EREF Awards Two New Research Grants

EREF is the only private, grant making institution with a national and international scope whose sole mission is to support solid waste research and education initiatives. Our research grants program is led by our Research Council, a body of volunteers consisting of technical experts in industry, academia and consulting. The work of the Council is guided by a long range strategic plan with the goal to achieve greater sustainability, good environmental stewardship, higher process efficiency and increased knowledge. Council recommended projects are then reviewed by our Board's Projects Committee for a final review and funding allocation. Non-research oriented projects are reviewed and recommended to the Projects Committee by technical staff.

Researchers are invited to submit proposals on solid waste management issues contained in EREF's Strategic Research Plan or on educational projects. The next proposal deadline is January 8, 2014. Visit www.erefdn.org/grants for more information.

(continued on page 14)

EREF Regional Summit on Sustainable Solid Waste Practices & Research

Meeting Focus: Managing & Treating Landfill Leachate
October 8 - 9, 2013
Four Seasons Hotel
Philadelphia, PA

Leachate treatment is becoming more challenging and typically is one of the largest operating costs for landfill owners. Publicly owned treatment works (POTWs) face more stringent discharge standards today than ever before, which are resulting in increased limitations being placed on accepting leachate from landfills, with some facilities no longer accepting leachate at all. Thus, landfill owners must seek new and more efficient means to cost-effectively treat leachate by either making it acceptable to POTWs or by managing it on-site.

(continued on page 18)
Over the years, EREF has funded more than 50 scholars, many of whom are now in key academic and professional positions throughout the world. Scholarships are a unique feature of EREF, and a trademark of the waste industry’s only research foundation.

François Fiessinger, one of the founding directors of EREF, believed in scholarly research and was one of very few people who, early on, had a long-term research and development vision for the solid waste industry. Upon his death in 1997, a contribution from Lyonnaise des Eaux established EREF’s first named scholarship – the François Fiessinger Memorial Scholarship Fund to recognize excellence in Ph.D. or postdoctoral environmental research and education.

In August our industry lost a great friend. Robert P. Stearns, P.E., DEE was a long-time EREF board member, mentor and supporter. Bob was Chairman and Co-Founder of SCS Engineers, where he directed or served in a review capacity on many solid waste management-related projects. EREF’s scholarship program has specifically grown because of Bob and SCS Engineers. As François Fiessinger, who also left us too early, Bob had the vision and desire to share his passion for our business with young talented students, to help introduce new techniques and improve our environment. In 2007 EREF awarded the first Robert P. Stearns/SCS Engineers Master’s Scholarship, which was established to expand EREF’s successful doctoral-level scholarship program. Bob’s restless commitment to the foundation and open mind allowed EREF’s leadership to progressively widen the research themes covered by EREF scholars to new fields. Such projects include “Using Business to Spur Waste-to-Energy Technologies in Developing Countries,” “Electronic Waste Issues and Solutions” and “Waste as Resources: Utilization of Coal Combustion By-products in the United States,” and reflect present and future trends in our industry.

On behalf of the EREF Board of Directors and staff, we will miss Bob’s commitment and vision, but also his attention to detail, that helped us progress in EREF’s mission. My personal thoughts go to Gisela, whose faith in life and natural joy is an example and a light in these difficult moments.

As outlined by the new Waste Industries scholarship honoring Lonnie C. Poole Jr. (see page 8), EREF is committed to focus on educating the next generation. EREF scholarships help students develop expertise of solid waste issues while pursuing a college degree. They provide young minds with familiarity of this industry that we are all a part of.

Sincerely,

Henry Saint Bris
Senior Vice President of Strategy, Suez Environnement
Chairman, EREF Board of Directors
EREF Offers Online Courses And Corporate Training

Dear Friends and Colleagues,

In the last newsletter sent earlier this year, I noted EREF was living up to its name by expanding its educational program. As we enter the last quarter of the year, by year’s end EREF will have provided more educational content and offerings than it ever has in the foundation’s 21 year history, with over 20 online courses, 5 webinars, a Summit conference focusing on leachate treatment and dozens of technical reports available online from EREF’s funded research.

In addition to this, EREF signed a memorandum of understanding with the Environmental Industry Associations (EIA) to work together, with EREF providing technical educational content to support EIA’s broad educational initiatives. EREF continues to provide educational talks at various events and to various groups, including: WasteExpo, the New England Waste Management Officials Association (NEWMOA), the Virginia Department of Environmental Quality, the North Carolina Biofuels Center and multiple SWANA events.

While our online educational program allows an individual to take our courses ‘a la carte’ on demand, EREF is now pleased to offer online corporate training packages. The subscription based packages provide EREF’s online content to all employees at an entire company without the hassle of registering and paying for each individual course. Our corporate training platform provides a dedicated password-access web page tailored to the training needs of a particular company. In this way, EREF content can be seamlessly integrated into any existing training acumen that may exist. Because content is bundled, rates for our corporate training packages are extremely affordable. I invite you to take a look at EREF’s continuing education offerings. It’s a great way to support the foundation while keeping your skill set up to date or giving an edge to your company.

