

AEESP Newsletter

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2 AEESP News

15 Member News

Highlights

President's Letter	PAGE	1
Spotlight	PAGE	3
Distinguished Lecture Series	PAGE	6
Board of Directors	PAGE	8
Faculty Appointments	PAGE	12
Member News	PAGE	15

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AEESP membership?
Go to "Membership > Online Renewal"
on the AEESP Website:
AEESP.org

AEESP Newsletter Submissions

Please send news, conference announcements, job postings, letters to the editor, and other contributions to the newsletter to Laura Arias Chavez at LChavez@tntech.edu. The next newsletter will appear in February 2020.

President's Letter

BY KARL LINDEN
University of Colorado Boulder



Coming off our energy-infusing AEESP conference at ASU, its easy to see we are all privileged to work in an area of such global importance. It was abundantly clear to me that we share a mutual joy in doing the work we do and part of that joy is valuing the personal connections we have to one another in collaboration and competition. Our diverse backgrounds are bound by our interweaving academic lineages and we share a sense of confidence and kindness that is unique and should be celebrated. I am truly honored to serve AEESP as President and to have worked with an amazing board of directors the past 3 years – a board that you elected to represent our community. A special shout-out to Prof. Maya Trotz who has been a great role model as an AEESP president and served us all on so many levels.

I get asked repeatedly "What is going to be your focus in your year as AEESP president?" One year is quite short, actually, so I got started last year! Maya, President-Elect Joel Ducoste, and I have talked about our collective vision for AEESP and how we can coordinate our efforts as successive presidents over 3 years, to best support the organization and our members. At the top of our list, and something that will be part of AEESP's focus for years to come, is the concept of inclusivity. AEESP strives to be an organization where we welcome and support everyone, regardless of background, socio-economic status, ethnicity, race, gender, or sexual orientation. Looking at our pipeline and recent history of board members and presidents, this organization, and our members, have chosen inclusion and valued diversity, over and over again. Our board is made up of representatives of our community and its diversity of geographies, ethnicities, universities, and genders represent you — our environmental engineering and science profession. But while we typically outpace our peer engineering disciplines, we still have more work to do in the ranks of the professoriate to reach gender equity and

optimal participation from the diverse population we seek to serve. I hope to challenge you and to serve you in a number of ways this year to move us closer to this goal of greater inclusivity.

My first challenge for you all, both faculty and students, is to broaden participation in our profession by providing teenagers, who are developing their identity and formulating their problems to become passionate about, with an opportunity to see firsthand what our environmental profession is all about. I challenge you all, to reach out to a local high school and offer to give a lecture about your passion, about your problem. Connect with students in your community. I have been doing this for the past 7 years in Boulder – it started by guest lecturing in my daughter's AP environmental science class, and now my grad students are also doing it. Create these relationships, but don't stop there. Invite one high school student into your lab each summer, just one, to learn how to use a pipet, or program a sensor, or measure turbidity, and get engaged with a graduate research assistant, working side by side. Connect their work to one of our wicked problems. It's 10 weeks that will change a young student's life. Dedicate yourself to finding a student from a background that has been traditionally underrepresented in the engineering community. Our organization has about 500 professors. If each one of you takes just 1 student into your lab each summer for the next 5 years, we will collectively train 2,500 high school students, instill in them a passion for environmental engineering and science, help them find their problem, and slowly transform our profession to represent an even broader population base. Think about it and talk about it. Small actions we each take do make a difference.

In my coming columns I will be talking to you about other initiatives I am working on with the Board over these next 12 months. One is the recognition of the coming 50th anniversary of the formation of the US EPA (1970 under President Richard Nixon) and various activities by AEESP over the year to commemorate the Clean Water

Continued on page 2



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www.aeesp.org/membership

and Clean Air Acts. Toward our goal of increased inclusivity, I am also launching an initiative to explore how AEESP can increase our international footprint. We have about 100 members from outside of the USA — we are not just a US-based organization. As many of you know, this is a passion of mine and I believe that improving the international connections between environmental engineering and science professors will help us to better address global environmental issues, engage and learn from local knowledge, and increase our diversity. I am setting up a committee of international colleagues to explore ways and develop a platform to better engage AEESP internationally and go #AEESPGlobal.

Many of you know that AEESP has an official journal — *Environmental Engineering Science*, or *EES*. Last year we surveyed our membership about how to better align our needs in publishing our work with the opportunities that exist in having our own journal. We are very excited to work with Princeton professor Catherine Peters, AEESP member and past-president, and the new *EES* Editor-in-Chief. As Catherine works with us to increase the value of *EES* to our profession, you will see the journal promoting special issues and creating a forum for publication of articles on cross-cutting themes around sustainability, Food/Energy/Water Nexus, Big Data, and life cycle assessment, in addition to our traditional fields in water, air, soils and solid waste, and hopefully will see many of your publications in *EES* featured in our email news blasts.

Of course, we have a lot of work to do at AEESP



Linden, UV disinfecting water, backpacking on the West Coast trail in BC Canada

day to day, to keep running the organization efficiently, providing opportunities for all of you, our members, to do the best work you can in our profession and have impact. Our committees are filled with volunteers, like me and like you, who carry on our important and established programs, which you can find at aeesp.org. Sign up to volunteer for something you are passionate about. I'm going to ask the most of you to make this organization even better.

Look for me on twitter @waterprof and follow @AEESPProfs for the latest happenings in our community. We are living in an amazing time — let's make it even greater, together.

AEESP Journal Spotlight

Mark Krzmarzick, Chair, AEESP Publications Committee

Catherine A. Peters, EES Editor-in-Chief

Susan J. Masten, EES Deputy Editor

Venkataramana Gadhamshetty, Member, AEESP Publications Committee

The “spotlight” column draws attention to selected articles in *Environmental Engineering Science (EES)*, the official journal of the Association of Environmental Engineering and Science Professors (AEESP). Spotlight articles appear regularly in the journal as an Editor’s Note, as well as in the AEESP newsletter. Through publication of high-quality peer-reviewed research, the *EES* journal helps AEESP achieve its mission of developing and disseminating knowledge in environmental engineering and science. In this entry, we shine the spotlight on selected articles from the December 2018 issue through the July 2019 issue of *EES*. Congratulations to all whose work is highlighted.

