



ERE MESSENGER

Environmental Resources Engineering

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DAVID VERNON JOINS ERE FACULTY

by David Vernon, ERE Assistant Professor

Hello ERE folks,

My name is David Vernon and I will be joining the ERE faculty this fall. I grew up in Madison, Wisconsin, in a family of teachers. For my bachelor's degree I studied Materials Science and Engineering at the University of Wisconsin Madison, and I became interested in energy through an internship that involved researching fuel cell materials. After college I worked in national labs and private industry, focusing on fuel cells and hydrogen energy systems. After 5 years, I realized that some of my favorite parts of these jobs were sharing ideas with the people around me and that I wanted a career where I could focus on interacting with people while using my technical skills to

pursue clean energy and sustainability. I decided that I wanted to be a professor so that I could teach and also continue to do research. With this goal in mind, I went to graduate school at the UC Davis and studied Mechanical Engineering with a focus on utilizing waste heat in hydrogen production processes and hydrogen enrichment to make combustion systems cleaner and more efficient. I minored in Transportation Technology and Policy to become more aware of how economics, policy, and technology all come together to determine what resources and technologies we use to meet our needs and desires.

I am excited to reach my goal of becoming a professor, and to join the active faculty teams in ERE and

Schatz Energy Research Center (SERC). I am looking forward to teaching in the well-developed energy curriculum in ERE, and over time I hope to develop some new courses focused on utilizing waste and improving both energy and exergy efficiency.

I became interested in HSU because of the innovative work in energy at SERC, and I realized that this was the right place for me to work with engaged and motivated faculty and students to pursue the goals of sustainability. I am looking forward to collaborating with the excellent faculty in ERE to continue strengthening the energy curriculum, and with the SERC team to pursue research with real world impact. I am excited by the passion of HSU students and their ground-breaking efforts, such as the Campus Center

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David in the Sierras near Donner Pass

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FROM THE EDITORS

Hello from the Messenger staff!
We hope you enjoy this Spring
2011 edition.

Co-editors
Annie Bartholomew
Holly Leopardi
Greg Pfothauer
Tahsa Sturgis
Kayla Williams

Faculty Advisor
Mike Anderson

Design and Layout
Leslie Scopes Anderson
Holly Leopardi
Tahsa Sturgis

Printing
University Graphic Services

ERESA@humboldt.edu
EREmess@humboldt.edu

www.facebook.com/hsu.eres

ERE Messenger online:
**www.humboldt.edu/engineering/
alumni/notes**

*“If you can’t get
rid of the skeleton
in your closet,
you’d best teach it
to dance.”*

—◆—
George Bernard Shaw
(1856-1950)

Alumni Profiles

William (Bill) Ward, PE

B.S. ERE 1975

Design Staff Leader (Retired)
Natural Resources Conservation
Service (NRCS)
Davis, CA

**[http://www.myspace.com/
westernlightsmusic](http://www.myspace.com/westernlightsmusic)**

In June 1974 I went to work as an Engineering Student Trainee for the Soil Conservation Service (SCS) in Visalia, California. After graduation from HSU in 1975 with a BS degree in ERE, I took my first full time engineering job with that agency in Ukiah, California. For the next 5 years I worked as an Agricultural Engineer in several locations, including Morgan Hill, Hollister and Santa Rosa. During this period I worked primarily with farmers and ranchers doing evaluations and design work involving a wide range of agricultural practices, including irrigation pipeline and system design, animal waste systems including storage tanks and collection facilities, erosion control and frost protection systems in vineyards.

In 1980 I transferred to our state office in Davis, CA, to work as part of a large team doing design work for larger water resources projects, including flood control channels, earth dams, large irrigation projects and emergency response projects after flood and fire disaster events. I also went back to school and received a Masters Degree in Geotechnical Engineering from California State University, Sacramento, in 1984. My first major project as a member of the design staff was design of “Antelope Dam”, a 50 foot high earth dam located near Tehachapi, California, for flood control benefits. In 1989 I became the staff leader for the entire design staff, with responsibility to oversee design of all SCS water resources projects in California.

In the mid 1990’s, SCS was renamed Natural Resources Conservation Service (NRCS). At that same time, our design responsibilities were expanded to provide design assistance to Hawaii, The Pacific Basin and Nevada as well as California. This allowed me to travel to the islands of Saipan and Hawaii as part of investigations and design work on a wide range of water resources projects in those locations.

I also worked on our “Emergency Watershed Protection” (EWP) projects after floods and fires. The purpose of these projects was to protect life and property considered at extreme risk as a result of the disaster event. The 1990’s was a devastating decade in California, with four major disaster events that our agency responded to in such great fashion as to receive a National Group Honor Award nomination. My role as program manager for this work included working closely with many other NRCS staff and sponsors (county and other local government agencies) to review proposed emergency projects, determine eligibility, request funding, and oversee design and construction of the needed emergency measures in very short time frames critical to protecting life and property at risk.

In 2006 a major flood event on Santa Paula Creek in Ventura County caused severe bank erosion, which threatened to take out the Santa Paula Airport. Our agency’s quick work with Ventura County Watershed Protection District restored and protected the bank, resulting in saving the airport.

I am now three months into my retirement, and I am very much enjoying this new phase of my life. I have more time with my family, and for playing music with my band, Western Lights, that I have been part of for 15 years.