As always I invite your feedback. We want to know what you think is working, what is not or what can be improved as we continue to serve the industry through our educational program. Please do not hesitate to contact me directly at (919) 861-6876 or bstaley@erefdn.org. I look forward to hearing your thoughts and suggestions.

Kind regards,

Bryan F. Staley, Ph.D., P.E.
EREF President and Chief Executive Officer
Tribute to Robert P. Stearns, P.E., DEE

The EREF Board of Directors and staff are greatly saddened by the passing of a great friend, long-time board member, mentor and supporter.

Bob Stearns, Chairman and Co-Founder of SCS Engineers, joined the EREF Board of Directors in 1999 and served as Chairman from 2004–2005. At SCS, he directed or served in a review capacity on many of the firm’s solid waste management-related projects. Under his leadership SCS grew to more than 500 employees located in 9 regional offices throughout the United States. Following his retirement in 2006, Bob continued as SCS Chairman of the Board focusing on strategic planning and acquisitions. In 2007 EREF awarded the first Robert P. Stearns/SCS Engineers Master’s Scholarship, which was established to expand EREF’s successful doctoral-level scholarship program.

Bob was a wonderful man who generously served his family, his company and the waste industry with all he had. Our hearts go out to Bob’s family, especially his wife Gisela, and colleagues in this time of sadness. Every member of the EREF Board and staff will miss Bob a great deal, and are honored to have called him friend.

The following individuals and companies have generously made donations to EREF to honor Bob Stearns:

Pat Carroll, Environmental Solutions Group
Tom Conrad, SCS Engineers
Suzanne Helak, SCS Engineers
Curtis Janq, SCS Engineers
Ronald Perkins, Ag Container Recycling Council
Galen Petoyan, SCS Engineers
David Ross, SCS Engineers
Richard Spencer, SCS Engineers
Bryan Staley, EREF
Jean Webb
Kevin Yard, SCS Engineers
Golder Associates, Inc.
Landtec North America, Inc.
Penton
SCS Field Services

“Bob Stearns was a very accomplished leader in our environmental industry. His great intellect, leadership and mentoring abilities have been a strong factor in the development and growth of the Environmental Research and Education Foundation. We have been very privileged to have him as a friend and associate.”

- Bob Riethmiller, PTR Baler and Compactor Company
“Bob Stearns was a bright and dedicated servant to our industry and to EREF. Bob was never reluctant to challenge us. He did it constructively but you were clear on where he stood, and I admired that trait of Bob’s. He was wise counsel to our Projects Committee at EREF. He left his mark on us, and we will miss him.”

- Jim Dowland, Waste Management

“The highest compliment an Englishman can pay to another man, is to say they are a ‘Gentleman.’ Bob Stearns wasn’t just a Gentleman, he was one of the finest I ever had the privilege to call my friend.”

- Paul Mitchener, Macquarie Capital Funds Inc.
2013 EREF Charitable Auction: Big Success in the Big Easy!

The 19th Live Auction, held on May 22, 2013 at WasteExpo in New Orleans, Louisiana, brought in over $1.3 million! Show attendees gathered at the EREF booth for an Auction reception, sponsored by Big Truck Rental, and then professional auctioneer Gary Seybold of Ritchie Bros. Auctioneers auctioned off the 27 lots of donated equipment and outings to very enthusiastic crowd. The frenzy paused when EREF scholar Jim Levis, a Ph.D. student at North Carolina State University, expressed his appreciation for the opportunities his EREF scholarship has provided. Attendees were then asked to raise their paddles for the students – and over $17,000 was given to the EREF scholarship fund.

In its third year, the Silent Auction boasted donations such as iPads and other electronics, equipment and sporting event tickets from more than 40 WasteExpo exhibitors, and raised more than $58,000!

The EREF Annual Charitable Auction is the foundation’s largest fundraiser, so far having raised more than $13 million to further EREF’s mission to fund and direct scientific research and educational initiatives for waste management practices.

The Auction is a direct result of the generosity of members of the Waste Equipment Technology Association (WASTEC) and the National Solid Wastes Management Association (NSWMA), who donate the fantastic items up for auction.

(above): Tony Lundy of Mobile Container Service, Inc. won a 1967 Pontiac Firebird sponsored by New Way

(left): The Silent Auction allowed WasteExpo attendees to “Make a Bid, Get a Steal!”

(above): Waste Industries’ Josh Thompson places the winning bid!

(above): The Auction Reception is always a great time to catch up with industry friends

(above) The WCA Waste Corporation team purchased a pink Slammin’ Eagle from The Curotto Can – who also made a donation to the local chapter of Susan G. Komen
Special Thanks to the Following Companies and Individuals That Donated to the EREF Auction:

3rd Eye Mobile Vision  
Advanced Disposal  
Air-Weigh  
Ameri-Kan  
Autocar, LLC  
Bayne Premium Lift Systems  
Big Truck Rental  
Bridgeport Manufacturing, Inc.  
Debbie Busby, Penton Media  
Calvert Street Group  
Cascade Engineering  
Caterpillar  
Civil & Environmental Consultants, Inc.  
Clean Energy  
The Curotto-Can  
Dumpster Mate  
Eagle Eye Waste Graphics  
Effenco  
Environmental Solutions Group  
FleetMind Solutions, Inc.  
Global Sensor Systems  
Golder Associates Inc.  
Goodyear  
Heil Environmental  
Hino Trucks  
Intel Video Systems, Inc.  
Labor Ready  
Machinex Technologies, Inc.  
Mack Trucks, Inc.  
Marathon Equipment Company  
McNeilus Companies  
New Way  
NSWMA  
O’Brian Tarping Systems  
Otto Environmental Systems North America, Inc.  
Perkins Manufacturing Company  
Peterbilt Motors Company  
Ven and Scott Poole  
PreView Radar Systems  
Progressive Waste Solutions  
PTR Baler & Compactor Co.  
Rheig Pacific Company  
Reliable Transmission Service  
Republic Services  
Roll-Rite LLC  
Schroeder Industries LLC  
Screen Graphics of Florida  
SCS Engineers  
Sonrai Systems  
Spartan Safety Supply  
SSI Schaefer  
tarpARMOR  
Trucks & Parts of Tampa  
TY Cushion Tire, LLC  
Volvo Construction Equipment North America  
Wastedbuilt

Plan Now to Donate to the 2014 Auction!  
Held in conjunction with WasteExpo, the EREF Annual Charitable Auction is the foundation’s largest fundraiser. All proceeds from the Auction support EREF’s mission to fund and direct scientific research and educational initiatives for waste management practices. For more information on how to participate or donate, send an e-mail to events@erefdn.org.

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This year’s four scholars were selected from numerous highly qualified finalists. The EREF scholarship program recognizes students with academic excellence, professional involvement and an interest in solid waste management issues at the postdoctoral, doctoral and master’s levels. Doctoral/post-doctoral scholarships are given in memory of Francois Fiessinger, P.E., Ph.D., a graduate of Rutgers University, who was a founding director of the foundation; and by EREF. Master’s scholarships are made possible by the late Robert P. Stearns, P.E., DEE of SCS Engineers and Robert J. Riethmiller of PTR Baler and Compactor Company. Most recently EREF has established the Waste Industries Scholarship Honoring Lonnie C. Poole, Jr., an EREF founder and Director Emeritus.

Ella Kim
Massachusetts Institute of Technology, Ph.D.
Francois Fiessinger Scholar 2013

Renewable Natural Gas from Anaerobic Digestion Processes

Project Description:
Renewable natural gas (RNG) is the gas produced by cleaning and upgrading biogas produced through anaerobic digestion of organic waste, such as food wastes, livestock manure and wastewater solids. RNG is currently one of the lowest carbon transportation fuels; it is also chemically identical to natural gas and can be used at any stage of the natural gas fuel supply chain.

Cities in the United States have numerous solid waste resources that can be exploited to produce RNG. Sites where organic wastes are already being aggregated with biogas production and collection, such as landfills, wastewater treatment plants and farm-based anaerobic digesters, can become producers of RNG by investing in technology to upgrade the raw biogas. However, most of the waste-to-energy projects at landfills and wastewater treatment plants in the U.S. currently only produce electricity for sale into the grid or local heat and power; no RNG is being used for transportation. Therefore, analyzing the benefits and barriers to utilizing RNG as a transportation fuel in the United States can further both sustainable urban transportation and the economic development of the solid waste management industry, while highlighting the crucial linkage between local waste systems and urban sustainability.

Biography:
Ella is currently pursuing a Ph.D. in environmental planning at the Massachusetts Institute of Technology (MIT). Prior to her studies at MIT, she graduated from Dartmouth College with a BA in economics and Columbia University with an MIA in environmental policy and an MA in quantitative methods. She has worked at a variety of private, public and not-for-profit organizations, including KPMG, the Environmental Protection Agency, the Earth Institute and the Clinton Climate Initiative.

Xunchang Fei
University of Michigan, Ph.D.
EREF Scholar 2013

Paradigm for Solid Waste Containment to Active Treatment and Energy Recovery

Project Description:
Approximately 250 million tons of municipal solid waste (MSW) is generated on a yearly basis in the United States. In 2010, 54% of the generated waste was landfilled, while 34% was recycled and 12% was incinerated. Both recycling and incineration have limitations in handling large volumes of waste and are only feasible for certain types of waste. Among the landfilled MSW, 60% consisted of

Waste Industries Scholarship Honoring Lonnie C. Poole Jr.

Lonnie C. Poole, Jr., one of EREF’s founders and currently a Director Emeritus, is the founder of Raleigh-based Waste Industries USA, Inc. Lonnie, who grew up on a farm in North Carolina, was the first in his family to attend college. After graduating with a B.S. in Civil Engineering from North Carolina State University, he served as a pilot in the U.S. Army for four years, and then returned home to find immediate success in the business world, excelling as both a sales manager and an engineer with several firms. In 1970 Lonnie founded Waste Industries, a non-hazardous solid waste services company, which now serves more than 700,000 customers across five states. One Lonnie C Poole Jr. / Waste Industries Scholar is awarded annually.