Fluorine is the most widespread contaminant in surface water and groundwater in western United States, Mexico, Argentina and several countries in Asia and Africa. Adsorption is one of the cost-effective water treatment methods for removing fluoride. However, there remains a need to identify and develop a new generation of more cost-effective adsorbents for removing fluoride. A study by **Wallace et al. (2019)** demonstrated the efficacy of eleven (hydro)oxide nanomaterials for removing fluoride from water using both batch and fixed bed continuous flow through column systems. These nanomaterials include hematite, magnetite, ferrihydrite, goethite, hematite-alpha, hydroxyapatite (HAP), brucite, and four different titanium dioxides. Among the 11 nanomaterials, ferrihydrite, HAP, and brucite were found to demonstrate potential for remediating fluoride polluted water. The authors indicated the need for pilot scale studies to assess the performance of the three nanomaterials for large scale applications, especially for treating fluoride in complex industrial wastewaters. They also highlighted the need to evaluate the regeneration and reuse capacity of these three nanomaterials.

Hydraulic fracturing uses a range of chemicals (i.e., “fracturing fluids”) to break open impermeable pores and release the previously inaccessible oil and natural gas in shale formations. This technology generates voluminous amounts of oil and gas wastewater that is characterized by unusually high levels of total dissolved solids and a range of toxic and radioactive chemicals. Improper disposal or the accidental release of the fracturing fluids from oil and gas wastewater threatens ecological health of the subsurface environment. Thus, it is important to understand the biodegradation patterns of the fracturing fluids in soil environments. **Lozano et al. (2019)** studied the ability of six representative fracturing fluids to enrich indigenous microbial communities in typical surface soil for nearly 78 days. As expected, the chemical oxygen demand exerted by all the fluids decreased over time; however, a significant recalcitrant fraction was observed for four of the six amended fluids. Their Illumina MiSeq sequencing of a 16S ribosomal RNA gene amplification and polymerase chain reaction studies revealed that 24 bacterial taxa were closely related to known species, specifically to well-known xenobiotic degraders. The composition of the enrichment was unique for each of the six fluids. Their study implied that the composition of fracturing fluids exerts a critical influence over the design of bioremediation efforts.

Harmful algal blooms in Utah Lake have been reported to be influenced by both the internal and external sources of nutrients (nitrogen and phosphorus). The shallow nature of Utah Lake renders it vulnerable to rapid evaporation and sediment disturbance during windstorms and summer seasons, resulting in internal nutrient release from sediments. Externally, the lake receives continuous treated discharges from seven wastewater treatment plants. **Hogsett et al. (2019)** studied the impacts of internal phosphorus loading on eutrophication of the Utah Lake. Their study was focused on understanding the internal nutrient recycling and its triggering factors by determining three major factors, namely the oxygen demand associated with the water column and sediment, nutrient fluxes under ambient conditions and changing dissolved-oxygen and pH scenarios, and sediment characteristics and their effects on sediment oxygen demand and nutrient flux. Their study highlighted the importance of implementing nutrient reduction strategies that are capable of decreasing sediment nutrient content, nutrient flux, and water column phytoplankton biomass.

As the world population is approaching 8 billion, there is an ever increasing need to develop conscious stewardship of the three vital resources, food, energy, and water (FEW). Considering the critical need to secure the future for the next generation, it is important to recognize that water security, energy security and food security are closely linked with one another. Simply put, negative actions in one particular area often can significantly degrade one or both of the other areas. The past decade has witnessed the evolution of FEW nexus as a separate field of study, especially to understand intricate dependencies among these three resources. The introductory article (**Grady et al. 2019**) in a special issue of *Environmental Engineering Science* provides an excellent overview of how environmental engineering and science interdisciplinary efforts play a critical role in understanding and protecting food security, water resources, and sustainable energy. The entire issue focuses on new methodological approaches for FEW modeling, theoretical dialogue, and ways to transition theory into practice.

Citations

Hogsett, M., Li, H., Goel, R. (2019). The Role of Internal Nutrient Cycling in a Freshwater Shallow Alkaline Lake. *Environmental Engineering Science*, 36(5), 551-563.

Grady, C. A., Blumsack, S., Mejia, A., Peters, C. A. (2019). The Food–Energy–Water Nexus: Security, Sustainability, and Systems Perspectives. *Environmental Engineering Science*, 36 (7), 761-762.

Lozano, T. M., McCutchan, A. L., Krzmarzick, M. J. (2019). Hydraulic Fracturing Fluid Compositions Induce Differential Enrichment of Soil Bacterial Communities. *Environmental Engineering Science*, 36(4), 385-395.

Wallace, A. R., Su, C., & Sun, W. (2019). Adsorptive Removal of Fluoride from Water Using Nanomaterials of Ferrihydrite, Apatite, and Brucite: Batch and Column Studies. *Environmental Engineering Science*, 36(5), 634-642.

2019-20 AEESP/EESF* Student Video Competition Guidelines and Rules

Motivation

The AEESP Student Video Competition seeks to highlight environmental engineering and science to increase awareness about the field and encourage young people to learn more about stewardship of water, land, air, mineral, and energy resources. The theme of the competition is “**The U.S. Environmental Protection Agency turns 50**”. Some ideas for video topics include:

- What does 50 years of the EPA mean to you?
- How has the EPA improved your quality of life?
- What might life in the U.S. look like without the EPA?

Even if you have no experience making videos, we encourage you to form a team and consider entering the competition. Many university libraries provide access to audiovisual recording equipment and editing software. For tips on making, and uploading, YouTube videos, check out the following link: <http://www.youtube.com/yt/creators/>.

*The Environmental Engineering and Science Foundation (EESF) is a charitable 501(c)(3) organization associated with the American Academy of Environmental Engineers and Scientists (AAEES)

Eligibility

The competition is open to undergraduate and graduate students studying environmental engineering or science worldwide. At least one team member or Faculty Advisor must be a member of the Association of Environmental Engineering and Science Professors (AEESP) or the American Academy of Environmental Engineers and Scientists (AAEES). All team members must be enrolled in a college or university at the deadline for video submission.