Alumni Profiles

Martha Brook, PE

B.S. ERE 1985

Senior Mechanical Engineer
California Energy Commission
Sacramento, CA

mbrook@energy.state.ca.us

I was born in August 1959 under the star of the Dodo bird. During my last semester as an ERE student at HSU (1985), I had to write a speech on a topic of my choice for a GE course, and I checked out the National Geographic edition for my birth year and month to look for a topic. And there it was, an article about the Dodo, an extinct, flightless bird.

The Dodo built a mud nest in the shape of a dome, and used its beak to monitor the temperature of the nest. It would add or remove leaves and other debris to modulate the temperature in the nest. I thought it was pretty cool that I, an ERE student with an emphasis in energy, and the Dodo, an extinct bird of the Indian Ocean, had a common interest – thermodynamics.

Resource conservation was the focus of my education at HSU, and continues to be my profession. I am a Senior Mechanical Engineer at the California Energy Commission (CEC), where I've worked for twenty years. I've had many jobs while at the CEC, including long term energy demand forecasting, public interest energy research management, and building energy efficiency standards development. I am currently one of three Senior Engineers responsible for all technical decisions in a multiple year effort to update the Building Energy Efficiency Standards (aka Title 24). I also manage the building energy simulation software development activities necessary to support the Title 24 update. My other major assignment in the High Performance Buildings and Standards

Development Office is as program lead for existing commercial building efficiency improvements. The CEC is developing regulations to implement the commercial building energy use disclosure law (AB 1103) that was passed in 2007. The CEC is implementing three large commercial building retrofit programs funded with federal stimulus dollars. I am working with other regional and national organizations to develop and pilot a relative energy performance rating system for commercial buildings, focused on property assets rather than energy usage.

My favorite ERE courses were thermodynamics, fluid mechanics, numerical analysis and statistical modeling. I also liked measuring solar radiation on the roof of the ERE building and explaining to someone what a pyroheliometer is. My ability to explain technical subjects verbally and in writing to diverse audiences has been one of my professional strengths. Listening well, asking focused questions and creative problem solving are others.

My recommendation to current ERE students is to get outside often. You live in a spectacularly beautiful area that is rich in natural inspiration. Appreciate it while you can and create some lifelong memories.

Michael Fritschi, PE, WWTPO V

B.S. ERE 2005

Prior to entering the ERE program, I was a wastewater treatment operator with El Dorado Irrigation District. There I assisted a design engineer named Ed Barenburg, and working and talking with Ed opened my eyes to the world of engineering.

I started taking remedial math

courses and eventually received my A.A. degree in General Education. I originally intended to apply to Sac State's Civil Engineering program, but after experiencing a 105-degree summer afternoon, my future wife and I decided on the HSU ERE program.

I started HSU in the fall of 2002, and my first engineering class was Statics with Al Burrows. By the end of that first lecture, I knew I was in the right place. I remember Eileen Cashman's important advice in ENGR 115 about not letting your academic and (future) career take too much time from your relationships with family and friends. This is the best advice I received in school, yet it also remains challenging to put into practice.

I realized that the Comp Methods course objectives were two-fold. First, Fortran is a good number crunching language. I know a few engineers who use it for writing their own models. Second, the real outcome (I believe) from the comp courses is the ability to think logically. Having survived Dr. Finney's comp methods extravaganza, I started moving through the program, crossing courses off of that crazy flow chart. My favorite course was Systems Analysis, without a doubt.

In fall 2005, while in my final ERE semester, I worked as an intern at Oscar Larson & Associates (OLA). One of my jobs was to review a 200-sheet plan set for the Fortuna Wastewater Facility Expansion, as I would soon be doing onsite construction observation. At OLA, I worked on studies, reports, designs, contract management, marketing, and drafting. I took the PE Exam in spring 2008 and passed the 8-hr general exam, but had to retake the seismic and survey portion.

In 2009 I passed the PE and moved

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Alumni Profiles

Continued from previous page

from OLA to Winzler & Kelly, where I worked with several other ERE grads. I also helped create the new College of the Redwoods Water and Wastewater Operations program, and I began teaching night courses. Later, I assisted CR in applying for the creation of an A.S. degree program.

Public and private engineering offer different advantages. I suggest that anyone interested in the private sector be prepared to be a “seller/ doer.” Private companies typically do more design work and business development, and generally provide higher pay. Public agencies rarely require business development, and often provide more vacation time! I suggest starting with private industry, since you are used to working your tail off (in the ERE program). It is easier to go from private-to-public than public-to-private.

I encourage you (students) to take the EIT exam as soon as you qualify; do not wait for graduation. Having an EIT allows you to gain experience toward your PE (after you graduate). It also shows potential employers that you are serious about your career.

Career Advice: When interviewing for a job, remember that all of your subsequent salary adjustments are based on your starting salary. The more experience you have, the more bargaining power you have. If you are being offered a job, it is you they want, so don't be afraid to negotiate!

Future plans? Currently, I'm deciding whether to stay in private industry, move on to public employment (more vacation!), or go into teaching (I love to teach!). To help with that decision, my wife and I and Jack Russell terriers will be traveling the U.S. in our VW bus for a few months. Why not?!

