundance patterns of SPUs and generalists. Response diversity was observed within SPUs, suggesting that the corresponding ecosystem services were maintained until development reached 30-40%. Our data provide evidence that ecosystem functions, such as water infiltration and soil productivity, may be diminished at sites subject to greater levels of urbanization and that conserving ant communities and the ecosystem services they provide could be an important target in land-use planning and conservation efforts.

Value of Graduate Degree in Career Development:
High, imperative

Current Position:
Private Consultant, Environmental Planner, and Research Scientist

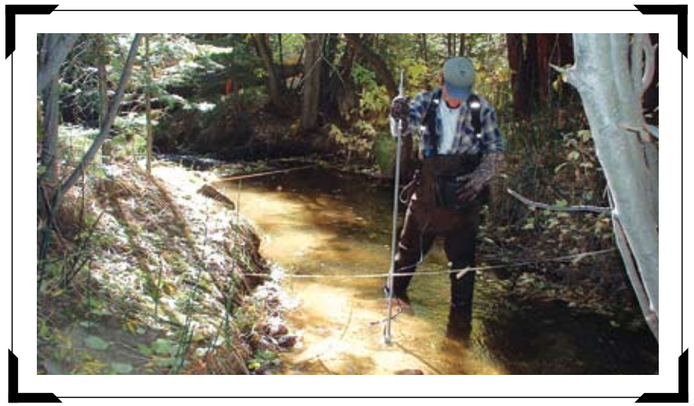
Publications from Graduate Research:
Manley, P.N., D.D. Murphy, L.A. Campbell, K.E. Heckmann, S. Merideth, M.P. Sanford, M.D. Schlesinger. 2006. Biotic diversity interfaces with urbanization in the Lake Tahoe Basin. California Agriculture 60(2): 59-64.

Manley, P.N., D.D. Murphy, L.A. Campbell, K.E. Heckmann, S. Merideth, M.P. Sanford, M.D. Schlesinger. 2006. Multi-taxonomic patterns and thresholds of biological diversity along a gradient of human development. Journal of the Nevada Water Resources Association. Lake Tahoe Special Edition.4: 83.

Sanford, M.P., Manley, P., Murphy, D. Urban development impacts on ant communities: implications for ecosystem services and management. Conservation Biology.

Sanford, M.P., Murphy, D.D., Manley, P. Effects of forest management on ant communities and their ecosystem services in a wildland-urban interface in the Sierra Nevada. In review Forest Ecology and Management.

Bangert, R., Sanford, M.P., Ramirez, J.L., Huntly, N., Kreuzer, M. Jr. Biogeography of arthropods on sagebrush (Artemisia tridentata) in ancient and recently fragmented sage-steppe. In review Journal of Biogeography.



Jamie Trammell

Student Name:
Jamie Trammell

Major Professor and Institutional Affiliation:
Dr. Don Sada, Desert Research Institute

Graduate Program:
Geography at the time, now Ecology, Evolution and Conservation Biology

Graduation Date:
M.S. in Geography in Spring 2006, Ecology, Evolution and Conservation Biology hopefully Spring 2010

Title of Research Project:
Fish community and stream habitat relationships, eastern Lake Tahoe basin, Nevada

Key Findings of Research Project:
Diversions from smaller creeks should be kept to a minimum, native fish communities are rare in the eastern basin creeks, barriers and naturally reproducing rainbow trout need to be studied to better understand the unique ecosystem the eastern basin presents.

Value of Graduate Degree in Career Development:
My graduate degree helped me define the area of research I was most interested in and also provided funding for my first year as a graduate student.

Current Position:
Graduate Research Assistant, University of Nevada, Reno

Sandra L. Carroll

ENVIRONMENTAL SCIENCES AND HEALTH

Student Name:
Sandra L. Carroll

Major Professor and Institutional Affiliation:
Dr. Glenn C. Miller, Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Environmental Sciences and Health (Environmental Toxicology)

Graduation Date:
May 2005

Title of Research Project:
Complex Mixtures of Polycyclic Aromatic Hydrocarbons in Motorized Watercraft Emissions: Phototoxic Effects at Very Low (ng/L) Concentrations

Key Findings of Research Project:
Polycyclic aromatic hydrocarbon (PAH) compounds found in Lake Tahoe waters were the lower molecular weight compounds with higher aqueous solubilities, and the phototoxic PAHs detected most often were: acenaphthylene, anthracene, fluoranthene and pyrene. Mortalities of Ceriodaphnia dubia were observed in bioassay treatments containing 900 ng/L total phototoxic PAH with UV exposure, approximately one-half the concentration seen in UV-filtered treatments. Ultraviolet radiation exposure and emission sources (two-stroke and four-stroke marine engines) were significant indicators of daphnid survival and reproductive success.

Value of Graduate Degree in Career Development:
I currently have a senior level scientist position with a major consulting firm that specializes in water quality and environmental services

Current Position:
Senior Toxicologist, Tetra Tech, Inc., Reno, Nevada

Student Name:
Veronica Edirveerasingam

Major Professor and Institutional Affiliation:
Dr. Glenn C. Miller, Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Environmental Sciences and Health

Graduation Date:
December 2006

Title of Research Project:
Implications of vehicle emissions to Lake Tahoe soils and sediments

Key Findings of Research Project:
Petroleum hydrocarbon input into Tahoe soils and sediments are high, catchment basins are preventing the pollutants from entering the Lake to a certain degree. Engine oil is a source of phosphorus input to Lake Tahoe

Value of Graduate Degree in Career Development:
Good

Current Position:
Chemist for UC Davis at the Tahoe Environmental Research Center, Incline Village, Nevada

Publications from Graduate Research:
Implications of vehicle emissions to Lake Tahoe soils and sediments

Mary Fiore-Wagner at work at Tahoe

Student Name:
Mary Fiore-Wagner

Major Professor and Institutional Affiliation:
Dr. Glenn C. Miller, Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Environmental Science and Health

Graduation Date:
December 1999

Title of Research Project:
Quantifying the Dissolved Phase of MTBE and BTEX Exhausted from Marine Engines – Lake Tahoe Motorized Watercraft Study

Key Findings of Research Project:
The seasonal distribution of MTBE and BTEX observed in the reconnaissance study conducted during 1997 suggested that gasoline concentrations found in Lake Tahoe were associated with motorized watercraft activity. Additional studies conducted during the summer of 1998 revealed that all six types of watercraft tested, regardless of operating cycle (two- or four-stroke) and induction system (carbureted or fuel injection), released measurable amounts of gasoline into Lake Tahoe. However, the amounts of soluble gasoline constituents (MTBE and BTEX) discharged into the water from motorized watercraft exhaust were largely dependent on marine engine type. Field experiments demonstrated that the two-stroke carbureted engines had the greatest amount of unburned gasoline passing through the engine and into the water. In a localized area, the average concentrations of gasoline constituents (MTBE and BTEX) released by a two-stroke engine were over an order of magnitude greater than concentrations measured for four-stroke carbureted and two-stroke direct injected technologies. In open water, the carbureted two-stroke engines released at least seven times more gasoline (using toluene as the surrogate gasoline constituent) than the four-stroke carbureted and newer two-stroke fuel injected engines. This study provided scientific evidence to assist regulators at Lake Tahoe in making educated decisions about preventing pollution of Lake Tahoe by watercraft exhaust. The findings from this thesis project and other related watercraft studies were used to support the Tahoe Regional Planning Agency's decision to ban watercraft powered by two-stoke engines, a regulation that was a very controversial issue in the Lake Tahoe Basin at the time.
Subsequent to the watercraft ban, water quality monitoring of Lake Tahoe indicated that the levels of gasoline pollutants present in the Lake during the boating season had decreased significantly compared to pre-ban levels of pollutants.

Value of Graduate Degree in Career Development:
Since I worked part-time while completing my master's degree, my thesis work helped me develop effective time management and organization skills, as well as the ability to multi-task. I was able to work independently and able to manage and train a team of researchers. Since my thesis topic involved an issue that was very controversial (i.e., watercraft regulation that banned boat use), I was asked to present my findings at several local and state public meetings. Presenting my thesis work allowed me to hone my public speaking skills and effectively communicate with proponents and opponents of the watercraft ban while being sensitive to all interests. Additionally, I experienced the value of applying research and science toward adaptive management and policy decisions.

Current Position:
Environmental Scientist with the California Regional Water Quality Control Board

Publications from Graduate Research:
Quantifying the Dissolved Phase of MTBE and BTEX Exhausted from Marine Engines – Lake Tahoe Motorized Watercraft Study (December 1999)

Student Name:
Lynell M. Garfield

Major Professor and Institutional Affiliation:
Dr. Mark Walker, Natural Resources and Environmental Science, funded through USDA Cooperative State Research, Education, and Extension Service (CSREES) Water Quality Program.

Graduate Program:
Environmental Science and Health

Graduation Date:
August 2007

Title of Research Project:
Fecal Contamination of Water from a Dog Park and Water Potential Changes Affecting Bacterial Survival

Key Findings of Research Project:
Land use may result in runoff to surface waters, and with increased urbanization, the proportion of rainfall and snowmelt occurring as runoff is increased by impervious surfaces. Fecal matter from companion animals may enter waterways and cause microbial contamination in drinking and recreational waters. This research included two studies, a field study at Lake Tahoe that examined the links between a heavily used dog exercise area and microbial water quality, and a laboratory study that looked at effects of evaporation on indicator organism populations losses through time. The 14 month field study measured fecal accumulation and distribution on land and E. coli levels in a creek passing through the site. This study utilized Inverse Distance Weighting to estimate fecal loading on site, and membrane filtration to test microbial water quality. Results showed localized loading with an estimated 45.4 kg dry mass accumulation over the study period. Results also showed lower E. coli levels downstream from the park than upstream, presumably due to an on-line sedimentation basin on the creek in the park. Based on results of the field study, a laboratory study examined survival of indicator organisms in feces, specifically the relationship of evaporation to microbial survival. Canine feces were used to make a standardized sterile matrix, which was inoculated with E. coli, ATCC strain 25922. An environmental chamber study examining fecal bacteria degradation in canine feces evaluated bacterial degradation rates at evaporation conditions of 0.08, 0.21, and 0.29 in/day. With the data fitted to Chick's law, estimates of decay coefficients corresponded to results of -.07, -.22 and -.23/hr, respectively. High and medium rate studies were not statistically different from one another, but significantly different from the low rate study. Control studies showed that high temperatures add to bacterial degradation rates, and that E. coli survival in feces is mostly limited by water potential. We measured changing water potential with water content losses and created a moisture release curve for canine feces. The data corresponded to previous research stating that E. coli would not survive conditions below ~ -22.4 MPa water potential.