Submission

The 3-5 minute videos must be uploaded to YouTube by **11:59 pm ET (US) on February 17, 2020** to be considered for official Competition prizes. In addition, each team must submit an official online competition entry form to <https://aeesp.org/content/2019-2020-aeespeef-student-video-competition-entry-form> by 11:59 pm ET (US) on December 8, 2019.

Competition Prizes

Cash prizes will be awarded to the top three videos, as indicated below:

- 1st place – \$1,000
- 2nd place – \$750
- 3rd place – \$500

Important Dates

- December 8, 2019 (11:59 pm ET) Team entry forms are due
- February 17, 2020 (11:59 pm ET) Student Video submission
- June 2020 Finalists highlighted and winners announced by AEESP
- October 5, 2020 Prize money awarded

Guidelines

Each team should consist of 3-8 students and a faculty advisor in a civil, chemical, or environmental engineering or science related program. Faculty advisors may give guidance and provide suggestions about the video, but cannot perform actual project work. At least one member of the team should be an AEESP member or an AAEES member. Online registration is available at <http://www.aeesp.org/membership> and <http://www.aees.org/membership.php>

Team members should be enrolled in a college or university at the time of the video submission and should be studying environmental engineering, environmental science, or related disciplines. Students from all nationalities and educational levels (e.g., undergraduate or graduate) are welcome to participate.

No monetary compensation may be provided to anyone contributing to the video. This competition is strictly for educational purposes and students are expected to complete 100% of the work involved in the creation of video submissions.

Initial video submissions should not refer to AEESP, AAEES, or EESF, the AEESP/EESF Student Video Competition, or utilize the AEESP/AAEES/EESF logo. The winning video submissions may be branded with the AEESP or EESF logo or otherwise altered to indicate a particular video has the endorsement of AEESP or EESF.

Videos should be between three and five minutes in length. The content should be aimed at middle- and high-school students with the main objective of promoting environmental engineering and science.

Video language must be in English. Data should be reported in metric units and currency in U.S. dollars. Currency conversions can be found at www.xe.com.

Video Submission

Each team must submit an official competition entry form. The entry form should be submitted online to <https://aeesp.org/content/2019-2020-aeesp-student-video-competition-entry-form> by 11:59 pm ET (US) on December 8, 2019 with the following information:

- Tentative video title
- Team member names and affiliations
- Faculty advisor name and department
- Tentative description of the video (500 words or less)
- Contact information for the team leader and faculty advisor

Videos must be uploaded to YouTube by 11:59 pm ET (US) on February 17, 2020 to be considered for official Competition prizes. In addition, each group must send an e-mail to bschorr@aeesp.org with the link to the video to be considered for official competition prizes.

Citations

Only credible sources of data or materials should be included (e.g., journals, software, websites, books, personal communication, etc.) and **must** be properly cited in the video.

Permission to use any figures, tables, or images from external sources must be obtained by the project team. See <http://creativecommons.org> for information on copyright issues.

Information collected from Environmental Engineering professionals **must** be properly cited.

Only open source data are allowed. Students should consult their Faculty Advisor for guidance on whether information is considered proprietary.

Evaluation Criteria

Submitted videos will be assessed on the following criteria:

Effectiveness in reaching the target audience (i.e., middle- and high-school students)

Accuracy and creativity in describing the history, major milestones, and importance of the EPA

Originality and entertainment value of the video

Competition Prizes

Cash prizes will be awarded to the top three videos, as indicated below:

- 1st place – \$1,000
- 2nd place – \$750
- 3rd place – \$500

The winning teams will be announced by AEESP in June 2020. AEESP may, within its discretion, require prize-winning teams to sign an affidavit of eligibility and a liability and publicity release. Winning teams must also consent to release of their videos, without additional compensation, for promotional purposes. These arrangements will be conducted as a precondition to awarding of a prize. Failure to consent to these conditions may disqualify the entry.

Official Contest Rules and Regulations

Teams are encouraged to copyright their submissions. By submitting a video, teams agree to allow AEESP to use their videos for marketing and information purposes, as well as provide a link to the video on AEESP's website. In the event that it is removed from YouTube, AEESP reserves the right to obtain the video from the creators at no charge. AEESP reserves the right to publicize and promote the video for its own purposes. All work will be given full credit to the creators.

Contact Information

If you have questions regarding the video competition, eligibility requirements, or submission process, please contact Krista Wigginton at kwigg@umich.edu.

AEESP Distinguished Lecture Series Dates Released

Dr. Diana McKnight, the 2019-2020 AEESP Distinguished Lecturer, will be presenting her lectures, "A biogeochemical perspective on the reactivity of dissolved organic matter in natural waters: from Antarctica to the Arctic" and "Trouble Ahead, Trouble Behind: Acid Mine Drainage and Climate Change in the Rocky Mountains" at twenty different locations over this academic year. We encourage you to attend a lecture near you and to contact the relevant host school's representative for more information on specific events. For more general inquiries, please contact Dr. Debora Rodrigues, Chair of the AEESP Lecturers Committee (dfrigi@central.uh.edu).

Date	Host School	Co-Host School(s)	Contact
FALL 2019			
Oct. 19	University of Missouri	Missouri University of Science and Technology; Washington University at St. Louis; Southern Illinois University - Carbondale; Southern Illinois University - Edwardsville	Baolin Deng, dengb@missouri.edu
Oct. 21	Washington University at St. Louis	Missouri University of Science and Technology; Southern Illinois University - Edwardsville	Daniel Giammar, giammar@wustl.edu
Oct. 22	Missouri University of Science & Technology	N/A.	Dev Niyogi, niyogid@mst.edu
Nov. 1	University of Minnesota - Twin Cities	St. Thomas University; St. Cloud State University; North Dakota State University; Gustavus Adolphus College; University of Minnesota-Duluth	Bill Arnold, arnol032@umn.edu
Nov. 6	Michigan Technological University	University of Minnesota-Duluth; Northern Michigan University; University of Wisconsin - Stevens Point; University of Wisconsin - Oshkosh	Alex Mayer, asmayer@mtu.edu
Nov. 15	University of Florida	University of Central Florida, University of South Florida	Andreia Fonseca de Faria, andreia.faria@essie.ufl.edu
Nov. 18	Northern Arizona University	University of Arizona; Arizona State University	Terry Baxter, terry.baxter@nau.edu
Nov. 22	Texas A&M University	University of Texas at Austin; Rice University; University of Houston	Shankar Chellam, chellam@tamu.edu
SPRING 2020			
Week of Feb. 10*	Carnegie Mellon University	University of Pittsburgh	David Dzombak, dzombak@cmu.edu
Feb. 18	Duke University	North Carolina State University; University of North Carolina, Chapel Hill; North Carolina Central University	Helen Hsu-Kim, hsukim@duke.edu
Feb. 21	Purdue University	Purdue University Northwest; Purdue University at Fort Wayne; University of Illinois at Champaign-Urbana; University of Notre Dame	George Zhou, zhizhou@purdue.edu
Feb. 25	University of Wisconsin-Madison	Marquette University; University of Wisconsin-Milwaukee	Andrea Hicks, hicks5@wisc.edu