END

ERE Team is Outstanding Winner of Int'l Math Modeling Contest

by Brad Finney, ERE Professor

Again this year, two HSU ERE teams entered the Consortium for Mathematics and Its Applications (COMAP) Mathematical Modeling Contest. The contest ran February 10-14, 2011, with more than 3,500 teams competing from U.S. and foreign universities. Each team developed a model and prepared a report detailing their solution to one of three modeling problems.

One team consisted of Patrick Fox, Sam Speet, and Jason Crowley. They competed against 2,775 other teams, and were awarded a “Successful Participant” ranking. Their problem was to develop a model to determine the shape of a snowboard “halfpipe” course that would maximize the production of “vertical air” by a skilled snowboarder. They were also required to investigate course shapes that would optimize other possible criteria, such as maximum twist in the air, as well as consider what tradeoffs may be required to develop a practical course.

*See related article
“Diary of a Math Modeling
Dream Team”
on page 9*

The other team consisted of Zak Stanko, Brenda Howell, and Rick Bailey. They competed against 735 other teams, and received the “Outstanding Winner” award. This is the highest award given, and they were one of only six teams to be honored with this designation. They chose a problem that involved complex issues of the environmental impacts and economic viability of electric vehicles. They were required to address whether the widespread use of electric vehicles is feasible and practical by developing a model of the environmental, social,

economic, and health impacts associated with such use, and to determine the key factors that governments and vehicle manufacturers should consider when determining if and how to support the development and use of these vehicles.

Both teams completed a semester's worth of work in one weekend. Nice work!!!! Thanks for giving your time and doing such a great job representing the ERE Department!



Rick, Zak, Brenda, Sam, Patrick and Jason

END

ERE Team Wins ASCE Water Treatment Competition

by Kendra Miers, ERE Senior

A team of ERE students has won the Water Treatment Competition at the 2011 ASCE Mid-Pacific Regional Conference held in Sacramento on April 14-17. The other teams represented UC Berkeley, UC Davis, Sac State, Fresno State, Univ of Nevada Reno, Univ of the Pacific, Chico State, and San Jose State. This was the first time in more than 10 years that an ERE team has participated.

The competition involved a scenario in which a levee breach sends water at a rate of 5,000 cfs into a composting facility adjacent to a wetland. Each team was required to design a water treatment device from items typically found in a tool shed, and then to construct and operate the device at the competition while being timed! The wastewater “cocktail” and the list of items that could be used to construct the device were specified in the rules.

Our team, appropriately named “Earthen Levee Breach into a Biosolids Composting Facility Near a Sensitive Wetland Emergency Response Team,” was composed of Kendra

Miers, Zak Stanko, John Hunter, Lauren Adabie, Blair Kinser, Travis Clohessy, Ryan Seng, Ben Adams, and Izzy Konopa. Our winning design was made up of these three main components: a window screen in a milk crate to remove the large debris, a settling basin with a baffle filled with coarse sand as the drain, and a sand filter with a small amount of OxiClean. The design was required to treat 10 gallons of the wastewater in one hour, and the effluent was judged on turbidity, pH, dissolved oxygen, and phosphorus and nitrogen content.

In addition to having the best removal efficiency, our design had the lowest cost (less than \$50, compared to more than \$80 for the next lowest), and the best first-gallon-through time (2 minutes, 10 seconds). In addition, in our presentation we were the only team to address MCLs (Maximum Contamination Levels) set by the EPA.

Participating in the competition was challenging and took a lot of time, but we learned a lot, had a great time, and are excited to have secured bragging rights for HSU and ERE!



Top row: Izzy, Zak, Ryan, Lauren, Blair and Ben
Bottom: John, Kendra and Travis

END

CHIAPAS

by Annie Bartholomew
ERE Sophomore

In the summer of 2010, I traveled with HSU students to San Cristóbal de Las Casas, Mexico as part of the HSU Chiapas Program. This program is a continuation of the Parras de Fuente Program which was created in 2005 by ERE lecturer Lonny Grafman and World Languages and Cultures faculty member Dr. Francisco de la Cabada. The Program is a Spanish immersion and appropriate technology abroad program which attributes its overwhelming success to the community partners who have pre-existing relationships with the areas the program works with.

The Chiapas program accepts students with all levels of Spanish, and does not require any background in appropriate technology. The only requirement is the ability to perform manual work. So with ENGR 215 “Intro to Design” and five years of French under my belt, I decided I needed to go to Chiapas.

In Mexico we studied the Chiapas version of ENGR 305 “Appropriate Technology,” which focused on improved cookstoves, rainwater catchment, microhydro feasibility, and biodigestion, all with local applications. In addition to our regular classes, each student had their own 215-style project. We learned the challenges in Mexico of creating, disseminating, and adopting new technologies by installing a demonstration biodigester in the city of San Cristóbal de las Casas. This biodigester is designed to educate surrounding villages about biodigestion, the anaerobic process of converting animal waste into methane gas which has applications as a cooking and heating fuel. Our group worked in partnership with

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ERE Graduate Program alumni, Alexander Eaton, President of the International Renewable Resources Institute-Mexico, who works on biodigester projects in southern Mexico. Although biodigestion as a means of waste management and energy conservation seemed like common sense to our American team, our project required the creativity of not only sharing new knowledge but finding cultural relevance to our solutions specifically for the people of rural Chiapas. A biodigester could not be just a biodigester. It wasn't enough to be functional. It also had to be aesthetically pleasing and informative. Instructions could not be written solely in Spanish, but instead had to be researched and translated into Tzotzil, the indigenous language most spoken in the region. Our final product featured whole earth building techniques taught to us by our client and local home designer, Juan Hidalgo, who specialized in super adobe and sand bag structures that used many recycled materials.

