

ERE MESSENGER

Environmental Resources Engineering

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SPRING 2016

ERE Students Support Blue Lake Rancheria Climate Action Plan

by Jana Ganion, Energy Director, Blue Lake Rancheria, Blue Lake, California

The Blue Lake Rancheria (BLR) is a federally recognized tribal government located 5 miles northeast of HSU, adjacent to the town of Blue Lake, California. The BLR Tribe serves on the U.S. Dept. of Energy's Office of Indian Energy, Indian Country Energy and Infrastructure Working Group, working on national policy related to Native American energy development.

BLR has an aggressive climate action strategy. The government has set an ambitious greenhouse gas (GHG) reduction goal: a 40% reduction in GHGs community wide by 2018, from a 2014 baseline (calculated *after* significant reductions achieved prior to 2014). Additionally, resilience is a priority as we prepare for the impacts of climate change that are already here (drought, wildfires, large storms, etc.).

As a government implementing green energy and fuels projects, Blue Lake Rancheria has chosen to partner with HSU whenever and wherever possible, including the ERE program and the Schatz Energy Research Center. We have partnered with ERE undergraduates, graduate students, and their professors to conduct technical and economic feasibility studies, as well as implement robust renewable energy and green fuels projects. At presentations on our climate action strategies, we always stress the involvement of ERE students and how their work has led to successful, real-world projects. BLR encourages others to form similar partnerships with their own local universities and those bright minds. Thanks to the caliber of students and professors at HSU, we have proven that these partnerships can be very

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ERE students and other volunteers installing residential solar arrays in the Blue Lake Rancheria community. These systems are designed to provide 75% of a household's electricity to replace fossil energy.

Photo credit: Jacob Pounds, Blue Lake Rancheria

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FROM THE EDITORS

Hello from the Messenger staff! We hope you enjoy this Spring 2016 edition.

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*I have only just a minute,
Only 60 seconds in it.
Forced upon me, can't refuse it,
Didn't seek it, didn't choose it.
But it is up to me to use it.
I must suffer if I lose it,
Give account if I abuse it.
Just a tiny little minute —
But eternity is in it.*

—Dr. Benjamin Elijah Mays
6th President of
Morehouse College

Alumni Profiles



Rob Salcido, PE, LEED AP
BS ERE 1990
Principal
Salcido Solutions LLC
Louisville, Colorado

I came to HSU in 1985 to begin my education in Forestry because I wanted to be a partner in protecting forests and also to become a wildland firefighter. I had discovered rowing while watching the 1984 Olympics, so I also joined Humboldt Crew. After my first year, I worked as a Forestry Technician and a wildland firefighter in Winema National Forest in Klamath Falls, Oregon. After two years as a firefighter and technician, I discovered I loved firefighting but not the forestry major, so in 1987, I changed my major to Environmental Resources Engineering. I took a building energy analysis class with Tom Borgers and I loved it. I made building energy analysis my emphasis, and Tom Borgers became my advisor. I graduated with a Bachelor of Science degree in 1990.

During my senior year, I received an offer to join an elite rowing camp to develop my skills in hopes of joining the Olympic Rowing team. I took the chance and began my pursuit of Olympic glory, putting my engineering

career on hold for the next three years as I developed my rowing. While I enjoyed many successes and major victories, my dream of Olympic rowing was not to be, and I returned to engineering.

My love of rowing led me to coach rowing at HSU and Washington University in St Louis in 1992. However, I was still looking for work in the building energy field to start my engineering career, so I reconnected with my ERE advisor, Tom Borgers. He informed me of a job opportunity in the Bay Area, at DeLima Associates in San Rafael, that sounded perfect for me. I applied and was offered the position.

I moved back to California in the summer of 1993 and started work at DeLima Associates as a building energy modeler and residential technology analyst. I also continued my coaching career at Marin Rowing Association. In 1995, after two years in San Rafael, I started graduate work in HVAC (Heating, Ventilation, and Air Conditioning) design at the University of Colorado at Boulder. I received an internship with Highland Energy Group (HEG) for energy services work. I graduated with my Master of Science Degree in 1997 and continued working at HEG. In 1999, I joined Architectural Energy Corporation (AEC) for software development and commercial energy services work. Coincidentally, my business team leader at AEC was also an ERE graduate, Dave Roberts (BS ERE 1985)!

In 2008, I became the manager of the REM/Rate software, the most widely used Home Energy Rating software in the US. I became the Director of REM Software in 2011, and was responsible for all software activities

Alumni Profiles

at AEC, which formerly merged with NORESKO in 2014.

After 16 years with AEC/NORESKO, I left the company in 2015 and started my own consulting company, Salcido Solutions LLC. I assist companies with software development, consulting, data analysis and energy code development.

I currently live in Louisville, Colorado, with my wife, Robin, and when I'm not working you can find me riding or hiking somewhere in the mountains.



Connie (Perkins) Gutowsky, PE, CFM

BS ERE 1998

Senior Civil Engineer
City of Sacramento
Department of Utilities
Sacramento, California

Throughout high school, my favorite subjects were always math and science, and I knew I was headed toward a major involving those fields. The environmental field was just starting to develop at the time, and very few public schools in California offered the program. Coming from a family of engineers, I followed in their footsteps and applied to the ERE program at HSU.