Date	Host School	Co-Host School(s)	Contact
Feb. 28	Northwestern University	Loyola University; Marquette University; University of Wisconsin-Milwaukee	George Wells, george.wells@northwestern.edu
Mar. 2-4*	Rutgers University	Princeton University, New Jersey Institute of Technology; Stevens Institute of Technology; Columbia University; New York University; Temple University; Raritan Valley Community College, Rowan University; Hofstra University	Nicole Fahrenfeld, nfahrenf@rutgers.edu
Mar. 5-6*	University of Connecticut	University of Massachusetts, University of Rhode Island; Yale University; Worcester Polytechnic Institute; Northeastern University	Tim Vadas, vadas@enr.uconn.edu
Week of Mar. 16*	University of Michigan	Michigan State University; University of Toledo; Wayne State University	Lutgarde Raskin, raskin@umich.edu
Week of Mar. 16*	Michigan State University	University of Michigan; Wayne State University; Western Michigan University; Grand Valley State University	Susan Masten, masten@egr.msu.edu
April 8	University of Toronto	York University; Ryerson University	Elodie Passeport, lodie.passeport@utoronto.ca
April 10	Syracuse University	Clarkson University; Colgate University; Cornell University; SUNY-Buffalo; SUNY-ESF	Cliff Davidson, davidson@syr.edu
(TBA)*	Howard University	Johns Hopkins University; University of Maryland Baltimore County; University of Maryland College Park	Kimberly Jones, kljones@howard.edu

*Date to be confirmed. Updates can be found on the AEESP website.

Announcement

2020 AEESP Award Nominations

Submitted by Kevin Finneran (Clemson University), AEESP Awards Committee Chair

The AEESP Awards Committee is pleased to call for nominations for 2020 AEESP awards. **Nominations may be submitted between November 1, 2019 and January 31, 2020.** Please consider nominating a worthy colleague or student for one of these prestigious awards. All nomination materials must be submitted online. The submission link for each award, full instructions, and a list of prior award winners can be found on at <http://aesefoundation.org/awards>. The joint AAEEES/AEESP awards will be presented at the AAEEES Awards Luncheon on April 23, 2020, while the AEESP awards will be presented on October 5, 2020 at WEFTEC in New Orleans.

Highlights of the AEESP Board of Directors

2019 October 3-4 Meeting

Submitted by Joel Ducoste (North Carolina State University, President-Elect) and William Arnold (University of Minnesota, Vice President)

The AEESP Board of Directors (BOD) met on October 3-4 at the University of Minnesota in Minneapolis, MN. The Board was joined by Brian Schorr, AEESP's Executive Administrator, from Technology Transition Corporation (TTC). A summary of highlights from this BOD meeting is provided below.

Our meeting began with Maya asking board members to describe the moment in time that generated their environmental spark (i.e., the moment when they wanted to pursue environmental engineering), an exercise she learned recently from NSF CBET Program Officer Karl Rockne. Board member comments ranged from family influences, a faculty mentor, company policies, and an environmental incident. It was a fun way to learn about each other.

New AEESP Officers

Karl Linden (University of Colorado Boulder) assumed the role of President and Joel Ducoste (North Carolina State) assumed the role of President-Elect. Board elections were conducted for the vacant officer positions. The following new officers were installed:

Vice President: William Arnold (University of Minnesota)

Treasurer: Helen Hsu-Kim (Duke University)

Chief Technology Officer: Amy Pruden, Virginia Tech

The Board is grateful for the service of outgoing Board members: Maya Trotz, Timothy Strathmann, and Lutgarde Raskin. Their inputs during their time on the board were thoughtful and insightful and will be missed. We look forward to their continued service to AEESP.

Membership Update

In YTD 2019, 149 new members have joined AEESP (71 Regular Members, 2 Affiliates, 75 Student/PostDoc Members, and 1 Sustaining Member). Among the Regular Members: 22 full professors, 11 associate professors, and 38 assistant professors joined. As of September 2019, there were 901 members up to date on dues payments with an additional 164 members in arrears. Reminders will be sent for members in arrears. The Board encourages members to check their online membership profile to determine membership status, renew membership online if necessary, and consider multi-year renewal options now available at a discount. The official total of Sustaining Members in 2019 is 22. We continue to seek new sustaining members and encourage regular members that have relationships with companies to discuss joining AEESP as a sustaining member.

WEFTEC and AEESP Meet and Greet:

AEESP held its annual set of activities at WEFTEC, including the Master Lecture (speaker: Dr. Bruce Logan), Scientists' Lunch (speaker: Dave Dzombak), and Meet and Greet. Maya, Karl, Joel, Lut, Robert, and April represented AEESP at these events. Awards for the AEESP/EESF Social Media contest were given out to the student groups during the Scientists' Luncheon. All events were well attended.

AEESP Awards and Endowments

The Board voted to formally establish an Endowments Committee, building on the Ad Hoc one that was formed a year ago. The fully endowed awards are: Jacobs Engineering Group/AEESP Outstanding Doctoral Dissertation Award, Paul V. Roberts/AEESP Outstanding Doctoral Dissertation Award, Charles R. O'Melia AEESP Distinguished Educator Award, and the Perry L. McCarty AEESP Founders' Award. The board discussed ideas for raising funds to fully endow all AEESP awards. The board decided to recommend to the AEESP Foundation that awards be given even before full endowment, but that fully endowed awards would have higher dollar amounts.