Value of Graduate Degree in Career Development:
Greatly helped me in bridging the gap between theory and real-world applications.

Current Position:
Hydrologist, Public Works Sanitary Engineering Team, City of Reno, Reno, Nevada

Publications from Graduate Research:
"Water Potential Changes in Fecal Matter and E. coli Survival" Thesis Chapter 3, published in the Journal of American Microbiology, Spring 2008.

"Microbial Water Quality and Influences of Fecal Accumulation from a Dog Exercise Area" Thesis Chapter 2, TBP to the Journal of Environmental Health November, 2008.

Leland Tarnay

Student Name:
Leland Tarnay

Major Professor and Institutional Affiliation:
Dr. Alan Gertler, Desert Research Institute

Graduate Program:
Environmental Sciences and Health

Graduation Date:
December 2001

Title of Research Project:
Atmospheric Nitrogen Deposition to the Lake Tahoe Basin

Key Findings of Research Project:
Sources of dry nitrogen deposition are likely local and direct wet and dry deposition to Lake Tahoe proper explains only a fraction of the amount thought to be causing Tahoe's eutrophication. Watershed sources of nitrogen may be more important than previously thought.

Value of Graduate Degree in Career Development:
This research was a springboard for me to enter the field of air resources management (of which nitrogen deposition is an important component). The basic knowledge acquired in the performance of this research has been applicable to a wide range of topics related to land-atmosphere interactions, including climate change and carbon sequestration, smoke dispersion and modeling, and fire ecology.

Current Position:
Air Resources Specialist, Yosemite National Park.

Selected publications from Graduate Research:
Gertler, A. W., B. A., M. Arbaugh, S. S. Cliff, J. K. Koracin, L. Tarnay, R. Alonso, and W. Fraczek (2006). Local Air Pollutants Threaten Lake Tahoe's Clarity. California Agriculture 60 (2): 53-58.

Tarnay, L.W., D.W. Johnson, and A.W. Gertler (2005). Modeled inputs of atmospheric nitrogen to the Lake Tahoe Basin due to gaseous pollutant deposition. Journal of the Nevada Water Resources Association 2 (4): 41-57 http://www.nvwra.org/docs/journal/jnwra_2_article4_tarney.pdf.

Tarnay, L.W., A.W. Gertler, and G.E. Taylor (2002). An Inferential Model for HNO3 Deposition to Semi-arid Coniferous Forests. Atmospheric Environment 36 (20), 3277-3287.

Tarnay, L.W., A.W. Gertler, and M. Luria (2001). Sources and Magnitudes of Nitrogen-containing Compounds Responsible for Deposition in the Lake Tahoe Basin, California-Nevada. Paper #395 AWMA 94th Annual Meeting & Exhibition, Orlando, FL, June 24-28.

Tarnay, L.W., A.W. Gertler, R.R. Blank, and G.E. Taylor Jr. (2001). Preliminary Measurements of Summer Nitric Acid and Ammonia Concentration in the Lake Tahoe Basin Airshed: Implications for Dry Deposition of Atmospheric Nitrogen. Environmental Pollution, 113(2): 145-153.

GEOGRAPHY

Student Name:
Peter Gower

Major Professor and Institutional Affiliation:
Dr. Paul Stangl and Dr. Scott Bassett, Department of Geography, University of Nevada, Reno

Graduate Program:
Land Use Planning

Graduation Date:
December 2008

Title of Research Project:
Resorting to Aesthetics: Measuring the Visual Qualities of Selected New Urbanist-Style Resort Developments in the Lake Tahoe Region

Key Findings of Research Project:
New urbanist planning and design techniques contribute to increased visual quality; urban settings have a greater ability to absorb visual impacts compared to rural settings

Value of Graduate Degree in Career Development:
My graduate research greatly furthered my knowledge and understanding of aesthetics, new urbanism and the relationship between the two. This added education advanced my career as scenic program manager at a private planning consulting firm on the north shore of Lake Tahoe. However, a recent move to the Truckee Meadows Regional Planning Agency is directing my attention to other planning matters.

Current Position:
Senior Planner, Truckee Meadows Regional Planning Agency

Publications from Graduate Research
Resorting to Aesthetics: Measuring the Visual Qualities of Selected New Urbanist-Style Resort Developments in the Lake Tahoe Region; Saving the Scenery: Managing scenic resources on the shores of Lake Tahoe; Rating the View: How Visual Quality Protection in the Lake Tahoe Basin Measures Up

Student Name:
Jill Holderman

Major Professor and Institutional Affiliation:
Dr. Chris Exline, Professor of Geography, Department of Geography, University of Nevada, Reno

Graduate Program:
Land Use Planning

Graduation Date:
May 1991

Title of Research Project:
Development of a Bike Path in the Ecologically Sensitive Lake Tahoe Basin

Key Findings of Research Project:
Development of bike path to reduce erosion from recreational use is plausible, however, it is a quite expensive way to address this problem.

Value of Graduate Degree in Career Development:
My degree was a general degree for land use which gave me the qualifications to pursue a natural resource career in recreation, land use planning, forestry, and wildlife biology. I started with the U.S. Forest Service as a forester trainee, became a professional forester and later switched to wildlife biology in 1993 with the U.S. Forest Service and then became a wildlife biologist in 2002 with the Bureau of Land Management.

Current Position:
Wildlife Biologist, Bureau of Land Management, Four Rivers Field Office, Boise District, Boise, Idaho

Student Name:
Mark S. Morrison

Major Professor and Institutional Affiliation:
Dr. Scott Mensing, Department of Geography, University of Nevada, Reno

Graduate Program:
Geography

Graduation Date:
December 2003

Title of Research Project:
Middle Holocene vegetation change at Lake Tahoe (Nevada, California)

Key Findings of Research Project:
A sediment core from Lake Tahoe, California-Nevada was analyzed for pollen to determine the nature and timing of vegetation change during the middle Holocene. Turbidite layers were found to be common in the sediments, which proved troublesome. The turbidite layers and slow deposition rate at the lake left little sediment for pollen analysis. Zone 1, between 8750 and 7280 cal yr B.P., was cool and dry with high percentages of TCT (8.7%) and Artemisia pollen (4.9%) and relatively low percentages of pine pollen (69%) from 8090 to 7280 cal yr B.P. Zone 2, between 7060 and 4550 cal yr B.P., was relatively warmer and dry with TCT as Juniperus and Artemisia decreasing to 7.4% and 3.1% respectively while pine increased to almost 90% from 7060 to 5510 cal yr B.P. Zone 2 concluded with wetter trend marked by an increase in TCT as Calocedrus, Abies, Typha and Isoetes.

Value of Graduate Degree in Career Development:
There are no jobs in palynology outside academia. I chose a career in GIS based on my interest in geography and the contacts I made in the Geography Department at UNR. The M.S. I earned gave me an edge when it came time for a promotion.

Current Position:
GIS Analyst

Publications from Graduate Research:
Graduate Thesis: Middle Holocene vegetation change at Lake Tahoe (Nevada, California)

Jon Fenske

GEOLOGICAL ENGINEERING

Student Name:
Jon Fenske

Major Professor and Institutional Affiliation:
Dr. Robert Watters, Geological Science and Engineering, Mackay School of Mines

Graduate Program:
Geological Engineering

Graduation Date:
May 1990

Title of Research Project:
Erosion Control and Water Quality in the Tahoe Basin California-Nevada

Key Findings of Research Project:
Construction of artificial wetlands are a necessary component in strategy for protecting water quality at Lake Tahoe.

Value of Graduate Degree in Career Development:
Extremely valuable. I would not have been employable without it.

Current Position:
Senior Hydraulic Engineer, Corps of Engineers-Hydrologic Engineering Center, Davis, California

Publications from Graduate Research:
Erosion Control and Water Quality in the Tahoe Basin California-Nevada

GEOLOGY

Student Name:
Thomas G. Prescott

Institutional Affiliation:
Geological Science and Engineering, University of Nevada, Reno

Graduate Program:
Geology

Graduation Date:
December 2006

Title of Research Project:
Estimating Temporal and Spatial Variations in Water Clarity At Lake Tahoe, California-Nevada, using ASTER Multi-Spectral Remote Sensing Data

Key Findings of Research Project:
Established a new methodology to employ space borne spectral (ASTER) data for monitoring water clarity in ultra-oligotrophic lakes, based on "maximum depth of visibility"; combined SHOALS high resolution shallow water bathymetry with ASTER data to determine maximum depth of visibility; utilized simple band ratios to minimize sun-glint for water clarity analysis.

Value of Graduate Degree in Career Development:
Essential. I currently work for Sky Research in Ashland, Ore. I collect and process Light Detection and Ranging (LiDAR) and Orthophotography data, for the purpose of environmental remediation, including the detection and retrieving unexploded ordinance (UXO). I provide technical advisement for our remote sensing program on various sensors including Hyperspectral, Multispectral, Lidar, and Orthophotography. I also assist with ground-based geodetic surveys to support our various airborne programs. UNR provided me with an outstanding skill set for working in the remote sensing field. The classes I took, the academic advisement I received, and the resources at the University have allowed me to engage competitively in the work force and landed me here at Sky Research! UNR also provided me with a great networking environment. Today I enjoy professional relations with some of the leading researchers in my field. My research on Lake Tahoe provided me with an interdisciplinary background in many sciences including Remote Sensing, GIS, Hydrology, and Environmental Geochemistry. In my professional career, this wide and varied background has allowed me not only to collect and process remote sensing data, but also to understand and interpret the physical processes occurring on the ground.

Current Position:
Remote Sensing Data Analyst, Sky Research

Publications from Graduate Research:
Estimating Temporal and Spatial Variations in Water Clarity At Lake Tahoe, California-Nevada, using ASTER Multi-Spectral Remote Sensing Data

Measuring Water Clarity At Lake Tahoe California/Nevada, A New Approach that integrates Remote Sensing with GIS (AGU poster)

HYDROLOGIC SCIENCES

Student Name:
Kip K. Allander

Major Professor and Institutional Affiliation:
Dr. Jim Thomas, Desert Research Institute

Graduate Program:
Hydrologic Sciences

Graduation Date:
May 2004

Title of Research Project:
An Estimate of the Contributions of Streamflow and Nutrients to Trout Creek, South Lake Tahoe, California

Key Findings of Research Project:
The majority of streamflow and nutrients in Trout Creek originated upstream of development and mainly from groundwater discharge. However, a disproportionate amount of nutrients, as compared to streamflow, originated downstream of development.