While at HSU I was involved in many extracurricular activities. I rowed on the crew team my freshman year and part of my sophomore year. However, I soon realized that I wouldn't be able to major in ERE and row crew at the same time, so I chose ERE. This was the right decision for me.

I was a little different from other engineering students because I was also a member of Phi Delta Psi Sorority for many years, and I eventually was President in 1997. A lot of other ERE students made fun of me for this, but I felt that it made me a more well-rounded person. In addition, I was one of the founding members of the HSU Student Section of the Society of Women Engineers under Professor Beth Eschenbach.

After the spring 1998 semester I had one class left, so I stayed at HSU that summer to complete a senior project on the Arcata Marsh under Professor Bob Gearheart. I paddled out in a canoe and collected multiple water samples at different depths in the tertiary treatment wetlands, and I determined what areas of the wetlands were not being fully utilized to treat the wastewater.

After graduating from HSU, I completed my Master of Science in Civil and Environmental Engineering at Cal Poly in San Luis Obispo. Going directly from HSU to Cal Poly was a bit of a culture shock for me, but it turned out to be a great experience in the end. My thesis project involved one of the nation's worst oil spills that had occurred under the Guadalupe Dunes in San Luis Obispo County. I completed a funded thesis on intrinsic bioremediation (natural attenuation) under Chemical Engineering Professor Nirupam Pal.

After graduating from Cal Poly in December 1999, I went to work for the State Water Resource Control Board in their Leaking Underground Storage Tank Section. After a couple years, I moved over to the Division of Financial Assistance where I managed grant and loan projects for clean beaches and worked on other water/wastewater projects. After five years with the State of California, I went to work for the City of Sacramento in their Stormwater group. I implemented various programs required by the city's NPDES permit.

In 2007, I was offered a promotion to take a new position running the City of Sacramento's Floodplain Management Program. In this program, I am currently involved with emergency preparedness, floodplain modeling, FEMA mapping and insurance, flood control projects, and floodplain development. I truly enjoy the flood control/floodplain management field. I received my Certified Floodplain Manager (CFM) certificate in 2008 and Floodplain Manager of the Year Award over California, Nevada, and Hawaii in 2014. I currently sit on the Floodplain Management Association Board of Directors.

I plan to expand my career over the next 20 years, but right now I am taking a step back to focus on my personal life. I was married last October, and we are expecting our first baby boy this July!

I still keep in contact with many people that went through the ERE program. Some are people I work with in the same field and have meetings with on a regular basis. Others are friends that I have kept in contact with over the years.

Alumni Profiles



Ryan Patrick Dunne

BS ERE 2014

Staff Engineer II

Peterson Brustad, Inc.

Folsom, California


I knew I wanted to be an engineer from a very young age. What I enjoyed most as a kid was building things and dismantling just about anything to try to understand how it worked. Unfortunately, I was a poor student and resented spending time in school. I did especially poorly in math classes, usually barely passing, and the last thing I wanted to do when I graduated from high school was more school. So, I joined the Army as a Combat Engineer and volunteered for Airborne School. By the time I finished my initial training and jump school, I had learned a lot about myself and had a new perspective on what I was capable of. I learned the algebra that I had previously struggled with from a demolitions instructor, and I knew I could learn anything I needed to if I could understand it systematically and practically, rather than by rote memorization.

I became interested in environmental engineering during my time in Iraq and Afghanistan, where I saw widespread pollution and a complete lack of sanitation. A Lieutenant I knew with an engineering degree told me

about environmental engineering. It seemed like an interesting and highly rewarding profession. I started my education at Cabrillo College and got straight A's my first two years. School was very interesting, and not really so difficult. HSU didn't come up on my initial search for engineering schools. I planned on going to Cal Poly and was taking classes to transfer there. On a summer bike tour down the Pacific Coast I stopped in Arcata and ran into some engineering students when cruising through campus on my bike. I didn't even know HSU had an engineering program, let alone a dedicated ERE department! When I researched the program, I was struck by how focused the courses were for an undergraduate program. Rather than taking civil engineering courses with a few environmental engineering electives, I could take courses that were focused on environmental, water resources, and energy issues. I still applied to Cal Poly as a backup and was accepted, but I knew that HSU was the best choice for me.

My first class at HSU was Introduction to Environmental Resources Engineering with Margaret Lang. This class jump-started my interest, and greatly expanded the list of things I wanted to learn about. I remember being very impressed that Dr. Lang seemed like a subject matter expert on every topic that came up in the class. After my first year or so in the ERE program, I realized my greatest interests were in hydraulics, water quality, and water/wastewater treatment, and I took my design electives in those areas. The knowledge and skills I gained in these classes were extremely helpful in my getting hired by an engineering consulting firm after graduation. My employers were impressed that I had learned practical skills in addition to theory, something they were not used to seeing in recent engineering graduates.