AEESP's International Growth Initiatives

The Board went through the exercise of identifying their international footprint. Led by the incoming President, Karl Linden, each board member determined their footprint by stating where they have lived internationally, had performed any research abroad or have international research collaborators, and where their international advisees come from. The board has a roster of researchers and faculty that are members of AEESP and have a strong international connection. We hope to reach out to them and others for assistance in helping the organization increase our international footprint by sharing best practices in education and promoting international perspectives in environmental engineering and science.

AEESP/EES Journal

The Board had a discussion with the new editor of *Environmental Engineering and Science (EES)*, Catherine Peters, along with Susan Masten (Deputy Editor) and Mark Krzmarzick (chair of AEESP publications committee) about ways to increase participation and value to AEESP members. As part of the conversation, we discussed membership-based discount of open access fees and a fee waiver for colored graphics. AEESP Board recommends that *EES* provides an open access discount to AEESP members and subscription discounts to their institution's libraries. The Board believes that these discounts and fee waiver will provide more incentives for institutions to subscribe to *EES* and will also encourage AEESP members to submit to *EES*. The goal is to increase the connection between AEESP members and *EES*, which is needed for the official journal of AEESP.

Conflicts of Interest Policies

The Board developed draft policies addressing conflict of interest (COI). This COI policy applies to all committees that select AEESP Awardees, Lecturers, and Fellows. The COI policy guides the handling of COIs for those committees in the selection of the awardees/lecturers/fellows, therefore promoting an overall ethical process and upholding values of equality, inclusiveness, integrity, and excellence. The purpose of this COI policy is to avert, to the extent possible, biasing circumstances or the appearance of biasing circumstances in the selection of award/lecturer/fellow recipients.

Activities of Committees

The Board discussed the various committees that make AEESP work. Highlights from a couple of our committees are presented below. You can find the listing of the AEESP committees and contact information for the committee chairs at <http://www.aeesp.org/about/committees>. Please consider volunteering your time on one of these committees and getting more involved and connected with AEESP.

Conference Planning: Conference planning is progressing. The Board was informed that 6 preproposals have been submitted. The committee reviewed all submissions and the board recommended a subset to request for full proposals.

Education Committee:

The committee is planning to be involved in the Environmental Engineering Body of Knowledge (BoK) 2.0. The committee chair convened a small working group of AEESP, AAEEES, and ASEE Environmental Engineering Division members who discussed common education efforts to identify gaps and maximize shared value. The goal is to deliver a strength, weakness, opportunity, and threat (SWOT) analysis for the education of environmental engineers.

Newsletter/Publications

The Publications Committee is now chaired by Mark Krzmarzick (Oklahoma State University). The committee selects Spotlight articles, which brings attention to selected papers from *EES*, thrice a year in the AEESP newsletter: 1) Early-year covers August through November of that year; due in December, 2) Mid-year covers December of previous year through March of that year; due in April, and 3) Late-year covers April through July of that year; due in August. The Publications Committee is encouraging ideas from members to develop special issues in *EES*. Please contact the committee chair to suggest ideas and receive feedback. Each special issue would have a minimum of 8 articles.

Lectures Committee

The Board discussed proposed changes to the selection of the AEESP Distinguished Lecturer and approved changes to make the process more robust including submission of a nomination package with letters of support, potential topics and abstracts, and demonstrated support from their home department leadership. Look for details in the upcoming communications from AEESP!



The AEESP Board of Directors. Front Row Shaily Mahendra (UCLA), Amy Pruden (VA Tech), Timothy Strathmann (CSM), Allison MacKay (Ohio State), April Gu (Cornell), Lutgarde Raskin (U Michigan), Helen Hsu-Kim (Duke), and Maya Trotz (USF).

Back Row: Brian Schorr (TTC), Joel Ducoste (NCSSU), Rob Nerenberg (Notre Dame), Karl Linden (UC Boulder), Willie Harper (AFIT), and William Arnold (U Minnesota).

AEESP Foundation Grant Report: “Healthy Sustainable Buildings”

PI: Shamia Hoque

Organization: Department of Civil and Environmental Engineering, University of South Carolina

Project time period: January 2019 to June 2019

Report:

The project objective was to introduce K-12 students to the concept of healthy sustainable buildings. It was designed based on the Next Generation Science Standards (NGSS) guidelines, which state that the framework for three-dimensional learning should be such that science would be learned, not just as concepts and facts, but rather through the integration of disciplinary core ideas, science and engineering practices and crosscutting concepts. This project applied that principle to educate future generations about indoor environments, building design through considering sustainability, energy efficiency and health of occupants. The module had three components: 1) Field sampling, 2) Building Construction and 3) All about Universities. The first two components focused on students discovering the hidden world of microbes that live with us in our building spaces and understanding that engineering goes beyond physical safety. The third component introduced participating students to the University campus and the cutting-edge research civil and environmental engineers do through visiting the College of Engineering at University of South Carolina. The funds from the AEESP Foundation grant were used for purchase of materials and supplies.

The outcomes of the project are: 1) students learn about the methods of collecting samples from air and for surfaces for bacteria and fungi, 2) students learn about design and construction based on a given set of parameters and required performance metrics, 3) students learn to take results from small scale tests and apply the knowledge in a larger scale, 4) students learn about an array of instruments for measuring indoor environmental parameters such as temperature, humidity, flow rates and particle concentration and 5) students learn to incorporate health parameters when designing and constructing buildings balancing sustainability and energy efficiency.

Field sampling: The project was executed in two high schools, 24 students participated in this portion, of which 70 to 75% were from minority and underrepresented groups. The PI kicked it off through a presentation and demonstration about indoor environments, ventilation systems, aerosols and included sampling protocol for collecting microbial samples and recording indoor air quality data.

Building Construction: This portion of the project was executed as a week-long summer camp, the GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs) in collaboration with the International Baccalaureate (IB) Program at Richland Northeast High School in Columbia, SC. The camp was a summer bridge program designed to familiarize the students with certain expectations of the IB Science courses, in which they would be enrolled for the 2019-2020 school year. There were 23 participants, of which 61% were female, 44% African American and 13% identified as Hispanic or Latino.

