Watershed Moment
Shedding Light on Cleaner Drinking Water

Changing the Global Landscape
Civil engineers as environmental engineers

Remote Sensing
A view from above
On My Mind

Welcome back to Impact, the second installment of our new magazine for the School of Civil Engineering. As we go to press in late May, our newest graduates (see a few of them on page 18) have just marched in caps and gowns. It’s an exciting time to have a civil engineering degree in hand. Most of our graduating students received two and three job offers as early as last year’s Homecoming weekend.

The world demand for civil engineers is great, and we cannot educate enough of them to respond to all the opportunities. Graduates will begin careers this summer in a wide array of industries: from construction to infrastructure, waterways to roadways. To echo the sentiments of alumna Joan Miller (BSCE ’79), civil engineers are making a world of difference.

Today’s civil engineers work in many fields. Within this themed issue of Impact, we’re focusing on the environmental engineering area. One of our faculty members, Ernest “Chip” Blatchley, has teamed up with students and colleagues across campus to develop technology to ensure safe drinking water. According to the World Health Organization, a staggering 80 percent of all illness worldwide is attributable to unsafe and inadequate water supply and sanitation. Please read about the impact of one civil engineer on public health and the environment.

In future issues, we’ll explore where civil engineers contribute to other areas. For now, I hope you’ll enjoy this look into a few of our efforts—from students, faculty, and alumni—on how we’re helping engineer a better environment.

M. Katherine Banks
Professor and Interim Head

Civil Correspondence

We have heard some grapevine rumbles concerning what people thought about the premier issue of Civil Engineering Impact, but we would like to hear more. What would you like to see in future issues? What’s on your mind about the ever-changing world of civil engineering? We did get a nice comment from one alumnus. John Kinnaman (BSCE ’48) wrote:

Congratulations!
In sixty years this is the first Purdue publication I have read from cover to cover. Thanks.

That wasn’t very civil
In our first “Up Close: Alumni” feature, we had the wrong photo of Philip Stutes (BSCE ’75). He actually looks like this.

Good news
Cindy Lawley, the manager of alumni relations and communications, reports that Rachel Ulrich (her photo at left) is alive and well in Ohio. Her nephew contacted the Purdue Alumni Association after being alerted to the “Check it Out” article in the last issue. She has since been reunited with the personal memorabilia, and the mystery of the 50-year old box has been solved. Special thanks to Bill Ridgely for bringing the mystery to our attention.

Send your e-mails to peimpact@purdue.edu

Cover illustration by Susan Ferringer • iStockphotos
UP FRONT
A message from the school’s head and response to the first issue.

COMING UP
What’s on the civil engineering calendar.

AROUND CE
A new internship and co-op initiative.
Faculty news.

IN MY VIEW
Civil engineers making a world of difference.

COVER
A research trio and their drinking-water breakthroughs.

UP CLOSE: FACULTY
How one professor is taking remote sensing to new heights at Purdue.
And how another is miniaturizing a lab for on-site sensing in the field.

UP CLOSE: ALUMNI
One alumna who’s climbing the corporate ladder outdoors.

UP CLOSE: STUDENTS
A student fund-raiser overhauls a student lounge.
An all-nighter raises money to fight cancer.

ALUMNI NEWS
Class notes and CEAAA honorees.

CHECK IT OUT
Looking for your memories of Ross Camp.
## Calendar 2006

### September
- **9** Ross Summer Camp Reunion
- **23** CE Homecoming Breakfast
  - Football: Purdue vs. Minnesota

### November
- **TBA** Alumni Reception

### December
- **17** Winter Commencent Reception

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### Purdue University

#### COLLEGE OF ENGINEERING

**School of Civil Engineering**
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- Professor and Interim Head: M. Katherine Banks
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**Civil Engineering Impact**

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To make a gift to the School of Civil Engineering, or to learn more about renovation plans for the CE Building, please contact

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Gerald (MSCE ’56) and Edna Mann provided major funding for The Gerald D. and Edna E. Mann Hall, which will house the e-Enterprise Center in Discovery Park. Mann Hall will be home to the administrative functions of the Center for Advanced Manufacturing, the Regenstrief Center for Healthcare Engineering, the Purdue Homeland Security Institute, the Purdue Terrestrial Observatory, the Indiana Center for Cultural Exchange, and the National Institute for Pharmaceutical Technology and Education. It will provide significant research and lab space for other Discovery Park projects.
Enhancing the Two-Way Exchange

Civil Engineering will provide greater opportunities for internships and cooperative education for students while increasing its outreach with companies.

If education and outreach are a two-way street, the School of Civil Engineering hopes to increase traffic on both sides of the yellow line. The Industrial Relations Program for Civil Engineering and Construction Engineering and Management (CEM) should help develop career paths for students and also provide technical solutions for companies. And Bryan Hubbard hopes to be the conduit between Purdue and its industrial partners.

Led by Hubbard, who has served since 2002 as the director of internships for CEM, the new program will help promote research initiatives for companies, foster potential partnering opportunities between faculty members in civil engineering and industry, and expand the school’s cooperative education opportunities for students. Co-op students work with companies as part of their educational experience.