Kip Allander

Value of Graduate Degree in Career Development:
Having an MS degree in hydrology has helped in my career development. Having this degree helped me to get the position as project hydrologist for the U.S. Geological Survey's Walker River Basin Project. The Walker River Basin Project is a large six-year project with the goal of refining understanding of the Walker River Basin hydrologic system.

Current Position:
Hydrologist, U.S. Geological Survey, Nevada Water Science Center, Carson City, Nevada

Publications from Graduate Research:
Allander K.K., 2004, Nutrient characteristics related to ground-water and surface-water relations along an alpine stream in the Lake Tahoe Basin during a drought period [abs.]: Research as a Tool in Tahoe Basin Issues, 2nd biennial conference on Tahoe environmental concerns, Crystal Bay, Nevada, May 17-19, 2004, Publication of Abstracts, p. 91.

Allander, K.K., 2004, An estimate of the contributions of streamflow and nutrients to Trout Creek, South Lake Tahoe, California: University of Nevada, Reno, unpublished Masters Thesis, 120 p., 30 figs.

Allander, K.K., 2004, Nutrient characteristics related to ground-water and surface-water relations along an alpine stream in the Lake Tahoe Basin during a drought period [abs.]: Nevada Water Resources Association Annual Conference, Mesquite, Nevada, February 24-26, 2004, Abstracts of Technical Presentations, p. 6

Allander, K.K., 2003, Trout Creek – Evaluating ground-water and surface-water exchange along an alpine stream, Lake Tahoe, California in Stonestrom, D.A., and Constantz, J., eds., Heat as a Tool for Studying Movement of Ground Water near Streams: U.S. Geological Survey Circular 1260, p. 35-45

Rowe, T.G., and Allander, K.K., 2003, Nutrient loads, suspended sediment, and trends for selected watersheds in the Lake Tahoe Basin, California and Nevada [abs.]: Nevada Water Resources Association Annual Conference, Sparks, Nevada, February 26-28, 2003, Abstracts of Technical Presentations, p. 40

Allander, K.K., 2002, Stream monitoring in Lake Tahoe Basin [abs.]: Lake Tahoe Higher Education and Research Symposium, Lake Tahoe, May 13-14, 2002, Abstracts Proceedings, p. 29

Allander, K.K., and Prudic, D.E., 2000, Shallow Ground-Water Flow in Relation to Streamflow in the Upper Truckee River and Trout Creek Watersheds, Stop 9 in Hydrology of the Tahoe Basin Field Trip Guidebook, edited by Prudic, D.E., Fogg, G.E., and Glancy, P.A.: Geological Society of America Annual Meeting, Reno, Nevada, Field Trip 19, November 17-18, 2000.

Rowe, T.G., and Allander, K.K., 2000, Surface- and ground-water characteristics in the Upper Truckee River and Trout Creek watersheds, South Lake Tahoe, California and Nevada, July-December 1996: U.S. Geological Survey Water-Resources Investigations Report, WRI 00-4001, 39 p.

Student Name:
Douglas P. Boyle

Major Professor and Institutional Affiliation:
Dr. John Warwick, Division of Hydrologic Sciences, Desert Research Institute and Hydrologic Sciences, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
December 2006

Title of Research Project:
Partial area rainfall-runoff modeling: A case study in a small, undeveloped catchment near Lake Tahoe

Key Findings of Research Project:
My research involved the application and evaluation of the Soil Conservation Service (SCS), variable source area (VSA), and constant source area (CSA) rainfall-runoff models on a small, undeveloped catchment near Lake Tahoe. The research was conducted to test the utility and predictive capability of the models in small, undeveloped, forested catchments within the Lake Tahoe basin. The performance of each model was evaluated with a variety of calibration and verification scenarios over seven observed rainfall-runoff events. Results of the research indicated that all three models did a poor job of simulating peak flows and flow volumes.

Value of Graduate Degree in Career Development:
This research and my graduate degree experience had a significant impact on my career development in that I became very interested in hydrologic model development, calibration, and performance evaluation. These intellectual interests motivated me to pursue Ph.D. studies in multi-objective performance evaluation of hydrologic models and Systems Engineering at the University of Arizona. After completion of my Ph.D., I returned to Nevada as a Post Doctoral research scientist at the Desert Research Institute. Eight years after earning my Ph.D., I am now an Associate Research professor at DRI and teach courses (including parameter estimation uncertainty analysis) at UNR. I am also the Director of the Nevada Water Resources Research Institute.

Current Position:
Associate Research Professor, Division of Hydrologic Sciences, Desert Research Institute, Reno, Nevada

Student Name:
Anya Butt

Major Professor and Institutional Affiliation:
Dr. Sherman Swanson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
December 1999

Title of Research Project:
Stream channel morphology in the Lake Tahoe Basin within a hierarchical framework: a geomorphic perspective

Key Findings of Research Project:
Streams and their associated environments represent a unique focus of many research interests due to the fluvial processes that shape and influence their morphology as well as the ecological interactions of the riparian environment. The need to understand stream environments has generated numerous classification systems at various scales. In an attempt to examine stream morphology in a hierarchical context, I linked three scales of geomorphological information and examined their interaction. With assistance from the USFS, I classified 33 streams in the Lake Tahoe Basin according to the Rosgen (1994) classification system and categorized these reaches according to the Montgomery/Buffington (1993) system. There is general agreement between the two systems, but categories in the Montgomery/Buffington system are often unclear, while the quantitative description in the Rosgen system provides a clear mental image and tool for classification. I proposed the channel incisement depth ratio, defined as the ratio of the height of the first terrace above the channel bed to the maximum bankful depth, and the channel incisement width ratio as the ratio of the width of the floodplain contained between the terrace banks to the bankful channel width, as alternative and additional channel morphological parameters to more fully describe the channel environment. I found significant differences in bankful channel width/depth and entrenchment ratios between reaches in terrain with differing geomorphic heritage (fluvial versus glacial fill). The influence of geology on stream morphology is muted due to the formation of alluvial valleys by the stream. In steeper reaches, an interaction between geology and geomorphic heritage exists, reflecting the increased weathering susceptibility of volcanic rocks and the greater sorting imparted by fluvial processes. In-stream habitat units also had significant differences in their occurrence and physical structure in the varying geologic and geomorphic terrains. The influence of geology and geomorphology at the stream-reach level and the habitat-unit level indicates that a hierarchical structure is inherent in the fluvial system. Understanding these interactions allows us to more effectively manage stream ecosystems by addressing restoration concerns by encompassing the entire watershed.

Value of Graduate Degree in Career Development:
I went from UNR to Turkey where I teach Hydrology and Geography.

Current Position:
Vermeer Science Center, Central College, Pella, Iowa

Publications from Graduate Research:
Butt, A. Stream channel morphology in the Lake Tahoe Basin within a hierarchical framework: a geomorphic perspective. 160 pp. Ph.D. Hydrologic Sciences, University of Nevada, Reno. 88 pp.

Butt, Z. A. and S. Swanson. 2000. Putting numbers to the Montgomery/Buffington Classification Scheme: A case Study. Pages 65-70 In: Wigington, P. J. and R. L. Beschta (Eds.) Riparian Ecology and Management in Multi-Land Use Watersheds. Am Water Resources Association, Middleburg, Virginia, TPS-00-2, 616 pp. (Proc of Symp. Portland, Ore. Aug 28-31.

Butt, Z. A., M. B. Ayers, S. Swanson, and P. T. Tueller. 1999. Riparian Corridor Assessment in the Lake Tahoe Basin: Combining Vegetation and Stream Morphology Classifications into a GIS Database. Am. Water Res. Assoc. Water Resources Conf., Seattle, WA Dec. 6-9, 1999.

Butt, Z. A., M. B. Ayers, S. Swanson, and P. T. Tueller. 1998. Relationship of stream channel morphology and remotely sensed riparian vegetation classification. Pages 409-416 In: Potts, D. E. (Ed.) Rangeland management and Water Resources, Am. Water Res. Assoc. Specialty Conference, Reno, Nev. May 27-29, 1998.

Swanson, S., P. Tueller, A. Butt, and M. Ayers. 1997. Hierarchical classification of geomorphology and riparian vegetation for high priority Lake Tahoe Basin streams. Pages 27-30 In: Lake Tahoe Presidential Forum Overview University of Nevada, Reno and Desert Research Institute.

Student Name:
Student Name: Todd G. Caldwell

Major Professor and Institutional Affiliation:
Dr. Dale W. Johnson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
December 1999

Title of Research Project:
Prescription fire and nutrient dynamics

Key Findings of Research Project:
Prescribed burning is a possible option to reduce fire potential in the Lake Tahoe Basin (California and Nevada). However, subsequent nutrient loading to the lake is a major concern. Fire is the dominant factor affecting C and N losses from the semi-arid forests of the eastern Sierra Nevada. As prescription fire becomes a best management practice, it is critical to develop an estimate of these fluxes. The ratio method of nutrients to non-volatile calcium was developed and tested at 3 sites within the Tahoe Basin. Regardless of method, the estimated losses were significant, particularly for N, compared to deposition and leaching rates. Volatilization will represent the major mechanism for N loss from forest ecosystems of this region subjected to prescribed fire.

The effect of ash deposits on anion retention, primarily O-PO4 and SO42-, was studied following two understory prescription burns in and near the Tahoe Basin. Field results indicated that fire significantly ($P<0.05$) increased pH and extractable SO42-. However, O-PO4 showed opposite trends for andic and granitic soil type. Laboratory addition of ash to both soils resulted in an increase in soil pH, and an increase in extractable SO42-, as would be expected from the reduced anion adsorption due to the elevated pH. Conversely, extractable O-PO4 decreased with increasing pH.

Value of Graduate Degree in Career Development:
My graduate degree from the University of Nevada, Reno gave me the necessary skills to complete any task, as well as to adapt to future challenges. Furthermore, the connections I made were invaluable to opening doors later in life.

Current Position:
Assistant Research Soil Scientist, Desert Research Institute; currently pursuing Ph.D. in the Graduate Program of Hydrologic Sciences, UNR

Publications from Graduate Research:
Caldwell, T.G. 1999. Nutrient dynamics following prescription fire in Tahoe basin forest soils. M.S. Thesis, University of Nevada, Reno. 69 pp.