While at HSU I was involved in several extra-curricular activities that greatly enhanced my education. In the summer of 2013, I participated in the NSF's Research Experience for Undergraduates by conducting energy efficiency research at Northern Illinois University. I also participated in two COMAP international math modeling competitions, under the mentorship of Brad Finney. Each contest was a long weekend of equal parts research, coding, writing, and coffee! Over those weekends we learned a lot about approaching problems, teamwork, and leadership. I recommend that all ERE students seek out opportunities like these, which have remained some of my most memorable experiences from my time at HSU.

After graduating, I decided to work in engineering consulting because I thought the exposure to a large amount of design work would give me the best experience to start my career. I was hired as a Staff Engineer at Peterson Brustad, Inc. in Folsom, California, to work on water infrastructure and water resources projects. One of my first projects involved performing hydraulic modeling and floodplain mapping for FEMA certification of a levee system. Coincidentally, it turned out I had briefly lived in an area that was protected by one of these levees! I've now been working at PBI for nearly two years, and I have also designed booster pump stations, reviewed the design of a water treatment plant in support of litigation, written a large portion of a groundwater well rehabilitation master plan, and performed engineering analyses to assess the ability of levee systems throughout California to meet DWR's new Urban Levee Design Criteria. I attribute much of my success to my strong and diverse education at Humboldt State, and I give thanks to my ERE professors for the top-notch education they provided. 

Jeffrey S. Navarro Mentorship Program

by Jax Gill, ERE Junior and JSN Peer Mentor
Jason McMack, ERE Senior and JSN Peer Mentor

All semester 2015 marked the beginning of the Jeffrey S. Navarro Mentorship Program. This program is made possible by a generous donation from the family of Jeffrey S. Navarro, a recent graduate of the ERE program who passed away last year. His family chose to recognize and honor the extraordinary relationship Jeff had with the ERE program and its larger community by creating and supporting a mentoring program. Those of us who participated as mentors used this opportunity to help support ERE students, and through them, enrich the ERE program.

ASPIRATIONS

The definition of success as an ERE student varies depending on who you ask. For some, it may be getting a 4.0 GPA, or graduating as quickly as possible. For others, like us (Jax and Jason), it is doing the best you can to earn a degree while also striving to positively affect the ERE community. This definition drives the Jeffrey S. Navarro Mentorship Program as tribute to the kindhearted legacy of its namesake. Those of us who had the privilege of knowing Jeff remember an individual who worked hard to find success, not only for himself, but for those around him as well. These characteristics and ideals helped us shape the mentoring program.

The purpose of the mentoring program is to be a resource for ERE students in finding success as they develop as students and transition to become engineering professionals. As anyone who has gone through the ERE program knows, this process is full of hurdles and hoops. Some of these are not explicitly addressed in any of our classes, leaving students to figure them out on their own independently.

Mentoring helps fill in these gaps by providing a ready source of tips and support to help students develop both inside and outside of the classroom. This is enabled via direct mentoring relationships and by connecting mentees to the larger ERE community through clubs and activities.



Jeffrey S. Navarro

ACTIONS

Our first semester building the program went well. We didn't have the resources to mentor every lower division ERE student, so we decided that it would be the most beneficial for students to have a mentor when they first get to the point where the ERE program becomes more serious. That way, they would have more resources and develop better habits to help them push through. Ultimately, ENGR 225 (Computational Methods I) was chosen because it represents a pivotal point where students begin to transition out of introductory math and science classes and into engineering-specific classes. After deciding upon Comp I, we planned a kick-off event with the class. A pizza party, consist-

ing of ice breakers, brainstorming, and food, was held on a nice Sunday afternoon. Students had a chance to build stronger relationships with one another, a valuable opportunity to help build study groups among peers. For mentors, it was an opportunity to ask our future mentees what benefits they hoped to gain through the mentor-mentee relationship. Feedback revealed interests in the internship and job application processes, and developing better time management and study skills.

After the pizza party kick-off, interested students who volunteered to participate in the mentoring program were assigned mentors, and they began to meet with their mentors one-on-one. Thirty-four of the forty Comp I students chose to participate in mentor meetings. These meetings gave students the chance to talk openly about any problems they may be encountering, while receiving advice on time management, resume development, finding jobs/internships, and integrating into the ERE community.

At the end of the semester, mentees were invited to another pizza party to relax and destress from the semester. As a group, the mentees reflected on the most beneficial aspects of the mentoring program and brainstormed areas that could be improved. Many students reported positively on the experience as a helpful resource for ERE program advice, general check-ins, and ERE community involvement. One stated: "Thanks! This program is a vital resource to lower division engineering students. It helped me feel more confident in my path and helped me to weather the storm." In addition, students suggested more emphasis on clubs, more pizza parties, and regular online check-in surveys. This advice is being used to modify and improve the mentoring program in Spring 2016.

While the main focus of the mentoring program is assisting students enrolled in Comp I, there are additional activities that have been in the works since

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Research Abroad, Lessons at Home

Visiting Faculty Member Leslie Miller-Robbie

by Leslie Miller-Robbie, ERE Visiting Faculty

My interdisciplinary background veers significantly from the traditional engineering path. I grew up in the rural area of Littleton, Colorado. My family always had animals around that were either rescued from the side of the road or acquired from classified ads in newspapers. I cherished them and was inspired to become a veterinarian, so I decided to study biology in college and pursue a pre-vet track.

