

# The BRIDGE

Civil, Architectural and Environmental Engineering

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MISSOURI  
S&T



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# Message from the chairman

**William P. Schonberg, Ph.D., P.E.**

Over the past year or so the faculty and I, with the assistance of some of our academy members, have been engaged in a new round of strategic planning that will ultimately set the department's direction for the next 10 to 15 years. Our department is already a special place. Our objectives are now to make it the place of choice for faculty, students and staff and to maintain its preeminence in the arenas of civil, architectural and environmental engineering education and research. We have examined our values and our strengths, and have tried to predict future areas of opportunity and growth. Based on this analysis, we have developed strategic goals that will allow us to reach our vision for the coming decade and beyond.

The tradition of the civil, architectural and environmental engineering department has always been to prepare the best 'street-ready' engineers possible. To continue this into the 21st century, we need to predict future societal technical needs that will be faced by our graduates while concurrently addressing the research needed to support these needs. Essentially, we will continue to prepare 'street-ready' engineers, but must now consider that these streets may be in Bolivia or China, or that they may be 'smart highways' involving new transportation modes, or that they may be even on the Moon or on Mars.

Our plan is to transform the department so that we are able to more effectively:

- prepare graduates to solve technical and engineering challenges around the world for decades to come
- enhance our national reputation among employers, future students, and our peer institutions so that we become "a destination of choice"
- engage in multi-disciplinary scholarly and tech transfer activities in targeted areas of national and international importance

## Strategic Goals

In order to execute this plan, we are proposing the following strategic goals:

1. Enhance our educational programs and delivery methods to equip civil, architectural and environmental

engineering students to face the challenges of 2020 and beyond;

2. Develop an even more diverse, high quality, highly motivated student population;
3. Attract premier faculty and promote faculty development to meet critical needs in the department's education and research portfolios;
4. Further the national/international recognition of faculty scholarship by establishing a leading research presence in a small number of key areas, including building sustainability, innovative and resilient infrastructure materials and systems, energy and the environment, and detection/assessment/mitigation of health-threatening pollutants.

I believe that the spirit of discovery must form the foundation of our educational and research enterprises. We must be committed to achieving, through individual and collective efforts, high levels of performance as continually measured against regional, national and global standards. Teamwork is crucial to meeting our goal of greatness and we must maintain the ideal of a "community of scholars." We must endow a strong and lasting sense of social responsibility in our students and demonstrate that same sense of responsibility in our own professional and personal lives.

I believe we are setting forth an exciting agenda for the coming years. I look forward to working with our faculty, staff, and students, and with you, our alumni, as we meet our challenges and opportunities and pursue our hopes and dreams.

## Connect with us

**You can reach us by:** email ([bridge@mst.edu](mailto:bridge@mst.edu)) or mail (The Bridge, civil, architectural, and environmental engineering department, Butler-Carlton Hall, 1401 N. Pine St., Rolla, MO 65409-0030) or call 573-341-4461. Letters should include the writer's full name, address, email and daytime phone number. Copy may be edited for clarity and space.

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Photo by B.A. Rupert



Photo by B.A. Rupert



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## DEPARTMENT ADMINISTRATION

### Department Chair

William P. Schonberg, Ph.D., P.E.

### Associate Chair

Joel Burken, Ph.D., P.E., BCEE

### Assistant Chairs

Civil: Ronaldo Luna, Ph.D., P.E.

Architectural: Stuart Baur, Ph.D., A.I.A.

Environmental: Mark Fitch, Ph.D.

Graduate Program: Richard Stephenson, Ph.D., P.E.

### Undergraduate Advising Center Director

Eric Showalter, Ph.D., P.E.



Graduate **Gary White**, CE'85, MS CE'87, (center), and actor Matt Damon (right) founded Water.org in 2009.



# Graduate Gary White makes 2011 **TIME 100** list

**Gary White**, a 1985 graduate of Missouri University of Science and Technology, was named to TIME magazine's list of the "100 most influential people in the world" for 2011.

White was cited for his work to improve access to clean water to many parts of the developing world through his organization, Water.org, which he co-founded with actor Matt Damon. Both White and Damon were named to the 2011 TIME list.

Water.org, based in Kansas City, Mo., is a non-profit organization that works with partners in Africa, South Asia and Central America to provide access to clean water

and sanitation. The organization was created in 2009 by the merger of White's organization, WaterPartners, which he founded in 1990, with Damon's non-profit, H2O Africa.

White earned a bachelor's degree in civil engineering from Missouri S&T (then known as the University of Missouri-Rolla) in 1985 and a master's degree in civil engineering from S&T in 1987. He was named an Honorary Knight of St. Patrick in 2007.

Since founding WaterPartners in 1990, White has helped improve water and sanitation access to more than 600,000 people around the world.



The 2011 TIME 100 list appears in the magazine's May 2 edition and also appears online at [www.time.com/time100](http://www.time.com/time100).

# MOST INFLUENTIAL ALUMNI

## *honored*



Of Missouri S&T's more than 50,000 living alumni, untold thousands have left a lasting mark on the world.

But only a select few qualify as those whose work, leadership and contributions have made a lasting impact on our world and campus. In recognition of these 28 individuals, Missouri S&T hosted the "Alumni of Influence," event on Saturday, Nov. 12.

Nine civil engineering alumni — the most of any major—were among the 28 honored.

To read full profiles go online to [influence.mst.edu](http://influence.mst.edu).

Photo by B.A. Rupert



**Mariana Rodriguez, CE'80, center, was recognized as an influential alumna in the field of education.**

Photo by B.A. Rupert



**Wayne Laufer, CE'67, center, was recognized for his remarkable contributions in business.**



**Dick Arnoldy:**  
investing in destinies

**Dick Arnoldy, CE'69, MS EMgt'73,** embarks on a new career providing loans to people in poverty.



**Fred Kummer:**  
hospitals and hospitality

**Fred Kummer, CE'55,** has reached a pinnacle of business success that few others can match.



**Jerry Bayless:**  
Mr. Miner

**Jerry Bayless, CE'59, MS CE'62,** is an institution at this institution, where he has taught over 10,000 students.



**John Mathes:**  
environmentally engaged

**John Mathes, CE'67, MS CE'68,** makes a difference beyond the ordinary through his financial and volunteer services to S&T.



**Robert Bay:**  
setting standards

**Robert Bay CE'49,** focused his service on building navigation systems, skyscrapers, and water and wastewater treatment systems.



**Mariana Rodriguez:**  
Peruvian pioneer

**Mariana Rodriguez, CE'80,** is a trailblazer in the field of higher education, helping found two universities and two technical institutes.