(continued on page 16)
Big Truck Rental Executive Scott Dols Elected to EREF Board of Directors

Scott Dols is the President and CEO of Big Truck Rental, Trucks & Parts of Tampa and Trucks.com International, which is the Trucks.com Web site. Dols has over 25 years of business experience specializing in developing companies in high-growth market segments. Dols created Big Truck Rental [BTR] in 2002 after identifying a solid market need for quality refuse truck rentals. Within two years, Dols grew BTR into the nation’s largest refuse rental truck fleet. In 2007, Dols purchased majority interest in BTR and in 2009 purchased a 50% interest in Trucks & Parts of Tampa, a 64 year old second generation family business that sells new and used refuse trucks and the Trucks.com URL. That same year, Dols helped develop Vocational Energy, which specialized in the design and construction of compressed natural gas [CNG] fueling stations. Since 2009, Vocational Energy has been responsible for the construction of over 60 CNG stations throughout the U.S. In December 2012 Vocational Energy was acquired by Fortistar and is now doing business under the name TruStar Energy. Dols sits on the WASTEC Board of Governors, EIA Board of Trustees and the DCA Board (Detachable Container Association). Dols and his wife Vicki have been married for 16 years and have three children.

“I’m thrilled to play a leadership role in EREF,” said Dols. “This is an organization dedicated to the science of our industry through the funding of scholarships and grants. I find it extremely exciting that EREF’s research is expanding beyond just landfills - in fact roughly 40 percent of currently funded projects focus on sustainable end-of-life technologies.”

EREF Scholar Visits PTR Baler

One of EREF’s named scholarships is the Robert J. Riethmiller/PTR Baler and Compactor Master’s Scholarship. The most recent recipient of this scholarship, Kaitlyn Sniffen, had the opportunity this summer to pay a visit to the company that contributes so greatly to her education. Kaitie is currently in her second year at Drexel University in Philadelphia, and is pursuing a degree in environmental engineering. Her EREF research project, entitled “Using Algae as a Biomass for Biofuel,” explores the feasibility of growing algae as a biomass in naturally nutrient rich landfill leachate.

Kaitie, who visited PTR Baler and Compactor in August along with EREF staff members Bryan Staley and Kristy Pickurel, presented her research and findings thus far to members of PTR’s leadership team. “We were thrilled to meet Kaitie and hear about her research,” said PTR President Mike Savage. “The PTR family greatly values the work that EREF does and believes wholeheartedly in its mission to educate the next generation of industry leaders and researchers.”

About the Robert J. Riethmiller/PTR Baler and Compactor Master’s Scholarship

Robert J. Riethmiller, chairman of PTR Baler and Compactor, currently serves on the EREF board as the chairman of the Scholarship Committee. Riethmiller’s grandfather, also Bob Riethmiller, began working for PTR in 1911, and purchased it in 1929; since then it has been a family-run business. PTR is a fourth generation, family-owned company that manufactures, installs and services balers and compactors in all 50 states and sells internationally. Riethmiller has been working in the waste industry for over 50 years. EREF Riethmiller/PTR Scholars are awarded each year.
More than 50 students have been EREF scholars, many of whom are now in key academic and professional positions across the United States. More information on the EREF scholarship program can be found in the article on page 8.

In its first newsletter of 2013, EREF provided updates on five past scholars. This issue continues the new tradition of taking a closer look at what a few past EREF scholars are doing now.

Ramin Yazdani
University of California at Davis, Ph.D.
EREF Scholar 2008

**Project:** Factors Limiting Aerobic Degradation During Aerobic Bioreactor Landfilling

**WHERE RAMIN IS NOW:**
Senior Civil-Environmental Engineer in the Division of Integrated Waste Management
Yolo County Planning and Public Works Department in California

Dr. Yazdani received his Ph.D. in Civil & Environmental Engineering from the University of California at Davis. He is a registered Professional Civil Engineer in California.

Dr. Yazdani conducts research and operates a commercial scale controlled landfill bioreactor facility. His research work is in the areas of waste to energy, with emphasis on anaerobic digestion, aerobic composting, landfill methane emission reduction and biogas. He has over 22 years of experience in environmental engineering applied research, plant design, construction and operation of various solid waste management and waste to energy processing facilities. He has conducted numerous research and demonstration projects for the California Energy Commission, the Department of Resources Recycling and Recovery (CalRecycle) and the U.S. Department of Energy-NETL. He has published numerous project reports and articles in leading environmental engineering and science journals.

“The EREF scholarship was not only helpful as a financial assistance in completing my Ph.D., but it also provided me with industry recognition as to the importance of the research work that I was doing in the areas of organic waste diversion from landfill and landfill bioreactor applied research work. To receive funds from EREF was an honor and I am proud and grateful to have had the opportunity.”
Nicole Berge  
*University of Central Florida, Ph.D.*  
Francois Fiessinger Scholar 2004

**Project:** Full-Scale Management of Nitrogen at a Bioreactor Landfill

**WHERE NICOLE IS NOW:**  
Assistant Professor of Civil & Environmental Engineering  
University of South Carolina

Dr. Berge’s research centers around understanding how physical, chemical and biological processes can be manipulated to promote sustainable waste management. Her primary research interests include sustainable and environmentally-beneficial waste conversion to value-added products, energy generation from waste streams and sustainable treatment/management of emerging wastes (e.g., nanomaterial containing wastes, pharmaceuticals). Current areas of exploration include the hydrothermal carbonization of mixed feedstocks, hydrothermal carbonization of food waste for energy source generation and the fate of discarded nanomaterials in bioreactor landfills. Her work associated with the hydrothermal carbonization of food waste for energy source generation is currently being funded by a grant from EREF.

