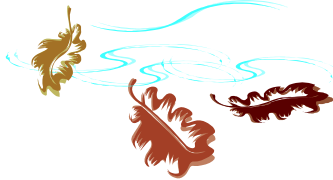


ERE MESSENGER

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Just a Note from the Pres:

Many of the returning ERE students are familiar with ERESA and the activities and services the club provides, but for those new to the halls (or should I say "hall") of Science D here is some information on ERESA.

The Environmental Resources Engineering Student Association (ERESA) is the Humboldt State American Society of Civil Engineers (ASCE) Student Chapter. As a declared ERE major you are automatically considered a member of ERESA. However, it is important to join ASCE (free student membership) to have access to all membership benefits. We are fortunate to have an awesome local professional member ASCE branch (North Coast ASCE Branch) with which to interact.

In case you didn't know, your 2004 ERESA officers are:

Jill Montgomery – *President (Spring 2004)*
 Desi Ramirez – *V. P. (President, Fall '04) & North Coast ASCE Liaison*
 Kris Baker – *Secretary*
 Jayne Nordstrom – *Treasurer*
 Jennifer Beard – *Webmaster & Coffee Table Coordinator*
 Nicole Campbell – *Monthly Speaker Coordinator*
 Eric Stikes – *Service Project Coordinator*
 Nate Sanger – *Special Events Coordinator*
 Eric Zielke – *Public Relations Officer & RESU Liaison*
 Jessa Rego – *SWE Liaison*

With the Fall 2004 semester already in motion, ERESA is gearing up for the Fall Follies and 2005 Officer Elections on Thursday, November 18. So start thinking about becoming an officer – we'll be asking for nominations soon! The Fall Follies is an excellent time to enjoy the company and talents of fellow students and faculty and let's not forget the great food.

Community involvement is important to ERESA. Eric Stikes organized a successful

clean up of ERESA's Adopt-A-Highway section in Manila. Volunteers were able to fill nearly 10 bags with trash. But Eric wouldn't stop there; he also organized a group of ERESA members to participate in the annual Coastal Clean Up Day. *Thanks, Eric!* ERESA is planning a community service project with the Myers Flat Mutual Water System. Everyone is welcome to attend the ERESA meetings on **Mondays at 5pm in Science D Room 17** to offer ideas and suggestions for events and community service projects.

ERESA's main goal is to provide services to ERE students. The services provided include funding for tutoring, special workshops, the ERE Messenger and supplies for the computer lab (i.e. staplers, hole punch, tape). Also, ERESA officers are responsible for organizing fun events each semester such as Fall Follies (Fall), Comedy Night (Spring), Welcome Back BBQ (Fall), Welcome Back Pizza Party (Spring), Graduation Reception (Spring) and Order of the Engineer Ceremony (Spring). All ERE students are encouraged to attend these events. Hopefully you will have a good time, meet some friends, eat some food, commiserate about homework/projects/professors and most of all escape Science D for at least an hour!

ERESA is able to provide these services and events because of our main fundraiser, the *COFFEE TABLE*. I'm sure everyone has been saved by a hot cup of coffee and a freshly toasted bagel from our wonderfully convenient coffee table. Be sure to thank the coffee table volunteers for helping out and remember to sign up next semester for a coffee table shift.

Enjoy the semester!

-Desi

SWE Gears Up for Another Busy Year

submitted by: **Jessa Rego**, ERE Student and current SWE President

You don't have to be a woman or an engineer; you just have to like us! Everyone is invited to attend Society of Women Engineers (SWE) meetings: 8AM, Mondays, Science-D room 23.

Are you interested in getting junior-high girls stoked about river hydraulics and electrical circuits? Or ready to inspire a young person to study math and science who never thought she could? Would you like to make connections with classmates in your program and professional engineers all over the nation?

SWE is a national professional organization that includes student sections, like ours here at HSU. We believe that a diverse group should help achieve SWE's mission. Our vision is that this group includes women, men and engineering, math and science majors. National SWE's mission is to:

- Stimulate women to achieve full potential in careers as engineers and leaders,
- Expand the image of the engineering profession as a positive force in improving the quality of life, and

- Demonstrate the value of diversity.

Our HSU section supports the national mission while tailoring events and activities to meet the needs of our one-of-a-kind community.

If you're looking to broaden your sphere of experience, give back to the community, and have a ton of fun, check out HSU's SWE section. Attend one of our meetings, e-mail us at swe@humboldt.edu or visit our website: www.humboldt.edu/~swe. **ERESA**



Order of Engineer Ring Ceremony Success

Submitted by: **Jayne Nordstrom**, ERE Student

The Environmental Resources Engineering Student Association (ERESA) and the ASCE North Coast Branch held their *first* Order of the Engineer Ring Ceremony on May 13, 2004 at the Warfinger Building in Eureka. The "Order of the Engineer" is a fellowship of engineers who are trained in science and technology and dedicated to the practice, teaching, and administration of their profession, while promoting public recognition and appreciation of the engineering profession.

Forty engineers participated in the Ring Ceremony (11 graduating seniors and 29 professionals). Brent Siemer, Engineer for the City of Eureka and Vice President of the ASCE San Francisco Section, presided over the ceremony. F.G. Alden Burrows, emeritus ERE professor and member of the Canadian Order of the Calling, presented the steel rings to the inductees.

The Order of the Engineer was initiated in the United States to foster a spirit of pride and responsibility in the engineering profession, to bridge the gap between training and experience, and to present to the public a visible symbol identifying the engineer. The first Ring Ceremony was held on June 4, 1970 at Cleveland State Uni-

versity and many more have since followed.