**Gary Forsee:**  
down to business

**Gary Forsee, CE'72,** renewed the UM System's focus on college affordability, economic development and cost saving measures.



**Gary White:**  
water warrior

**Gary White, CE'85, MS CE'87,** is helping transform more than 600,000 lives in Africa, South Asia and Central America through better access to safe water and sanitation. (see page 4)



**Vernon Jones:**  
pipeline to prosperity

**Vernon Jones, CE'53,** knows what it takes to be an effective executive.



[influence.mst.edu](http://influence.mst.edu)

The following alumni also were honored during the event for their remarkable contributions.

#### Business:

- **Don Gunther, CE'60**  
Retired vice chair for the Bechtel Group
- **Wayne Laufer, CE'67**  
Retired co-founder of Bois d'Arc Energy
- **Steve Malcolm, CE'70**  
Retired chair, president and CEO of Williams
- **Bryan Stirrat, CE'67**  
President of Bryan A. Stirrat & Associates

#### Humanitarian Efforts:

- **John E. Priest, CE'52,** whose work led to the Indus Basin Treaty Works

# A CONCRETE WAY to help the environment

By Mindy Limback

**Researcher Jeffery Volz is leading a study to increase the amount of fly ash used in concrete. If successful, the effort could divert millions of tons of the waste product away from ponds and landfills and reduce CO2 emissions.**



Photos by B.A. Rupert

**C**urrently the nation's power plants generate about 130 million tons of fly ash and bottom ash during the coal combustion process. Fly ash — the fine particles that rise with flue gases during combustion — are captured through filtration to reduce air pollution and are often stored at coal power plants or placed in landfills.

Adding fly ash to concrete isn't a new concept. For more than 70 years, the waste product has been a component of concrete used to build the nation's bridges, roads, dams and overall infrastructure. The material increases concrete's durability, extending the service life of these structures. About 43 percent of the material is recycled as components of wallboard or concrete.

"Traditional specifications limit the amount of fly ash to 35 or 40 percent cement replacement," says **Jeffery Volz**, assistant professor of civil, architectural and environmental engineering at Missouri S&T. "Recent studies have shown that higher cement replacement percentages — even up to 75 percent — can result in excellent concrete in terms of both strength and durability."

Concrete typically has three key components: portland cement, water and aggregates like gravel and sand. During the manufacture of cement, limestone and other materials are heated to extreme temperatures, releasing tons of CO2 from both chemical reactions and the heating process. If fly ash could replace cement, it would not only reduce the amount of fly ash that ends up in ponds and landfills but CO2 emissions as well, says Volz.

High-volume fly ash is significantly more sustainable, but also can be unpredictable. The physical and chemical characteristics of the material can vary, which can change how it reacts to additives.

"At all replacement rates, fly ash generally slows down the setting time and hardening rates of concrete at early ages, especially under cold weather conditions, and when less reactive fly ashes are used," Volz says.

The disposal of fly ash isn't without some controversy. In December 2008, 1 billion gallons of wet coal ash spilled when an earthen retaining wall of an ash pond gave way in Tennessee. Dozens of wells were

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# Grad inspired iPad application

## Filling the void in project management software for midsize contractors

A new iPad app designed to help with construction management is being tested in civil engineering classrooms at Missouri S&T. The app was developed by **Bob Brinkmann**, CE'71, the founder and CEO of Brinkmann Constructors in Chesterfield, Mo. Brinkmann also donated 30 iPads and 30 of the apps for use in courses taught by **W. Eric Showalter**, associate teaching professor of civil engineering.

Already available in the App Store, Construction Superintendent ensures critical construction project information is effectively collected and transferred from the field to the main office in a timely manner. It provides site management forms including daily logs, safety inspections and time sheets, which are easily entered, tracked and forwarded. Construction

Superintendent minimizes time delays and lost profits by ensuring the majority of the superintendent's time is spent where he or she is most valuable — in the field.

Construction Superintendent was developed by Construction Centrics, a joint venture between Brinkmann Constructors and Impact Technologies Inc. of Chesterfield, Mo.

Read more...



This project is discussed in Engineering News-Record, iPad App: Learning Curve for All Ages

<http://enr.construction.com>

## A CONCRETE WAY to help the environment *continued...*

contaminated with toxic materials, like arsenic and mercury. Soon after, the Environmental Protection Agency began reviewing regulation of the material. While the EPA supports adding fly ash to concrete or using it for soil stabilization, the agency is considering designating fly ash as a hazardous waste. The ruling would attach a stigma to the material despite solid evidence that once fly ash is added to concrete, the material is chemically altered and unable to leach the toxic materials over time.

Still, Volz acknowledges that owners may not want it in their buildings. "Construction workers might refuse to work with it," he says. "And there's also the issue of at what point is it not a hazardous material when used for beneficial reuse. Is it once it is added to the ready mix truck, which means it is a hazardous waste in the silo at the ready mix plant? Or is it once the concrete hardens, which means it's a hazardous waste up to that point?"

Volz is working with the Missouri Department of Transportation to develop guidelines for the proper application of high-volume fly ash concrete in bridges, roadways, culverts, retaining walls, and other transportation-related infrastructure components.

"By nearly doubling the use of reclaimed fly ash in concrete, high-volume fly ash aligns well with MoDOT's green initiative on recycling," he adds.

# Sign of the times:

## Researcher studies **work zone safety**

By Mindy Limback

When schools are back in session, there's one lesson that transportation engineers want drivers to learn, it's to pay attention while driving in construction zones. That's why **Ghulam Bham**, assistant professor of civil, architectural and environmental



engineering at Missouri S&T, and his students are studying the effectiveness of dynamic variable message signs that are often used in highway work zones.

When used effectively, these devices provide motorists with real-time information about

current traffic conditions, such as traffic congestion or reduced speeds. The messages displayed are automated and based on data collected by sensors that are placed alongside the road.

The signs are common sights to motorists who travel on Interstate 44 in Missouri. They were recently used in construction zones near Lebanon and Richland while the Gasconade River bridge, built in 1955, underwent an overhaul.

"We are evaluating drivers' perceptions of the signs," Bham says. "In addition to collecting video data and sensor information, we conducted a survey of 100 passenger and truck drivers who had stopped at a nearby gas station."

Last year, more than 2,500 vehicles were involved in work zone crashes in the St. Louis area. Eight people died during those crashes and many more were injured. According to the Missouri Department of Transportation, most of the crashes in work zones were rear-end crashes, which usually indicates that one or more vehicles crashed into stopped or slowed traffic ahead.

"Dynamic message signs, when used in construction zones, can reduce delays and rear-end crashes, and improve traffic flow by informing drivers of real-time conditions," Bham adds.