Fortunately, there was not a main document to slave over. However, working in Mexico presented many cultural challenges to us. Sometimes the person teaching you to make cement could speak only Tzotzil. Although this made the work more difficult, it also allowed for more opportunities to learn from the people of Chiapas. Also, some students were living with families in San Cristóbal de Las Casas, which provided the full cultural immersion and dietary problems as well as opportunities that can come with traveling to a foreign country.

You would be hard-pressed to find another program that offers the same quality of experience anywhere in the world. The HSU Chiapas program participants left with international experience, Spanish language, and a service learning component unique to Chiapas. Oh, and the experience of a lifetime. **END**

So, What's In It For Me?

Or, Why You Might Want to Join Professional Societies

by Sophie Lagacé, P.E., ERE Lecturer and ASCE Student Liaison

Between the Environmental Resources Engineering Student Assn (ERESA/ASCE Student Chapter), Engineers Without Borders (EWB), the Society of Women Engineers (SWE), and the Renewable Energy Student Union (RESU) – not to mention all the other clubs on campus – you have access to a wide range of organizations that provide both entertaining social activities and professional street credentials. Now, you graduate, and you are approached by the national professional chapters of these and other organizations: American Society of Civil Engineers (ASCE), SWE and EWB national, and so many more.

Why would you want to spend your precious time joining and participating in them? What will you get out of the experience? The answer is, Many Things.

- **Growth and experience you can't get just through your classes or your job.** You can get involved in projects of wider scope and you will also acquire or refine skills that will serve you all your life: technical, organizational, leadership, project management, presenting, people management...
- **Contacts, both personal and professional.** You will develop rapport with colleagues who will remember you years from now, as well as with professionals that can serve as mentors and references. These people will have seen you in action and will know your true abilities and drive, not just the fact that you took a certain class.
- **A mental break from your studies or work.** Even though it may seem like more work, you get to be in a different mental space while

still working on your career. A lot – hopefully most – of the activities will be great fun too.

- **Bragging rights about real experience.** Employers often don't really care about the list of specific courses you have taken. If you have graduated from an accredited engineering program, it is pretty much assumed you can do the engineering. They do care, however, about initiative, resourcefulness, leadership and the willingness to put in extra effort to learn more and become more accomplished.

- **A sense of what you really want to do.** As an undergraduate, you may not have a clear idea of all the career possibilities you have, and you may not have developed the passions that will drive your career. Participating on real projects will help you discover what you genuinely love and where you want to develop.

- **Giving back to the community.** Most of us are not in environmental engineering because of the notion that this is the way to make money hand over fist. We're in it because it's fun and because we care about making the world a better, safer place, about making a difference, about protecting or restoring the environment, about using natural resources better.

So, if you have not joined one of the professional clubs already, consider doing so as soon as you can. When you graduate, keep your ties with the organization and with members. Some societies, like ASCE, even offer free or reduced-cost membership for a while after graduation, and provide many additional services, such as career events, networking opportunities, mentoring, professional exchanges, and much more. **END**

California's Water Boards: An Overview

by Katie Bowman, PE, (ERE 2001) Water Resources Control Engineer
 Central Valley Regional Water Quality Control Board, Redding, CA

What would California be like without the State Water Resources Control Board and Regional Water Quality Control Boards (collectively referred to as California's Water Boards)? Well, a look back in history, when California was a newly formed state in the mid-1800's, shows us what life was like without them. Water quality concerns quickly arose when activities during the Gold Rush began to affect water and the environment. Hydraulic

mining released large amounts of sediment and debris into streams, and open mine portals began to release highly acidic water and toxic metals including copper and mercury. The lumber industry quickly fell into over harvesting, resulting in erosion and siltation to adjacent creeks. Domestic and industrial wastewater flowed freely to rivers and streams without thought to downstream users, and solid waste was dumped in convenient locales and eventually burned. Much of these activities led to toxic surface