Initiation into the Order includes commitment to the "Obligation", and acceptance of a stainless steel ring to be worn on the little finger of the working hand. Only those who have met the high standards of professional engineering training or experience are invited to accept the Obligation, which is voluntarily received for life. The ring is worn as a visual symbol of the engineering profession in its goal of benefiting mankind. The stainless steel from which the ring is made depicts the strength of the profession. Membership in the organization is offered to all graduates of and seniors in ABET-accredited engineering programs. Inductees also pledge their commitment to a code of ethics that reads, in part: "As an engineer, I pledge to practice integrity and fair dealing, tolerance and respect, and to uphold the devotion to the standards and the dignity of my profession, conscious always that my skill carries with it the obligation to serve humanity by making the best use of my Earth's precious natural wealth."

The City of Eureka graciously donated the use of the Warfinger Building for the ceremony and has offered to make it available for the next Order of the Engineer Ring Ceremony.

ERESA

ERE Awards for the 2003 - 2004 Academic Year

submitted by: **Beth Eschenbach**, Ph.D. Environmental Resources Engineering Department Chair

Awards received by students and faculty honored the Environmental Resources Engineering program during the 2003-2004 academic year. Here's what happened:

2004 Robert Zwihy Public Education.

Peter Lehman received the National Hydrogen Association 2004 Robert Zwihy Public Education.

Student Competition in the National Hydrogen Association

The HSU team placed in the top three out of 17 teams of the first NHA Student Design competition. Their design was titled: H2GO Refueling Station. The following students were on the team: Bryan Jungers – team leader, Gabe Adami, Juliette Bond, David Carter, Anin Gopal, Avram Pealman, Douglas Saucedo, Eric Stikes, Terrance Williams, and Eric Zielke.

Water Quality Competition Team

Once again, HSU- ERE competed strongly and placed fourth overall at the "Water Treatment from Your Kitchen and Beyond" at Corvallis, Oregon this past spring. Our team placed higher than UC Berkeley and UC Davis. In addition, HSU received the highest presentation marks. The ERE students that competed in Corvallis were Adrienne Carter, Andrea Castro, Michael Fritschi, Lisa Hockaday, Bryan Jungers, Michael Layton, and Eric Stikes.

Students were recognized during the ASCE Annual Awards Banquet held at Plaza Grill in April 2003 for the following ERE Department Awards:

Outstanding ERE Graduate

Carlos Diaz, Michelle Livesey, and Andrew Sorter each received recognition as the Outstanding ERE Graduates. This award recognizes a combination of demonstrated best academic achievement and best professional potential in Environmental Resources Engineering by a graduating ERE student.

Carlos is from the Houston, TX area. He was awarded a scholarship in Mechanical Engineering at UVM from IBM, but decided that environmental engineering was more up his alley. Carlos was one of a three-student team who competed in the 2003 international Interdisciplinary Math modeling competition. That team finished first in world out of 80 different teams. He is nominated for Outstanding Academic Student for the College of Natural Resources. Carlos is currently taking many more classes than he ever needed to graduate while maintaining a very high GPA. Carlos has been accepted at Stanford for graduate school and he will be studying in the area of environmental fluid mechanics and hydrology.

Michelle is from Orange County, and she went as far north as possible for in-state tuition. She transferred from Saddleback Junior College in Mission Viejo. She doesn't know why, but she was always supposed to go to HSU. Her dad and a neighbor suggested engineering to her and she was hooked after her first semester. Michelle was also on the three-student team that competed last year in the international Interdisciplinary Math modeling competition that finished first in world out of 80 different teams. Last summer she completed a National Science Foundation Research Experience for Undergraduates with Montana State University. Her academic focus is on water quality and numerical methods. She is now at Montana State University pursuing a masters degree. She has received a Teaching Assistantship and will be in charge of labs for applied hydraulics class in Civil Engineering at MSU. After obtaining her graduate degree, she plans to pursue her career in the consulting arena.

Andy is originally from Arcata. After spending time in Seattle, he found out about the ERE program & SERC and decided to move back to Arcata. He worked at SERC for two years with the single coveted student research engineer position. His plans include working locally for SERC or elsewhere. He has two children (ages 6 and 4). He received the Homer Arnold award last year. He also received the ASHRE award for applied engineering. He has published in the American Journal of Undergraduate Research. He anticipates a return to HSU to obtain a MS in Environmental Systems Engineering.

Homer Arnold Award

Jeremy Svehla received the Homer Arnold Award for demonstrated outstanding achievement in applied Environmental Resources Engineering by an ERE student. One or two ERE students receive this award each year, in honor of former HSU Engineering professor Homer Arnold.

Jeremy is originally from Lakeport, CA. Jeremy chose the ERE program because engineering fascinated. As the son of two HSU graduates, Jeremy realized that working with the environment is needed and is a good cause. Jeremy completed a 3-unit independent project titled **Instream Design Analysis for Stream Bank Stabilization and Restoration in the Lower Van Duzen River**. His project applied RMA2 (a 2-D hydraulic model) to a bioengineering project for stream bank erosion control and habitat creation for adult salmonids. His approach uses rock deflectors to mimic woody debris. He worked with NRCS and the California Department of Fish and Game. The ERE faculty are impressed with his work as his analysis was well above and beyond what NRCS required to complete the project. Jeremy now works with NRCS in Eureka.

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ERE Awards...