Bham also plans to create a virtual work zone using these signs during the fall semester to further collect driver perceptions using the campus driving simulator.



# Lots of SPACE JUNK is circling our planet at HIGH speeds

By Lance Feyh

**William Schonberg** says academia is cool because you usually get to research what you're really curious about. As chair of civil, architectural and environmental engineering at Missouri S&T, Schonberg, when he has time, likes to study high-speed impacts — specifically, those that could be caused by space debris.

Schonberg was a member of a National Research Council committee that recently issued a 180-page report warning about the dangers of space debris.

One of the first “hits” was on a space shuttle in the early eighties, when a very small piece of paint hit one of its windows. Now, low-Earth orbit is becoming increasingly cluttered by trash.

The large stuff — rocket boosters and so on — typically ends up falling back down and burning up in the atmosphere. But smaller projectiles continue to race around the planet and cause problems for astronauts and engineers. Schonberg studies the amount of damage that could be caused by potential impacts.

“We can track almost anything four inches in diameter and larger,” says Schonberg, who first got involved in this type of research at the University of Alabama in Huntsville, which is located near NASA’s Marshall Space Flight Center. “There are risk assessments performed before each NASA mission.”

In recent years, evasive actions to avoid such projectiles in space have been more common.

As more and more rockets, shuttles and satellites have been launched, low-Earth orbit has been polluted by junk. In addition to high-tech stuff that is just left in orbit, even frozen human waste that was jettisoned years ago poses problems. “We’re talking about projectiles that travel at around 18,000 miles per hour,” Schonberg says.

And that’s to say nothing of potentially even more dangerous natural objects, like meteorites and asteroids.

Of course, with the end of the U.S. shuttle program, not as many American astronauts will be put in harm’s way. But the International

“

**WE’RE TALKING ABOUT PROJECTILES THAT TRAVEL AT AROUND 18,000 MILES PER HOUR.”**

**— WILLIAM SCHONBERG**  
*chairman, civil, architectural and environmental engineering*

Space Station is still colonized, and Schonberg thinks humans will continue to explore space. “I hope so,” he says. “It’s human nature to explore.”

In the meantime, scientists will have to continue to monitor space junk closely. It’s not currently plausible from a cost perspective to clean up all the stuff circling our planet.



**As an enthusiast for space travel, William Schonberg studies high-speed impacts that might occur in low-Earth orbit.**

Photo by B.A. Rupert

# Commencement

## Engineering **links** science and technology, Petroski says

Photo by B.A. Rupert



In his May 2011 Commencement speech, civil engineer, historian and author Henry Petroski told S&T graduates that engineering is the essential link between science and technology.

“It is sometimes said that engineering is merely applied science,” said Petroski, the Aleksandar S. Vesic Professor of Civil Engineering and a professor of history at Duke University. “That is at best a gross oversimplification. . . . Wherever there are scientific principles or scientific facts that engineers can use, they do so. But they do not let the absence of scientific knowledge keep them from making new technology. In fact, there have been

instances where scientists insisted that something was impossible, only to have engineers rise to the occasion and disprove the scientists.”

Petroski also spoke on campus in April as part of the Neil and Maurita Stueck Distinguished Lecture Series.

The Stueck Distinguished Lecture Series is made possible by a fund established by Maurita Stueck to bring outside perspectives to Missouri S&T, and to honor her late husband, Neil Stueck, a 1943 civil engineering graduate of the university.

## AEI Competition

The Missouri S&T chapter of the Architectural Engineering Institute (AEI) recently formed a team to participate in the national student competition, held by the national chapter of AEI and the Charles Pankow Foundation.

Teams were given a set of basic architectural footprints for the Contemporary Art Museum at Presidio in San Francisco, Calif., and were asked to come up with designs for the building in five different categories, which included electrical, mechanical, structural, building integration and construction.

Submissions were judged on innovation, knowledge, sustainability and overall collaboration. After four months of planning and design, S&T was one of three teams that presented at the national conference in Oakland, Calif., in the electrical category. After presenting their design, which included solar panels, LED and halogen light sources, an environmental sensor system, and natural lighting sources, S&T was awarded runner-up for the electrical category.

### The AEI team:

**Pictured above right:** front row, left to right, is Lauren Svoboda, Teresa Rose, and Ellen Richardson. Back row, left to right is Brett Balsters, Robert Hall and Ryan Reed. Not pictured is Todd Richbourg.

Photo by Stuart Baur



Living intentionally

# The village GREEN

By Andrew Careaga

Environmental engineering professor **Dan Oerther** and his family want to show others how to live intentionally. And they have the perfect place for it: in one of four student-designed solar homes at Missouri University of Science and Technology.

The Oerthers — Dan, **Sarah** and their baby boy **Barney** — live in one of the four student-designed and -built solar homes located on the western edge of the Missouri S&T campus, in a neighborhood known as the Solar Village. Members of S&T's Solar House Team constructed the four homes as part of an international design competition called the Solar Decathlon. Held every two or three years on the National Mall in Washington, D.C., the event is designed to show the world that solar-powered living is achievable.

But you don't have to travel to D.C. to see sustainable living in action. The Oerthers, who live in the 2007 house, are demonstrating the same thing on campus in their 800-square-foot home. Living in such tight quarters may seem unusual in our world of McMansions. But Dan, the John and Susan Mathes Chair of Environmental Engineering at S&T, points out that many people around the world live in homes that are much smaller than standard U.S. houses.

In their solar home, the Oerthers are living "intentionally." By intentional living, they are not only trying to use fewer resources but also be more aware of the environmental and social costs of their everyday choices, from shopping to energy use to transportation.



**Dan, Sarah  
and Barney  
Oerther**



Photos by B.A. Rupert



READ Sarah's blog on intentional living



<http://chooseintentionalliving.blogspot.com>



## Phytoforensics



<http://pubs.acs.org/journal/esthag>  
click on browse the journal,  
list of issues, Aug. 1, 2011

# Nature's expert witnesses: *plants tell of environmental pollution*



By Andrew Careaga  
Photos by B.A. Rupert

*The poet William Blake once wrote that we could “see a world in a grain of sand.” Today, environmental engineers are seeing the world beneath the surface through a greener part of nature: the trunks and branches of trees.*

This practice of sampling and analyzing tissue from trees and other plants to determine the presence of contaminants in soil and groundwater holds promise because it gives engineers a quick, accurate and inexpensive way to measure the extent of environmental pollutants without having to dig into the ground.

As **Joel Burken**, professor of civil and environmental engineering at Missouri University of Science and Technology, explains in the August cover article of the journal *Environmental Science & Technology*, this new approach “is rapid, fast, inexpensive and causes little or no discernible damage to personal or ecological systems.”