My dad worked for a small airline based in Denver, and his job allowed my family to purchase discounted airline tickets to limited locations. These cheap flights played a major role in where I could go to school, and I chose Boston University due in part to flight availability paired with my interest in their biology program.

In my senior year, I studied abroad in Ecuador for a semester in an ecology program. This program exposed me to new environmental issues, including the impacts of oil exploration in areas with the highest-recorded biodiversity on the planet. My interests grew from the medical sciences to include environmental health issues. After graduation, I took a job in a skin cancer research lab at the University of Colorado. I became skilled in molecular biology methods, studying proteins and genes to encourage autonomous cell-death in cancer cells. After a few years in the lab, I started thinking about graduate school and began taking environmental engineering courses on the side from the woman who would later become my PhD advisor, Dr. Anu Ramaswami.

In late 2007, I entered into an interdisciplinary program focused on Sustainable Urban Infrastructure that was funded by a National Science

Foundation Integrative Graduate Education and Research Traineeship (IGERT) grant at the University of Colorado. This program was a joint effort by four departments: Health and Behavioral Sciences, Architecture and Planning, Policy, and Engineering, which worked together to tackle complex problems. I worked on food, water, and energy topics, and I spent a summer at the National Renewable Energy Lab as a Life Cycle Assessment Intern. I wanted my dissertation to have an impact on environmental quality and people's lives, and I focused my dissertation project on wastewater treatment plants in India.

In early 2010, I traveled to Hyderabad, then the fifth largest city in India with approximately 7 million people.



Leslie harvesting spinach samples from a small urban farm plot on the grounds of the Nallacheruvu Wastewater Treatment Plant in Hyderabad, India.

Today, the population estimate is 10 million, indicating the rapid growth rate of the city, which makes the task of providing infrastructure to the population seem almost insurmountable. The government had recently implemented centralized wastewater treatment plants, but they were capturing only 40% of the wastewater. The local government was looking for quantification of the benefits to the surrounding environment resulting from these newly-built plants.

I focused on the connections between water quality and urban agriculture in small plots of land that relied on surface water to flood-irrigate vegetables, herbs, and fruit. While managing this project, I worked closely with a farmer and treatment plant operators, and I was given lab space at a crop research institute that housed researchers from around the world. I also studied the life cycles of energy and greenhouse gas emissions associated with Indian treatment plants. With the long history of wastewater-irrigation in the area and the persistent pathogens in the soil, we found that higher quality irrigation water from the treatment plant did not provide as many benefits to urban farmers as were expected compared to untreated river water. Toward the end of the study, summer temperatures were reaching 115°F and killing off a significant portion of the bacteria on the leaves. Unfortunately, harvesting practices would bring the produce in contact with the soil and re-contaminate the crops. This complex system includes economic, social, and environmental tradeoffs that are weighed differently by different stakeholders, but everyone involved agrees that cleaning up the water is a necessity, and that longer-term benefits are needed.

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Balancing ERE and Life

by Terran Hilden, ERE Sophomore
Kaileigh Vincent-Welling, ERE Junior
Laura Wallace, ERE Senior

All of us in the ERE department have different stories and motivations that brought us into this whirlwind of a major. We also have different natural abilities and work habits. But, we do have one thing in common: a need for life balance skills to succeed in classes, remain healthy, and maintain a personal and social life. Here, three ERE students share their strategies for staying afloat while in the program.

Terran Hilden, ERE Sophomore

Honestly, I am not sure if there is a perfect way to balance life in the ERE program. I tend to compare this program to a roller coaster. There will be ups and downs, and every once in a while a crazy loop will send you straight toward the sky and back down again at dizzying speeds. Balancing life in this major is one of the hardest tasks I have had to deal with. There is the constant struggle of wanting to skip assignments and go out hiking all day, but it takes days of planning and hard work just to take one day off, let alone a whole weekend.

I achieve balance by following three key principles:

- I make sure my life is as organized as possible. I have a planner that is scheduled by the hour; it runs my life and keeps track of all my time and activities, including making time to see my friends and decompress.
- I have friends by my side. Having friends and a good study group has been crucial for me.
- I try to do something active each day. When I get up in the morning I make time for a short run or a nice yoga flow to get my brain thinking and my body moving. I have also started rock climbing. Grabbing my shoes and climbing, even for just an hour, has

frequently saved me mentally. There is nothing better than a day of good friends, good food, and some rock.

At the end of the day we are all going to leave this program, go out into the world, and make a difference. The next time you are in Science D until two in the morning, just remind yourself that this is all temporary, and very much worth it.

Kaileigh Vincent-Welling, ERE Junior

I never truly felt the weight of school until beginning my journey as an engineering student in ERE. Before transferring to HSU, I was able to take 18 units of GE classes, work 30 hours a week, and have a social life. Now, I take no more than three engineering classes and an additional non-engineering class each semester, and more than 15 hours a week of work seems almost impossible. Yet, balancing school with work, extracurricular activities, and “free” time can be done.