(Continued from page 3)

Winzler & Kelly Award

The Winzler & Kelly Award recognizes demonstrated superior leadership in ERE Department related activities and was awarded to Bryan Jungers. Originally from Mohavi Desert, Bryan came to HSU because of the hydrogen program and SERC. Bryan completed the ERE program in 4 years, which included his first year as an environmental science major. He is a past president of ERESA (2003) and was an active ERESA member. Bryan was a co-chair of RESU (Renewable Energy Student Union). Bryan also helped found the HSU Engineers Without Borders (EWB) chapter and is a past-president of this club. He has a minor in leadership. He has been a Living Group Advisor and Assistant Coordinator in the dorms (2001-2003). He served on the student fees committee for CNRS during the spring 2004 semester and did a great job for the college and the department. Bryan led the water quality competition team in 2003 and was part of the spring 2004 team. Bryan was the captain of a design team, consisting of 10 people, for the National Hydrogen Association competition. Bryan spent the summer of 2003 in an internship at UC Davis in the Institute for Transportation Studies and he is now pursuing a masters degree with a research assistantship at UC Davis.

Roscoe-Schenler Award

This ERE award recognizes outstanding potential in Environmental Resources Engineering by a Sophomore/Junior ERE student. This award is in honor of two former HSU Engineering professors: Jim Roscoe and Bill Schenler so it is fitting that two students received the award, Kris Baker and Auriah Milanes.

Kris is originally from Rhode Island. She started as computer science major at UC Boulder, but did not find what she was looking for. In the ERE program she believes she is receiving the preparation to make a significant impact by making a difference in the world. She is currently the ERESA secretary. ERE faculty speak to her academic excellence, her careful work and self motivation. Her area of interest is water resources.

Auriah comes originally from Calistoga, CA. He transferred to HSU from Santa Rosa Junior College. Auriah says he is "a builder at heart". However, he does not want to have others telling him what to build, so he is seeking the preparation to allow him to design what he would like to build. In environmental engineering, he considered Cal Poly. He prefers the alternative technology approach available at HSU. His interest is in water and wastewater systems. ERE faculty speak to his academic excellence, thoroughness, and self education. He is interested international work in water quality in the future. **ERESA**

Overview of 2003-2004 Academic Year

submitted by: **Beth Eschenbach**, Ph.D. ERE Department Chair (based on remarks made at ASCE Awards Dinner April 22, 2004)

Last year was a year of transition and challenges. Barbara Smith, F. Alden Burrows and Bob Gearheart retired last summer. Mary Jo Sweeters became our new department administrative assistant and I became the new department chair after Mike's productive period at the position. It was a difficult year financially, given the statewide budget cuts. Half our faculty was unexpectedly moved from their offices in Karshner house to three trailers during the spring semester due to the start of construction on the Behavioral & Social Sciences building. Two of our faculty lost a parent. Two other faculty members have had significant others with serious health issues and Al Burrows was diagnosed with liver cancer.

Despite these challenges, it was a rewarding year. The ERE department has an amazing group of people. As it became clearer that the college would not support certain courses, people volun-

teered to teach courses; people like Bob Gearheart, Dan Ihara, Peter Lehman, Susan Ornelas and Sheri Woo. As faculty members were not able to teach their courses due to needing to care for their families, others stepped forward to fill in the teaching load; people like Annje Dodd, Lonny Grafman, Anin Gopal, Margaret Lang, Peter Lehman, Antonio Reis, Daryl Van Dyke and Sheri Woo. When I was not able to complete my responsibilities as chair due to covering other classes, people stepped forward to assist me; people like Eileen Cashman, Brad Finney and Mary Jo Sweeters. We have a great team of people making our department work. I am proud to be a member of our faculty.

Our students have accomplished much this year. Two new student organizations were started – Engineers Without Borders (EWB) and the Renewable Energy Student Union (RESU). EWB has accomplished much this year. They traveled to El Salvador for their first pro-

ject and gave a presentation about the project at the National EWB Conference. In addition, three of HSU members were awarded scholarships to attend that conference.

Our department was one of a handful of departments at HSU allowed to search for new faculty this year. I partially attribute our success to RESU's activism. RESU officers started a petition and met with the dean of our college to convey the message that our program needs more faculty. I am happy to say that we have hired two new faculty members in January 2004: Arne Jacobsen and Dustin Poppendieck. Arne is leading the International Development and Technology program as well as teaching renewable energy courses. Dustin is teaching introductory courses and will be teaching air quality and soil remediation. We are very fortunate and feel much support from our administration

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Renewable Energy is Students' Top Priority

submitted by: **Stephen Kullman**, ERE student and RESU member

ERE Students Dave Carter, Kelly Miess and Doug Saucedo formed the Renewable Energy Student Union (RESU) in the Fall 2003 semester in response to the dwindling nature of the renewable energy aspect of the ERE program. After organizing interested students RESU pursued their initial goal of encouraging the university and department to hire new faculty with tabling, a petition with over 200 signatures, and lobbying the ERE Department Chair and the Dean of the College of Natural Resources and Sciences. In the Spring of 2005, two new faculty members will join the department.

After the wild success of their first objective, the members of RESU began looking for new projects that fit with the mission of strengthening the renewable energy aspect of the ERE program. RESU was instrumental in initiating the Schatz Energy Center's (SERC) docent program, which provides volunteer opportunities for ERE students. Currently, five students act as docents at SERC, helping educate the public on renewable energy. Another one of RESU's projects has been the creation of a solar radiation monitoring station at HSU. This includes the acquisition and installation of a pyranometer on the roof of Science D. This equipment will provide real insolation data for the Arcata area, which was previously interpolated from data collected elsewhere. The pyranometer has been purchased and is ready for installation, but quite a bit of work remains before real data logging can begin.