Burken, an expert in the emerging field of “phytoforensics,” is the principal author of the journal’s August feature story, which describes how these new approaches are being used for monitoring contaminants.

“The water and wood of a tree is partly a reflection of groundwater chemistry,” write Burken and his co-authors in the article, titled *Phytoforensics, Dendrochemistry, and Phytoscreening: New Green Tools for Delineating Contaminants from Past and Present*.

Because of this molecular makeup, researchers are using trees and other plants as “bioindicators” to map pollutants in the environment, write Burken and his co-authors, Don Vroblesky, a research scientist with the U.S. Geological Survey Water Science Center in Columbia, S.C., and Jean Christophe Balouet, an environmental forensics expert and principal scientist at Environment International in Paris, France. For example, Burken and his colleagues have tested their phytoforensics method at more than 35 sites in six countries and nine states, including five communities in Missouri.

Trees act as nature’s solar-driven sump pumps, actively transporting water from the ground by using the energy of the sun and the air around them, Burken says. Through a process known as “evapotranspiration,” a tree’s extensive root system absorbs all the water and nutrients it needs. At the same time, the tree absorbs trace amounts of chemicals in the water and soil and transports those chemicals to the trunk, branches and leaves.

In their ES&T article, Burken, Vroblesky and Balouet describe how recent advances in plant-monitoring technology have fared in determining contamination levels in soils and groundwater. Among the most recent advances is a more sensitive method of putting sampling devices in trees designed by Burken and his students at Missouri S&T. One of the devices is called a solid-phase microextraction fiber, or SPME. The SPME is a thin filament — smaller than a pencil lead — that can detect traces of chemicals at minute levels, down to part per trillion or parts per quadrillion.



**Joel Burken, (far right), professor of civil and environmental engineering, tests a tree in Rolla’s Schuman Park with freshman Amanda Holmes and S&T graduate student Matt Limmer.**

“  
The water and wood of a tree is partly a reflection of groundwater chemistry.”  
— **Joel Burken**  
S&T professor

In the article, Burken, Vroblesky and Balouet also discuss advances in determining pollution levels over time by analyzing the chemistry of a tree’s growth rings, a method known as “dendrochemistry.” This method can look back in time, giving a history of subsurface contamination. Other sampling methods show potential for using leaves, bark and needles of plants as “proxy recorders” of airborne contaminants. Methods to study presence of pollutants on these surfaces can be used to pinpoint a local source of airborne pollution as well as to investigate more widespread evidence of airborne contamination, including radioactive contaminants.

Finally, the authors discuss the potential use of these green approaches to monitoring in legal proceedings. Dendrochemistry, for example, may help lawyers trace the origin of contamination on property that has been owned over time by multiple parties.

While Burken, Vroblesky and Balouet believe phytoforensics are important and valuable tools for determining the presence of pollution, they also point out that their use may be limited in some instances. For example, a tree’s root system may be too shallow to detect groundwater contamination well below the surface, and some chemicals (such as the explosive trinitrotoluene, or TNT) may biodegrade rapidly in a tree’s root system and therefore not be easily detected above the surface. Also, it’s important to sample several plants in an area in order to obtain the most accurate understanding of potential contamination, the authors say.

## Students put plant solution projects into action



### Award winners

S&T professor Joel Burken with students Matt Limmer and Amanda Holmes

Environmental students from Missouri S&T brought home a second-place award for best poster presentation from the 8th International Phytotechnologies Conference held in Portland, Ore., Sept. 13-16, 2011.

The poster, titled “Long-Term Monitoring of Chlorinated Ethenes in Trees: Seasonal Variation,” was presented by **Matt Limmer**, a graduate student in environmental engineering from Oregon, Ohio. Co-authors included **Amanda Holmes**, a freshman in environmental engineering from Rolla, and **Joel Burken**, professor of civil, architectural and environmental engineering.

The conference theme was “Putting Plants to Work where we Live, Labor, Breathe, and Play.” Attendees from more than 25 countries were represented and 150 student posters and oral presentations were featured.

## Health and human services

# Where rice may **NOT** be so nice

By Linda Fulps



Eric Farrow (left) and Jianmin Wang take grain samples from rice plants in S&T's greenhouse.

Photo by B.A. Rupert

**Eric Farrow** wants to make sure the rice that ends up on your plate is toxin-free. Farrow, a Missouri S&T graduate student in environmental engineering, is working with **Jianmin Wang**, associate professor of civil, architectural and environmental engineering, to find ways to reduce the arsenic content in rice.

Arsenic is a tasteless and odorless heavy metal that can occur naturally in soils. While small levels of organic arsenic are not considered dangerous, the U.S. Department of Health and Human Services says exposure to the metal has caused a number of known health problems, including neurodegenerative conditions and cancer.

For decades, arsenic-containing pesticides and defoliants were used in the cotton fields of the south-central United States. Although this type of treatment is no longer in practice, the toxic metal has accumulated in the soil. Now much of this land is used for rice crops, and rice grown in this area may contain elevated levels of arsenic.

“The risk is even greater for people who regularly consume up to four times the amount of rice in the average diet,” says Farrow.

Farrow's research, funded by the U.S. Department of Agriculture, is a joint project of S&T and Dr. John Yang at Lincoln University in Jefferson City, Mo., Dr. Wengui Yan at the USDA Dale Bumpers National Rice Research Center and Dr. Baolin Deng at the University of Missouri-Columbia.



Photo by B.A. Rupert

# Service & SOLAR POWER

By Andrew Careaga

After three trips to the tiny mountain village of Tacachia, Bolivia, **Anna Osborne** has discovered an appreciation for the simple things of life.

“The people there don’t have a lot, but they are so content with what they have,” says Osborne, a senior in civil and architectural engineering.

For the past three years, Osborne and other members of Missouri S&T’s Engineers Without Borders chapter have been working with the villagers of Tacachia to design and build a water distribution system. Now Osborne is focusing her extracurricular efforts on another small — but more modern — village.

A member of the Missouri S&T Solar House Team, Osborne is also the latest resident of S&T’s Solar Village, a neighborhood of four solar-powered homes designed and constructed by Solar House Team members. The homes were built in 2002, 2005, 2007 and 2009 for an international design competition known as the Solar Decathlon. Each year of the event, the team would haul the newly built house to Washington, D.C., and reconstruct it on the Capital Mall for the 10-day competition. S&T’s 2009 entry, which Osborne helped construct, attracted the most visitors of any entries that year.

This semester, Osborne inhabits the 2005 house. Like the other Solar Village structures, the house is limited to an 800-square-foot roof footprint. That makes it much smaller than typical American homes.