“Cooperative education enables our students to get actively involved with companies,” says Hubbard. “And we’re looking for companies to get even more involved with our students in many different ways, whether it is through cooperative education and internships for undergrads or working with our graduate students.”

As director of internships, Hubbard places and supervises more than 140 students per year. He has helped forge and maintain partnerships with companies such as HNTP Corp., Bowen Engineering Corp., American Consulting, Inc., and Trayler Brothers Inc.

“Bryan will continue to lead the internship program for construction engineering and management and also will develop new co-op and internship initiatives for civil engineering,” says Kathy Banks, interim head and professor of civil engineering. “Bryan’s role in both programs presents an excellent opportunity to coordinate professional practice opportunities for the students in all areas of civil and construction engineering.”

Companies interested in finding out more information can contact Hubbard at (765) 494-2241, or bhubbard@purdue.edu.
Faculty on the Up-and-Up
Our civil engineering faculty is making headlines and headway.

Awards

Dulcy Abraham was awarded the Boeing Leadership Award by the College of Engineering. This award recognizes excellence in faculty leadership that promotes a culture of diversity.

Ernest “Chip” Blatchley was awarded the William W. Edgar Pioneer Award. This award is given by the Water Environment Federation to an engineer or scientist for his or her pioneering work in the area of disinfection. See related story on page 6.

Robert Frosh received the 2006 Outstanding Young Alumnus award at the University of Texas in Austin. This award recognizes an alumnus under the age of 40 who has distinguished himself or herself with outstanding service and contributions to the engineering profession.

Julio Ramirez was awarded the American Concrete Institute’s Joe W. Kelly Award for dedicated teaching and research in the area of reinforced concrete.

Rodrigo Salgado received the Prakash Research Award at the ASCE/GI Geo-Congress held in Atlanta in March 2006. He was recognized for his contributions in the analysis of the load response of foundations, the static and liquefaction response of nontextbook soils, and seismic slope stability analysis.

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Promotions

Phillip Dunston was promoted to associate professor of civil engineering.

Srinivas Peeta was promoted to full professor of civil engineering.

Appointments

Darcy Bullock was named a University Faculty Scholar, as recommended by a special committee of engineering distinguished professors. This five-year appointment is based on a combination of his research contributions in transportation, successful mentoring of students as a classroom teacher, research adviser, assistant head in the civil engineering graduate program, student organization sponsor, and leadership in service to civil engineering.

Vincent Drnevich was elected vice president of the Indiana Society of Professional Engineers. Founded in 1934, the National Society of Professional Engineers (NSPE) strengthens the engineering profession by promoting engineering licensure and ethics, enhancing the engineer image, advocating and protecting PEs’ legal rights at the national and state levels, publishing news of the profession, providing continuing education opportunities, and much more.

Kumares Sinha, the Edgar B. and Hedwig M. Olson Distinguished Professor, was inducted as an honorary member into the American Society of Civil Engineers (ASCE) for his contributions in research, education, and practice of transportation engineering worldwide. This is the highest honor awarded in ASCE, received by only 534 engineers in its 153-year history.

Best Papers

Darcy Bullock and coauthors received the Transportation Research Board D. Grant Mickle Award for best paper in the area of operations and maintenance. The paper, “Evaluation of Stop Bar Video Detection Accuracy at Signalized Intersections,” was written by Avery Rhodes (MSCE ’05), Bullock, Zachary Clark (a current undergraduate), James Sturdevant (USDOT), and Dave Candey (Econolite Control Products).

Jason Weiss and Jan Olek were recently honored with the Bengt Friberg Award for Best Paper Award, along with a former student, Narayanan Neithalath, at the 8th International Conference on Concrete Pavements.
Making a World of Difference

Civil engineers are at the forefront of environmental engineering innovation.

Now is an especially exciting and rewarding time to enter the civil engineering profession. Population and economic growth in rapidly developing countries such as China and India necessitates explosive growth in supporting infrastructure—roads, water supply and treatment, sanitation, environmental controls, and building construction—all of which place enormous pressure on the globe’s natural resources. Here in the U.S., we face aging infrastructures, overdrawn groundwater aquifers, rapid development in some parts of the country, and redevelopment projects in many cities. In addition, global climate change has mobilized interest and investment in various forms of renewable energy and in projects to reduce carbon emissions.

When I entered the civil engineering field 26 years ago, in all honesty I didn’t know much about it. I also didn’t appreciate how integral the civil engineer’s role is to the overall success of any given project. When I chose my field of study, I was drawn to civil engineering because I wanted to take a project from concept through design and construction, and then see the completed project come to life. I had the good fortune to join CH2M HILL, where experience soon revealed that my education put me squarely in the middle of the action on our projects—I often served as the project or program manager. After all, the civil engineer’s role as the integrator of all engineering disciplines gives us an intrinsic vantage point for understanding the project as a whole.