The camp was designed around constructing single room houses and testing the performance of built designs under two simulated weather conditions — hot/dry and cold/humid. It was executed in two steps. In the first step,

two undergraduate civil and environmental engineering students who received McNair Junior Fellowships from University of South Carolina (given to students who show potential in research and plans to pursue graduate school) planned the camp with instructions and guidance from teachers at the high school and the PI. They designed the weather tents, tested material performance under different conditions, determined best range of measurements for students to both execute on time and obtain data for assessing performance as well as testing criteria. A range of materials and construction approaches were chosen from least to most sustainable (based on cost, manufacturing carbon footprint, recyclable or not) and least to most energy efficient (based on temperature maintenance indoors).

On the first day of the camp, each group was given one weather condition to design for — and the criteria to adhere to, which were: 1) ensure indoor temperature and humidity are maintained and 2) ensure ‘particle’ number in the room did not increase or spread when outdoor and indoor particle sources are introduced. They were also provided with a range of building materials such as cardboard, Styrofoam, newspaper, old clothes, plastic wrap, aluminum foil, sealants, tape, hot glue etc. for construction and insulation. Each group was equipped with a humidifier, heat lamp, and a fan for simulating different weather conditions. Talcum powder outside the houses represented dust simulating outdoor source and fluorescent particles sprayed indoors simulated and indoor source such as a sneeze. During the design and construction phase students were asked to think what steps could be taken so that it would be energy efficient, i.e. locate the window at a height such that it receives maximum/minimum sunlight or choose a wall material that does not lose heat. For ensuring healthy indoors, students ascertained how their design fared in terms of keeping outdoor particle sources outside and control the dispersion of indoor sources. Over the next four days, students designed, constructed, tested, and assessed the performance of the



At the PI's laboratory, planning phase



A constructed house prototype with makeshift air conditioning unit



PI's lab activity



PI, students and the weather tent

'house' for their given weather conditions as well as the alternative weather conditions for a range of parameters – outside wind speed (altered by blowing fans), outside temperature (number of lamps), and humidity (using humidifiers). Makeshift air conditioners were built from Styrofoam boxes and connected to the HVAC system incorporated inside each building using pool noodles.

All about universities:

One day of the week-long camp, was sched-

uled for a visit to the University of South Carolina campus by the participating students and teachers. It involved among other things, activities at the PI's lab. One activity involved identifying different microbes grown on plates created from samples collected from known locations. Students were asked to guess what those locations could be and what the species are based on a database of pictures and corresponding species as well as other pertinent characteristics, color, shape, size. The students enjoyed guessing locations! The other activity was to see the laser setup in operation in the PI's lab for capturing air and particle movement as a function of varying indoor environmental conditions. Besides visiting the PI's lab, students had the opportunity of touring the facilities at College of Engineering. The day culminated with a visit at the research symposium being held that day at the university. Their work was showcased through posters presented by the undergraduate students, McNair fellows at the symposium.

Impact

The projects were executed with a diverse group of students, with a majority of the students coming from under-represented and minority populations.



At Civil and Environmental Engineering, University of South Carolina

Students expressed great enthusiasm and were very engaged for both portions of the project. It was evident also by parents' testimonies such as, "My son was not sure about engineering, but this project has definitely lit a fire for him". The GEAR UP camp also attracted higher proportion of female students. The PI plans to make this camp a yearly event, expanding to other high schools and redesigning for middle school.

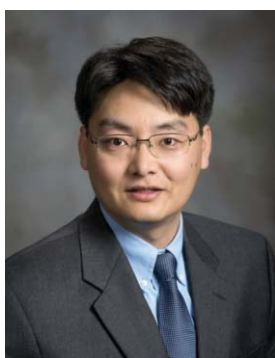
Contribution to the AEESP Foundation mission

AEESP Foundation's mission "is to improve the state of knowledge in environmental engineering and science through support and encouragement of excellent education, outreach and scientific research". The project fulfilled this mission and exposed 'budding' engineers to the 'humane' and 'social' aspect of engineering and was successful in generating intense enthusiasm among students as it showed how engineers can shape the future from a very personal viewpoint: the spaces we live in, our homes. The numbers based on pre- and post-assessment surveys showed better perception about the role of environmental engineering in designing and constructing buildings and the importance of health as well as physical safety and sustainability.

New Faculty Appointments

Jason He and Randall Martin join Washington University in St. Louis

Dr. Randall Martin joined the Department of Energy, Environmental and Chemical Engineering at Washington University in St. Louis in July 2019, and Dr. Zhen (Jason) He will join the faculty in January 2020. Their appointments as professors contribute to the ongoing growth of environmental engineering research and education at the university.



Dr. He will join the McKelvey Engineering School at Washington University from Virginia Polytechnic Institute and State University (Virginia Tech), where he is a professor in the Charles E. Via, Jr., Department of Civil and Environmental Engineering. At Virginia Tech, He is the founding director of the Center for Applied Water Research and Innovation. He joined Virginia Tech in 2013 as an associate professor. Previously, he was an assistant professor in the Department of Civil Engineering & Mechanics at the University

of Wisconsin-Milwaukee and a postdoctoral research associate at the University of Southern California. He has a PhD from Washington University in St. Louis, a MS from the Technical University of Denmark, and BS from Tongji University.

His research on environmental biotechnology and bioenergy encompasses sustainable wastewater treatment, resource recovery, and desalination and membrane technologies. He is one of the most highly cited researchers on bioelectrochemical technologies. His research has been supported by National Science Foundation, other federal funding agencies, the Qatar national Research Fund, as well as industrial sponsors. He has received numerous awards for his scholarship, including being recognized as a highly cited researcher by Clarivate Analytics in 2018 and the Walter L. Huber Civil Engineering Research Prize in 2018. He is an active member of the Water Environment Federation and International Water Association, having chaired committees and sessions. He is co-editor-in-chief for *Environment International*, co-editor-in-chief for *Journal of Hazardous Materials*, and editor-in-chief for *Water Environmental Research*.



Dr. Martin joins Washington University from Dalhousie University, where he had been on the faculty since 2003. He was named professor in 2011 and Arthur B. McDonald Chair of Research Excellence in 2016. Since 2003, he also has been a research associate at the Harvard-Smithsonian Center for Astrophysics, where he had previously been a postdoctoral fellow. He serves on a variety of task forces, advisory boards and working groups as an expert on air quality.