Caldwell, T.G., D.W. Johnson, W.W. Miller, and R.G. Qualls. 2002. Forest floor carbon and nitrogen losses due to prescription fire. Soil Science Society of America Journal 66:262-267

Caldwell, T.G., D.W. Johnson, W.W. Miller, and R.G. Qualls. In preparation. Prescription Fire and Anion Retention in Tahoe Basin Forest Soils

Student Name:
Mark Engle

Major Professor and Institutional Affiliation:
Dr. Mae Gustin, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
Winter 2005

Title of Research Project:
Only part of one of my chapters dealt with Lake Tahoe (so maybe only 1/5th or 1/6th of my entire dissertation). The pertaining chapter is entitled: “Mercury distribution in two Sierran forest and one desert sagebrush steppe ecosystems and the effects of fire.”

Key Findings of Research Project:
Although the mineral soil contained more than 90% of the mercury in these ecosystems, mercury in the foliage, bark, and litter play a much larger role in biogeochemical cycling. At one site near Truckee, which had been subjected to a prescribed burn, the only significant loss of mercury had been from the combustion of litter while at a second site near South Lake Tahoe, which had been burned during the Gondola wildfire, mercury and mass were removed during the combustion of litter and above ground live biomass.

Value of Graduate Degree in Career Development:
My Ph.D. opened many doors and has allowed me to have a very flexible but demanding position as a research scientist.

Current Position, including location:
Research Geologist, U.S. Geological Survey, Reston, Va.

Publications from Graduate Research:
Gustin, M.S., Engle, M., Ericksen, J., Lyman, S., Stamenkovic, J., Xin, M., 2006. Mercury exchange between the atmosphere and low mercury containing substrates, Applied Geochemistry, 21:1913-1923.

Engle, M.A., Gustin, M.S., Goff, F., Janik, C.J., Counce, D.A., Bergfeld, D., Rytuba, J.J., 2006 Atmospheric mercury emissions from substrate and fumaroles associated with three hydrothermal systems in the western United States: Yellowstone Caldera, Wyoming; Lassen Volcanic Center, California; and Dixie Valley, Nevada, Journal of Geophysical Research (Atmospheres), 111: D17304, doi{10.1029/2005JD006563}.

Engle, M.A., Gustin, M.S., Johnson, D., Murphy, J.F., Miller, W.W., Walker, R.F., Wright, J., Markee, M., 2006. Mercury distribution in two Sierran forest and one desert sagebrush steppe ecosystems and the effects of fire, Science of the Total Environment, 367:222-233.

Engle, M.A., Gustin, M.S., Lindberg, S.E., Gertler, A.W., Ariya, P.A., 2005. The influence of ozone on atmospheric emissions of gaseous elemental mercury and reactive gaseous mercury from substrates, Atmospheric Environment, 39:7506-7517.

Engle, M.A., 2005. The Influence of Tropospheric Ozone, Hydrothermal Systems, and Fires on Atmospheric Mercury Emissions from Natural Sources. Ph.D. Thesis in Hydrogeology, University of Nevada, Reno.

Dallas W. Glass

Student Name:
Dallas W. Glass

Major Professor and Institutional Affiliation:
Dr. Dale Johnson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
May 2006

Title of Research Project:
Factors Affecting Short Term Nitrogen Availability from Vegetation Fire in the Sierra Nevada

Key Findings of Research Project:
Short term nitrogen availability after vegetation fire is a factor of soil type and fire intensity. Post-fire nitrogen is available as NH4 which often converts to NO3 within first year following fire. Moisture content of soil at time of fire may have an effect on NH4 concentrations post fire. Natural variability in soils makes quantifying post fire effects difficult.

Value of Graduate Degree in Career Development:
My background in science has allowed me to develop skills as an ecologist specializing in soils, fire, hydrology, and botany. My employment has primarily been in Alaska producing soil surveys for the NRCS. My winter employment has developed from soil physics to snow and avalanche physics as I work as the avalanche forecaster of Mt. Rose.

Current Position:
Biological Technician, Yukon/Charley Rivers National Preserve Soil Survey, USDA, Natural Resources Conservation Service; Ski Patrol/Snow Safety Supervisor, Mt. Rose Ski Tahoe (Permanent Seasonal, winter)

Publications from Graduate Research:
Glass, D.W., D.W. Johnson, W.W. Miller, and R.R. Blanks. Factors Affecting Short Term Nitrogen Availability from Vegetation Fire in the Sierra Nevada. University of Nevada, Reno. Program of Hydrologic Science. May 2006.

Glass, D.W., D.W. Johnson, R.R. Blank, and W.W. Miller. Factors Affecting Mineral Nitrogen Transformations by Soil Heating: A Laboratory Simulated Fire Study. Soil Science, In Press.

Student Name:
Douglas G. Guerrant

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
August 1989

Title of Research Project:
Evaluation of Infiltration, Runoff, and Sediment Transport Characteristics in Sierra Nevada Watersheds Through Rainfall Simulation

Key Findings of Research Project:
Erodibility of the Cagwin soil, a major granitic soil type of the Lake Tahoe Basin, is strongly influenced by soil texture, percent slope, soil surface characteristics, and storm intensity and duration. This soil was found to possess high infiltration rate (4.6 – 6.1 cm/hr), low percent runoff (36 – 59%), and relatively low sediment discharge characteristics.

Value of Graduate Degree in Career Development:
The overall value of my Hydrology/Hydrogeology Masters Degree has been significant if not immeasurable. The academic, technical, and practical "hands-on" experience/education that I received in the course of earning this degree well equipped me to enter the consulting industry work force where I have been for the past 19 years. Without this educational experience I am certain that my career would not have been nearly as successful as it has been. Furthermore, writing skills that I developed in this program have without question helped advance my career. Lastly, I think the program taught me how to take pride and ownership in my work which continues as a driving force in the success of my career and life.

Current Position:
Principal Hydrogeologist, Broadbent & Associates, Inc., Reno, Nevada

Publications from Graduate Research:
Evaluation of Infiltration, Runoff, and Sediment Transport Characteristics in Sierra Nevada Watersheds Through Rainfall Simulation – Masters Thesis

Guerrant, D.G., W.W. Miller, C.N. Mahannah, and R. Narayanan, 1991. Site specific erosivity evaluation of a Sierra Nevada forested watershed soil: Journal of Environmental Quality, Vol. 20, No. 2, April-June, p. 396-402.

Guerrant, D.G., W.W. Miller, C.N. Mahannah, and R. Narayanan, 1990. Infiltration evaluation of four mechanical rainfall simulation techniques in Sierra Nevada watersheds: Water Resources Bulletin, Vol. 26, No. 1, p. 127-134.

Theresa Jones

Student Name:
Theresa Jones

Major Professor and Institutional Affiliation:
Dr. Jim Thomas, Desert Research Institute

Graduate Program:
Hydrologic Sciences,

Graduation Date:
May 2004

Title of Research Project:
Evaluation of Effectiveness of Three types of Highway Alignment Best Management Practices for Sediment and Nutrient Control.

Key Findings of Research Project:
Retrofitting Tahoe basin highways with Best Management Practices (BMPs) to treat storm water runoff is difficult due to the steep terrain, limited right-of-way and ever-present utility conflicts. These restrictions severely limit the type and size of BMPs available to reduce pollutant loading of highway runoff to the lake. The study examined three types of mechanical flow-through systems typically used for treating highway runoff and found these systems reduce pollutant loading of TN, TP, and TSS up to 21%, 26% and 35% respectively.

Value of Graduate Degree in Career Development:
Having a M.S. in hydrology has been very beneficial to my career, expanding my technical knowledge base as well as improving promotional opportunities.

Current Position:
Project Manager, PBS&J Water Resources, Reno, Nevada

Christine Kirick

Student Name:
Christine Kirick

Major Professor and Institutional Affiliation:
Dr. Joe McConnell, Desert Research Institute

Graduate Program:
Hydrologic Sciences

Graduation Date:
August 2002

Title of Research Project:
Trends in littoral zone turbidity at Lake Tahoe, California-Nevada

Key Findings of Research Project:
No statistically significant trend in near shore/ littoral zone turbidity was identified, as based upon raw water turbidity samples collected at the water utilities at Lake Tahoe. Turbidity in the near shore zone of Lake Tahoe could be described by a number of physical parameters. A Principal Component Analysis demonstrated that stream discharge plays a major role in near shore turbidity.

Value of Graduate Degree in Career Development:
A graduate degree in Hydrology provided me with additional coursework and a background in the Hydrologic Sciences, which has proven beneficial in my career. Through my Master's degree, I learned how to approach a scientific question or problem and how to work through to obtain an answer or solution. I also learned how to look at a specific problem in relation to the larger picture. My research experiences at Lake Tahoe and the Desert Research Institute were invaluable to my career and personal development.

Current Position:
Hydrologist, Wood Rodgers, Inc., Reno, Nevada

Publications from Graduate Research:
Kirick, C., 2002. Trends in littoral zone turbidity at Lake Tahoe, California-Nevada, A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Hydrology, University of Nevada, Reno.

Kirick, C., McConnell, J., Taylor, K., and Panorska, A., 2001, Trends in littoral zone turbidity at Lake Tahoe during the previous decade, presented at the 2001 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 10 – 14, 2001.

Melissa Larsen

Student Name:
Melissa Larsen (last name previously Gunter)

Major Professor and Institutional Affiliation:
Dr. Jim Thomas, Desert Research Institute

Graduate Program:
Hydrologic Sciences

Graduation Date:
May 2005

Title of Research Project:
Characterization of nutrient and suspended sediment concentrations in stormwater runoff in the Lake Tahoe basin

Key Findings of Research Project:
The clarity of Lake Tahoe has declined about one foot per year since 1968. One element in the Lake Tahoe basin that contributes to the lake's water clarity decline is stormwater runoff. Nineteen monitoring sites have been established throughout the basin, from which two years of discharge measurements and nutrient and sediment concentrations have been collected. These data were compared to concentrations reported in national stormwater databases and found to be significantly different. Discharge-weighted concentrations for each monitoring site were related to watershed characteristics and land use through multiple linear regression analysis. Particulate species of nitrogen and phosphorus were the most abundant sources of nutrients in stormwater, and they were especially high in commercial land uses. The concentrations of all nutrients and sediment were enhanced significantly by localized summer thunderstorms. Population density and residential yard maintenance play a key role in nutrient and sediment concentrations for residential land uses.

Value of Graduate Degree in Career Development:
My degree allowed me to transition from Geotechnical Engineering to Water Resources Engineering/Hydrology. For my personal career goals, the degree was quite important.