As project managers, civil engineers can lead the integration of global development needs with the protection of our natural systems and resources. Sustainable solutions—where engineers balance environmental, social, and developmental needs—are our future, because the health and wealth of our societies depend on them. Sustainable solutions ask us to think big and bold. They ask us to develop new technologies and solutions. And across the board, the special analytical skills of engineers will be critical in shaping a sustainable world.

We can no longer view natural systems as an endless source of raw materials or a bottomless sink for waste products. Although environmental regulations are still a strong driver for mitigating the environmental impacts associated with projects we design and build, our clients increasingly want to go beyond environmental compliance. Why? Because sustainable solutions can reduce their costs as well as enhance the reputation of their businesses with the public, investors, and other stakeholders. I see examples at CH2M HILL every day:

• Throughout the U.S., green buildings are being designed and constructed under the U.S. Green Building Council’s LEEDTM green building rating system.
• In multiple locations, natural water treatment systems such as constructed wetlands are being used to treat wastewater.
• In the Nevada desert, a new power station uses an air-cooled condenser that consumes 90 percent less cooling water than a conventionally designed plant.
• In Vietnam, a shoe manufacturing facility uses sustainable architectural elements to help cool and light the interior of a 101,200-square-foot factory.
• In Singapore, reclaimed municipal wastewater is treated for reuse as ultrapure water by the nation’s high-tech manufacturing industry.
• A Canadian oil and gas company is improving its greenhouse gas (GHG) measurement and reporting practices and exploring comprehensive ways to prevent global warming.
• In California, treated municipal wastewater is piped 40 miles away, where it is injected into an aquifer to recharge a geyser basin. The resulting steam is used to generate electricity.

Today’s issues have generated research and investment in a broad range of new technologies, all of which have expanded the civil engineering field. In storm-water management, for example, the new tenets of low-impact development (to reduce flows and increase infiltration) have created myriad new building products and design methodologies, such as porous pavements, bioswales, and green roofs. On the renewable energy front, civil engineers now design and construct sustainable systems ranging from wind turbines and solar installations to biofuel plants and landfill gas-to-energy systems. The water-supply field is also active, with highly developed filtration systems creating newly available sources of water through desalination and wastewater reuse. And transportation engineers more frequently consider “context-sensitive” options in roadway design to promote community safety, identity, and walkability.

It’s easy to see that civil engineers play an important role in building a better world. At Purdue, students continue to build an exceptionally strong foundation in civil engineering—and they’re developing the creativity and capabilities required to look beyond traditional outcomes for inspired solutions. When these students take full advantage of their opportunities they’ll make the world a better place.

—Joan Miller, P.E.
Ernest “Chip” Blatchley (seated) with research colleagues Donald Bergstrom (left) and J. Paul Robinson in Purdue’s cytometry lab.
When three very different Purdue researchers put their heads and labs together under the umbrella project of using UV radiation to treat drinking water, their collaboration became a breakthrough.

A nasty bug made its way through the Milwaukee drinking water supply in 1993. The offending microorganism, Cryptosporidium—a mouthful in name and a stomach-turner by nature—affected more than 400,000 residents in what is now recognized as the largest waterborne outbreak in U.S. history. A highly infectious threat, “Crypto,” similar to the giardia parasite, is harmful to anyone who ingests it and possibly deadly to those with previously weakened immune systems.

For environmental researchers, the Crypto challenge sounded the alarm for improved treatment systems, including the use of ultraviolet (UV) radiation to keep drinking water clean. Ernest “Chip” Blatchley III, a professor of civil engineering, is working on that frontline battle.

But because of perception problems associated with UV, the battle began uphill. “In the recent past,” Blatchley says, “as late as the late 1990s, the perception in this country was that UV wasn’t practical for drinking water applications because people had, as it turns out, incorrect information about what UV would actually do.”

UV disinfection, it now seems, is an approach whose time has come. According to Blatchley, some fairly important discoveries in the late 1990s proved UV to be a very effective disinfectant against many microorganisms that threaten drinking water supplies. “There are a few exceptions,” he says, “but it’s a much broader antimicrobial agent than people had previously believed.”

UV is also energy and cost-efficient. “The UV process is very fast,” Blatchley says, “so that means that the reactors occupy only a small amount of space.”
And it turns out that UV doesn’t use much power, which addresses the misperception of a power-intensive process. Finally, UV does little or nothing to change the chemistry of the water. Consider the use of chlorine in water, Blatchley suggests. “Chlorine reacts with many chemicals in water, and some of the products of those reactions are undesirable in terms of their effects on human health and the environment,” he says. “For the most part, UV doesn’t suffer from that.”

Because of those collective attributes, there’s tremendous interest in the use of UV applications in drinking water production. Literally thousands of utilities in the U.S. are considering it, Blatchley says, including New York City, which is the largest drinking-water supply in the country, treating up to 2.5 billion gallons of water each day.

The ability of a UV system to disinfect depends on the “dose” of UV delivered to the microorganisms in the water. However, in practical UV systems microorganisms each follow a unique path through the reactor. As a result, they each receive a different UV dose. So real UV reactors deliver a distribution of UV doses, and it is that distribution that determines the effectiveness of the reactor.