But Osborne doesn’t mind. As she learned from her EWB experience, bigger isn’t always better. Besides, she plans to design and build solar homes as part of her career.

Designing and building homes for the Solar Decathlon “is a very realistic project that has applications to the real world,” she says. “It’s also very interdisciplinary because you’re designing structural, mechanical, electrical, heating and cooling systems.”

As the team’s public relations director, she helps coordinate Solar Village tours and design displays for the team to use at various events. She also serves as editor for the team’s newsletter.

It’s a job many engineering types may avoid. But Osborne recognizes the value of public relations.

“It’s very important, especially for engineers, to learn how to communicate and to promote yourself and your organization,” she says. “You can’t succeed without PR.”

Congrats Anna!!



Pictured from left to right: Cesar Mendoza, Anna Osborne and Stuart Baur

## OSBORNE RECEIVES GOLD AWARD

The Missouri University of Science and Technology Alumna and Woman Student of the Year Committee recently announced its 2011 award winners. The awards are given to alumna and female students who are dedicated to enhancing the lives of women and committed to diversity.

The Missouri S&T 2011 Woman Student of the Year Gold Award went to **Anna Louise Osborne**, a senior majoring in civil and architectural engineering. Osborne served as the director of design and construction and is currently the director of public relations for the Missouri S&T Solar House Team. Honors and activities include Engineers Without Borders, Chi Epsilon Civil Engineering Society, Tau Beta Pi Engineering Honor Society, Phi Kappa Phi Honor Society, surveying teaching assistant, and elementary fluid mechanics LEAD peer learning assistant.

# McKinney awarded STAR Fellowship

## Presents research on Capitol Hill

**Jon McKinney**, EnvE'10, was recently awarded the EPA Science to Achieve Results (STAR) Fellowship for his research on "Forensic Analysis of Historical Occupant Exposures to VOCs in Buildings." On Sept. 20, 2011, McKinney presented his research as part of a Capitol Hill reception for a select number of



EPA STAR Fellows. The event was sponsored by the EPA, the National Council for Science and Environment and the American Association for the Advancement of Science.

McKinney said of his research, "The future impact is to give health scientists a new tool that they can use to forensically analyze

historical indoor air pollution exposure events (exposures that occurred in the past and are possibly causing current health problems). Hopefully such studies could lead to consumer product improvement and emission regulation."

McKinney is presently pursuing his master's degree in chemical engineering at S&T. **Daniel Forciniti** and **Glenn Morrison** serve as his co-advisors. He started his research while working toward his undergraduate degree in the department of civil, architectural and environmental engineering.

As an undergraduate, McKinney received an EPA GROW Fellowship. According to his research advisor, Glenn Morrison, "he made a great deal of progress during his undergraduate research and is pushing it much further in his graduate work. The methods he is developing will significantly improve our ability to identify causative factors in asthma and other childhood diseases."

## Burken to lead environmental group

**Joel Burken**, professor of civil and environmental engineering at S&T, has been elected president of the Association of Environmental Engineering and Science Professors (AEESP). He has previously served as vice president and president-elect.

AEESP is made up of more than 900 professors and practitioners in academic programs throughout the world who provide education in the sciences and technologies of environmental protection.

Burken will serve as president until October 2012, leading the organization's efforts to improve education of environmental engineering and science students, and increase the global outreach of the organization.

For more information visit [www.aeesp.org](http://www.aeesp.org).

## Faculty member receives UM System President's Award

**Rick Stephenson**, professor of civil, architectural and environmental engineering and assistant department chair for graduate affairs, has received a President's Award, the highest honor bestowed by the University of Missouri System, for excellence among the university's four mission areas of teaching, research, service and economic development.

"The faculty and students honored with a President's Award represent some of the finest, most dedicated educators and students we have on our four campuses," says University of Missouri Interim President Steve Owens. "Their passion and commitment to excellence have made a profound impact not only on our university but on all who have the pleasure of knowing and working with them."

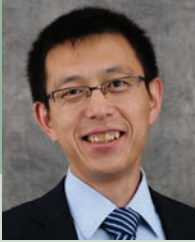
The award was presented in early March and recipients were honored at an awards dinner in June with the University of Missouri Board of Curators.



# NEW FACULTY

## Bate Bate

*Geotechnical Engineering*



**Email:** bateba@mst.edu

**Joined S&T:** Fall 2011

**PhD:** Georgia Institute of Technology

**Research interests:**

contaminant containment and site remediation, in situ soil improvement, beneficial reuse of industrial waste materials, modeling of fundamental soil behavior using discrete element method, and unsaturated soil mechanics

## Chien-Chung Chen

*Structural Engineering*



**Email:** chenchi@mst.edu

**Joined S&T:** Fall 2011

**PhD:** Pennsylvania State University

**Research interests:**

multi-hazard mitigation, bridge engineering, and hybrid/composite structural members

## Joon-Ho Choi

*Architectural Engineering*



**Email:** chojj@mst.edu

**Joined S&T:** Fall 2010

**PhD:** Carnegie Mellon University

**Research interests:**

human-centered environmental building technology, evidence-based sustainable building system design, building energy simulation, advanced building control systems, indoor environmental quality control, and work productivity and human health in built environments

## Kamal H. Khayat

*Materials Engineering*



**Vernon and Maralee Jones**

**Chair of Civil Engineering**

**Director, Center for Infrastructure**

**Engineering Studies**

**Director, Center for Transportation**

**Infrastructure and Safety**

**Email:** khayatk@mst.edu

**Joined S&T:** Fall 2011

**PhD:** University of California at Berkeley

**Research interests:**

design of innovative structural materials, including high-performance concrete with adapted rheology

## Daniel B. Oerther

*Environmental Engineering*



**John A. and Susan Mathes Chair of**

**Environmental Engineering**

**Director, Missouri S&T**

**Environmental Research Center**

**Email:** oertherd@mst.edu

**Joined S&T:** Fall 2010

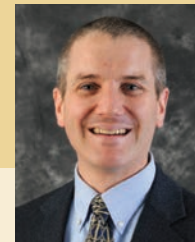
**PhD:** University of Illinois at Urbana-Champaign

**Research interests:**

environmental biotechnology, urban sustainability, and global development

## Ian Prowell

*Structural Engineering*



**Email:** prowelli@mst.edu

**Joined S&T:** Spring 2011

**PhD:** University of California, San Diego

**Research interests:**

challenges in structural dynamics, including implications of multiple simultaneous load sources on novel civil structures

# Munger receives award

**Paul R. Munger**, Ph.D., P.E., F.ASCE, was awarded the Edmund Friedman Professional Recognition Award for 2011, for his extraordinary contributions in university education, counsel to students, leadership in the professional engineering community and unrelenting, unselfish volunteer contributions to civil engineering and ASCE.