I do three things to help balance it all:


- I keep a planner. Having a planner is essential as an ERE student. I start at the beginning of the semester by recording when each exam or critical due date is. Keeping track of what needs to be done each day and week really helps me attack each task at hand and avoid procrastinating.
- I actively de-stress. Taking a mental break from the stresses of work/school is necessary for me to reset my brain so that I can more efficiently focus during study and work times. In the midst of studying, I frequently take a break to go on a walk, listen to music, or meditate to relieve stress.
- I make sure to get enough sleep. I have never pulled an all-nighter. Emotional and physical health is important

to achieving balance. Getting enough sleep allows me to stay awake, alert, and focused in my lectures and labs.

Overall, balancing life and ERE can be overwhelming. It is essential to stay alert and organized, value your health, and allow your brain to rest.

Laura Wallace, ERE Senior

Learning how to manage my time and balance my life as an ERE student has truly been my greatest challenge. I feel I am just starting to get it right, now that my time here is coming to a close! The hard truth is that it is virtually impossible to avoid making sacrifices when it comes to managing your time in ERE. The key is identifying which areas of your life you are willing to sacrifice, and if possible, rotate those sacrifices to ensure no parts of your self are abandoned. Perhaps one week your housework slips because you have a test to study for or a project deadline. Don't beat yourself up over that, but the next week make sure you catch up on those chores, even if it means not seeing your friends.

Taking on additional responsibilities with work and clubs has made me significantly better at managing my time. Being busy has forced me to develop organizational skills, increase my work efficiency, and stop second-guessing myself. The most significant change I made came from a simple revelation: you are not relaxing if you are stressing. In the past, I had a tendency to stop working to “relax” and watch T.V. or hang out with friends, while in my head continuing to stress about assignments that I wasn't working on. This is wasted time; I wasn't receiving benefits from either working or relaxing. The solution is simple: if you are stressing about an assignment, just work on it. When it is done, or at least farther along, true relaxation will come naturally. Keep in mind the big picture of why you are here, as it can get lost if you focus on short-term struggles. Never forget that the payout of an engineering degree is likely to be tremendous. 

Blue Lake Rancheria

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successful. They help create and sustain a culture of science, technology, engineering, and math education within the tribal community.

The typical project structure is that BLR becomes a client, and students perform project work guided by their professors. Projects serve as important stepping-stones to professional practice and the practical application of engineering studies. ERE student-led projects at BLR that have resulted in real-world project implementation include:

Biodiesel Manufacturing

ERE students, guided by Professor Margaret Lang, conducted technical and economic feasibility studies to assess whether BLR would be able to take the waste cooking oil from its large kitchens and manufacture enough biodiesel to fuel its public transit system buses. It was determined that biodiesel would be economically and technically viable, and would generate an estimated annual savings of \$4,000 while reducing GHGs by seventeen (17) tons per year. The project was implemented because of the students' great work. Today, the Blue Lake Rancheria Transit System is powered by a B20 blend of biodiesel that is created onsite.

For its efforts in greenhouse gas reductions and increased community resilience, the BLR Tribe was recognized as a 2015-16 "Climate Action Champion" by the White House and the U.S. Department of Energy.

Solar Power

ERE students, led by Professor Arne Jacobson, have completed solar technical and economic feasibility studies on over fifteen government and economic enterprise buildings and ground

sites at the Rancheria. Findings from these studies were the cornerstone of a successful funding application which led to the implementation of a low-carbon, community-scale microgrid with 0.5 MW of solar power. The project location was selected by ERE students as the most favorable for solar. Once operational, this will be the largest solar array in Humboldt County. The microgrid project is an exemplary partnership between HSU, SERC, and BLR, and will have a far-reaching, perhaps global, influence in terms of lessons learned and opportunities for replication. *And it all started with HSU ERE students!*

Biomass Combined Heat and Power

Most recently, ERE students conducted complex feasibility studies to

"The university / tribal government partnership is ideal because education and knowledge transfer are built into every activity."
—Jason Ramos, Blue Lake Rancheria Regulatory Chairman and government liaison for matters of energy and education.

◆
"Even before graduating and joining the professional ranks, HSU ERE students have made specific and quantifiable contributions to local climate action and infrastructure."
—Jana Ganion, Energy Director, Blue Lake Rancheria

determine the most economically and technically viable waste heat recapture scenarios to pre-heat biomass fuel. BLR has a research and development project that includes biomass gasification – a system that has a significant source of waste heat. ERE students quantified the waste heat and studied how it could be captured and used to dry biomass. As a result, BLR is positioned to implement efficient and economical solutions to obtain optimal moisture content for its biomass feedstock.

These are just a few of the ways ERE students have worked with BLR on green energy and green fuels projects. In addition, students working at SERC have conducted critical data analyses for many BLR projects. ERE students have also generously volunteered their

time to help install two residential solar arrays in the Blue Lake Rancheria community. These systems eliminated 75% of the fossil fuel electrical use for each home.