“I am extremely grateful to EREF. The foundation’s support during my Ph.D. studies allowed me to pursue valuable education and research opportunities I would not have otherwise been able to pursue. I am also grateful to EREF for its continued support of scientific research and education in the waste management field.”

Mohan B. Dangi  
*The Johns Hopkins University, Ph.D.*  
Francois Fiessinger Scholar 2007

**Project:** Assessing Municipal Solid Waste Streams to Illustrate Waste Composition and Generation Patterns Solid Waste Management in Kathmandu, Nepal

**WHERE MOHAN IS NOW:**  
Assistant Professor of Environmental Systems and Policy in the Department of Geography  
California State University, Fresno

Mohan B. Dangi earned his Ph.D. and M.S. in geography and environmental engineering at the Johns Hopkins University. He received M.Sc. in environmental science and engineering and B.Sc. in chemical engineering with a minor in Asian studies and international politics from the Colorado School of Mines. A licensed professional engineer in Colorado, Dr. Dangi is an Assistant Professor of Environmental Systems and Policy in the Department of Geography at California State University, Fresno. His research interest encompasses across municipal solid waste management, urban-rural interface issues in developing countries, water/wastewater and environmental change in mountain ecosystems. Some of this work has been published in peer-reviewed journals and has been widely disseminated via invited talks across the U.S., Nepal, Mexico and Europe. Highlights of his work include recommendations for reorganization of waste management in Kathmandu to the two different Prime Ministers of Nepal.

Since his internship in National Renewable Energy Laboratory in 1998-99, Dr. Dangi has consistently tackled environmental issues in Nepal, thus completing five projects, instigating five memoranda of understandings between the US and Nepalese universities and creating two engineering curricula. These tasks were funded by the Department of Energy, USAID, EREF and the National Science Foundation. His work in international involvement and academic excellence has earned him National Student of the Year Award from the Phi Beta Delta (U.S.) and a Gold Medal (Nepal).

Dr. Dangi has been serving as a Visiting Professor in the Departments of Civil and Architectural Engineering and Ecosystem Science and Management at the University of Wyoming and also at the Central Department of Environmental Science in Tribhuvan University, Nepal. Recently, he helped develop a faculty-led study abroad program in Nepal, Environmental Quality in the Himalayas, for the University of Wyoming.

“When I first heard that I received the Francois Fiessinger Fellowship in July 2007, I was in the middle of characterizing restaurant waste with a number of local student scientists in Kathmandu. I immediately was charged with emotion and joy which later became a source of encouragement. Without the EREF scholarship, it would have been very difficult for me to complete my studies on time at the Johns Hopkins University. Inspired by the fellowship, my students and I have continued our journey in the discipline of solid waste from Kathmandu (waste characterization and waste policy) to Fresno (life cycle analysis of green waste), and most recently to Laramie (recycling policy). Although the award was limited to my Ph.D. studies, the opportunity presented by it has reenergized me to my own learning of solid waste and to many of my students in the U.S. and Nepal.”
EREF and EIA to Work Together Collaboratively

EREF and the Environmental Industry Associations (EIA) have completed an agreement that sets out how they will work together on matters of research and education going forward. EIA is the trade association that represents the American private sector solid waste and recycling industry through its two sub-associations, the National Solid Wastes Management Association (NSWMA) and the Waste Equipment Technology Association (WASTEC).

The agreement between the two organizations delineates the areas and parameters for such collaborative work for the mutual benefit and achievement of the missions of the respective groups. An announcement was made at the EREF Annual Charitable Auction held in conjunction with WasteExpo 2013.

Said EREF President and Chief Executive Officer Bryan Staley, “The initial effort we plan to undertake is to develop an industry work group to identify data and information needs. EREF and EIA are both dedicated to serving the solid waste and recycling industry, and we are very excited to continue our longstanding collaborative relationship in this way to more effectively fulfill the needs of our members and stakeholders.”

EREF and EIA will work together to prioritize data aggregation efforts, gain member/stakeholder support, complete research and share non-sensitive data. EREF and EIA will discuss mutual support of EIA’s certification efforts, safety program and advocacy efforts.

The organizations will work together to provide more educational options for industry stakeholders. The groups also will identify topics where white papers may be needed by EIA members. EREF will utilize its current research grants program as well as obtain content via its various research initiatives under its internal research program to generate such papers.

About the agreement, EIA’s President & Chief Executive Officer Sharon H. Kneiss said, “EIA’s programs will be strengthened by our relationship with EREF. By working together, we can smartly conserve resources and extend the research capabilities of both groups. This will allow us to better serve the needs of our members and communicate about important topics related to the waste and recycling industry.”

“This is a very exciting time in our industry,” said Richard Burke, President of Advanced Disposal. “The collaboration between EREF and EIA leverages the resources of both organizations to address the needs of our industry members, while allowing both organizations to maintain their own branding, independence and autonomy.”