Perhaps RESU's most exciting (and time-consuming) project has been the National Hydrogen Association's (NHA) annual hydrogen design contests. Last year, members of RESU formed a multi-departmental team of students to



After clarifying the rules for the National Hydrogen Association's 2nd annual contest, RESU members show a little togetherness.

represent HSU designing a hydrogen refueling station. Not only did HSU take third place overall, beating out teams from much larger and well-known universities, but also took first place for teams using renewable sources of electricity. Furthermore, the point spread between first and third place was a mere 1.5 out of 115!

Members are beginning to gear up to win this year's contest, which involves designing a hydrogen power park (that's okay, we weren't exactly clear what that meant, either). During a conference call to discuss the rules, RESU learned that there are already 70 competing universities from 15 different countries. The final design will be a facility able to produce, store, distribute, and consume energy produced using hydrogen technology.

Participation in RESU is welcome to any interested parties. RESU meets on Thursday, 9:30 am, in Science D Room 23. The NHA competition meeting follows immediately at 10 am. RESU's website, designed by Eric Zielke, can be found

at <http://www.humboldt.edu/~eaz4/RESU>. A more convenient URL is in the works. For more information, come to a meeting or contact Douglas Saucedo at drs37@humboldt.edu. **ERESA**



CALENDAR OF EVENTS

<i>October</i>	ASCE One-on-One Pizza
<i>November</i>	Fall Follies ERESA Officer Elections Thanksgiving Break
<i>December</i>	Winter Break
<i>January</i>	Spring Session Begins
<i>February</i>	National Engineers Week
<i>March</i>	Spring Break
<i>April</i>	Comedy Night ASCE Awards Banquet
<i>May</i>	Order of the Engineer Ring Ceremony Commencement

ASCE Policy 465 - "Raising the Bar"

Editorial submitted by: **Nancy Atkinson, P.E.**

Editors Note: The views expressed in editorials are those of the authors alone. They do not represent the views or opinions of the ERE Messenger or its staff, nor do they represent the views or opinions of ERESA or Humboldt State University.

American Society of Civil Engineers national leadership, actively lead by current and past ASCE Presidents, is stridently advocating that a Master's degree be the minimum academic degree required before anyone can qualify to sit for a State engineering licensing exam. The official name for this idea is the "**Academic Prerequisites for Licensure and Professional Practice**," ASCE Policy Statement 465. This policy is also known as "Raising the Bar." From the ASCE.org website:

"Policy The American Society of Civil Engineers (ASCE) supports the concept of the Master's degree or Equivalent as a prerequisite for licensure and the practice of civil engineering at a professional level."

This policy has been approved by the ASCE Task Committee on the First Professional Degree on May 7, 2001, approved by the Board Policy Team on August 16, 2001, and adopted by the Board of Direction on October 8, 2001. When ASCE

leadership gains support and acceptance for this increase in compulsory academic qualifications, all students graduating with a Bachelor's had better plan on a minimum of two or more years of graduate school if they ever hope to be a licensed engineer. This could happen by 2020.

I participated in a leadership conference last March and heard a lot about the deficiencies in my education. According to ASCE national leadership, many senior engineers believe that today's engineering students are not as well educated nowadays as engineers were in the past. They claim that 20-30 years ago, engineering students had to work harder and take more classes. Undergraduate students are now ill-prepared, and that lack of competence to face a more complicated work environment can be restored by requiring many more years of school.

At the leadership conference, when ASCE national leaders

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Alumnus Profile

submitted by: **Frank Garofalow** -Manager, Environmental Management Branch, Blue Mountains City Council

Despite my best efforts I graduated from HSU in December 1993, although my senior project was submitted in January 1994. That was a great Christmas and New Years of staring at a computer screen for hours on end. I was in such a rush to get it in that I failed to notice two typos on the front cover.



Chasing (and catching) love I migrated to Australia almost immediately after finishing my degree. Arriving in the land of wonder the land down under I started my job search. I was able to get some work with the Australian National Physics Laboratory doing some basic computer support. As this job was not the career path I was looking for I started applying to any relevant position that came up. On average I was applying for 20 jobs a month. After seven agonising months, I finally scored a good job as Environment Officer with Wyong Shire Council.

Wyong Shire Council is equivalent to a County local government in the US and covered a large coastal area with a forested hinterland, urbanized coastal plain and three large estuarine lakes. My role was responsibility for all environmental management activities including estuary management activities, water quality testing, native vegetation management, and stormwater/urban runoff issues.

While working I commenced and completed a Masters of Science in Environmental Management at the University of New England. The focus of my studies was on native Australian ecosystems management. In particular I studied threatened species management and ecosystems restoration.

I moved on from Wyong Shire Council to Blue Mountains City Council where I am presently employed. Blue Mountains City Council is located in a World Heritage listed area of amazing beauty and environmental significance. I hold the position of Manager, Environmental Management Branch. The Branch has a staff of 22 and an annual budget of \$14 million. The core responsibilities of the Branch are Waste, Natural Systems, and Bushfire and Emergency Management.

In terms of Waste Management the Branch has a weekly collection of domestic waste, recycling, and bulky waste and provides a green waste chipping service to 30,000 residences. The Branch also manages 2 open and 2 closed waste management facilities. The Natural Systems Section manages 22,000 hectares of native bushland. Primary natural systems programs include weed control, native vegetation and threatened species management, water quality testing and streambank restoration, and nature based recreation management. The Bushfire and Emergency Management Section is responsible for emergency preparedness and response, mechanical and prescribed burning fuel reduction, and fire mitigation planning.