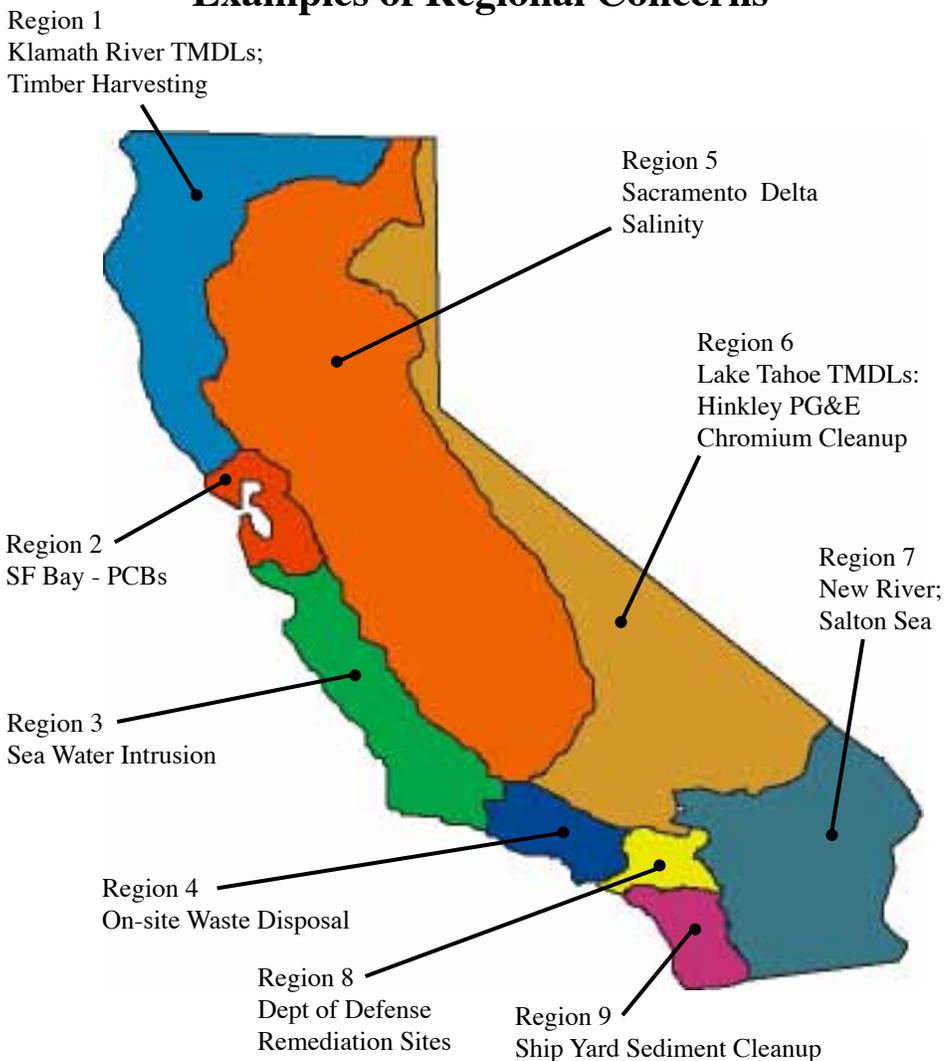
water conditions and threatened to impact groundwater.

In the mid-1940's, outbreaks of water-borne diseases, degradation of fishing and recreational waters, and other impacts from rapid development and population growth, prompted California to create the Dickey Water Pollution Act in 1949. The Dickey Act established the nine Regional Water Quality Control Boards, as the Legislature realized that California's water pollution problems were regional, i.e., dependent on climate, topography, population, and local land and water uses. The State Water Resources Control Board was created by the State Legislature in 1967, and in 1969 the Legislature enacted the Porter-Cologne Water Quality Act. This, along with the Federal Clean Water Act of 1972, are the cornerstones of today's water protection efforts. The two Acts established surface water quality standards, and mandates for sewage and wastewater treatment.

The Water Boards now lie under the umbrella of the California Environmental Protection Agency (created in 1991), along with multiple other regulatory agencies including, the Air Resources Board, Department of Pesticide Regulation, Department of Toxic Substances Control, and Office of Environmental Health Hazard Assessment.

Unlike most government agencies, the Water Boards operate under a Board structure, which means that the public has opportunities to provide input on Water Board actions at regular Board meetings. It also means that rather than have directives be made from the top down, most regulatory directives are rooted at the staff level and are

Examples of Regional Concerns



Continued on next page

Water Boards

Continued from previous page

elevated to the Board for final consideration at a public meeting.

Water Board staff have a variety of mechanisms in their “regulatory tool box” to protect water quality and enforce state and federal laws. These mechanisms include: permits, waivers, certifications, enforcement orders, and even civil penalties. When permits are violated and/or laws are broken, the Water Boards have the ability to pursue civil penalties (a.k.a. “fines”). Many may relate regulatory work to “environmental policing”, but the majority of the day to day work consists of assisting dischargers, the public, and other environmental professionals through the sometimes convoluted expanse of the regulatory framework. Water Board staff on a daily basis are performing inspections, writing permits, reviewing technical reports,

educating dischargers, assisting environmental consultants, and reviewing local land use planning.

So, why is this so important now? Because surface waters are currently being impacted by urban storm water, industrial and municipal wastewater, and agricultural runoff, and groundwater is threatened by leaking underground fuel tanks, failed septic systems, fertilizers, pesticides, and animal wastes. Some of the higher profile issues that Water Board staffs are currently working on include, salinity in the Sacramento-San Joaquin Delta, Klamath River watershed restoration, hexavalent chromium cleanup in groundwater, and the cleanup of pollution in the New River at the Mexico-California border. These issues are on-going and complex, and affect all of California.

The HSU ERE program provides an excellent training ground for students preparing to work in all facets of the engineering field, including work

at the Water Boards. The Water Boards offer a variety of types of work, from groundwater remediation, to assisting watershed groups, to forming statewide policies. If you are considering working for the Water Boards, take a look at the video, “Working for Water”, which features the stories of a few Water Board employees. The ideal Water Board employee has a strong technical background in biological sciences, geology, and engineering, and can communicate effectively, but above all has good common sense.