Munger has an over 50-year engineering career, launched by his undergraduate and graduate degrees at Missouri S&T. He served continuously for over 41 years at S&T, beginning as an instructor and rising to professor and chairman of the civil engineering department, and subsequently to the present as professor emeritus. He served as a personal advisor to hundreds of engineering students, and always insisted on performance at the level each was capable.

Munger worked diligently throughout his professional career to enhance the quality of engineering education. He has been a strong advocate of licensing of engineering school faculty as a requirement for teaching engineering courses in ABET-accredited programs. This assures by faculty example, that engineering students understand the importance of protecting public health, safety and welfare and meet professional standards of practice.

# FACULTY HONORS

- **Gary T. Moore**, adjunct professor, was recognized by the American Society of Civil Engineers (ASCE) for making substantial contributions to the civil engineering profession and the St. Louis Section. The award is made to a member who has an established reputation of professional service; lasting achievement in improving the conditions under which professional engineers serve in public and private practice; a significant contribution to improving civil engineering education; and a guidance of young civil engineers in the formative stages of their careers.
- **Glenn Morrison**, associate professor of civil, architectural and environmental engineering will receive a Faculty Excellence Award at a ceremony scheduled for Tuesday, Feb. 7, 2012. Five awards are given to recognize teaching, research and service excellence. Each award winner receives a \$3,000 stipend funded by industry and alumni contributions.

Morrison was also elected to the International Society of Indoor Air Quality and Climate Academy of Fellows. The organization promotes scholarship for indoor environmental and building sciences. Morrison was initiated into the academy in a ceremony at the Indoor Air 2011 Conference, held in Austin, Texas, June 5-10. He was also an organizer of the international conference, which had more than 1,000 attendees from 50 countries.

- **Daniel Oerther**, the John A. and Susan Mathes Chair of Environmental Engineering, was one of 65 of the nation's "most innovative young engineers and educators" selected to take part in the National Academy of Engineering's third Frontiers of Engineering Education symposium. The symposium was held Nov. 13-16, 2011 in Irvine, Calif. During the event, researchers shared ideas about innovations in teaching and learning.

Oerther was also selected for participation in the University of Missouri System Leadership Development Program (LDP). The LDP is a year-long program that provides leadership development opportunities and ongoing support to academic leaders on all four campuses.

- **Shamsher Prakash**, Ph.D., P.E., F.ASCE, emeritus professor at Missouri S&T, was recently named a Distinguished Member of the American Society of Civil Engineers (ASCE). The society's highest accolade, active distinguished membership is comprised of approximately only 200 of its 140,000 members worldwide. Prakash was presented the award, in honor of his pioneering work in soil dynamics, seismic analysis and revolutionizing geotechnical engineering, Oct. 20-22, 2011, at ASCE's Annual Civil Engineering Conference in Memphis, Tenn.

Prakash has also been inducted into the Academy of Geo-Professionals of the American Society of Civil Engineers (ASCE) as a Diplomat, Geotechnical Engineering (D.GE), during the 5th Induction Ceremony for the Academy of Geo-Professionals, held in conjunction with ASCE's Geo-Frontiers Conference in Dallas, Texas, March 13, 2011.

- **Jeffery Volz**, assistant professor of civil, architectural and environmental engineering received an Outstanding Teaching Award for 2010-11. Thirty-three faculty members were recognized at a ceremony on Wednesday, Nov. 30, in the Missouri-Ozark Room of the Havener Center. The Outstanding Teaching Award is given each year to faculty members by the Outstanding Teaching Award Committee, which bases its selections on student evaluations.

# Professional degrees

S&T awarded professional degrees to the following civil engineering alumni during commencement ceremonies.

## December 2010 Commencement

### Jeffrey Lee Feaster

**Jeffrey Feaster**, vice president of engineering at NCI Building Systems in Houston, earned a bachelor of science degree in civil engineering from Missouri S&T in 1977. Feaster began his career in consulting engineering with Crane and Fleming in Hannibal, Mo., and then moved to Black & Veatch in Kansas City, Mo., in 1978. In 1983, Feaster joined Butler Manufacturing Co. as a project engineer. He became manager of custom buildings in 1986 and then engineering manager of the Northeast Region in 1988, when he was transferred to Hershey, Penn. In 2001, he was named director of builder services. Feaster left Butler in 2005 to join NCI Building Systems, which provides metal buildings and components throughout the U.S. and Canada. He is a member of S&T's Academy of Civil Engineering and Kappa Sigma fraternity.

### Mary C. Lamie

**Mary Lamie** earned a master of science degree in civil engineering from Missouri S&T in 1998 after earning a bachelor's degree from the University of Missouri-Columbia. Lamie is deputy director of highways in region five for the Illinois Department of Transportation. Region five consists of 27 counties, 3,300 state highway miles and 1,700 bridges. Lamie is responsible for the development and implementation of the region's \$2 billion transportation program, including the new St. Louis Mississippi River Bridge, the 37-mile Gateway Connector and Interstate 57 reconstruction.

### Stephen H. McVeigh

**Stephen McVeigh** earned a bachelor of science degree in civil engineering from Missouri S&T in 1972. After 32 years of service, he retired from Shell Oil in 2004. From 2000 to 2004, McVeigh served as CEO for Sakhalin Energy Investment Co., an upstream joint venture in Russia. Prior to joining Sakhalin, he was vice president of production for Shell's domestic oil and gas operations. He also served on the board of directors for Enterprise Products and Enventure Global Technologies. From 1996-98, McVeigh was chief operating officer of Altura Energy, a Shell-Amoco-BP upstream partnership. He currently serves on the advisory board of Celerant Consulting Co. At S&T, McVeigh was a four-year letterman on the varsity football team and served as Student Brigade Commander of the Army ROTC unit. He received the Alumni Achievement Award in 2000.

## May 2011 Commencement

### Kirk Randolph

**Kirk Randolph**, president of the Central West division of Oldcastle Materials, earned a bachelor of science degree in civil engineering from Missouri S&T in 1985. Previously, he was with Ashland Inc.'s APAC group of companies. Randolph held various positions with APAC, including president. He was also vice president of the Major Projects Group in the southeast and vice president of operations support. His materials and construction experience includes aggregates, hot mixed asphalt, ready mixed concrete, earthwork, concrete and asphalt paving and bridges. Randolph lives in Dunwoody, Ga.