I loved my time at HSU and the skills I learned through the ERE degree assist me everyday. **ERESA**

“Raising the Bar”

(Continued from page 6)

spoke to a large group of students and younger ASCE members (a group who might be indignant that *anyone* would describe their education as mediocre, or not as arduous as the four-year program in 1940), they referred to the mandatory Master's Degree policy as "additional education after the undergraduate degree." This variation in terminology may have been an attempt to gain support for the policy from these beginning engineers. They may be misguided in their attempt to play to the younger members. These soon-to-be and recent graduates, might shudder to think of spending nights and weekends taking on-line graduate courses for the next three to six years while they work 50 to 60 hours per week, and find time to care for their second child.

The "raising of the bar" seems laudable: engineers need to be up to speed about such things as politics and business in order to make good decisions, and protect the public interest and safety. I'm not saying that taking classes after graduation is unnecessary or asking "too much" from a professional. I think additional training is a situational choice to meet personal professional goals, and I welcome that kind of opportunity.

While I understand how life-long learning is an engineer's aspiration, I just don't agree that the additional graduate-level academics will be more effective than on-the-job experience and mentorship in achieving professional competence. If most new engineers lack vital knowledge, as claimed by ASCE, then private firms and agencies should "Step Up to the Plate." This approach may cause some of the engineering community to balk. More of the onus for professional improvement would be laid at the feet of senior engineers and their consulting firms, instead of the individual engineering student.

Academics can also participate in my "Step Up to the Plate" plan. As an alternative to adding more classes, the undergraduate engineering curriculum could be improved to prepare students for the kind of work that engineers might do in the future. Professors could be trained to teach. Secondary education could also be improved to support the college curriculum.

If the problem is "academic," how will choosing more classes from a limited curriculum help anyone to develop abilities that will be needed for a career that will change rapidly over the course of a lifetime? There are those who may equate education with ability. Students know the difference. Ability comes from a combination of backbone, experience and education, and more often than not, large parts of an excellent education can remain dormant for years. Brilliance at academic pursuits does not automatically forecast triumph or effectiveness as a working professional. A discipline like

engineering is a combination of knowledge and practice. A clever student will learn to teach herself. That ability and skill should be fostered during an undergraduate program.

There are real hardships and obstacles that need to be overcome in order to have an opportunity to earn a Master's. With limited graduate school openings, competition between students would be atrociously fierce. It has been my experience that one of the most harmful academic skills passed on to the professional world is competitiveness. I have worked with people who won't share information, and refused to be effective team members because they want to be "first." They want to be the best, and the smartest in the office; keeping secrets and not sharing information are some of the tools that made them successful in school.

Students with limited resources, and who don't win those sought after scholarships, won't be going directly on to graduate school. This group has historically included women and minorities. Students with families to support may need to find a job after graduation. Students that delay graduate school will be forced to start paying back their debt.

This proposed policy will keep unlicensed engineers from qualifying to sit for the exam unless their firm or agency supports their "additional education" for a number of years. I have heard

of isolated cases where firms paid for seminars, and allowed time off (unpaid) so that employees could pursue course work, but I have never heard of a firm that would be willing to significantly support an employee through four years of part time enrollment in graduate school, and accept the lack of productivity from an employee that was so distracted from work. Most employers want your best efforts and attentions, and as much of that as they can get. However they do have policies that sound good, including reimbursement of tuition after successful completion, as long as you are continue to be billable, and are willing to do your school work some other time than their time. If you are not a valuable employee, how can they justify any expense? This could work for some people. Perhaps baccalaureates looking to be licensed will only be hired by larger firms and agencies. I can imagine that large State agencies would be even more attractive employers to someone looking for good educational benefits. Who would go into consulting?

Along with concerns about how all of this "additional education" would actually materialize, I have my doubts that the motivations of the "Raise the Bar" policy are completely lofty. Could striving for more competency in the engineering pool of talent be a smoke screen? Other motivations, less attractive, more self-serving motivations, may make the Master's requirement seem enticing. As a new engineer, I heard grumbling from a senior engineer about the changes that have occurred in the engineering profession in the last 15 years. He told me that an engineer used to be more revered for his

Do they think that engineers are in danger of becoming the "Rodney Dangerfields" of the licensed professionals?

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Working at the Schatz Energy Research Center

The Schatz Energy Research Center (SERC), located in the Annex on the HSU campus, is dedicated to the sustainable use of renewable energy resources and to educating the public about issues related to energy. In addition, SERC provides employment opportunities for students through volunteer positions, internships, and student assistant positions. This past summer, four interns were employed by SERC to carry out two separate projects.

One internship involved a partnership between SERC, the Redwood National and State Parks and HSU with goals of reducing energy consumption and designing a photovoltaic system for the Kuchel Visitor Center. This internship was funded through the University-National Park Energy Partnership Program (UNPEPP).

The other internship was a joint effort between SERC and the Yurok tribe to bring electricity to an off-grid rural residence on the Yurok reservation. The Yurok project included the design and installation of a stand-alone photovoltaic system.