Until recently, techniques did not exist to actually measure the dose distribution delivered by a UV system. Instead, the standard practice was to measure the ability of a UV system to “kill” a standardized microorganism. This method, known as “biodosimetry,” provided a rough indication of the performance of the system; however, it gave no information about the dose distribution.

In collaboration with several other researchers at Purdue, the Blatchley group recently developed a method whereby dose distribution measurements can be collected on UV systems. This development was the result of roughly seven years of intensive research.

**Collaborating Across Campus**

Success within the scientific process often comes from fortuitous circumstances. For Blatchley, it followed a unique cross-disciplinary collaboration. For years, biodosimetry had been the standard (and only) method for measurement of UV reactor performance. However, the test is expensive to conduct and provides only limited information about the system. A need existed to develop a better method for characterization of performance in UV systems.

To address this need, dyed microspheres were developed. The microspheres mimic the behavior of individual microorganisms; however, the dye chosen for this application makes it possible to measure the UV dose delivered to each microsphere. “With the analytical tools we have access to, we can measure the dose of UV radiation delivered to each microsphere in a large population,” Blatchley says. Not something that can currently be done with microorganisms.

The microsphere system allows them to make quantitative, accurate statements about the distribution of doses, large or small, delivered by a UV reactor. That information allows researchers like Blatchley to make quantitative statements about how the system is going to work.

For the research to work, Blatchley needed some help from across campus. That’s where Donald Bergstrom and J. Paul Robinson came in. Bergstrom is a professor of medicinal chemistry and molecular pharmacology who has worked for many years in the area of nucleic acid photochemistry. He designed and built the microspheres. “Chip came to us with specifications,” Bergstrom says. “He needed some sort of microsphere that could mimic bacteria in size and behavior in solution.”

The microsphere system allows researchers to make quantitative, accurate statements about distribution doses delivered by UV reactors.
The microspheres also needed to be sensitive to UV radiation in a way that one could actually measure dosage of accumulated UV as the synthetic particles move through the water system. “We happened to have a molecule on the shelf that we discovered in the late 1970s that had the same properties required for the system,” Bergstrom says.

The molecule undergoes a measurable chemical change when it is exposed to UV radiation. Measurable, Bergstrom says, because the molecule is nonfluorescent before exposure to the UV radiation and fluorescent after it. Because a large number of these molecules can be attached to each microsphere, the fluorescence signal from each microsphere can be related to the UV dose it receives.

Robinson has helped take the quantification to new heights. The director of Purdue’s cytometry laboratories and a professor of both biomedical engineering and immunopharmacology, Robinson also took off-the-shelf technology and applied it to the drinking-water project. “We have some very sophisticated technologies that were developed primarily for the clinical diagnostic world,” he says. “These technologies use lasers to analyze particles. So we shoot the particles with a laser beam and collect many parameters.”

And they can shoot and analyze on the order of thousands of particles per second, resulting in some complex multivariate analyses. “It’s exciting to use existing detection technologies and then identify the specific needs for a completely different community,” Robinson says.

For the research trio, the application of the three-system approach is what’s most exciting. “It’s the right combination rather than the breakthrough,” says Bergstrom. “The collaboration among three different investigators doing different parts all created the breakthroughs.” Within their own corners on campus, a project involving a chemistry system, a UV reactor system, and a detection system all came together.

Making an Industry Splash

So what’s the next step? Robinson foresees technology leading to the development of relatively inexpensive equipment—in the $10,000 to $20,000 range—that water companies will find they need to use. “There are a lot of things that need to be done,” Robinson says, “but we’ve made an amazing amount of progress.”

The progress includes work with HydroQual, a New Jersey-based environmental company that for more than 35 years has used mathematical models to address the impacts of pollutant discharges on water quality and ecosystem health. “Greater restrictions and controls are being placed on finished water supplies, particularly with respect to disinfection byproducts and microbial contaminants such as Cryptosporidium,” says Karl Scheible, a principal at HydroQual. “The EPA has recognized UV as a best-available technology and encourages its application to drinking waters. This has opened the entire water market to UV.”

It has also kept Blatchley busy and in heavy demand. “We’ve been working with the people at HydroQual to apply these microspheres at very large scales at flow rates up to 60 million gallons per day,” says Blatchley. “That would be the largest UV reactor ever developed, and what New York City would have to do if they have around 50 of these things working in parallel to treat 2.5 billion gallons of water a day.”

And the parties in that collaboration also seem to be getting along swimmingly. “We’ve followed Chip’s work for many years,” says Scheible. “He has been innovative and in the forefront in defining and researching key issues regarding the proper design and application of UV.”

The rest of the water world is taking note, too. Last year, Blatchley was awarded the William W. Edgar Pioneer Award by the Water Environment Federation (WEF). The award, given to an engineer or scientist for his or her pioneering work in the area of disinfection, was presented to him at the Disinfection 2005 conference cosponsored by WEF, the International Water Association, and the American Water Works Association.