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Legacy of Ralph B. Peck

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International Conference on  
**Case Histories in  
Geotechnical Engineering**

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# Academy of civil engineers

# Inductees 2011



**Wayne Laufer**



**Kent Lynn**

▼ **Wayne Laufer**  
CE'67, PE  
Professional Degree Recipient '09  
Bois d'Arc Energy, Inc.  
Retired President and CEO  
Sanibel, Florida

Wayne Laufer's career in offshore oil exploration and development began in 1967 at Shell Oil. In 1977, he co-founded S.A. Holditch & Associates, now a part of Schlumberger. In 1998, he co-founded Bois d'Arc Offshore, LTD, which became Bois d'Arc Energy, an oil and natural gas exploration company that operates in the Gulf of Mexico region. Bois d'Arc Energy went public in 2005 and was sold in 2008. In 2009, Wayne and his wife, Gayle, endowed the largest gift for an endowed faculty position ever received by the University of Missouri System. Wayne received his professional degree from S&T in 2009. The Laufers are members of the Order of the Golden Shillelagh.

principal consultant to utility, energy and media/publishing companies. In his current position as Client Executive, Kent is responsible for managing relationships with some of the company's largest commercial clients. Throughout his career, Kent has traveled extensively, and decided to establish a scholarship to support international service learning. Kent is a member of the Order of the Golden Shillelagh.



**Michael McEvilly**



**Brad Parks**

▼ **Michael J. McEvilly**  
CE'90, MS EMgt'81, PE  
Senior Executive Vice President  
of Operations  
Spitzer Industries, Inc.  
Houston, Texas

Mike McEvilly has spent his career in the oil and gas industry and is currently Senior Executive Vice President of Operations for Spitzer Industries, Inc. With Spitzer, he oversees the design and fabrication operations of approximately 1,000 employees, in four facilities, manufacturing process and subsea equipment used in offshore oil and gas production operations. Mike is a member of several technical/professional societies and advisory boards and was named Young Engineer of the Year by the Sam Houston Chapter for the state of Texas. He received the Distinguished Achievement Award for Projects at the Offshore Technology Conference (2007, 2010) for the Marco Polo Tension-Leg Platform in 4,300 feet of water, and the Independence Hub



**Brad Parrish**



**Chuck Taylor**

▼ **Kent Lynn**  
CE'85  
MBA'91, University of Nebraska  
Professional Degree Recipient '09  
Senior Sale Executive  
IBM  
Bethesda, Maryland

Kent Lynn began his career as a systems engineer with IBM in Omaha, but quickly took on more responsibility. He served in various software sales and consulting roles, including global practice leader and



**Jeff Theerman**

Semi-Submersible in 8,000 feet of water, respectively, both of which were record water depths at the time of installation. He is a member of Tau Kappa Epsilon Fraternity, and was named a National Top Teke in 1980. He is a member of the Order of the Golden Shillelagh, and will be inducted into the Academy of Engineering Management this April.

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### ▼ **Dr. M. Brad Parks**

MS CE'87, PhD'87, PE  
Senior Manager  
Advanced Threat Technology  
Development and Response  
Group  
Sandia National Laboratories  
Albuquerque, New Mexico

M. Brad Parks is the Senior Manager for the Advanced Threat Technology Development and Response Group at Sandia National Laboratories (SNL), Albuquerque, New Mexico. Since 1987, he has worked at SNL on a variety of projects including accident performance of containment buildings housing nuclear power plants, structural analysis of ship-to-ship collisions to determine potential damage to on-board containers carrying radioactive materials, scientific advisor to the DoD's office that deals with counter proliferation of weapons of mass destruction and manager of a department studying transportation-related nuclear explosive security issues. In his current position, Brad manages four departments that focus on nuclear weapon security, nuclear emergency response, and consequence management for nuclear, chemical, or biological incidents. Brad has received many awards, including the 2000 Sandia Employee Recognition Award. He has authored approximately 50 publications.

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### ▼ **Brad R. Parrish**

CE'77, MS CE'78, PE  
President  
Palmerton & Parrish, Inc.  
Springfield, Missouri

Brad Parrish began his career in geotechnical engineering and construction materials testing in 1979, in 1989, he cofounded Palmerton & Parrish, Inc., and is currently the firm's president. The firm offers geotechnical, environmental, and design engineering services and operates a full service construction materials testing laboratory. Brad is licensed as a Professional Engineer in four states. Over the years, Brad has been very active in MSPE and has served as its president. He has been active in ACEC-MO, having served as a Director and PAC Trustee. In 1989, he was honored as MSPE Ozark Chapter's Young Engineer of the Year. In 2000, he received the MSPE "Extra Mile" Resolution Award for his work on Engineering Licensure and Registration. In 2008, Brad was named S&T's Chi Epsilon Chapter Honor Member.

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### ▼ **Chuck Taylor**

CE'83, PE  
Group Manager, Aviation Services  
Crawford, Murphy and Tilly, Inc.  
Springfield, Illinois

Following in his father's footsteps Charles (Chuck) Taylor attended Missouri S&T. After graduation, he worked for Crawford, Murphy and Tilly, Inc. in their aviation services division. Today, Chuck serves as CMT's Group Manager of Aviation Services. Throughout his career, Chuck has worked on airports throughout the U.S., engineering solutions to technical, as well as political and

funding problems, all the while meeting the stringent requirements of the FAA. His work on rehabbing Runaway 30R at Lambert Field in St. Louis won him a National Paving Award from the American Concrete Paving Association, Lambert's first national award. Chuck is a member of the Association of Airport Executives, the Missouri State Aviation Council, ASCE and other technical/professional societies.

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### ▼ **Jeff Theerman**

CE'80, PE  
MSCE from SIU Edwardsville  
Professional Degree Recipient '09  
Executive Director  
Metropolitan Sewer District  
St. Louis, Missouri

Jeff Theerman is the Executive Director of Metropolitan Sewer District (MSD), St. Louis. A long-time engineer at MSD, Jeff is responsible for all engineering, construction, operations and administration for the district. Jeff has been a great ambassador of civil engineering and S&T. Within the many technical, professional and community societies he works to further his profession as well as be a spokesman for engineering, MSD and Missouri S&T. Jeff is serving as the national president for the National Association of Clean Water Agencies and is a member of several other technical/professional organizations.

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# Homecoming awardees 2011

The following CAE alumni received awards presented by the Miner Alumni Association during Homecoming:

## **Robert V. Wolf Alumni Service Award**

» **Michael D. Hurst**  
CE'74, Prof. CE'00  
President and COO (retired)  
McCarthy Building Companies  
St. Louis, Missouri

Active, involved and committed are key words used to describe Michael D. Hurst, retired president and chief operating officer of McCarthy Building Companies. As a faithful supporter of S&T, Michael contributes both talent and treasures. He has served on the Miner Alumni Association's Board of Directors, and he is currently a member of the Academy of Civil Engineering and the university's Order of the Golden Shillelagh major donor society. Michael also just finished leading the major renovation and addition to Sigma Phi Epsilon house.