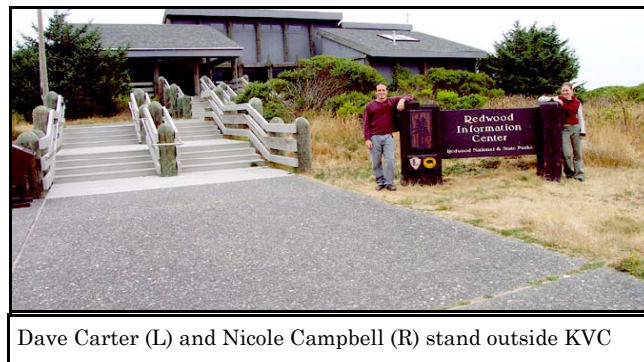
As interns, all four of us had a great experience working with SERC research engineers. Each of our projects was supported by two "mentors" from the staff, although everyone at the lab was gracious with their time and knowledge. Our mentors included Richard Engel (both projects), Angi Sorensen and Jim Zoellick. Guidance provided by the folks at the lab assured that both projects were successful and resulted in a great learning experience for the four of us. So, from all of the 2004 interns: **THANKS SERC!!!**

UNPEPP Interns

Submitted by: **Nicole Campbell** and **Dave Carter**, ERE Students

UNPEPP is a national program that provides work experience for university students while helping the Na-

tional Park system reduce its fossil fuel use. The focus of our summer project was the Redwood National and State Park's (RNSP) Kuchel Visitor Center (KVC). This facility is located on the beach about two miles south of Orick, California. KVC acts as a gateway to the redwoods of Northern California. In the summer of 2002, Andy Sorter and Kelly Miess were hired by SERC to design and install a solar water heating system to replace the electric resistance wa-



Dave Carter (L) and Nicole Campbell (R) stand outside KVC

ter heater at KVC. As part of their project, Kelly and Andy also conducted an energy audit of the facility. The purposes of our project were to: conduct an in-depth energy audit; identify, research, and recommend efficiency/conservation measures; and design a grid-connected photovoltaic (PV) system for KVC.

After researching efficient lighting, we found energy efficient upgrades that could supply similar, and in some cases improved light quality while reducing the power use. In addition, we researched sensors and timers that would reduce the duty cycle of the restroom lights and outdoor lights. If installed, the energy efficient upgrades we recommended would reduce the monthly electricity bill by 45%.

Next was our PV design. As requested by the park staff, we created three alternative PV system designs. The system sizes were 6 kW DC, 9 kW DC, and a combined design of 15 kW DC. These systems would cover 36%, 55%, and 91% (respectively) of

the electricity bill, after efficiency upgrades. The smallest system was to be mounted on the east-facing roof of the main building (adjacent to the roof that houses Andy and Kelly's solar water heater). The 9 kW system was to be mounted on the middle west-facing roof. The 15 kW system was a combination of the two smaller systems.

Working with the RNSP staff was a great experience. We met with them

at various points in our internship. They gave us enthusiastic feedback at each meeting. After the presentation of our results, the park staff was quite amazed that they could reduce their electricity bill by 91% and therefore improve their image as a

model of clean and sustainable energy technologies. RNSP staff made it clear to us that they wanted to install the largest PV system as well as all the energy efficient upgrades we recommended. RNSP's next step is to apply for the necessary funding for equipment and installation of the lighting technologies and PV system. Look towards Orick and in the near future you may see a grand PV system providing power and light to RNSP's Kuchel Visitor Center.

Yurok Interns

Submitted by: **Justin Daily** and **Dustin Jolley**, ERE Students

The Yurok tribe is in the process of implementing a rural electrification program for residents of the reservation that are currently living without reliable electricity. Gaylord and Marilyn Lewis live in an area far from the reach of the power grid so by far the most economical solution for them was an off-grid photovoltaic system. The tribe hired SERC to do the job as an educational opportunity.

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Working at SERC

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SERC then hired us as the interns to carry out the design and installation of the system. In addition, the Yurok tribe had 2 high school interns interested in learning about renewable energy so we mentored students R.T. Jones and Dalynn Nova through the process. The project coordinator for the Yuroks and our tribal correspondent was Lavina Brooks.

The first two-week phase of the internship consisted of classroom education and training about the basics of electricity and renewable energy. Research engineers Jim Zoellick and Richard Engel from SERC were our primary advisors during the project and they conducted the training and education phase of the project. We covered not only the basics of electricity and photovoltaic system design but also battery backup systems, micro-hydro generation, and efficiency.

Next, it was our job to design a quality stand-alone photovoltaic system for the Lewis family. We examined insolation data taken at nearby Butler Valley for determining the size of the array and battery backup. An initial site visit consisted of an energy audit on the house's existing loads modified for some projected ones, and an evaluation of many different possible locations for the array. The evaluation of the solar window was accomplished largely by using a Solar Pathfinder. The optimal location and solar window ended up being about 50 feet east of the house in the back yard. Do to limited space inside the house we decided to place all of the components of the system outside under the array in rain-tight enclosures. This made for a nice, compact, modular type design that could be implemented virtually anywhere to generate both AC and DC electricity.

David Katz, the owner of Alternative Energy Engineering in Redway gave SERC a distributor account so that we could thankfully order compo-



Left to right: Justin Daily, Yurok Tribal Elders and recipients of power system - Gaylord and Marilyn Lewis, and Dustin Jolley in front of completed Remote PV power system.

nents at wholesale prices. We decided on Outback Power System components for the inverter and charge controller because of their proven dependability and quality. Extensive research was done to ensure that every aspect of this system was of the highest quality. Rolls brand batteries were chosen as our energy storage media. These batteries are damn heavy (300 lb. each), but are specially designed for this type of application (deep cycle), and are commonly known to last 10 to 15 years or more. Each battery is 12VDC with about 500 amp-hours of energy storage.

The well known local solar wizard Roger helped us with occasional advice and was the one to do the final inspection before turning on the power, he also was able to supply us with 8, 185 watt (24 volt nominal, 14.2% efficient) Sharp modules at a discount. These are some of the best PV modules available on the market right now and are in very high demand making them difficult to get a hold of for the average homeowner.