Martin earned a doctorate in engineering sciences at Harvard University; a MSc in environmental change and management at Oxford University; and a bachelor's in electrical engineering at Cornell University.

Martin's research focuses on characterizing atmospheric composition to inform effective policies surrounding major environmental and public health challenges ranging from air quality to climate change. He leads a research group at the interface of satellite remote sensing and global modeling, with applications that include population exposure for health studies, top-down constraints on emissions, and analysis of processes that affect atmospheric composition. He serves as Co-Model Scientist for a global atmospheric model (GEOS-Chem), leads a global fine particulate matter network (SPARTAN) to evaluate and enhance satellite-based estimates of fine particulate matter, and on multiple science teams for satellite instruments including MAIA, TEMPO, and GEMS. Data from his group have been used for a wide range of international assessments and health studies to understand the effects of air quality on public health.

Antar Jutla joins ESSIE at the University of Florida



Dr. Antarpreet Jutla joined the Department of Environmental Engineering Sciences within Engineering School of Sustainable Infrastructure & Environment (ESSIE) at the University of Florida as an associate professor in the Fall 2019 semester. His research focuses on understanding the influence of hydroclimatological and environmental processes on the abundance and presence of pathogens and thereafter, predicting risk of outbreak of water-related diseases in human population. The objective is to produce actionable knowledge to improve human well-being and provide policy inputs

to develop innovative civil infrastructure (under current and changing climatic conditions) that include water distribution, storage, transportation and treatment facilities. He is an editor of *GeoHealth*, a new flagship journal started by the American Geophysical Union to integrate health (environmental, human and ecological) with geosciences. He received his BS and MSc in Agricultural Engineering from Punjab Agricultural University, India; his MSc in Civil and Geological Engineering from University of Saskatchewan, Canada and his PhD in Civil and Environmental Engineering from Tufts University. More detail on his research is available at <https://faculty.eng.ufl.edu/antarpreet-jutla/>.

Vicky Karanikola joins the University of Arizona

Dr. Vicky Karanikola joined the Department of Chemical and Environmental Engineering at the University of Arizona (UA) as an assistant professor in August 2019. Before joining the University of Arizona, she was a postdoctoral fellow at the Department of Chemical and Environmental Engineering at Yale University. Karanikola has an interdisciplinary engineering background combining a BS in Mechanical Engineering from the Advanced Technological Institute of Serres, Greece, an MSc degree in Civil Engineering from San Diego State University, and MSc and PhD degrees in Environ-



mental Engineering from the UA. Her PhD research focused on off-grid water and wastewater treatment through hybrid thermal processes (membrane distillation) and nanofiltration. During her postdoctoral appointment she focused on membrane material synthesis and modification for water and wastewater treatment as well as optimization of desalination processes. Alongside with her academic career, she is very strongly involved with EWB (Engineers Without Borders), an organization that works on engineering projects in developing communities. She is currently serving at the EWB-USA headquarters as the vice president of the EWB Mountain Region Steering Committee. Karanikola's research work with marginalized communities at Tribal Nations was recently recognized with the Agnese Nelms Haury Program in Environment and Social Justice Faculty fellowship. Her research at the University of Arizona will focus on water and wastewater treatment through membrane processes with particular interest on material and process optimization at the water-energy nexus interface. She is determined to continue to work with marginalized communities, providing safe water to off-grid communities, such as those in The Navajo Nation.

Emily Garner joins West Virginia University



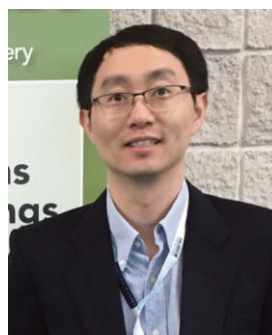
Dr. Emily Garner joined the Department of Civil and Environmental Engineering at West Virginia University as an assistant professor in August 2019. Garner's research is at the interface of environmental engineering, applied environmental microbiology, and public health. Her research emphasizes use of advanced molecular methods such as next-generation sequencing to characterize complex microbial communities in natural, agricultural, and engineered systems. Garner has worked on developing strategies for the

control of emerging pathogens in water reuse systems, understanding impacts to water quality associated with extreme weather events, and linking environmental exposures to human health outcomes using molecular techniques.

Garner earned a PhD from Virginia Tech in 2018 and a BS from West Virginia University in 2013, both in Civil Engineering. She has been the recipient of a National Science Foundation Graduate Research Fellowship (2013), the American Water Works Association Abel Wolman Doctoral Fellowship (2016), and the Paul V. Roberts AEESP Outstanding Doctoral Dissertation Award (2019).

Zhongzhe Liu Joins California State University-Bakersfield

Dr. Zhongzhe Liu joined the Department of Physics and Engineering at California State University-Bakersfield (CSUB) as an assistant professor in August 2019. Liu earned his PhD degree in Chemical and Environmental Engineering from the University of California-Riverside and his BS and MS degrees in Environmental Engineering from Shanghai University. Prior to



joining CSUB, Liu was a research assistant professor in the Department of Civil, Construction and Environmental Engineering at Marquette University, where he worked on the sustainable treatment of wastewater treatment byproducts (e.g. biosolids, grit) for renewable energy production and useful product application at the nexus of nutrient-energy-water.

CSUB is located in Kern County, the energy capital of California that produces 70% of the oil and gas in California along with significant wind, solar, geothermal, and bioenergy generation. Kern County is also one of the top vegetable producing regions in the nation. In this context, Liu's future research will be centered on the energy and resource recovery from various waste streams (e.g. produced water, crop residues) that are generated in petroleum and agriculture industries by using both thermochemical and physicochemical methods. Liu's current lab is equipped with both lab-scale and process-demonstration-scale thermochemical conversion systems and his research is affiliated with the California Energy Research Center at CSUB. Potential collaborations are welcome to contact Liu at zliu3@csub.edu.