Save the Date!
2014 Global Waste Management Symposium
June 22-25, 2014
Omni Orlando Resort at ChampionsGate
Orlando, Florida, USA
This unique event only comes around every two years – be sure you are part of it!

Join Your Peers and Colleagues for 3 Days of Presentations of Research and Case Studies on Waste Management! The GWMS is held in a setting which encourages discussion. The Symposium includes oral presentations and posters, as well as networking events to provide opportunities for technical interaction and discussion in a setting where all participants can engage and share ideas. The core of this event is the submission of extended abstracts reviewed by a program committee. Accepted abstracts will be published in a proceedings provided to GWMS participants.

Abstract Submissions: Due by October 18
Visit www.wastesymposium.com
Learn the latest waste and recycling industry safety best practices.

NSWMA-WASTEC and EREF have released the 2013 revised Manual of Recommended Safety Practices including a greater emphasis on recycling. This safety reference guide, updated by a team of respected industry safety professionals, will help safety practitioners & operations managers handle the most significant safety challenges facing waste and recycling service companies. The manual is a great resource for all levels of personnel: managers & supervisors, drivers & crew, equipment operators, process line workers, and maintenance personnel.

- NSWMA and WASTEC member price is $275 a copy.
- Non-member price is $400 a copy.
- Multi-copy company licenses for the safety manual will be offered.
- The manual is available as a digital download for your e-book (Kindle, iPad or Nook) or as a printed and bound book.

Keep your colleagues safe. Reduce your company’s liability. Order your copy of this important safety resource today.

202-364-3709, publications@envasns.org or www.environmentalistseveryday.org/safety-manual
At its last meeting, the EREF Board of Directors awarded the following two research grants:

**Advancing Multi-Stage Anaerobic Digestion Technologies through Improved Hydrolysis Processes**

**Principal Investigator:** Colorado State University  
**Award Amount:** $118,272

Existing and proposed regulations requiring organic waste diversion from landfills are driving an ever increasing need for sustainable waste management technologies.

Anaerobic digestion (AD) can produce bioenergy and represents the most sustainable organic waste management technology. However, AD is not widely applied to organic fraction municipal solid waste (OFMSW) in the U.S. because currently available technologies are not economically viable. Thus, advancements are needed to improve AD profitability. Our industrial collaborators Harvest Power and GICON (commercial providers of a multi-stage AD technology) have identified development of improved hydrolysis processes as a critical industry need. A specific challenge for achieving maximum hydrolysis rates of food wastes is elevated ammonia and salinity, which are known to inhibit microbial processes. To overcome this challenge, we have been developing advanced microbial inocula that are capable of achieving high rates of hydrolysis even in the presence of elevated ammonia and salinity, and we have recently shown in batch-scale studies with elevated ammonia and salinity that hydrolysis rates can be significantly improved (4- to 10-fold as compared to with standard inocula) using these specifically developed microbial seeds. However, future research is needed to develop technology for establishing and maintaining these optimized microbial populations in large-scale, multi-stage AD systems to realize improved hydrolysis rates at full scale.

Specific project objectives are:

1. Evaluate leachate-bed reactor operational approaches to control the microbial populations in AD reactors at startup and over the course of reactor operation via optimizing both initial seeding methods and process operation to maintain key organisms.
2. Develop operational approaches to maintain increased hydrolysis rates during long-term operation.
3. Conduct an economic analysis to evaluate profitability of developed improved hydrolysis processes.

**Development of a Strategy for the Treatment of Landfill Leachates**

**Principal Investigator:** Virginia Tech  
**Award Amount:** $171,842

In 2010, approximately 135.5 million tons out of 249.9 million tons of the municipal solid waste (MSW) generated in the USA was disposed to landfills (US EPA 2011). Each ton of MSW has been estimated to generate 53 gallons of landfill leachate (Water Research). The costs involved in transportation and treatment make leachate management a billion dollar industry.

The discharge of landfill leachates to publically owned treatment works (POTWs) has traditionally been the most economical disposal option. However, leachates have been observed to interfere with UV disinfection and add to the total effluent nitrogen at POTWs. Concerned about interferences with UV disinfection and biologically resistant organic nitrogen compounds in leachates, many landfills are moving to combinations of biological and physical-chemical treatment. These techniques may include reverse osmosis (RO) as a final treatment step, which is a costly and energy intensive alternative.

Earlier studies conducted by Dr. Novak’s research group at Virginia Tech have shown that leachate recirculation is effective for degradation of the ultra-violet (UV) quenching substances. A major goal of this research is to determine if the conditions associated with leachate recirculation can be mimicked in an anaerobic membrane bioreactor (anMBR). If successful, such a system can serve for removal of UV quenching substances and organic nitrogen. These systems are relatively inexpensive, have lower sludge production and a smaller ecological footprint while its by-product methane can be used to produce electricity and heat. The primary objectives of the project are to:

1. Optimize the removal of UV quenching substances (humic substances) using an anaerobic membrane bioreactor, coupled with physical/chemical treatment
2. Optimize the removal of organic nitrogen (hydrophilic fraction) using an anaerobic membrane bioreactor, coupled with physical/chemical treatment
3. Develop a comprehensive approach to treat leachate based on leachate characteristics and effluent discharge requirements
paper, food and yard wastes by wet weight. These organic wastes are in general economically or technically unfeasible for recycling and incineration, and are biodegradable under anaerobic conditions in landfills. Therefore there is a major need to develop a targeted and sustainable strategy for handling such types of waste.