The eight 185W PV modules were

“pole-mounted” on a 6-inch diameter iron pipe that was secured in a concrete footing 4.5 feet in the ground.

Mark Rocheleau of SERC was kind enough to accompany us one day to the job site to help build the platform that all of the components were to be placed on. ‘Nuff respect to Mark.

Overall System Specs:

PV Array:

1480W wired at 48VDC

V_{oc} : 89.8 VDC

I_{sc} : 23 A

Battery Bank:

800 amp-hours of storage at 80% depth of discharge @ 100 hr. draw rate.

Wired at 24VDC nominal.

We were originally installing the system in a different location, but due to a common legal issue in Humboldt County, we were forced to move during the middle of our timeline to a new reservation residence. We felt lucky to be able to continue with the project at all, because for a bit it looked like the whole project may be cancelled. With the decision to move to a new location, came the need for some quick recovery and adaptation. All of the equipment and design work was specific to the original residence and all of the gear had already been ordered! With the beginning of the semester approaching fast, we only had a couple of weeks left. We found that with some speedy changes in design, we could make it work with only a few changes of some of the more minor pieces of equipment. In the end, everything came together beautifully.

The Tribe, not to mention the recipients of the system, were quite pleased with the outcome of this project, and much talk has already gone on about similar projects in the future. Stay tuned for more RE projects with SERC in summers to come. This was a huge learning experience and was valuable and meaningful on many different levels. Thanks to everyone for this opportunity. **ERESA**

ENGINEERS WITHOUT BORDERS TRAVELS TO EL SALVADOR

Submitted by: **Vernon Bevan**, ERE Student

Many people have heard of Doctors Without Borders. However, most people are unaware of a similar organization called Engineers Without Borders. Engineers Without Borders (EWB) is a network of nearly two dozen humanitarian organizations primarily made up of national EWB organizations that have emerged over the last two decades. The primary goals of EWB are twofold: to assist disadvantaged groups improve their quality of life by helping them implement environmentally and economically sustainable engineering projects and training a new generation of internationally responsible engineering students.

Last year a number of engineering students got together to form a Humboldt State Chapter. Additionally, Environmental Resources Engineering professors Dr. Robert Gearheart, Dr. Al Burrows and former departmental secretary Barbara Smith agreed to act as advisors. After gaining status as a chapter of EWB – USA, the next step was to find a project. Through a contact in El Salvador, established by Barbara Smith, ties were formed with LUX Development, an international aid organization based in Luxembourg and working in San Agustin, El Salvador. Over the past six years El Salvador has been hit by four major natural disasters. In 1998 the country was hit by hurricane Mitch. Then between 2001 and 2003, El Salvador was rocked by three major earthquakes that did extensive damage to the country. San Agustin was hit particularly hard with virtually all of its homes destroyed. In addition to restoring the critical infrastructure of San Agustin, LUX Development rebuilt 425 of the homes that had been demolished in the last earthquake. To carry out the housing construction project, residents of the municipality were trained as masons, welders and electricians.

Communication ensued between Dr.

Gearhart and George Burri of LUX Development in order to determine how EWB-HSU could contribute to LUX Development's reconstruction efforts. Between them they decided that EWB-HSU would perform an environmental engineering site assessment that would not only assess the reconstruction efforts that had been carried out, but

which would also highlight needs of the community for any future collaboration.

Immediately after the ending of spring semester, 12 members of EWB-HSU departed for San Agustin for two weeks to carry out the site assessment. The reception of the local community was outstanding. All of the team's housing needs had been taken care of and there was a banner outside of their lodging welcoming them.

After getting settled in, the first order of business was to take a tour of the village and meet local people involved in the reconstruction efforts. It was important for the team to learn what international, national and local organizations were involved and how they worked together to rebuild San Agustin. It was also important to find out what reconstruction efforts had been carried out, which were presently underway and what was being planned for the future. It quickly became obvious there was a lot more to just showing up and implementing an engineering project. There was a whole range of a of individuals, organizations and interests that needed to be taken into account. Before any real work could begin it was necessary to build trust and relationships first. Therefore the first few days consisted of the students visiting the various projects being carried out in the village, meeting the local people and learning about the history of San Agustin.



After getting a feel for the local area, students split into groups to begin work on various projects including; collecting demographic data, carrying out a topographical survey, conducting a survey of stormwater runoff and evaluating the current water supply and distribution system.

After two weeks of collecting information, the team returned home to collate the data and begin writing reports. This was important not only to understand what was done, but also to identify possibilities for future collaborations with the community of San Agustin. This initial project was an exceptional learning experience for all of the students involved and would not have been possible without a great deal of assistance from the people of San Agustin, LUX Development and all of the sponsors from our local area who helped to fund the trip.



HSU-EWB presented our San Agustin Project at the national EWB conference in Denver, Colorado on the 24th of September. Three students and three professionals attended the conference. Each of the students received a \$500 scholarship from ASCE/ASME through national Engineers Without Borders to attend the conference.

With the site assessment completed, EWB-HSU is already planning another trip to implement a project based on the findings of the assessment and the needs identified by the local people. In addition, this year EWB-HSU is looking to expand its membership beyond engineering students. Anyone who is interested is welcome to attend club meetings which are held Mondays at 5:00 in room 17. **ERESA**

“Raising the Bar”

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expertise. An engineer would be consulted to solve a problem in much the same way that a doctor would be consulted to diagnose and heal an illness. According to my former coworker, engineering services are now a commodity. Firms are forced to work at competitive rates; clients have their own ideas and don't want to listen to experts. He told me he was glad he didn't have that many years left to practice before retirement. Would you "second guess" your doctor? Or your attorney? Would you compare rates?