Current Position:
Sr. Project Engineer

Publications from Graduate Research:
Characterization of nutrient and suspended sediment concentrations in stormwater runoff in the Lake Tahoe basin. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Hydrology, Melissa K. Gunter, Dr. James Thomas/Thesis Advisor, May, 2005

Nutrient and sediment production, watershed characteristics and land use in the Tahoe Basin, California-Nevada, by Robert Coats, Melissa Gunter, Alan Heyvaert, James Thomas , Matthew Luck and John Reuter, Journal of American Water Resources Association, June 2008.

Theresa Loupe

Student Name:
Theresa Loupe

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science

Graduate Program:
Hydrologic Sciences

Graduation Date:
December 2005

Title of Research Project:
Inorganic N, P, and S Discharged from Forest Floor Litter and as Affected by Biomass Reduction

Key Findings of Research Project:
A net release of inorganic nitrogen and phosphorous was measured from forest litter during a greenhouse leaching experiment, with the largest per unit mass contributions of these nutrients coming from the Oi, newly fallen litter. Fire suppression following Comstock logging in the Lake Tahoe Basin and surrounding areas has lead to the buildup of organic material on the forest floor (i.e. litter). Higher runoff nutrient concentrations were measured during summer months; however nutrient loads were higher for winter months which experienced greater precipitation. While mechanical forest harvest and/or controlled burning had a small initial impact on increased nutrient levels measured in runoff, the effects were minimal compared to background levels measured. Therefore, these biomass reduction techniques have the potential to improve forest health without the danger of large magnitude nutrient mobilization and degradation of surface water quality.

Value of Graduate Degree in Career Development:
My experience as a graduate student gave me the experience and education I needed to become a professional Hydrologist.

Current Position:
Hydrologist, USDA Forest Service, Lake Tahoe Basin Management Unit

Publications from Graduate Research:
Thesis: Inorganic N, P, and S Discharged from Forest Floor Litter and as Affected by Biomass Reduction. December 2005. University of Nevada, Reno.

Loupe, T.M., W.W. Miller, D.W. Johnson, E.M. Carroll, D. Hanseder, D. Glass, and R.F. Walker. 2007. Inorganic Nitrogen and Phosphorus in Sierran Forest O Horizon Leachate. Journal of Environmental Quality. 36: 498-507.

Loupe, T.M., W.W. Miller, D.W. Johnson, J.S. Sedinger, E.M. Carroll, R.F. Walker, J.D. Murphy, and C.M. Stein. Submitted 2008. Effects of Mechanical Harvest + Chipping and Prescribed Fire on Sierran Runoff Water Quality. Journal of Environmental Quality.

James Murphy

Student Name:
James D. Murphy

Major Professor and Institutional Affiliation:
Dr. Dale Johnson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
May 2004

Title of Research Project:
Soil Chemical Changes Following Wildfire and Prescribed Fire in Sierra Nevada Forest Soils

Key Findings of Research Project:
There are significant reductions in forest floor nutrients following wildfire and prescribed fire, notably carbon, nitrogen, sulfur and at times phosphorus; changes in soil chemistry following wildfire and prescribed fire are extremely variable; changes in soil extractable-phosphorous and associated mobility were minimal one year following wildfire in the Lake Tahoe Basin; decreases in soil total nitrogen following wildfire in the Lake Tahoe Basin were observed, however results were not statistically significant. If timber harvesting is to precede prescribed fire, land managers should consider cut-to-length harvesting rather than whole tree harvesting for soil fertility purposes.

Value of Graduate Degree in Career Development:
After graduating with a master's degree in Hydrologic Sciences, I immediately accepted a position with the Nevada Department of Water Resources working in the State Engineer's Office. I conducted hydrologic field investigations and assisted with much of the field work that led to the development of annual ground water groundwater inventories in Smith and Mason Valleys. I moved on from the Nevada Department of Water Resources in 2004 to work for the Nevada Department of Transportation's Environmental Service's Division, and have been here ever since. I am fortunate to be involved in many aspects of water resources such as wetlands management, ground water and surface water monitoring, post-construction site rehabilitation, etc. My undergraduate and graduate courses of study served as the foundation for my career in resource management; however, my graduate research work provided me with tools that of course work cannot offer, such as assessing findings, questioning results and thinking "outside of the box." Working for a transportation agency, I am highly involved with environmental issues across the state. Having had the opportunity to conduct soil chemistry and nutrient dynamic oriented research has allowed me to contribute to surface water monitoring efforts and stormwater related issues.

Current Position:
Water Quality Specialist, Nevada Department of Transportation, Carson City, Nevada

Publications from Graduate Research:
Thesis: Soil Chemical Changes Following Wildfire and Prescribed Fire in Sierra Nevada Forest Soils

Journal Publications:
Murphy, J.D., D.W. Johnson, W.W. Miller, R.F. Walker and R.R. Blank. 2006. Prescribed fire effects on forest floor and soil nutrients in a Sierra Nevada ecosystem. Soil Science 171: 181-199.

Murphy, J.D., D.W. Johnson, W.W. Miller, R.F. Walker, E.F. Carrol and R.R. Blank. 2006. Wildfire effects on soil nutrients and leaching in a Tahoe Basin watershed. Journal of Environmental Quality 35: 479-489.

Student Name:
David McGraw

Major Professor and Institutional Affiliation:
Dr. John Warwick, Desert Research Institute

Graduate Program:
Hydrologic Sciences

Graduation Date:
1998

Title of Research Project:
Investigating the Source of Stormflow in a Small, Sierra Nevada Watershed

Key Findings of Research Project:
The near-stream shallow aquifer responds very quickly to rainfall and is likely to be a source of dissolved nutrients to the stream.

Current Position:
Assistant Research Hydrologist, Desert Research Institute

Student Name:
Chad M. Stein

Major Professor and Institutional Affiliation:
Dr. Dale Johnson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
2005-2006

Title of Research Project:
Snowbrush (Ceanothus velutinus Dougl) Effects on Soil Leaching and Water Quality in a Sierran Ecosystem

Key Findings of Research Project:
The overall objective of this study was to examine the effects of nitrogen - fixing snowbrush (Ceanothus velutinus Dougl) on water quality and nitrogen leaching in Sierran systems and to compare these responses to those previously observed in red alder (Alnus rubra Bong) in the Pacific Northwest (Van Miegroet and Cole, 1984). Concentrations of mineral N were elevated in soil solution and runoff from a snowbrush-dominated shrub ecosystem in a former wildfire compared to a nearby forested system dominated by Jeffrey pine (Pinus jeffreyii Grev. & Balf) in Little Valley, NV. Soil solution NO3- concentrations in the shrub stand were greater than in more mature snowbrush-dominated stands in parts of Little Valley that have not burned recently, but considerably lower than those reported for red alder. In contrast to the solution data, mineral N fluxes measured by resin lysimeters were greater in the forest than in the adjacent snowbrush-dominated ecosystem. Cutting of snowbrush stands in another recently-burned (1994) site had no effect on mineral N leaching rates measured by resin lysimeters, even when cutting was followed by mastication of biomass and incorporation of masticated chips into the soil. In summary, we found that snowbrush did cause the expected increases in concentrations of inorganic N in natural waters, but the levels were considerably lower that those found in red alder.

Value of Graduate Degree in Career Development:
My experience was all positive and of great value.

Current Position:
Firefighter, Independent Consultant (Medical Sales)

Margaret Shanafield

Student Name:
Margaret Shanafield

Major Professor and Institutional Affiliation:
Dr. Kendrick Taylor, Desert Research Institute

Graduate Program:
Hydrologic Sciences

Graduation Date:
August 2004

Title of Research Project:
Influences on Water Clarity near the Upper Truckee River Outlet in Lake Tahoe, California-Nevada

Key Findings of Research Project:
Between July 2002 and August 2003, spatial surveys were performed at several near-shore locations around Lake Tahoe to determine the effects of storms, high winds, snowmelt runoff, and calm conditions on water. Filtered water samples were analyzed under a scanning electron microscope for elemental composition to determine the types of particles responsible for decreased near shore clarity. These samples show that an increased input of mineral particles during spring snowmelt runoff causes the observed elevated turbidity in the near shore area adjacent to South Shore Lake Tahoe. Drogued drifters released in July 2003 at the mouth of the Upper Truckee River recorded speeds of up to 840 meters per hour, with an average movement of 140 meters per hour. The greatest velocities were observed at a depth of 2 meters, with the current directions roughly following the prevailing wind direction. Therefore it is likely that the influence of wind movement plays a large role in mixing turbid near shore water with clearer mid-lake water.

Value of Graduate Degree in Career Development:
This degree gave me a good basis for a career as a hydrologist. After completing my master's, I was easily able to explore various career paths in international water development and environmental consulting, and to lead a group of young scientists studying water quality in Central Asian lakes. It also spurred my interest in returning to academia for further graduate work.

Current Position:
Ph.D. Candidate, Hydrology, University of Nevada, Reno (Desert Research Institute), Reno, Nevada

Publications from Graduate Research:
Shanafield, M., 2004. Influences on water clarity near the outlet of the Upper Truckee River in Lake Tahoe, California-Nevada. M.S. thesis, University of Nevada, Reno.

Shanafield, M., Taylor, K., and Susfalk, R., 2004. Influences on Near-Shore Clarity. Poster presented at the second biennial conference on Tahoe Environmental Concerns, Research as a Tool in Tahoe Basin Issues, Kings Beach, CA, May 17-19, 2004.

Shanafield, M., Taylor, K., and Susfalk, R., 2003. Temporal and spatial variability in mountain lake. Eos Trans. AGU, 84(46), Fall Meeting Abstract H12B-0985, December 8-12, 2003.

Student Name:
Adam Sullivan

Major Professor and Institutional Affiliation:
Dr. Sherman Swanson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrologic Sciences

Graduation Date:
1999

Title of Research Project:
Sediment trapping and channel changes by post-drought riparian vegetation.

Key Findings of Research Project:
Stream management and effective stream restoration require an understanding of the variables that directly influence processes that shape the channel. To understand current processes on two alluvial streams targeted for stream restoration, this study examined their geomorphic response to the January 1997 rain-on-snow flood and the 1997 and 1998 spring snowmelt runoff peaks. Sediment transport was compared among the three flow peaks in relation to patterns of exerted unit stream power. Changes in cross-sectional channel geometry were compared to patterns of stream power and channel geometry, vegetation community types, soil types, and available historical information. Stream power depends greatly on slope, and floodplain accessibility attenuates peak stream power. Neither peak nor cumulative unit stream power accurately gauged changes in channel geometry. Stream power estimated bedload transport differently than the Meyer-Peter Muller equation. Vegetation communities and soil types did not significantly correlate with changes in channel width. Spring runoff peaks dominate winter rain-on-snow peaks in cumulative sediment yield over time. The high magnitude of winter rain-on-snow runoff peaks accelerates the progression of natural recovery in incised but narrow alluvial channels. A multidisciplinary perspective on stream management and alluvial channel evolution puts channel changes into context and orients stream restoration efforts towards facilitating natural recovery.