With patents in the works and interested water utilities ranging from New York to California wanting to learn more, there’s seemingly no rest for these water-weary researchers at Purdue. But as the cross-campus collaborations continue to spawn healthy breakthroughs, they might each raise a glass of some sparkling tap-water to toast their present-day success.

—William Meiners
There’s an African flood every year that drops down like an enormous hand. Five months after the rainfall in February, the Okavango Delta in Botswana—peaking in August as right as rain—spills over like dripping fingers. People don’t die as they do in major floods, though roads become inaccessible. The spreading waters are actually welcomed in this arid land. The groundwater is recharged for vegetation and wells, and wildlife is sustained. Researchers who want to study the biodiversity effects of what becomes the world’s largest wetland often take to the air to do so.

One of those researchers, Melba Crawford, a professor with appointments in civil engineering and agronomy, arrived at Purdue this spring semester. After 25 years at the University of Texas at Austin, Crawford was recruited to take the Laboratory for Applications of Remote Sensing (LARS) to new heights. A civil engineer by training, her expertise has been applied in hydrology, agriculture, forestry, archeology, atmospheric science, as well as soil moisture and pollution-related areas. She also spent last year in Washington, D.C., as an inaugural Jefferson Science Fellow at the State Department.

But what is remote sensing? And where will it be applied?

“Remote sensing involves measuring any kinds of phenomena without direct physical contact,” Crawford says. “People often think of it in terms of weather satellites, pictures from astronauts on the space station, or aerial photography.”
Picture a cropduster making single-lane passes over a field with a camera staring out the bottom of the plane snapping pictures. Crawford, however, likes to think of remote sensing in a whole set of gradations. "There’s space-based remote sensing," she says, "but it’s not just photography. These instruments generally involve some type of sensor that measures reflected or emitted energy. It might be related to temperature, precipitation, the height of ice sheets, or something associated with plant or atmospheric chemistry."

Remote sensing is also performed from aircraft, on trucks and tractors, and on the ground, she says. Consider acoustic sensors, Global Positioning Systems, and ground penetrating radar, for example.

Crawford has used remote sensing to study environmental and property-related issues in the aftermath of Texas coast hurricanes, monitor endangered species’ habitats at Kennedy Space Center, assess earthquake damage in Algeria, and map wildfires in the Australian outback. Other remote sensing applications could provide a clearer characterization of forests, map soil patterns and different responses of crops through precision farming, and be used in urban areas like Houston and New Orleans to measure subsiding zones. As a technology for homeland security, remote sensing can be used for both planning and response to emergencies.

For a hands-on researcher like Crawford, there are too many projects and not enough air time. Though she says she could either be up in the air or on the ground with the calibration instrumentation. "I love being out in the field, and I still have projects in Texas," she says.

In her own research, Crawford is particularly interested in new laser-based technologies for characterizing vegetation structure and mapping fine-scale topographic variation. As far as LARS is concerned, Crawford is working with faculty to incorporate the most appropriate remote sensing technologies into their research. Her campus presence should also help foster interdisciplinary work. A new ground station for receiving data from satellites is being built here by the Purdue Terrestrial Observatory, a part of Information Technology at Purdue, and she hopes her connections to both engineering and agronomy will spark more crossover work.

"Remote sensing fits very well with spatial technologies and is important to modeling in areas such as climate change," Crawford says. "The data that are acquired must be analyzed. That’s where my expertise enters."

As Crawford enters Purdue, she hopes her leadership at LARS will help solve some problems by taking a view from above.  

—W.M.
A Look Underground
A researcher plans on taking his laboratory tools of the trade straight to the soil.

For Joe Sinfield, an assistant professor in civil engineering, the chance to quickly identify compounds underground is the driving force behind his desire to miniaturize laboratory equipment that can be taken straight to the fields. To see where Sinfield fits into the overall scheme of environmental engineers at Purdue, see page 16 on the college side of Impact.

Shown here in the lab with Oliver Colic, a graduate student in electrical and computer engineering, Sinfield is very much a cross-disciplinarian—working with agriculturists, engineers, and industry folk—pursuing the development of a real-time, mobile in situ sensing system capable of monitoring levels of compounds such as nitrogen and phosphorous in farmland effluent, animal wastes, and cultivated soils using optical spectroscopic techniques.

"Traditionally," he says, "to do this type of assessment, we’d collect field samples at a limited number of dispersed locations and perform in-laboratory analysis using a range of wet chemistry and bench-top spectroscopic techniques. That approach, however, is expensive, time-consuming, and limited in value due to the inherent spatial variability of the quantities under investigation and the limited amount of information gathered from the few samples that can be cost-effectively analyzed."

His work, utilizing recent advances in diode laser technology and fiber optics, promises real-time capabilities on site, providing greater spatial resolution and convenience at as little as one-tenth the cost.

—Lisa Hunt Tally
Some people free-fall from airplanes for fun, others backcountry ski. Purdue graduate Judy Nottoli climbs smokestacks. It’s more than an extreme sport for Nottoli—it’s part of her profession as an environmental engineer who specializes in air pollution. And she is one of only a few women in the country who do it.