In the rhetoric supporting the "Raise the Bar" policy, ASCE national leaders also compared engineering to medicine and law. At the leadership conference, they showed a chart that compared the salaries for lawyers and doctors with salaries for engineers, and pointed out that doctors are making a lot more money than engineers. Elevated rates charged by doctors were correlated with the number of years they spent in school, not the cost of their malpractice insurance. In our society, there are many people who associate earnings with importance or status. The ASCE web site contains this paragraph supporting the mandatory Master's that hints at what my former coworker complained about:

“Four years of formal schooling were considered the standard for three professions (medicine, law, and engineering) 100 years ago, and while medicine and law education lengthened with the growing demands of their respective professions engineering education did not. Perhaps this retention of a four-year undergraduate engineering education has contributed to the lowered esteem of engineering in the eyes of society, and the commensurate decline in compensation of engineers relative to medical doctors and lawyers.”

Do they think that engineers are in danger of becoming the "Rodney Dangerfields" of the licensed professionals?

The mandatory Masters will make a license more valuable. With more obstacles to getting a license, the lucky ones who already have their licenses could benefit from a shortage of qualified professionals, decreased competition for choice positions, and may be able to demand higher salaries. I wonder how the money will be raised to increase civil engineer's salaries overall? Will this mean increased costs for public improvement projects where funding is so limited now? Will licensed engineers be scarcer than hen's teeth and staff engineers do all the work?

Salaries have not soared, or ever been as lucrative, as in some other professions, but let's be proud to be engineers. There are many reasons that engineering attracts talented people. Sometimes engineers like to work as a team to develop strategies, to solve problems, and to challenge themselves to learn. Some engineers don't have a problem with a perceived lack of status or authority, want to make the world a better place and are eager to teach skills to new engineers. The work environment will expose new engineers to real-world dynamics and constraints that they may not have been exposed to in the

academic environment. Let's have more faith in each other to help the young and talented along, and not create artificial barriers that may exclude creative and gifted people. The world will need all kinds of help to solve problems in the future.

I'm sure that you know someone, or even a few of your fellow students who will be going on to graduate school after earning a Bachelors degree, and possibly you wish you could be among them. I know I did. Had this proposed Masters prerequisite been in effect when I graduated in 1997, I would have been limited to a non-engineering career or a career in planning or government where I would never be asked to stamp my work. Luckily, that did not happen to me. My options were open.

So what am I worried about? I would like to see a more diversified student body that can bring perspectives, life experiences, and communication skills to the engineering field. I would like to see academics, engineering firms and agencies "Step Up to the Plate," and take some responsibility by nurturing and training new engineers, and investing some of their assets into professional development. I think it is too much to ask of individual students to take all of the responsibility for the perceived lack in academic and engineering competency. Let's look to the academic institutions to enhance the undergraduate curriculum and redeem our education from its perceived irrelevancy. And, if a person is a self-starter, let them use their talents and motivation to grow professionally, instead of adding one more giant hurdle.

Nancy is a 1997 graduate of the Humboldt State Environmental Resources Engineering Program, and works locally as a civil engineer. She is also the current Vice-President of the North Coast Branch of

Overview of the 2003-2004 Academic Year

(Continued from page 4)

during such tough period for the university.

Support for the ERE program also comes from our alumni. Jay Bower (1984 ERE graduate) Principle and Chief Operating Officer of Landau Associates started a \$500/semester scholarship sponsored by Landau Associates.

The last major event of the 2003-2004 academic year is Ron Chaney's decision to retire. We are grateful for his years of contributions to the ERE program and appreciate him teaching during the fall semester. Please congratulate Ron when you see him. **ERESA**

ERE SHIRTS FOR SALE

ERESA has limited a limited quantity of shirts for sale. Available for purchase are short sleeve t-shirts, baseball t-shirts and hooded sweatshirts. All shirts feature the HSU logo with Environmental Resources Engineering on the front and a very cool design by ERE graduate Greg Orem on the back. T-shirts are \$15.00 and hoody's are \$30.00. Contact Jayne at jln22@humboldt.edu for availability.

**E.R.E.S.A.
STUDENT CHAPTER
AMERICAN SOCIETY OF CIVIL ENGINEERS**

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Letter from the Editor

I hope you have enjoyed this issue of the ERE Messenger. This should give you just a small peak into the lives and activities of the ERE students and faculty. Thank you to all the contributors in this edition.

Please contact us with your stories and news. Advertising is available upon request for a minimal fee. Contact eresahumboldt.edu to submit your news item or place an advertisement.

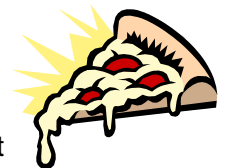
The Messenger is looking for a new editor. Please contact ERESA if you are interested.

Sincerely,

Jayne

Jayne Nordstrom
ERE Messenger Editor

ASCE One-on-One Pizza Dinner



The ASCE One-on-One Pizza Dinner will be held at Round Table Pizza on Thursday, October 7th starting at 6pm.

The dinner is a great opportunity to meet engineering professionals in a casual atmosphere. Pizza will be provided by the North Coast Branch of ASCE. See you there!

SWE BOWLING NIGHT



Need a break?

Join SWE in their annual bowling night at the E&O Bowl in Blue Lake on Thursday, October 14th.

Refreshments will be provided! For more information and carpooling arrangements con-

tact SWE at swe@humboldt.edu.