Value of Graduate Degree in Career Development:
My degree enabled me to work as a hydrologist for local consulting firms.

Current Position:
Hydrologist with Fluid Concepts in Reno, Nevada

Publications from Graduate Research:
Sullivan, Adam. 1999. Alluvial process and geomorphic effectiveness on two Tahoe streams (California). Thesis for MS in Hydrologic Sciences, University of Nevada, Reno

Student Name:
Richard Susfalk

Major Professor and Institutional Affiliation:
Dr. Dale Johnson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

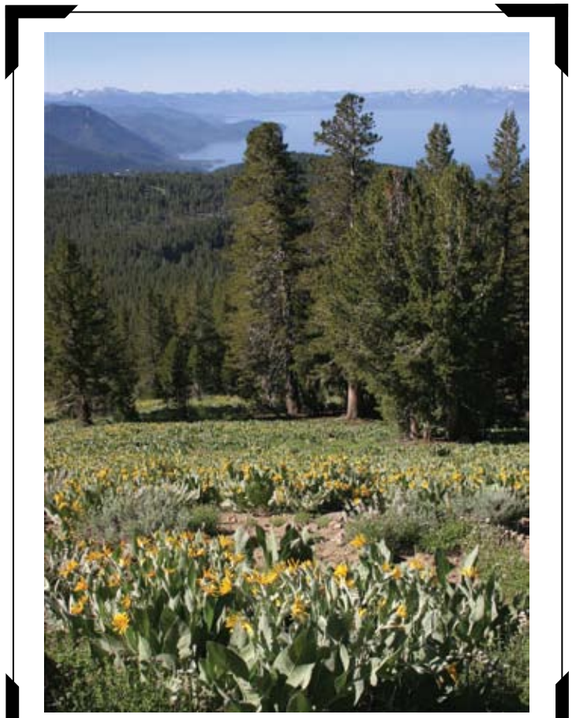
Graduate Program:
Hydrologic Sciences

Graduation Date:
May 2000

Title of Research Project:
Relationships of soil-extractable and plant-available phosphorus in forest soils of the Eastern Sierra Nevada

Key Findings of Research Project:
The objectives of this study were to determine the causes of the extreme variability in soil extractable phosphorus (P) in Sierran soils and to discern if these causes also affected plant available P. These objectives were addressed by 1) the correlation of extractable P with total and extractable Fe and Al fractions in field soils, 2) soil P adsorption and desorption studies in the laboratory, 3) a field fertilization study with Jeffrey pine (Pinus jeffreyi), and 4) a greenhouse fertilization study with ponderosa pine (Pinus ponderosa).

Value of Graduate Degree in Career Development:
Very important, as I gained a great understanding of nutrients and nutrient transformations in this semi-arid environment. It led directly to the series of watershed and lake-based research that I am now conducting at Lake Tahoe.



Current Position:
Associate Research Scientist, Division of Hydrologic Sciences, Desert Research Institute

Publications from Graduate Research:
Johnson D.W., J.F. Murphy, R.B. Susfalk, T.G. Caldwell, W.W. Miller, R.F. Walker and R.F. Powers. 2005. The effects of wildfire, salvage logging, and post-fire N-fixation on the nutrient budgets of a Sierran forest. Forest Ecology and Management, 220:155-165.

Johnson, D.W.; Susfalk, R.B.; Caldwell, T.G.; Murphy, J.D.; Walker, R.; Miller, W.W.; 2004. Fire Effects on carbon and nitrogen budgets in forests. Water, Air, and Soil Pollution pp 263-275.

Susfalk, R.B., and D.W. Johnson. 2002. Ion exchange resin based soil solution lysimeters and snowmelt collectors. Communications in Soil Science and Plant Analysis, 33(7&8), 1261-1275.

Johnson, D., R. Susfalk, R. Dahlgren, T. Caldwell, and W. Miller. 2001. Nutrient fluxes in a snow-dominated, semi-arid forest: Spatial and temporal patterns. Biogeochemistry. 55:219-245.

Susfalk, R.B. 2000. Relationships of soil-extractable and plant-available phosphorus in forest soils of the eastern Sierra Nevada. Graduate Program of Hydrologic Sciences, University of Nevada, Reno. 228pp. (Doctoral Dissertation).
Johnson, D.W., R.B. Susfalk, R.A. Dahlgren, and J.M. Klopatek. 1998. Fire is more important than water for nitrogen fluxes in semi-arid forests. Environmental Science and Policy. 1:79-86.

Johnson, D.W., R.B. Susfalk, and R.A. Dahlgren. 1997. Nutrient fluxes in forests of the eastern Sierra Nevada mountains, United States of America. Global Biogeochemical Cycles 11:673-681.

Johnson, D.W., R.B. Susfalk, R.A. Dahlgren, V. Boucher, and A. Bytnerowicz. 1996. "Nutrient fluxes in forests of the eastern Sierra Nevada Mountains, USA: Comparisons with humid forest systems." Proceedings, International Symposium "Air pollution and climate change effects on forest ecosystems." Riverside, CA, March 5-9, 1996. Published on the World Wide Web: <http://www.rfl.pswfs.gov/pubs/psw-gtr-164/fulltext/johnson/Johnson.html>

Dan Greenlee

Student Name:
Dan Greenlee

Major Professor and Institutional Affiliation:
Dr. Clarence Skau, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrology/Hydrogeology

Graduation Date:
December 1985

Title of Research Project:
Denitrification Rates of Mountain Meadow Soils

Key Findings of Research Project:
The ability of native soils to remove nitrogen from surface and subsurface water, thereby improving the water quality of a receiving body.

Value of Graduate Degree in Career Development:
I would not have the job I currently do without it.

Current Position:
Hydrologist, Snow Survey Program Manager

Student Name:
George D. Naslas

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Hydrology/Hydrogeology

Graduation Date:
1991

Title of Research Project:
Infiltration, Runoff, Nutrient and Sediment Transport analysis of soils in the Lake Tahoe Basin through rainfall simulation

Key Findings of Research Project:
Rainfall simulation was an effective tool to study runoff; the Hydrophobic nature of the soils played a significant role in the volume of runoff; sediment transport due to interrill erosion was generally less than anticipated; evidence of infiltration via macropores

Value of Graduate Degree in Career Development:
Obtaining a master's degree in a relevant field was essential to my career as I use the skills daily. We employ many types of graduates at our firm (Consulting Engineering) and we notice a difference in maturity and ability to produce a well thought-out product between those students who have a master's degree versus a bachelor's degree.

Current Position, including location:
Team Leader/Associate with Weston & Sampson, Peabody, Mass.

Publications from Graduate Research:
Infiltration, Runoff, Nutrient and Sediment Transport analysis of soils in the Lake Tahoe Basin through rainfall simulation, 1991 – Master's Thesis

Naslas, G.D., et. al., "Effects of Soil Type, Plot Conditions and Slope on Runoff and Interrill Erosion of Two Soils in the Lake Tahoe Basin," 1994, AWWA Water Resources Bulletin, Vol. 30, No.2, pp. 319-328.

Naslas, G.D., et. al., "Sediment, Nitrate and Ammonium in Surface Runoff from Two Tahoe Basin Soil Types," 1994, AWWA Water Resources Bulletin, Vol. 30, No.3, pp. 409-417.

JOURNALISM

Student Name:
Abbey Smith

Major Professor and Institutional Affiliation:
Dr. David Ryfe and Dr. Donica Mensing, University of Nevada, Reno Reynolds School of Journalism

Graduate Program:
Interactive Environmental Journalism

Graduation Date:
June 2007

Title of Research Project:
In search of reflective participation: an exploratory study of the citizen contribution modes of newspapers

Key Findings of Research Project:
The data collected for this project indicates that participation in public discussions must be attached to accountability and responsibility to create reflective discussions.

Value of Graduate Degree in Career Development:
Very high. The people I met and the critical thinking tools I developed through this graduate program are directly related to the work I now do everyday.

Current Position:
Project manager and web business analyst for the Internet Ventures Group at Swift Communications, Inc. Reno, Nevada

Ryan Jerz

Student Name:
Ryan Jerz

Major Professor and Institutional Affiliation:
Dr. David Ryfe, Reynolds School of Journalism, University of Nevada, Reno

Graduate Program:
Journalism

Graduation Date:
August 2007

Title of Research Project:
Social Network Analysis of Organizations in the Lake Tahoe Basin

Key Findings of Research Project:
Journalists can use a social network analysis to both learn more about the community they are covering and to improve public life within that community. We interviewed groups within the community to determine what their connections with other groups were, and found that the business organizations were well connected amongst each other and environmental groups were well connected amongst each other, but there was little connection between the sub-categories. This presents an opportunity for journalists to build something that bridges the gap and creates a collaborative environment that can improve the community.

Value of Graduate Degree in Career Development:
The degree opened doors that would not have been open before and led to my current job. My particular project did not, but the work we did in the program that was related to journalism helped me in crafting a position that uses journalism frequently.

Current Position:
Media Manager, Nevada Commission on Tourism, Carson City, Nev.

Publications from Graduate Research:
Professional Paper can be found at http://ryanjerz.com/sna/

Sienna Reid

POLITICAL SCIENCE

Student Name:
Sienna Reid

Major Professor and Institutional Affiliation:
Dr. Derek Kauneckis, Department of Political Science, University of Nevada, Reno

Graduate Program:
Political Science

Graduation Date:
2007

Title of Research Project:
Estimating the Impact on Agencies and Users of Transferable Development Rights Programs: An Empirical Study of the Lake Tahoe System

Key Findings of Research Project:
Focused on the need for increased evaluation of TDR systems.

Value of Graduate Degree in Career Development:
My topic helped me obtain my current position

Current Position:
Regional Planner, Truckee Meadows Regional Planning Agency

Publications from Graduate Research:
Estimating the Impact on Agencies and Users of Transferable Development Rights Programs: An Empirical Study of the Lake Tahoe System, M.A. Thesis, 2007

An Institutional Perspective on Evaluating Transferable Development Right Systems: Lessons from Lake Tahoe, Under Review with Journal of Environmental Policy and Planning

Evaluating Transferable Development Rights at Lake Tahoe: Lessons for understanding the costs of market-based environmental policy, Monograph manuscript under review with VDM Publishing.

NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE

Student Name:
Erin Carroll-Moore

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Natural Resources and Environmental Science

Graduation Date:
August 2006

Title of Research Project:
Applications of Spatial Analysis in Sierran Systems: Hydrologic Balance, Nutrient Budget, and Erosion

Key Findings of Research Project:
A surface water model was developed integrating Geographic Information Systems (GIS), Doppler radar, and field measurements to simulate the hydrologic balance of the Russel Valley watershed in order to better define total overland flow water and nutrient contributions to stream flow. Comparisons of the GIS model outputs to estimated Boca Reservoir inflow from Russel Valley watershed found most input to Boca reservoir occurs during spring snowmelt. The estimated area of collection for surface runoff collectors was found to be comparable to previous findings of about 1,000 to 10,000 cm2 during the dry season with larger areas of collection during the wet season. Estimates of surface and infiltrated waters' nutrient concentrations found surface runoff concentrations had the potential to surpass Truckee River standards, especially for nitrate/nitrite and ortho-phosphate, while soil water was typically well within limits. Using relative percentages of total input to Boca Reservoir contributed by surface water and infiltration, as determined by the GIS model, the model indicated overall output from Russel Valley watershed to be primarily in the form of base flow, and therefore have nutrient concentrations approximating the lower concentrations of soil water. This model, however, was limited by potential errors in snowmelt quantity and the potential for widespread decreases in infiltration rate due to winter freeze/thaw and biomass removal treatment. In the event of extensive freezing of soils and hydrophobicity induced by biomass removal treatments or wildfire, the system could be largely surface water dominant and therefore contribute large nutrient quantities to outflow via surface runoff, thereby exceeding water quality standards. A better understanding of these issues is needed to determine the true influence of surface runoff nutrient concentrations under these conditions.

High intensity wildfire due to long-term fire suppression led to the 2002 "Gondola" wildfire, located just southeast of Lake Tahoe, NV-CA, which was followed two weeks later by a severe hail and rainfall event that deposited 7.6 to 15.2 mm of precipitation over a 3-5 hr time period. This resulted in a substantive upland ash and sediment flow with subsequent down-gradient riparian zone deposition. Geographic Information Systems (GIS) software was applied to point data to spatially assess source area contribution and the extent of ash and sediment flow deposition in the riparian zone. An estimated average depth of 10.1 mm of surface material eroded from the upland source area. Compared to previous measurements of erosion during rainfall simulation studies, the erosion of 1,800 to 6,700 g m-2 mm-1 determined from this study was as much as four orders of magnitude larger. Wildfire, followed by the single event documented in this investigation, enhanced soil water repellency and contributed 17-67% of the reported 15-60 mm ky-1 of non-glacial, baseline erosion rates occurring in mountainous, granitic terrain sites in the Sierra Nevada. High fuel loads now common to the Lake Tahoe Basin increase the risk that similar erosion events will become more commonplace, potentially contributing to the accelerated degradation of Lake Tahoe's water clarity.

Overall, it was found that spatial analysis software is an extremely useful tool that is really only limited by gaps in data, lack of complete understanding of the forces involved in natural processes, and the operator's imagination. Gaps in knowledge identified by this investigation included extent of winter freeze/thaw of soils, hydrophobicity of soils immediately post biomass removal treatment, and velocity effects on surface runoff collector viability.

Value of Graduate Degree in Career Development:
The UNR, NRES master's degree program allowed me the opportunity to gain valuable field experience. I was granted the opportunity to work with and, in some instances, help develop several forms of field instrumentation. The process from development of a research proposal through to thesis defense gave me great insight into the nature of research. This process developed my planning, technical writing, and communication skills. This level of education also inspires new levels of initiative and self-reliance. My specific research improved upon my knowledge of hydrology, soils, statistics, GIS, and the Tahoe region. As a research associate at UNR I apply both the field and technical skills I acquired throughout my degree program on a daily basis.

Current Position:
Staff Research Associate, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Publications from Graduate Research:
Carroll, Erin M., Wally W. Miller, Dale W. Johnson, Laurel Saito, Robert G. Qualls, and Roger E. Walker. 2007. Spatial Analysis of a Large Magnitude Erosion Event Following a Sierran Wildfire. Journal of Environmental Quality, 36:4, pp. 1105-1111.

Miller, W.W., D.W. Johnson, T. Loupe, E. Carroll, J. Murphy, R.F. Walker, and D. Glass. Wildfire and Runoff Water Quality in Lake Tahoe Basin. California Agriculture, 60:2, pp.65-71.

Miller, W. Wally, Dale W. Johnson, Theresa M. Loupe, James S. Sedinger, Erin M. Carroll, James D. Murphy, Roger F. Walker, and Dallas Glass. 2006. Nutrients Flow from Runoff at Burned Forest Site in Lake Tahoe Basin. California Agriculture, 60:2, pp. 65-71.

Murphy, J.D., D.W. Johnson, W.W. Miller, R.F. Walker, E.M. Carroll, and R.R. Blank. 2006. Wildfire Effects on Soil Nutrients and Leaching in a Tahoe Basin Watershed. Journal of Environmental Quality, 35:2, pp.479-489.
Saito, L., W.W. Miller, D.W. Johnson, R.G. Qualls, P. Szameitat, and E. Carroll. Fire Effects on Stable Isotopes Signatures in Soils and Forest Floor Residue. Submitted to Journal of Environmental Quality.

Loupe, T.M., W.W. Miller, D.W. Johnson, E.M. Carroll, D. Hanseder, D. Glass, and R.F. Walker. Inorganic N and P in Sierran Forest O Horizon Leachate. Journal of Environmental Quality. NAES #52055642 In Revision.

Poster Presentations:
Carroll, E.M., W.W. Miller, D.W. Johnson, L. Saito, P. Szameitat, and R.F. Walker. Spatial Analysis of an Ash/Sediment Flow Following a Sierran Wildfire. 97th Annual Meetings of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, November 6-10, 2005, Salt Lake City, UT.

Loupe, T., W.W. Miller, D.W. Johnson, E.M. Carroll, D. Hanseder, D. Glass, and R.F. Walker. Nutrient Content in O-Horizon Leachate from a Mixed Conifer Sierran Forest. 97th Annual Meetings of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, November 6-10, 2005, Salt Lake City, UT.

Johnson, D.W., W.W. Miller, and R.F. Walker, Pls; J.D. Murphy, C.M. Stein, T. Loupe, and E. Carroll, Grad Students. Forest Fire Studies at University of Nevada, Reno. Senator Ensign 2003 Lake Tahoe Summit, Lake Tahoe, NV.

Student Name:
Joseph Ferguson

Major Professor and Institutional Affiliation:
Dr. Robert G. Qualls, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Natural Resources and Environmental Science

Graduation Date:
August 2005

Title of Research Project:
The Bioavailability of Sediment and Dissolved Organic Phosphorus Inputs to Lake Tahoe

Key Findings of Research Project:
Phosphorous is generally the factor that limits the growth of phytoplankton in Lake Tahoe and suspended sediments in tributary streams are one of the most important inputs of P. However, not all of this P may be available for algal uptake. No more than 50% of the P in suspended sediments was available for algal growth, and the variation between streams makes it important to consider bioavailability in ranking the importance of various sources in eutrophication of Lake Tahoe.

Current Position:
High school science teacher

Publications from Graduate Research:
Joseph Ferguson. 2005. The Bioavailability of Sediment and Dissolved Organic Phosphorus Inputs to Lake Tahoe. Masters Thesis. University of Nevada, Reno, NV, August, 2005.

Student Name:
Nicole Gergans

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Natural Resources and Environmental Science

Graduation Date:
December 2008

Title of Research Project:
Effects of a Sierran Stream Environment Zone and an Unpaved Road on Runoff Water Quality

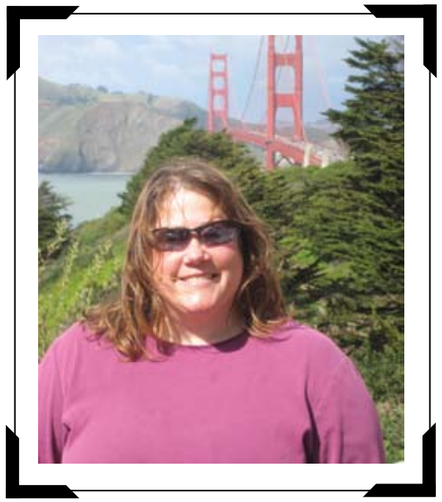
Key Findings of Research Project:
Sierran stream environment zones are ineffective at intercepting inorganic nutrients from upland overland flow.

Value of Graduate Degree in Career Development:
As an Environmental Program Advocate, I use the knowledge I gained through my graduate education to influence policy decisions in the Tahoe Basin relating to sediment and nutrient loading.

Current Position:
Environmental Program Advocate

Publications from Graduate Research:
Effects of a Sierran Stream Environment Zone and an Unpaved Road on Runoff Water Quality (Thesis)

Runoff Water Quality from a Sierran Upland Forest, Transition Ecotone, and Stream Environment Zone (JEQ, submitted June 2008)



Kim Gorman

Student Name:
Kim Gorman

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Environmental and Natural Resource Science

Graduation Date:
December 2003

Title of Research Project:
The Isolation of Dissolved Organic Phosphorus in Aqueous Solutions of Lake Water, Soil Leachate, and Plant Extracts

Key Findings of Research Project:
With regards to algal growth Lake Tahoe is primarily Phosphorus (P) limited. Extensive bioassays performed by UC Davis indicate that the dissolved P fraction is what algae utilize as a primary food source. The inorganic dissolved P (PO4) is believed to account for between 75-90% of bioavailable P. My research was to extract the dissolved organic P (DOP) fraction from aqueous solutions and then perform bioassays to determine the bioavailability of DOP. The methods used were not completely successful in isolating the DOP fraction; however we did observe that the DOP fraction behaved chemically - very similar to the inorganic PO4 fraction – suggesting it too is bioavailable to some degree.

Value of Graduate Degree in Career Development:
It allowed me to study information relative to Lake Tahoe's clarity loss. It also provided me a foot in the door to many state and local agencies; Dr. Miller's work is well known and appreciated in Lake Tahoe.