## **Distinguished Young Alumni Award**

» **Lister B. Florence Jr.**  
CE'95, MS IST'06, CSci'07  
Information Technology Specialist  
U.S. Geological Survey  
Rolla, Missouri

Lister B. Florence Jr. is a member of the Chancellor's Advisory Committee on African American Recruitment and Retention (ACAARR). In this capacity, he recruits fellow alumni to join him for Legislative Day in Jefferson City, where he speaks with legislators about the importance of state funding for the University of Missouri System and its students. He also serves as an admissions ambassador and has been chair of ACAARR's Legislative and Public Relations Subcommittee, S&T's Alpha Phi Alpha Fraternity Celebration Committee and S&T's Alpha Phi Alpha's homecoming celebration.

## **Frank H. Mackaman Alumni Volunteer Service Award**

» **James L. Foil**  
CE'74, MS CE'75, Prof. CE'04  
Senior Vice President and  
General Manager  
Burns & McDonnell  
Lee's Summit, Missouri

Like everyone else, James L. Foil has 24 hours in a day, but somehow, he manages to make it look like more through his energetic service to his community, the Miner Alumni Association and S&T. Jim is a member and past president of S&T's Academy of Civil Engineers. Each semester, he presents a lecture to the civil engineering senior design class. He also promotes campus activities, and attends college fairs and prospective student receptions. As a member of the University of Missouri System's Alumni Alliance, he advocates for increased funding for higher education at the Missouri Capitol. A past director of the Miner Alumni Association's Board of Directors, Jim continues to actively serve the Kansas City Section by hosting an annual student send-off picnic at his home. He and his wife, Ann, are also members of the university's Order of the Golden Shillelagh major donor society.

## **Outstanding Student Advisor Award**

» **Jeffery Volz**  
Assistant Professor  
Civil, Architectural and  
Environmental Engineering  
Missouri S&T

Jeffery Volz fulfills his dream of teaching college-level students as an assistant professor of civil, architectural and environmental engineering at Missouri S&T.

Jeff earned B.S. and M.S. degrees in architectural engineering from Penn State. He spent 16 years in Chicago involved in structural design, research and forensic investigations of buildings and bridges. In 2003, Jeff returned to Penn State to pursue a Ph.D. degree in civil engineering and received several fellowships and teaching awards during that time. More recently, Jeff received the Class of 1942 Excellence in Teaching Award from the Miner Alumni Association in 2009, and the Daniel P. Jenny Research Fellowship from the Precast/Prestressed Concrete Institute in 2011.

## **Alumni Admissions Ambassador of the Year Award**

» **David J. Bufalo**  
CE'66  
Director, Design and Construction  
Management Division (Retired)  
Denver Department of Public Works  
Denver, Colorado

Dave Bufalo is so good at recruiting students to S&T that many prospective students just assume he's a paid employee, until he tells them he volunteers for his alma mater. As an alumni admissions ambassador, Dave rolls out the recruiting materials and markets the benefits of an S&T education. He encourages prospective students to get involved on campus and to make a difference — both while attending and after graduation. He also tells them to replace themselves, which is what he sets out to do at every college fair. Active in the Rocky Mountain Section of the Miner Alumni Association, Dave serves on the Miner Alumni Association's Board of Directors and recently completed a three-year term as the Rocky Mountain Section president.



## Golden Alumni Reunion

Civil alumni celebrated their 50th reunion on May 23 and 24, 2011.

***Pictured are:***

Front row (left to right): Daniel True, Robert Harris, Robert Saxer, Robert Willey, John Wright, and James Kron; Second row (left to right): Richard Hampe, William Mathews, Jimmy Hahs, David Owsley and Merle Southern; Third row (left to right): Larry Farmer, Eugene Brenning, John Sturm, Richard Brake and Jerome Leslie.

# Engineers Without Borders

## *Changing the world, one community at a time*

Medical doctors travel all around the world treating sicknesses caused by a polluted water source. Can we save more lives by preventing these diseases? S&T students believe so. Engineers Without Borders (EWB) mission is to support community-driven developmental programs worldwide through the design and implementation of sustainable engineering projects while fostering responsible leadership.

The Missouri S&T EWB chapter has four projects in Bolivia, Honduras and Guatemala. Some communities such as Tacachia, Bolivia, had their potable water source cut in 2009 and homes in Santiago, Honduras, were receiving water only a few hours two or three times a week from their water system. Over the summer, each team sent a group of students to assess and implement their project while working alongside professionals and advisors. They implemented projects such as building gabions to protect the Los Eucaliptos, Bolivia, community from eroding land, constructing a well house to store

and protect equipment for the Nahualate, Guatemala's, future well.

With the chapter's efforts from last year, they were awarded the Midwest Premiere Chapter Award at the Midwest Regional Conference hosted by EWB-S&T. This award recognizes excellence in organization, fundraising and public relations, engagement in mentor/mentee relationship, and chapter and regional participation. "It was great to see all of our efforts to strengthen our chapter be recognized by EWB-USA. The fact that we were able to host the conference where we were presented the Midwest Region Premiere Chapter Award was icing on the cake!" said chapter president Grace Harper.

Changing the world, one community at a time, the Missouri S&T chapter spends the year designing, implementing, and educating for the chance to not only make an impact on other's lives, but their own as well.

» Learn more: <http://ewb-mst.org/>



Tacachia, Bolivia



Guatemala



Los Eucaliptos, Bolivia



Honduras



MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY  
Civil, Architectural and Environmental Engineering  
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Rolla, Missouri 65409-0030

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The Miner Alumni Community website, keeps you closely connected with your alma mater regardless of where you are in the world. Locate your friends and learn about alumni privileges and services exclusive to you.

### Read your *Missouri S&T Magazine* [magazine.mst.edu](http://magazine.mst.edu)

This complimentary quarterly publication is sent to all alumni to ensure that you remain clued in to what's happening on campus even after your graduation.

### Volunteer and share [alumni.mst.edu](http://alumni.mst.edu)

Nuture future generations of students and alumni. Share your wealth of knowledge and experiences with budding students and new alumni by mentoring a Miner.

### Attend a campus event or program [calendar.mst.edu](http://calendar.mst.edu)

Missouri S&T organizes events all year round to meet your professional, social and personal needs. Attend a guest lecture, sporting event, or catch up with your friends at Homecoming or St. Pat's.



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**Missouri S&T Civil, Architectural & Environmental Engineering (CArE)**