For additional information, please visit <http://www.waterboards.ca.gov>

Working for Water (video)
<http://www.youtube.com/watch?v=fNv6XsLRBDo>

A Dozen Things You Never Knew about the California Water Boards
http://www.waterboards.ca.gov/publications_forms/publications/factsheets/docs/dozenthings.pdf **END**



David Vernon

Continued from page 1

for Appropriate Technology (CCAT), the Renewable Energy Student Union, and the Humboldt Energy Independence Fund. These initiatives serve as models for other educational institutions, as well as for governments and businesses world wide. I want to support HSU students as they become leaders, designers, and community members who transform our society for the better. I look forward to working with all of you through classes, research, and extracurricular groups.

In my teaching and research I plan to explore ways that society can transition from the current strategy of economic growth through increased resource throughput to one focused on sustainability and community by increasing resource use efficiency. I see opportunities to contribute to this goal through technology development,

designing more effective policies and regulations, informing the public about the real impacts of our consumption decisions, as well as reducing and utilizing waste.

Ecological systems have many examples of integration to use waste from upstream processes. Opportunities to utilize waste to make products or meet service needs are exciting because they both eliminate waste disposal problems and produce valuable products. Learning from ecological systems can help us to more effectively integrate systems to make our homes, industries, and vehicles more efficient, less polluting, and more sustainable. One valuable tool in understanding the integration of energy systems is a concept called exergy. Exergy is the amount of useful work that can be extracted from an energy resource as it comes into equilibrium with the environment. Exergy analysis shows us where the work potential of our energy resources is not effectively utilized, and where

we have opportunities to extract multiple services through systems integration.

Outside of work I am interested in building communities, outdoor exploration through hiking, bicycling, and paddling, wilderness awareness, and waste reduction in everyday living. My girlfriend Ryan and I lived in a co-housing community in Davis, and love knowing our neighbors, borrowing and sharing, as well as cooperating to achieve community goals. It never ceases to amaze us that such small changes in our behavior and perspective can lead to such a large increase in the quality of our lives. We are looking forward to living in Arcata and have been impressed by the friendly atmosphere and strong sense of community in the area. We are also attracted to the area by the abundance of natural beauty to both enjoy and learn from.

I look forward to meeting all of you in the fall! **END**

Diary of a Math Modeling Dream Team

by Zak Stanko, ERE Senior

Whatever your perception of the COMAP Math Modeling contest is, throw it out the window. It's better than you think. Yes, you have to sacrifice three whole days, but let's face it, how much of that lab report were you REALLY going to do during that time anyway?

Selecting the right team is huge. During Materials lab I wrote a note that said "Do you want to do the Math Modeling Contest with me? Y or N," and handed it to The-Artist-Formerly-Known-as-Brenda "don't call me B.J." Johnson. It was kind of like how you would ask a girl to the prom in tenth grade. She said "Yes"!

Next, the rigorous screening process and tryouts for our remaining team member began. We wanted someone who would do all the dirty work: public relations, document handling, appointment and travel coordinator, personal chef, and general gofer. Brenda and I just wanted to sit back, relax, and do math in our heads. Who immediately popped into our heads as the perfect lackey? Rick Bailey, of course! The perfect choice. He has all the skills required of Belobog, the ERE mascot: the memory of an elephant, the speed of a cheetah, and the endurance of a whale (look for it during finals week).

So, we caught up (mostly) on all our schoolwork, got ready for a vacation from all the easy G.E. courses we were taking (just kidding, of course), and assembled on the Big Day. We were ready for three solid days of intense mathematical combat!

Really, I just wanted to find out what was up with these math modeling contests I kept hearing about. To provide some insight to anyone else who is curious, here is a chronological summary of our experience, only slightly exaggerated due to foggy memory.

Friday, February 11

5pm: Trying to register for the competition, I spent 20 minutes hitting refresh on the COMAP website, which was down due to the large traffic demand from nerds like us around the world. It was kind of like trying to get those Justin Timberlake tickets from Ticketmaster right when they go on sale. Finally, all registered and ready to choose one of the three possible problems:

1) Optimize the height a snowboarder can get out of a half-pipe. I like snowboarding, but why bring math into it; that just sort of ruins it.

2) Determine the minimum number of repeaters of a given bandwidth blah, blah, blah. My brain shut off after I read the word repeater. Why bring math into something that isn't interesting in the first place?

3) Model the feasibility of global integration of electric vehicles. Bingo! We had our modeling problem.

7pm: We set up shop in the HGH conference room and began brainstorming. Rick made team-building tacos. We cycled through a whole lot of nonsense on the whiteboard before we determined that a stopping criterion was met: maximum number of iterations was reached. We did a little more background research and retired early that night.

Saturday, February 12

8am: After the obligatory cereal-eating and cartoon-watching hour, we began the modeling process. Considering the limited availability of data, we decided to focus on the relationships between various factors affecting the success of electric vehicles. Variables were tossed about until we had our Good-Will-Hunting moment. Eureka! Lotka-Volterra! Those words can now

be used interchangeably.

We decided that the general feasibility of electric vehicle success would be based on how the electric vehicle competes against the alternatives in the vehicle market. The limited resource, species competition Lotka-Volterra model was adapted to an economic competition with the limited resource being consumer dollars.

12 noon: One of Brenda's kids had a tantrum, and a teenage crisis was narrowly avoided, thanks to the dedicated efforts of SuperMom herself and Rick's homemade ice cream.