MSW biodegradation prior to and after landfilling can be affected by various operations “from bin to grave.” These include source separation, temporary storage, collection and transportation, pretreatment, co-disposal or co-treatment with other waste streams, and biodegradation enhancement in landfills.

The degree of biodegradation of MSW determines its energy generation and recovery potential. However, there is a lack of complete understanding of the overall MSW biodegradation process and the factors influencing it at each step. Current waste management practices are often not optimized and energy recovery is not emphasized. Economic analysis is largely absent due to insufficient knowledge and data. Fei’s research targets impacts to the MSW biodegradation process prior to and after landfilling due to various operations.

Biography:
Xunchang “Fei” Fei was born and grew up in Shanghai, China. He received a Bachelor of Science degree in Environmental Science from Tongji University in China in 2008. His undergraduate study focused on toxicology of several organic pollutants on Zebrafish eggs. He received a MS in Environmental Engineering at the University of Michigan in 2010 and continues his study as a Ph.D. student. He is co-advised by two faculty members in Geotechnical Engineering and Environmental Engineering programs and is actively involved in assisting teaching, outreaching and services of both programs. Fei’s hobbies include badminton, exercise, reading science fiction and watching animations and electronic sports matches.

Jie Pan
Yale University, MEM
Stearns/SCS Scholar 2013

Integrating E-Waste Recycling Workshops for Resource Recovery

During her graduate studies, Jie will focus on production and recycling activities in the electric and electronic equipment sector. She is interested in researching the multiple factors affecting material productivity, the establishment and implementation of resources management policy, development of financial incentives for eco-design and designing efficient collection network for recycling wastes and by-products. By using material flows analysis in selected case studies, Jie aims to understand material flows in production and consumption, improve efficiency of e-waste collection and reduce toxic pollution from unsound recycling practices.

Biography:
Jie worked for the Ministry of Environment Protection in China from 2009-2010 as a Project Officer overseeing the implementation of a World Bank project to phase out two persistent organic termiticides. By completion, the project triggered a national ban on the pollutants under use and piloted remediation technologies on contaminated industrial sites in China.

In early 2011, Jie relocated to Washington, DC to work as a Junior Professional Associate (JPA) for the Global Environment Facility (GEF), the largest public fund for the environment. There she reviewed project proposals from more than 50 developing countries covering almost all aspects of chemicals pollution reduction and assisted partner UN agencies in developing two e-waste management projects.

Before attending Yale, Jie worked as an international consultant for United Nations Industrial Development Organization (UNIDO), developing projects to inventory the production, application and emission of 11 persistent organic pollutants under the Stockholm Convention. Jie is now a first year Master of Environment Management (MEM) student at Yale School of Forestry and Environmental Studies.

Megan Jaunich
North Carolina State University, Ph.D.
Lonnie C. Poole Jr./Waste Industries Scholar 2013

Developing an LCA Model for Residential/Commercial MSW Collection

Project Description:
Solid waste management (SWM) influences the natural environment and ecosystems as well as human health, safety and quality of life. SWM has short- and long-term, local and global implications. Although the methods, infrastructure and policies vary in different regions of the world, SWM is a process with which most people interact daily. Consequently, individual actions and practices at the household level can have a large effect on the sys-
Developing innovative ways to educate and involve the public in waste management decisions, and encouraging utilization of technologies and processes to decrease municipal waste streams will contribute to a culture of sustainability and can positively impact SWM and the environment. However, new SWM strategies, stimulated by regulation, policy or even public awareness campaigns could result in large changes in consumer interaction with the SWM system. Therefore, it is critical to evaluate changes to the SWM system to identify potential unintended consequences.

The goal of Megan’s research is to study the impacts of waste management policies, regulations, incentives and other initiatives on waste generation and composition, and to evaluate the potential influence of consumer practices on the broader SWM system. The research objectives are to: (1) characterize potential impacts to a SWM system due to changes in consumer behavior as a result of SWM initiatives, (2) quantify impacts to the SWM system, such as waste generation, composition, cost and environmental impact, using life-cycle analysis techniques, (3) compare the effects of SWM initiatives on the broader SWM system and identify strategies which may be effective at altering consumer behavior to achieve reductions in cost and environmental impact. Performing life-cycle analyses to evaluate how changes in consumer habits resulting from a particular SWM strategy impact the environment will ensure that new policies and regulations are well-aligned with high-level goals as defined by the implementing authority.

**Biography:**
Megan studied mechanical engineering at the Florida Institute of Technology and graduated with honors with her BS in May 2006 and MS in December 2007. After graduation, she worked as a system safety engineer for Millennium Engineering and Integration Company supporting NASA’s Launch Services Program at Kennedy Space Center. She became a licensed Professional Engineer in the state of Florida in 2012 and also completed a Master of Engineering in Systems Engineering at Stevens Institute of Technology in December 2012.