Nottoli works for MHW, one of the world’s top engineering companies in power, water, environmental, and wastewater issues. She is a vice president in the Natural Resources, Industry, and Infrastructure (NRII) business unit and also serves as the corporate talent manager. She divides her time between the Sacramento office, where she leads and supervises technical personnel and works for clients such as The Dow Chemical Company and Alyeska Pipeline, and the corporate headquarters in Denver, where she focuses on bringing top talent to the organization and implementing strategic initiatives.

Nottoli (BS Environmental Engineering ’82; MSCE ’86) became interested in environmental issues when she was in fifth grade. It was the early 1970s and pollution was beginning to draw a lot of attention. She got a first-hand look at environmental damage the next summer during a family trip to the Indiana Dunes when a fish kill closed Lake Michigan beaches. That experience ignited a desire in her “to clean up the world.”

A native of Munster, Indiana, and the proud daughter of Purdue graduates, Nottoli quickly gravitated toward environmental engineering when she enrolled at the university. The field was in its infancy and, along with biomedical engineering, was then offered through the Interdisciplinary Engineering Program. She says she got hooked on environmental engineering by Professors James Etzel, then program head, and Robert Jacko, from whom she took her first course on air pollution.

“Both professors brought real-world applications to the classroom and loved telling us about their experiences as consultants. There was never a boring moment in a class taught by either of these professors. They were full of energy during every class; they were passionate about what they did and passed it on to their students,” she recalls.

An additional thrill came during graduate school when Jacko, a licensed pilot, took Nottoli in the air in his single-engine plane to conduct stack sampling as far afield as Kentucky and New York. That field experience, along with a graduate-level course she taught on air pollution sampling and analysis, helped her to land her first job, with Radian Corporation in Austin, Texas, as an engineer in the process chemistry department working on air quality problems. She was one of the first women hired by the company to perform source testing and emissions characterization.

Now, at the age of 45, Nottoli is still blazing trails. After 17 years with Radian (which merged with Dames and Moore and then URS in 2000), she joined MHW in 2003 as a principal engineer and air services manager to work directly with the Air Service Practice Leader to develop a national air quality practice. With responsibilities having grown over the last three years, she clocks about 70 work hours a week, but enthusiastically says “it doesn’t seem like work when I’m having so much fun.”

With a birthday that coincidentally falls on Earth Day, some might say Nottoli was fated to go into environmental engineering. An avid hiker, camper, mountain biker, and fan of the outdoors, Nottoli says she feels fortunate to have made such a good match between professional and personal interests. Maybe there was a little determination, too.

“I’ll never forget sitting in class freshman year and having a professor say, ‘Look to your left, look to your right—at the end of this year, only one of you will remain in engineering.’ I was pretty determined to leave with an engineering degree in hand from such a highly respected institution,” she says.

—Linda Thomas Terhune

Family Boilers
Dad: Gene Nottoli, BS Mechanical Engineering, 1952
Mom: Barbara Schaefer Nottoli, BS Home Economics, 1953
Brother: Dave Nottoli, BS Industrial Management, 1979
Sister: Janet Nottoli Worjes, BS Early Childhood Education, 1984

Smokestack Stalker
How one civil engineering alum climbed the corporate ladder outdoors.
Student Initiative Pays Off

A fund-raiser helps overhaul a student lounge.

Ask and you shall receive. Respond promptly and enthusiastically to a suggestion, and you’ll reap a bounty.

That's one lesson civil engineering students mastered last fall when they asked the Civil Engineering Advisory Council for fund-raising ideas. By this spring, money raised, they were enjoying a renovated study lounge and student offices on the second floor of the Civil Engineering Building.

Space that formerly accommodated about five students hitting the books now welcomes about 30 with soft seating, group study tables, and individual study space, says Abigail Moyer, a civil engineering senior and president of the Civil Engineering Student Advisory Council (CESAC).

“Two walls have been removed, it’s been painted, the lighting adjusted, and we have new furniture and some new computer equipment,” she says. To expand the lounge, three student organization offices—CESAC, the Chi Epsilon Honor Society, and the American Society of Civil Engineers—have been consolidated into one smaller office.

There’s a new name for the space, too—the Charles J. Pankow Student Lounge, a thank-you for a $15,000 contribution from the Pankow Foundation, created by its namesake, a 1947 Purdue civil engineering graduate who received an honorary doctorate in 1980.

The student organizations, having previously raised $10,000, asked the Advisory Council for ideas on securing another $20,000. The council suggested pitching it to alumni.

“They heard this suggestion on a Friday afternoon, and by the time the annual Civil Engineering Alumni Breakfast started on Saturday morning, the students had prepared an impressive display, created a sponsorship form, and set up a booth,” says Steve Wanders (BSCE ’78, MSCE ’79), vice president and manager of the Northeast Region Transportation Business Group of Colorado-headquartered CH2M HILL. His take on the lounge that visit was that it hadn’t changed any since he’d used it some 30 years ago.