1pm: Let the programming begin. Code was written in a fury, numerical methods were tossed around, parameters were determined, and graphs were made (Hooray for GNUplot!). Rick made a lemon meringue pie for motivation.

5pm: Uhhh...don't we have a document to write? Twenty pages, the criterion stated in red, boldfaced, underlined letters. As much fun as it was getting model results based on one little tweak here and there, we had to start getting this thing together for submission. Luckily, we all have experience slapping research papers and lab reports together at the last minute (an essential skill for this competition).

Sunday, February 13

7am: Rick brings a fresh quiche and a dozen Don's donuts. Satiated, we continue to write. Somewhere during this day I blacked out on coffee and things somehow just got done. By the end of the day we had most of it put together, and it just needed to be made readable. Rick made a lamb roast with mint chutney that was just to die for.

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Math Modeling

Continued from previous page

11pm: Either I was hallucinating due to lack of sleep, or we got attacked by dragons and had to fend them off with the shrieks of Brenda's children, who were tired of watching their mom stare at a computer screen.

Monday, February 14

With a 5 PM deadline looming, the morning is a blur. But the last two hours involved speed writing, speed editing, speed eating, and failing to speed print the final document at 4:45 because I didn't have enough c-card points. Rick-the-runner then made his fifth and fastest trip to FedEx Office, and came back with our beautiful document, just in time to hand it in. He then baked us a three-tiered red velvet cake to celebrate our accomplishment.

To summarize, if you've ever thought twice about clicking on that link to the Math Modeling Contest that pops up on the ERE Announcements page every spring, you're qualified to participate. All you need is a comfortable spot to work endless hours, and lots and lots of coffee. Oh, yes, and Rick. You definitely need Rick. **END**

*“A clever man
commits no
minor
blunders.”*



*Goethe
(1749-1832)*

Engineering Student-Athlete: Can It Be Done? Why Would You Want To?

by Kayla Williams, ERE Junior

How do you explain what defines you? I am an ERE student and a member of the HSU Women's Varsity Basketball Team, and I am beginning to think there is no way to explain what it's like to be a student-athlete. I've often come to that fork where I sit down, take a serious look at my situation, and question why I'm doing it. After all, isn't there some truth to the common perception that it is nearly impossible to be both an engineering major and a serious athlete? Yet, every time I ask myself this question, the pros always outweigh the cons. I'll try to explain why.

First and foremost, there is balance. I believe most people are multi-faceted people, and no single interest can by itself be enough. For myself, I have two worlds: basketball and engineering. When I go any amount of time without one or the other, I feel unbalanced. As I reach the elderly age of 21, I understand better what a blessing it is to have a hand in both pies, so to speak. I am sure other people experience the same feelings about competing passions, and I hope they also would never give up one for the other. While it is difficult, often very difficult, I wouldn't be as successful in either if the other weren't there to keep me physically, mentally and emotionally balanced. I don't know whether it's the challenge of a time crunch, or an inability to structure time on my own, but my grades have reflected that I'm better off being in season than out of season.

I am a teamwork enthusiast. Yet, when I was first introduced to the concept of study groups in engineering courses, I was dismissive, thinking that I was an exception to the rule and didn't need to study with others. Amusingly enough, I now see that many students think the same thing, meaning I was actually falling into the sad majority

of students who haven't seen the light. But then, the mother of all beasts arrived and I became a believer. Yes, Systems happened. Around that same time, I started to appreciate the enormous gift I had been given that up until then I had let fall to waste: my basketball team. I've always been an unselfish team player, helping and giving to others, but I didn't realize how much I was getting back in return from my teammates. I now see that as a member of a team, you always have a home away from home with people who are working toward the same goals you are. Honestly, it has to be one of the greatest feelings there is. So, Prof. Willis... job well done.

Certainly, life is not always hunky dory in a land of balance and teamwork. Basketball schedules, both practice and official games, cover several months of the school year, and are usually inflexible, often conflicting with my engineering courses, homework and projects. This has turned into a biannual nightmare, given lab times, and has delayed my projected graduation date. It is very challenging to miss class, especially the same class on a regular basis. On the other hand, I am also usually forced to have closer relationships with professors than I would normally, due to the need for an open line of communication, and this is unquestionably a benefit.

While the disadvantages all make life harder, they really are only technicalities. Being able to maintain relationships with people in both spheres is invaluable, and I would never voluntarily give that up. So, if given the opportunity to experience the same sort of balance between two things you love, I encourage you to chase it. And if you ever reach the fork of uncertainty, remember – never give up what you can't go a day without thinking about. **END**