BLR works with HSU and its students in other ways as well. In September 2015, BLR announced the new Blue Lake Rancheria Fellowship for Clean Energy Studies ("BLR Fellowship"). Funded by BLR in honor of legendary local STEM educator, the late Jean Rousseau, the fellowship is open to applicants for either the Environmental Resources Engineering (ERE) or the Energy, Technology, and Policy (ETaP) option of the Environmental Systems graduate program who intend to focus on clean, renewable energy and/or energy efficiency work. The

BLR Fellowship provides \$15,000 in financial support for one academic year for one student chosen by the BLR Fellowship selection committee. The Fellowship may be renewed for a second year of study for an additional \$15,000 at the discretion of SERC directors and

BLR, based on the fellow's performance. More information on the Blue Lake Rancheria Fellowship for Clean Energy Studies can be found here: <http://www.schatzlab.org/about/getinvolved/blrfellowship.html>.

Future Renewable Energy Work at BLR

BLR's ultimate goal is to use 100% renewable energy for all of its government, economic, and community needs, and to reach zero net GHG emissions. This will be a large undertaking, as the last ~30% of such goals is often the most expensive and technically difficult to achieve. Upcoming projects under consideration include:


- Feasibility studies for expansion of onsite renewable energy production to supply power to local critical

infrastructure on or adjacent to the Rancheria.

- Potential expansion of biodiesel fuel production to further reduce GHG emissions of transit buses.
- Migration to electric vehicle buses and other vehicles where possible (charged using carbon-free power from the BLR solar array).

- Potential expansion of the low-carbon, community-scale microgrid to encompass BLR's fuel station, community wells, and other critical infrastructure.
- Expand the community-scale solar array up to ~1MW.
- Add up to 15 additional residential solar arrays.

These potential projects are being considered because of the excellent work done by past students. We hope to include ERE students on as many of our upcoming projects as possible.

For more information, please visit the Blue Lake Rancheria website: www.bluelakerancheria-nsn.gov. 

Mentorship Program

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the start of the program. We developed a planning guide to provide ERE students with an academic and professional checklist of tasks and goals that promote leadership roles, professional development, and important habits of successful students. We also developed a new ERE flowchart with a cleaner layout that includes more information than the original. As our final task this semester, we selected three new mentors for the next academic year: Jeffrey Mosbacher, Emily Klee, and Cavanaugh Carter.


The lasting success of the mentoring program depends on the continual development of the people who are a part of it and the methods that are utilized. We are currently developing resources to aid the next group of mentors so

that they can be more successful as they continue to build the program. For those students who like the idea of assisting in the development of fellow ERE students, look for the mentorship job announcement every Spring semester. Being a mentor is not merely a job; it is also a pleasure. We hope that this program will become a staple of the ERE program, helping students for years to come.

MENTOR FULFILLMENT

Jason: After all is said and done, I could tell you all the reasons why being a mentor was great, leave you with a quote from Yoda, and call it a day. Instead, I'll leave you with this: there are opportunities all around you. Ultimately, you have to decide which ones are right for you, but you'll never know for sure until you've experi-

enced them. I chose this opportunity to help people, and in that process I have learned more about myself than I could have hoped for.

Jax: Being a mentor this year has been quite enriching for me. It is a rare opportunity to become someone's trusted confidant so quickly. It is inspiring to learn why other students are driven to succeed despite the difficulty of our program. Watching students progress through the program where I was just a year ago showed me how much this program truly does grow and develop our skills. Mentoring has proved to me that we all have hard days and deal with stress. Yet, with perseverance and a community to share the load, we can all thrive through our studies to become engineering leaders of tomorrow. 

Visiting Faculty


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I came home from India and spent a year finalizing data and writing my dissertation. Over the next few years my personal life changed drastically. I graduated in May 2011 and got married the next month. My vibrant mom was then diagnosed with pancreatic cancer, and it was a shock when she passed away. Not quite a year after that, my husband and I welcomed our son into the world. I continued to pursue career goals while taking care of my family.

Meanwhile, I was working on a post-doctoral fellowship at the Colorado School of Mines, focusing on water infrastructure in the United States.

I shifted from lab and field work to numerous life cycle assessment projects on novel water and energy resource recovery technologies. The projects were primarily funded by the National Science Foundation Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt) and the Department of Energy Advanced Research Projects Agency-Energy (ARPA-E). While working with Dr. Tzahi Cath and Dr. Chris Higgins, I also mentored graduate students and started covering undergraduate classes for professors when needed. I then taught the 300-level Fundamentals of Environmental Science and Engineering course. I enjoyed teaching and wanted to pursue it further.

When I learned of the visiting faculty position at HSU, my family and I decided to jump at the opportunity. I wanted to teach, and as a family we thought it was a good time for an adventure. I am thankful for the opportunity to teach at HSU and am continually impressed with the program and people here. Although my focus has been pulled away from research, I continue to be interested in the connections between the environment and human health.

The balance of life and career goals can be difficult. I know that at different times in my life family may have to be the primary focus, but I will continue to pursue my academic interests nonetheless. 

Salt River Project

Continued from page 12

ecologic and economic uses of the Salt River watershed.