Impressed with the students’ initiative, Wanders e-mailed other Boilermaker
Chi Epsilon took top fund-raising honors in Purdue’s Relay For Life.

Early last April, with the memory of Professor Leonard Wood serving as their inspiration, Chi Epsilon (XE) raised more money in the fight against cancer than any other Purdue entity. As part of the Relay For Life fund-raiser, the civil engineering students participated in a 14-hour overnight event, bringing in more than $3,800 for the American Cancer Society.

Comprised of 13 XE members, the team set a fund-raising goal of $2,500 and surpassed it through a very successful Charity Date Auction. Local restaurants donated free meals, and many civil engineering students attended the auction, paying big bucks to go on dates with their friends and classmates. Eighteen dates were secured, accounting for a total of $1,300 of the raised funds.

Purdue raised more than $92,000 in total, and the XE contingent—which plans on participating again next year—was presented with a plaque for its first-place efforts during the closing ceremonies. Led by Kristy Davis, the XE Relay For Life chair, the team included Keith Churchill, Teresa Dallinger, Dave DeLong, Chadi El Mohtar, Aaron Evans, Shelley Finnigan, Eric Gnade, Kyle Helfrich, Steph Kessel, Kristin Norville, Brian Walker, and Chip Walton.

—Kathy Mayer

Kristy Davis, the Chi Epsilon coordinator for Relay for Life, dances with A.J. Fricke, the organization’s incoming president. Below: Margaret Wood, widow of Leonard Wood, joins the festivities.

Finishing First

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Congratulations to recipients of the 2005 Civil Engineering Alumni Achievement Awards presented in February of this year.

The Purdue University Chapter of Chi Epsilon proudly announced the elevation of four alums to Chapter Honor Members: Robert Bowen (BSCE ’62), chairman/CEO, Bowen Engineering Corporation; Thomas Burke, Jr. (MSCE ’92, PhD ’96), head of water resources at Christopher B. Burke Engineering, Ltd; Charles Dulic (BSCE ’76, MSCE ’78), president of HNTB Corporation; and Robert Shanks (BSCE ’75, MSCE ’76), president of Eastern Operations of Arch Coal, Inc. The Purdue Chapter has elevated 98 alumni to chapter honor status.

Paul I. Cripe, Inc. (Al Oak, BSCE ’68, principal) and Bowen Engineering Corporation (Robert Bowen, BSCE 62, principal) were honored by the Indiana Chamber of Commerce as two of the “Best Places to Work in Indiana” in the small/medium company category.
Otto Guedelhoefer (BSCE ‘67) • Growing up just 60 miles from campus, Otto “Chuck” Guedelhoefer always wanted to be a civil engineer. He applied only to Purdue. Throughout a challenging and rewarding career as a structural engineer, Guedelhoefer has turned his expertise to failure and collapse investigations. His firm has investigated such notable structural collapses as the Hartford Civic Center roof, the Cline Avenue Bridge, and the Tropicana Parking Garage. He currently serves as president of a 33-person firm that provides worldwide forensic engineering services, along with repair and testing services.

Kenneth Kaszubowski (BSCE ‘80, MSCE ‘82) • Participation in the cooperative education program provided the driving force for Ken Kaszubowski’s draw to civil engineering. Early in his career, he focused on municipal and industrial wastewater management. Later, as manager of environmental engineering and safety for Kohler Company, he gained an appreciation for the intersection of business, engineering, manufactured goods, and public involvement and the role of the engineer in solving these problems. His company has contributed to the design and construction of Miller Park, the baseball home of the Milwaukee Brewers. Kohler also works with Harley Davidson Motor Company and SC Johnson.

Lewis McCammon (BSCE ‘40, MSCE ‘48, PhD ‘51) • Born in Wheeling, West Virginia, Lewis McCammon was familiar with a classic suspension bridge over the Ohio River. At the time of its 1847 construction, it was the longest in the world. That span, along with a mining engineer uncle, would steer him toward structural engineering. Between his Purdue degrees, McCammon played a pivotal engineering role in World War II. His military unit supported construction of the Ledo Road across northern Burma to join with the Burma Road in China. His entire military service—spent with African American troops in the segregated army—would make him a lifelong advocate for equal rights. His career would involve an odyssey of teaching jobs and structural engineering positions at C.F. Braun & Company, Fluor Corporation, Northwestern University, the U.S. Military Academy, and beyond.

Roger Reckers (MSCE ‘73) • When Roger Reckers was a child, the gift of an erector set instilled in him a love for buildings and construction. High school success in math and science sealed his civil engineering fate. At 30, Reckers was concurrently designing and managing three Chicago high-rise buildings for Skidmore, Owings & Merrill. At 35, he formed the partnership Gavlin and Reckers that evolved into TGRWA, of which he is now president. Several of his projects have won state and national awards, ranging from renovations of a Frank Lloyd Wright historic structure to state-of-the-art new designs. Chicago, he says, is an inspiring environment for structural engineers. It has world-class structural engineers for world-class architecture.