Get Involved: ERE Clubs Information Board

Compiled by Tahsa Sturgis, ERE Sophomore

Organization	Spring 2011 Activities	Upcoming Plans
<p>Environmental Resources Engineering Student Assn (ERESA)</p> <p>Email: eres@humboldt.edu</p> <p>Webpage: http://www.facebook.com/hsu.eres</p>	<ul style="list-style-type: none"> • Welcome Back Pizza • Lazer Tag • All Clubs Meeting • ERE Rafting Trip • Mock Interviews 	<ul style="list-style-type: none"> • Pizza with Professionals • Welcome Back BBQ • Fall Follies
<p>Engineers Without Borders (EWB)</p> <p>Email: humboldtewb@gmail.com</p> <p>Webpage: http://www.humboldt.edu/ewb</p> <p>Donate: http://www.ewb.usa.org/chapters.php?ID=597</p>	<ul style="list-style-type: none"> • Worked closely with North Coast Professional EWB and their current program Camoapa, Nicaragua • Worked toward 30% design plans for the four Camoapa projects in preparation for an implementation trip late this summer • Hosted third EWB Poker Night 	<ul style="list-style-type: none"> • Present plans/trip at annual I Block Party • EWB backpacking trip in the Trinities • Finalize designs for Camoapa projects • Plan future implementation trip in Camoapa
<p>Renewable Energy Student Union (RESU)</p> <p>Email: resu@humboldt.edu</p> <p>Webpage: http://resu.humboldt.edu</p>	<ul style="list-style-type: none"> • Design and build solar hot water system for showers at Rock Creek Ranch • Install wind monitoring devices to gain data on the feasibility of wind power installation at the Manilla solid waste facility • Awarded \$75,000 from EPA to implement P3 project in Bhutan 	<ul style="list-style-type: none"> • Help organize group webinar on energy topics • Apply for phase I P3 new project funding • Recruit new members (Join Mailing list: renewable_energy_student_union@googlegroups.com)
<p>Society of Women Engineers (SWE)</p> <p>Email: swe@humboldt.edu</p> <p>Webpage: http://humboldt.edu/clubs/club_sites/society_of_women_engineers1</p>	<ul style="list-style-type: none"> • Held a calculator tutorial • Held annual SWeshi • Girl Scout day in Science D • Attended SWE Regional Conference in Santa Clara • Hosted First Annual SWE Social where local women engineers provided insight and inspiration 	<ul style="list-style-type: none"> • Organize fall fundraising for general club expenses and to attend the Nat'l Conference in Chicago next year • Host a calculator/CAD workshop for ERE students • Annual SWeshi • Outreach to Girl Scouts in the middleschool to encourage engineering as a potential career
<p>All-clubs Google Calendar: http://www.google.com/calendar/embed?src=ere.clubs@gmail.com&ctz=America/Los_Angeles&gsessionid=OK</p>		

Now My Time Is Up...

by Mike Anderson, ERE Emeritus Professor

To my many HSU friends and colleagues (students, alumni, faculty, staff and administrators) I say “goodbye.” Or, better yet, “until we meet again.” After 38 years and change, the retirement bell is ringing. I leave with a great deal of pride and satisfaction in the part I have played in creating and nurturing the ERE program, and in educating more than 1,000 ERE students, but also with a tinge of sadness in knowing that I will see many of you much less frequently in the future. However, I have offered to provide additional support to the department in some capacity in the future, so depending on if and how that plays out, perhaps there are some interactions between us yet to come.

As some of you know, I entered the FERP (Faculty Early Retirement Program) five years ago. I have had a memory-based learning disability all my life, and it finally got to the point where I was not able to teach a full load and do the job I believe students expect and deserve. Under FERP, I was able to work out a part-time schedule with the ERE Department that allowed me to teach one course with two labs each semester, rather than the three or four courses usually

required. This has been great for me, and I hope for my students and the department as well. But FERP requires you to retire fully after five years, so – now my time is up.

I am very proud of our students and alumni. Not only those we all knew from the start were going to set the world on fire, but also, perhaps even especially, those who struggled mightily in the process. My greatest pleasure as a teacher has been seeing a student’s eyes light up after finally working out something he or she struggled with seriously over days, weeks or months, sometimes alone, sometimes with the support of a group. Yes, our students and alumni are the greatest! And, I can’t imagine working every day with a more wonderful faculty and staff. Fortunately, this legacy continues! I am very excited that David Vernon is joining the department in the fall.

Happily, I have a wide range of interests, from literature, music and theater, to hiking, rafting, and photography, so I don’t expect to run out of things to do any time soon. Also, I just passed my 10-year anniversary as a volunteer counsellor at Six Rivers Planned Parenthood, and I plan to continue in that role.

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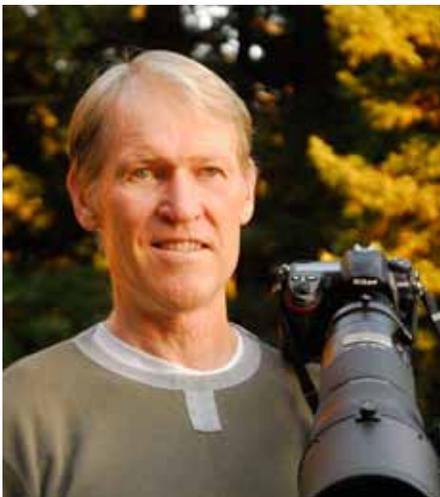
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As many of you know, my wonderful wife, Leslie, introduced me to photography about six years ago, and we have gotten seriously into bird photography. I started Mike Anderson Bird Photography in 2007, and I plan to have a web site up soon. We travel extensively to find and capture birds with our cameras, and we frequently exhibit our photos locally. I hope you get a chance to see some of them.

And now, dear friends, I depart. But, not too seriously, or too far away.



Mike and Gear



Buffleheads in the Snow

Lower Klamath NWR

2/26/2011