In August 2012, Megan was admitted to the Civil, Construction and Environmental Engineering department at North Carolina State University (NCSU) and received a dean’s doctoral fellowship for her academic achievement.

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**EREF Receives Donation from the Garbageman’s Invitational**

The Garbageman’s Invitational Golf Tournament and Social Event, which just completed its 4th Annual event, was founded in 2010 by Kerry Holmes (Vice President of Sales, Consolidated Fabricators), Mike Melideo (Owner, Consolidated Fabricators) and Ray Burke (Vice President, Clean Energy). These three men set out to create a unique annual networking event for their customers and prospects in the solid waste and recycling industry throughout the United States and Canada.

The Garbageman's Invitational is sponsored by multiple suppliers in the industry, each of whom is in attendance. The three primary sponsors for this year’s event were Consolidated Fabricators, Clean Energy and Rehrig Pacific. The support sponsors are comprised of a limited amount of non-competing suppliers that include Container Pros, Amrep, Inc., Solid Waste Insurance Managers, Sloan & Vasquez Consulting Group, Westhoff, Cone & Holmstedt, Impact Plastics, Rush Refuse Systems, Can Do Services and Agility Fuel Systems.

The invitation-only tournament includes solid waste and recycling company owners and executives including independent private haulers, regional and national haulers, and municipalities. The event has grown since its inception and the event is rapidly becoming known throughout the United States and Canada.

The Garbageman’s Invitational is meant to bring industry leaders together for two days of golf and social events. It is spouse friendly and one of the highlights is the opening night reception/dinner at the ranch of Cole & Tracy Burr (Owner) Burrttec Waste Industries, Inc. The ranch features a spectacular replica of an old western town on the ranch property that is called BlackWater.

The sponsors of the Garbageman's Invitational felt strongly that there should be an element of "giving back" to the industry. As the leader in solid waste research and education, EREF was an easy choice as the charity to benefit from the event. EREF, with its presence throughout North America, is well aligned with the Garbageman's Invitational's goal to attract more industry leaders throughout the United States and Canada.

The next Garbageman's Invitational will be held April 9 - 11th, 2014. For more information please visit [www.garbagemansinvitational.com](http://www.garbagemansinvitational.com).
**EREF REGIONAL SUMMIT AGENDA**

**October 8 (1 pm - 5 pm)**
Tour of Waste Management Inc.’s Tullytown Resource Recovery Facility
*(separate registration required - limited to first 50 participants)*
Bus sponsored by Civil & Environmental Consultants, Inc.

**October 9 (8 am - 5 pm)**
Managing Leachate At Different Landfills Across the U.S.: Perspectives from an Owner
Tony Walker, Republic Services

Leachate Management Decision Making & Available Technologies
Kevin Torrens, Brown & Caldwell

Leachate Characterization and Treatment: Challenges and Countermeasures Between Landfills and POTWs
Dr. Renzun Zhao, Kruger Inc. - Veolia Water Solution & Technology

POTW Discharge Permits and Agreements - Regulatory, Fee and Surcharge Topics
Leon Wright, Civil & Environmental Consultants, Inc.

**BREAK/NETWORKING (10:15 - 10:45 am)**

Strategies for Reducing Leachate Volume
Jim Johnston, SCS Engineers

Leachate Evaporation at a Large Landfill in the Southeast: Challenges & Solutions
Stacey Smith, Smith Gardner, Inc. & Daniel DeArment, CB&I

Evaluation of Treatment Processes to Reduce Long-term Pollution Potential of Landfills
Stephanie Bolyard, University of Central Florida (EREF Scholar)

**LUNCH/NETWORKING (12:15 - 1:45 pm)**

Nutrient Removal from Leachate by Bioassimilation
Kaitlyn Sniffen/Mira Olson, Drexel University

Sulfate Radical-based Advanced Oxidation Processes (SR-AOP) for Landfill Leachate Treatment
Dr. Yang Deng, Montclair State University

Emerging Trace Organics in Landfill Leachate: Fluorinated Compounds & Surface Water Implications
Dr. Mort Barlaz, N.C. State University

**BREAK/NETWORKING (3:15 - 3:45 pm)**

Development of a Bio-filtration System to Treat C&D Landfill Leachate
Brian Stuver, Joyce Engineering

Biological Treatment of Leachate in Cold Climates: Overview and Case Studies
Dr. Sara Arabi, Conestoga-Rovers & Associates

Impact of Aggressive Gas Well Dewatering on Leachate Quality
Ivan Cooper, Civil & Environmental Consultants, Inc.

**Registration Fees**
Consultants/Industry Personnel = $150
Federal-State/Local Agencies/Non-Profits = $25
(Scholarships are available*)

Academia/Students = FREE
(Verification of student status may be requested)

Certificates of attendance will be provided for those requiring professional development or continuing education credits. Visit [www.erefdn.org](http://www.erefdn.org) to register for the Regional Summit.

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- Weaver Energy Consultants

Additional sponsorship opportunities available. Send an e-mail to events@erefdn.org for more information.