David Wallace (BSCE ‘72, MSCE ‘73) • Through an Eagle Scout cooperative program, David Wallace was paired with a Purdue graduate who owned an engineering firm. Hired on as a high school student, the early experience allowed Wallace to follow his father’s footsteps en route to an engineering career. It has been a career defined by megaprojects, including the $2.4 billion Woodrow Wilson Bridge Replacement over the Potomac River and the $2.4 billion Intercounty Connector in Maryland. For the Wilson Bridge, Wallace, now a partner at Rummel, Klepper & Kahl’s, led the company’s efforts for the Maryland approach on contracts totaling nearly $500 million. The 7.5-mile-long project was recently featured on Discovery Channel’s “Extreme Engineering.”

Joseph Cibor (BSCE ’76, MSCE ’78), P.E., president of Fugro Consultants LP, has been elected president of ASFE/The Best People on Earth, a nonprofit association of geoprofessional, environmental, and civil engineering firms that employ some 75,000 technical professionals. Established in 1969, ASFE develops programs, services, and materials its members apply to enhance their business practices and “prosper through professionalism.”

Christopher Burke (BSCE ’77, MSCE ’79, PhD ’83), president of Christopher B. Burke Engineering, Ltd., has received the Illinois Association of Floodplain and Stormwater Management (IAFSM) Lifetime Achievement Award. IAFSM’s highest honor, this award is given to outstanding longtime professionals in the floodplain and stormwater management field.

Cristine Klika (BSCE ’78), former commissioner of the Indiana Department of Transportation, has been named executive director of the Indiana High Speed Rail Association. Klika is president and cofounder of Klika Stinson Group, an Indianapolis consulting firm specializing in civil engineering and transportation project management.

Corby Thompson (BSCE ’81), owner of Boomerang Development, LLC, and K.E. Thompson, Inc., was awarded the 2005 Larry A. Conrad Civic Service Award by the 460-member Indiana Association of Cities and Towns. This prestigious award is bestowed on a citizen for
Graduation Day, 2006
The newest civil engineering alumni marched across campus on a rainy May Saturday.

Kathy Banks, the interim head of civil engineering, shook a lot of hands this past graduation day, which happened to fall a day before Mother’s Day. Among the 2006 class receiving diplomas were 88 undergraduates and 29 graduates.

private sector contributions to municipal government. Thompson previously received the Faberge National Hero Award in 1994 for his years of work with the Indianapolis Big Brother program.

Kari Craun (MSCE ’87), former chief of the USGS mapping center in Rolla, has been named the USGS supervisory liaison for the central region. In this position she will be responsible for building partnerships with federal, state, and local agencies, as well as with private contractors and universities, to ensure that a basic set of national map data is available.

Shauna Weaver (BSCE ’94), P.E., has been promoted to vice president, land development, of Pape-Dawson Engineers, Inc. She will lead a team of engineers and technicians designing major projects for both the public and private sectors. Weaver has worked at Pape-Dawson for more than 11 years and was named the 1999 Young Engineer of the Year by the Bexar Chapter of the Texas Society of Professional Engineers.

We are always interested in featuring recent news about our alumni. To have your accomplishments included in this magazine and share them with fellow alumni, please e-mail information on awards/honors/recognition, promotions, and related matters to Cindy Lawley (lawley@purdue.edu). Please be sure to include the year(s) and Purdue degree(s) you have received.
Remembering Ross Camp

A reunion for students who attended the summer surveying camps is in the works.

For civil engineering students 100 years ago, part and parcel of a first-rate education was the rigorous training in surveying instruction and fieldwork. Students averaged more than 20 hours a week in their freshman and sophomore years just getting to know the lay of various lands. To ease that out-of-class load, Purdue opened its first Summer Surveying Camp in 1914—an annual rite of passage that would run through the 1970s.

At Ross Summer Camp (known as such after David Ross’s donation of a 120-acre farm to the project in 1926), students took part in both construction and instruction. They helped build the facilities and through “camp betterment projects” developed the surroundings, which included a much-welcomed swimming pool. For campers, recreational sports like baseball provided a field work alternative.

The summers also reflected the surrounding times—with fewer students during the Great Depression, a revival as part of a Civil Works Administration project, and no camps at all during various war years. For thousands of Purdue civil engineering students, however, Ross Camp would be remembered as a pivotal moment in their personal histories. And we’re hoping you’ll share those stories.

—W.M.

This fall, civil engineering is planning a Ross Camp reunion for the weekend of September 9th. Do you have any stories or photos from your days there that you would like to share? If so, send them to Cindy Lawley, and be sure to mark your calendar for the big event.

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The device, a vacuum pressure gauge, operates on the principle of gaseous ionization. The glowing filament produces electrons, which are accelerated until they collide with gas molecules and ionize a portion of them. The gauge then measures the ionic current, which is related to the vacuum pressure. Purdue mechanical engineering professor Tim Fisher, who studies electron emission phenomena in high-vacuum environments, uses the gauge to ensure that his research group’s work is operating at low pressure. Applications of the research include flat-panel displays, radio frequency electronics, and direct energy conversion processes.