The Salt River Ecosystem Restoration Project is an ecosystem-wide, multi-phased, watershed scale project, comprised of four main components: 1) restoration of the Salt River Channel and riparian floodplain, 2) tidal marsh restoration at Riverside Ranch, 3) sediment management in the channel and riparian floodplain, and 4) upslope sediment reduction actions.

The large scale of this project requires the collaboration of funders, partners, consultants, contractors, and landowners, including federal, state, regional, and local agencies; private companies; universities; and nonprofits (See insert for list).

Since 2013, HCRCD and its partners have completed 4.2 miles of channel restoration, excavated more than 350,000 cubic yards of sediment (of which approximately 160,000 cubic yards were used as agricultural amendments on grazed pastures), and installed more than 60,000 native trees, shrubs, and wetland grasses on 43 acres. During the 2016 construction

season, Francis Creek will be connected to the Salt River, a sediment management area will be established, and a pilot channel connecting Williams Creek to the Salt River will be constructed. Plans are to restore sections of the Salt River each year, with the last section located just upstream of the confluence of the Salt River and its largest tributary, Williams Creek.

GHD, Inc. is the primary consultant for the Salt River Project. Since 2010, Jeremy Svehla (BS ERE 2003) has

served as GHD's Project Manager for this project. Jeremy oversees daily environmental, engineering, and construction related activities while interfacing between the technical team and the project partners. He coordinates the many different technical disciplines, including engineering, geology, geomorphology, ecology, biology, ornithology, soil science, and botany, contributing to the project by developing the necessary regulatory documents and engineering designs. Some of the software used in design development are 1- and 2-D hydrodynamic models, RUSLE2, AutoCAD Civil 3D, ArcGIS, and numerous spreadsheet models.

There are many challenges in a project of this scale, and some of the most important and difficult ones relate to

The Natural Resource Conservation Service (NRCS) has funded numerous projects on private properties in the Wildcat Hills that reduce sediment loads to Salt River's tributaries. These projects include: streambank stabilizations, fish barrier removals, and culvert to bridge replacements.

To assess the success of these sediment reduction projects and to aid in the Salt River project design process, HCRCD maintains a Total Suspended Solids (TSS) sampling station on Russ Creek in partnership with the EPA Region 9, and a TSS station on Francis Creek in partnership with the County of Humboldt. Both stations are located below the Wildcat Hills and upstream of the confluence of each creek with the Salt River. Sampling is conducted for turbidity, velocity, depth, pH, and temperature. The data collected at the Russ Creek station uses a Waterlog 3 data logger and is uploaded to the Storm Central website. The data collected at the Francis Creek station uses a Campbell Scientific data logger and is uploaded to the Redwood Sciences Laboratory website.

The Salt River Project has been many years in the making, and it took

immense effort to get off the ground. Working on a large-scale project with so many stakeholders has proved to be challenging, yet rewarding for everyone involved. This project requires keen technical minds in a wide range of fields to come together to solve a complex problem. Next time you are in Ferndale, take a look at the amazing work that has been, and is in the process of being, accomplished. For additional information and updates, visit the HCRCD website: humboldtred.org.

Salt River Ecosystem Restoration Project HCRCD Partners, Funders, Consultants, and Contractors

Partners and Funders

County of Humboldt; Coastal Conservancy; Calif State Water Resource Control Board; NOAA; Salt River Watershed Council; Calif Dept of Water Resources; USDA-NRCS; Calif Dept of Fish and Wildlife; Calif Dept of Forestry and Fire Protection; U.S. Fish and Wildlife Service; Calif Coastal Commission; City of Ferndale; State of Calif Wildlife Conservation Board; Pacific States Marine Fisheries Commission; North American Wetlands Conservation Council; Army Corps of Engineers; Ducks Unlimited; Calif Dept of Natural Resources; National Fish and Wildlife Foundation; Caltrans

Consultants and Contractors

GHD, Inc.; Pacific Watershed Associates; Kamman Hydrology & Engineering, Inc.; LACO Associates; University of Calif Cooperative Extension; Mike Love & Associates; H.T. Harvey & Associates; Northern Hydrology & Associates; Ross Taylor & Associates; Hanford Applied Restoration & Conservation; McCullough Construction; Figas Construction; Andersen Dragline; Mattole Restoration Council; Samara Restoration; Miller Farms; Americorps; Watershed Stewards Project; Calif Conservation Corps

meeting the design objectives while satisfying the multiple permit and land use constraints. Fortunately, the timeframe of this project has allowed Jeremy and the technical team to adapt their approach over time. After each phase of the project is completed, the performance of that phase is evaluated and future designs are refined.

Another component of the Project consists of sediment reduction actions in the upper part of the watershed, which encompass the Wildcat Hills.