Current Position:
Associate Water Quality Program Manager for the Nevada Conservation District

Publications from Graduate Research:
The Isolation of Dissolved Organic Phosphorus in Aqueous Solutions of Lake Water, Soil Leachate, and Plant Extracts

Student Name:
Elizabeth Harrison

Major Professor and Institutional Affiliation:
Dr. Dale Johnson, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Natural Resources and Environmental Science

Graduation Date:
May 2007

Title of Research Project:
An Analysis of Lake Tahoe Nutrient Budgets (Professional Paper)

Key Findings of Research Project:
This project was initiated to determine whether updates to the nutrient budgets published in the 2000 Lake Tahoe Watershed Assessment (LTWA) (Reuter and Miller, 2000) were warranted based on the significant amount of research conducted in the Tahoe Basin since its publishing. Three sources of nutrient contributions were evaluated; atmospheric deposition, upland sources and groundwater loading. Due to the large variability in reported data and in some cases large data gaps, it was deemed appropriate to utilize averages of nutrient source categories calculated in this project to compare to estimates reported in the LTWA. The estimate of total N (TN) reported in this study was 80 MT yr-1 higher than the estimate reported in LTWA, while estimates of total phosphorus were quite similar. This project revealed that significant gaps in data still exist for calculations of N and P in atmospheric deposition and groundwater loading to Lake Tahoe. It was intended that the budget developed as part of this project be used as a tool for identifying data gaps and informational needs that should be the focus of future research efforts.

Value of Graduate Degree in Career Development:
My focus and passion over the last 10 years has been dedicated to understanding and promoting practices and projects which lead to improvements in water quality and hopefully increases in Lake Tahoe clarity. The completion of my graduate program allowed me to obtain a deeper understanding of water quality issues at Lake Tahoe. I believe my graduate work has also provided me tremendous guidance towards 1) improving delivery of water quality improvement projects in the Tahoe Basin and 2) the application of research to management/policy decision-making. The experience was great for me and I know it will open a lot of doors for me in the future.

Current Position:
Water Quality Program Manager, Nevada Tahoe Resource Team, Nevada Division of State Lands

Marcy Kamerath

Student Name:
Marcy Kamerath

Major Professor and Institutional Affiliation:
Dr. Sudeep Chandra, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Natural Resources and Environmental Science

Graduation Date:
December 2008

Title of Research Project:
Distribution, Impacts, and Bioenergetics modeling of warm water nonnative fish

Key Findings of Research Project:
Warmwater nonnative fish are prevalent in Lake Tahoe at 58% of survey locations. Warmwater nonnative fish are predating and competing with the last remaining native forage fishes of Lake Tahoe which could further alter Lake Tahoe's food web.

Value of Graduate Degree in Career Development:
My experiences while obtaining my graduate degree have exposed me to local and international projects in several ecosystem types, and on several issues. My degree will prepare me for eventual project management with a focus in ecosystem restoration and water resource management.

Current Position:
Graduate Research Assistant, University of Nevada, Reno

Publications from Graduate Research:
Kamerath, M., S. Chandra, and B.C. Allen. 2008. Distribution and impacts of warm water invasive fish in Lake Tahoe, USA. Aquatic Invasions 3: 35-41.

Student Name:
Scott A. Burcar

Major Professor and Institutional Affiliation:
Dr. Wally Miller, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduation Date:
December 1992

Graduate Program:
Natural Resources and Environmental Science

Title of Research Project:
Seasonal preferential flow and nutrient transport in selected Sierra Nevada soils

Key Findings of Research Project:
Preferential flow does occur in the soils studied, however, the applied nutrients (ammonium and nitrate) do not pass through these preferential paths unabsorbed.

Value of Graduate Degree in Career Development:
When I was a graduate student at UNR working on my research project in the Tahoe basin I never would have guessed where it was going to take me. I look back on my years in grad school at UNR as several of the best years of my life (to this point). While working on my research project I always anticipated putting my M.S. to work in the field of environmental consulting, which I did for a number of years in Boulder, Colo. Through some of life's unpredictable circumstances I faced a decision that would point me in a completely different direction. For the past nine years I have been a high school science teacher in Golden, Colo. The decision to go into teaching was largely based on how much I enjoyed the academic environment while at UNR. Once I did become a teacher my master's degree directly impacted my confidence and knowledge in the classroom as well as my salary.

Current Position:
High school science teacher

Publications from Graduate Research:
Thesis: Burcar, Scott Anthony, Seasonal preferential flow and nutrient transport in selected Sierra Nevada soils. University of Nevada, Reno, 1992.

S. Burcar, W. W. Miller, D. W. Johnson, and S. W. Tyler. Seasonal Preferential Flow in Two Sierra Nevada Soils under Forested and Meadow Cover. Soil Sci Soc Am J 1994 58: 1555-1561.

S. Burcar, W. W. Miller, S. W. Tyler, and R. R. Blank. Moist- and Dry-Season Nitrogen Transport in Sierra Nevada Soils. Soil Sci Soc Am J 1997 61: 1774-1780.

Dave Rios

Student Name:
Dave Rios

Major Professor and Institutional Affiliation:
Dr. Sudeep Chandra, Department of Natural Resources and Environmental Science, University of Nevada, Reno

Graduate Program:
Natural Resources and Environmental Science

Graduation Date:
Spring 2009 (anticipated)

Title of Research Project:
Vegetation communities in natural and constructed wetlands in the Lake Tahoe Basin. Pre-restoration hydrologic conditions in a small urban watershed in Lake Tahoe.

Key Findings of Research Project:
Project not complete.

Value of Graduate Degree in Career Development:
Completion of the graduate degree will prepare me for a career in natural resources by providing a hands-on research experience, relevant coursework, and exposure to public speaking.

Current Position:
Graduate research assistant, University of Nevada, Reno

Appendix

Student	Advisor	Dept.	Year defended
Angle, Vincent J.	Christopher Exline	Geography	2005
Ayers, Michael Benson	Paul Tueller	Natural Resources and Environmental Science	1997
Beck, Mo	Stephen Vander Wall	Ecology, Evolution, and Conservation Biology	current
Bentley, Susanne Gail	Stephen Tchudi	English	1997
Boyle, Chistopher Francis	Christopher Exline	Geography	2003
Bradley, Timothy Scott	Paul Tueller	Natural Resources and Environmental Science	1999
Brown, David L.	Clarence Skau	Natural Resources and Environmental Science	1987
Cai, Qingmei	Steven Chai	Atmospheric Science	1996
Cave, Deborah Lee	Mike Campana	Hydrologic Science	1987
Cheng, Ericson W	John Kleppe	Electrical Engineering	1997
Clarke, Richard Michael	William R. Eadington	Institute for Study of Gambling and Commercial Gaming	1991
Curtis, Jeffry G.	V. Dean Adams	Environmental Engineering	2007
Fan, Yuanchaoe	Peter Weisberg	Natural Resources and Environmental Science	current
Fitzgerald, Brian	Mark Walker	Natural Resources and Environmental Science	2004
Flatland, Robert Michael	Robert J. Watters	Geology	1994
Fox, Forrest Lee	N/A	N/A	1982
Fritchel, Patrick Earl	Keith Dennett	Civil and environmental engineering	2003
Gangopadhyay, Arun Kumar	N/A	Political Science	1989
Ganschow, Sarah	Peter Weisberg	Ecology, Evolution, and Conservation Biology	current
Giglini, Tony	Mae Gustin	Natural Resources and Environmental Science	2003
Gore, Allison Lynn	Leah Magennis	Political Science	1999
Green, Jena M.	Michael Strobel, Scott Tyler	NRES, Geosciences and engineering	2005
Gupta, Kimberly Tina	V. Dean Adams	Environmental Engineering	2002
Gworek, Jen	Stephen Vander Wall	Biology	2005
Harlow, David Eric	Wally Miller	Natural Resources and Environmental Science	1998
Hill, Kevin	Paul Tueller	Natural Resources and Environmental Science	2000
Hoffman, David	N/A	Journalism	1984
Holderman, Jill C.	Christopher Exline	Geography	1991
Huntington, J.	Greg Pohll	Hydrologic Science	current
Kirchner, Peter	Franco Biondi	Geography	2006
Kuhn, Kellie	Stephen Vander Wall	Biology	2006
LeNoir, James Sullivan	James Nicholas Seiber	Environmental Science and Engineering	1999
Maholland, Becky	Lynn Thomas Bullard	Hydrologic Science	2002
Mandeno, Petrolina Esther	Paul Tueller	Natural Resources and Environmental Science	2000
Marcus, Jonathon Allen	Wally Miller	Natural Resources and Environmental Science	1995
Martinelli, Diane Marie	Keith Priestly	Mines and Geology	1989
Massoth, Harry Peter	N/A	Natural Resources and Environmental Science	1978
Melgin, Wendy Lynn	Clarence Skau	Natural Resources and Environmental Science	1985
Mercer, Michael Mills	Greg Pohll	Hydrologic Science	2002
Muehlberg, Jessica	Richard Schweickert	Geology	2007
Nachlinger, Janet Lynn	N/A	Biology	1985
Norris, William Jacob	John Kleppe	Electrical Engineering	2001
Rambo, Michele	Christopher Exline	Geography	1998
Ramsing, Frederick John	Scott Tyler	NRES, Geosciences and engineering	2000
Rhea, Alison	Wally Miller	Natural Resources and Environmental Science	1993
Rhodes, Jonathan Jose Griffith	Clarence Skau	Natural Resources and Environmental Science	1985
Ridenoure, Brian	Keith Dennett	Civil and environmental engineering	2007
Rost, Andy Llyod	John Tracy	Hydrologic Science	2003
Sabine, Charles	James V. Taranik	Geological Sciences and engineering	1992
Schwaneflugal, Andres Kidd	Wally Miller	Natural Resources and Environmental Science	2002
Silverberg, Shari	Wally Miller	Natural Resources and Environmental Science	1999
Skalski, Anne	N/A	N/A	1983
Smolen, Katrina	Roger Jacobson	Hydrologic Science	2004
Solury, Theresa	Donald Hardesty	Anthropology	2004
Stone, Chris H.	Kate Berry	Geography	2004
Sullivan, Matthew David	John Warwick	Natural Resources and Environmental Science	2000
Thayer, Ted	Stephen Vander Wall	Biology	2002
Torch, David Brendan	David Ryfe	Journalism	current
Walsh, Laurie Alane	Catherine Fowler	Anthropology	1995

Editor's note: The names above represent a list of students who were known to have completed graduate research projects at Lake Tahoe. Efforts to contact these students were unsuccessful. Updates, clarifications or corrections are welcomed. Please email the Academy for the Environment at the University of Nevada, Reno, environment@unr.edu

TAHOE SUMMIT

2008

University of Nevada, Reno

DRI
Desert Research Institute