ERE Clubs Information Board

Compiled by Heidi Otten, ERE Senior

Organization	Spring 2016 Activities	Fall 2016 Planned Activities
<p>ERE Student Association (ERESA)</p> <p>Email: <i>eres@humboldt.edu</i></p> <p>Webpages: <i>http://www.humboldt.edu/clubs/club_sites/eres.1</i></p>	<ul style="list-style-type: none"> • ERE coffee table • ASCE Leadership Conference • ASCE Local Wastewater Treat Comp • ASCE Mid-Pac Wastewater Treat Comp • Mock interviews at local firms • ERE rafting trip • Ice Cream Social • ASCE ERE Awards Banquet • ASCE Order of the Ring Ceremony • ERE graduation reception • Locker raffle 	<ul style="list-style-type: none"> • New officer elections • ERE coffee table • Welcome Back Pizza • All Clubs meetings • ASCE Pizza with Professionals • Fall Follies (Thurs before Thanksgiving) • Presentations by professionals • Tour engineering firms • Community outreach • Locker raffle • ASCE report card meetings
<p>Engineers Without Borders (EWB)</p> <p>Email: <i>humboldtewb@gmail.com</i></p> <p>Webpage: <i>http://www.humboldt.edu/ewb/</i></p>	<ul style="list-style-type: none"> • New officer elections • Present interactive demonstration at Sister City Project's I-Block Party • Screen printing T-shirts • Assist Professional Chapter with project in Camoapa, Nicaragua 	<ul style="list-style-type: none"> • Move forward with wastewater project in La Manzanilla, Mexico • Design project for engineering education at Hoopa School
<p>Renewable Energy Student Union (RESU)</p> <p>Email: <i>resu@humboldt.edu</i></p> <p>Webpage: <i>http://www.humboldt.edu/resu/</i></p>	<ul style="list-style-type: none"> • New officer elections • Solar Regatta competition • HSU Solar Radiation Monitoring Station • Smoothies with bike blender 	<ul style="list-style-type: none"> • Major project TBD • HSU Solar Radiation Monitoring Station • Smoothies with bike blender
<p>Society of Women Engineers (SWE)</p> <p>Email: <i>swe@humboldt.edu</i></p> <p>Webpage: <i>hsu.swe.org</i></p>	<ul style="list-style-type: none"> • New officer elections • Girl Scout Day • SWE Social • 2016 SWE Regional Conf in Seattle • He for SWE • Thai Tea • Mentoring Program with Professional Section • Region A Leadership Summit in Santa Clara 	<ul style="list-style-type: none"> • Resume building workshop • SWeshi • Societal Conference in Philadelphia • PaddleFest cardboard and duct tape kayak race • Blue Lake Elementary School outreach • New outreach day
<p>Society of Hispanic Professional Engineers (SHPE)</p> <p>Email: <i>shpe@humboldt.edu</i></p> <p>Webpage: <i>www.facebook.com/shpe.hsu</i></p>	<ul style="list-style-type: none"> • New officer elections • ERE drop-in tutoring sessions • Humboldt Math Festival • SHPE Conference • Celebración Latin@ • 1st Annual Commencement Celebration 	<ul style="list-style-type: none"> • ERE drop-in tutoring sessions • ERE All Clubs Fair • Día de Los Muertos cultural event • SHPE National Conference in Seattle • 5-Year course planning

Salt River Ecosystem Restoration Project

by Heidi Otten, ERE Senior
Summer Daugherty, Project Coordinator,
Humboldt County Resource Conservation District, Eureka, California

The Salt River Watershed is located in Humboldt County, California, on the southern edge of the Eel River Delta with the city of Ferndale roughly at its center. Historically, the Eel River Delta was occupied by the Wiyot people until the 1850's, when it was settled by Euro-Americans. In those early days, the Salt River ran 9 miles from the base of the Wildcat Hills

to its confluence with the Eel River, before discharging into the Pacific Ocean. It was approximately 200 feet wide and 15 feet deep at Port Kenyon, large enough to accommodate small ocean steamers. Over time, however, development within the Salt River watershed caused the system to become hydrologically dysfunctional, reducing ecosystem benefits, and creating socio-economic problems.



A nearly completed portion of the Salt River Restoration, waiting for tree and shrub plantings. Main channel on the left, active berm in the middle, and floodplain outlet on the right with large woody debris structures.

The Salt River Watershed contains 30,425 acres with five tributaries: Williams Creek, Francis Creek, Reas Creek, Russ Creek, and Smith Creek, all originating in the Wildcat Hills. Severe changes to the Salt River have resulted from changes in land use, including land reclamation activities, levee and tide gate construction, and channel aggradation (filling in with sediment). The most notable impact has been channel aggradation, as seen by the fact that, in 2012, only a small fraction of the Salt River contained flowing water.

Channel aggradation is caused by high loads of sediment being transported through a watershed and deposited in a river. In this case, the sediment transport is caused by the steep topography of the Wildcat Hills, relatively high rainfall, unstable geological structure, high rates of tectonic activity, and highly erodible soils. Channel aggradation not only leads to ecosystem dysfunctionality, but it also causes severe flooding throughout the watershed floodplain. Most of this floodplain is used for agricultural purposes, and flooding can have major economic impacts on these operations.

In 2004, the Humboldt County Resource Conservation District (HCRCD) responded to the significant negative ecologic and economic impacts, and formed the Salt River Advisory Group (SRAG). This group established a partnership between private landowners and public groups. SRAG propelled the Salt River Ecosystem Restoration Project into motion, with the goal of restoring the

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