Anthony Straub and Cresten Mansfeldt join the University of Colorado Boulder

This fall, the Environmental Engineering Program and the Department of Civil, Environmental, and Architectural Engineering welcomed two new faculty members, **Anthony Straub** and **Cresten Mansfeldt**, to the University of Colorado Boulder at the assistant professor level. Their hiring is part of a larger initiative to advance the area of water sustainability and builds on the Environmental Engineering program's current expertise in this area.



Dr. Straub's research develops environmental technologies to address issues at the intersection of water and energy. He conducts work across scales from nanomaterials design to laboratory-scale testing to system-level optimization. During his postdoctoral research at the Massachusetts Institute of Technology, he developed carbon-based electrically conductive materials for membrane applications. His doctoral work at Yale University focused on emerging membrane processes for

power generation, and his research helped to develop a new technology that uses nanoporous membranes to generate power from low-grade heat. At the University of Colorado Boulder, Straub plans to create a research program that leverages his expertise in membrane science, energy analysis, and materials engineering to develop advanced water treatment technologies.

Straub holds PhD, MS, and MPhil degrees in Chemical and Environmental Engineering from Yale University, where he was a National Science Foundation Graduate Research Fellow. He obtained his BS in Civil and Environmental Engineering from the University of Illinois at Urbana-Champaign. He also received the Swiss National Science Foundation Postdoctoral Fellowship to conduct research at the Massachusetts Institute of Technology in the Department of Materials Science and Engineering.



Dr. Mansfeldt's research addresses the control of microbial communities associated with bioproduction, health facilities, and public infrastructure. He investigated microbial systems involved in the bioremediation of hazardous waste, generation of commercial photosynthetic products, and biotransformation of polar organic pollutants in conventional wastewater treatment. Consistent throughout these systems has been his application of advanced molecular sequencing technologies combined with computationally-intensive statistical and modelling techniques to unravel the complexity of these communities. His research program at the University of Colorado Boulder will expand upon this fundamental laboratory research by investigating microbial systems in natural, industrial, and municipal settings.

Previously to his appointment, Mansfeldt completed postdoctoral research at the Swiss Federal Institute of Aquatic Science and Technology and at Cornell University. He received his PhD in Environmental Engineering from Cornell University and his Bachelor of Civil Engineering from the University of Minnesota. He was also the recipient of the National Science Foundation Graduate Research Fellowship.

Garrett McKay joins Texas A&M



Dr. Garrett McKay joined the Zachary Department of Civil & Environmental Engineering at Texas A&M University in September 2019 as an assistant professor. McKay's research focuses on the fundamental chemistry occurring in natural and engineered systems, including aquatic photochemistry, dissolved organic matter characterization, and treatment of emerging contaminants. Before joining the faculty at A&M, he was a postdoctoral scholar at The

Colorado School of Mines where he worked with Dr. Timm Strathmann. McKay graduated with his PhD in Environmental Engineering in 2017 and was advised by Dr. Fernando Rosario-Ortiz. McKay is looking forward to contributing to the growing Environmental Engineering program at A&M by sharing his passion for chemistry with undergraduate and graduate students through his teaching and research.

Hannah Horowitz and Christopher Tessum join the University of Illinois at Urbana-Champaign



Dr. Hannah M. Horowitz will join the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign (UIUC) as an assistant professor in January 2020. Broadly, her research focuses on the coupling between human activity, climate, biogeochemistry, and pollution, with the goals of informing policy and protecting human and ecosystem health. Her interests include understanding

atmospheric chemistry - climate interactions to improve predictions of climate impacts, air quality, and environmental pollution in a changing world. She develops global numerical models informed by observations and theory. Previously, she was an NSF Atmosphere and Geospace Sciences and Joint Institute for the Study of the Atmosphere and Ocean Postdoctoral Fellow at the University of Washington where she worked with Drs. Becky Alexander, Lyatt Jaegle, and Cecilia Bitz. She received her PhD in Earth and Planetary Sciences from Harvard University, where she worked with Drs. Daniel Jacob and Elsie Sunderland on understanding the global biogeochemical cycle of mercury.



Dr. Christopher Tessum will join the Department of Civil and Environmental Engineering at UIUC as an assistant professor in January 2020. He was previously a research scientist at the University of Washington in Seattle, working with Dr. Julian Marshall to study health and environmental effects of human systems. Tessum received his BME in Mechanical Engineering and MS and PhD in Civil, Environmental and Geo-Engineering from the University of Minnesota.

His research focuses on modeling air pollution and its health impacts, quantifying inequities in the distribution of those impacts, and proposing and testing solutions. He studies the relationships between emissions, the human activities that cause them, and the resulting health impacts, and he develops modeling capabilities to enable these types of analyses.

Heyang Yuan joins Temple University



Dr. Heyang Yuan joined the Department of Civil and Environmental Engineering at Temple University as an assistant professor in August 2019. Dr. Yuan received a BS degree at Tongji University in China, an MS degree at the Technical University of Munich in Germany, and a PhD in Environmental Engineering with Dr. Zhen (Jason) He at Virginia Tech. Prior to joining Temple University, Yuan worked as a postdoctoral research associate at the University of Illinois at Urbana-Champaign.

Yuan leads the BioNex Laboratory at Temple University. His research focuses on integrating engineering, microbiology and electrochemistry to address the grand challenges at the nexus of water, energy and health. His specific research interests include: (i) developing biotechnologies for simultaneous wastewater treatment, desalination, bioenergy production and resource recovery; (ii) understanding and modeling microbial communities and functional dynamics in engineered biological systems; (iii) fate and removal of emerging biological contaminants such as antibiotic resistance genes in bioreactors; and iv) material-microbe interactions.

In Memoriam... Edward J. Bouwer

Edward (Ed) John Bouwer, Abel Wolman Professor of Environmental Engineering at Johns Hopkins University, died of multiple myeloma in Baltimore on October 9, 2019. Ed was an internationally recognized leader in the area of environmental microbiology and biotechnology who served as a beloved member of the faculty of JHU's Whiting School of Engineering for more than 34 years. Widely respected by his colleagues for his dedication to assisting and mentoring student and faculty colleagues, both inside and outside of JHU, Ed attended the successful dissertation defense of his 26th doctoral advisee just last month.

Ed was born in Auburn, Alabama, on December 5, 1955, as the oldest of three children of Dutch-born parents, Herman and Agnes Nancy Bouwer. Herman was himself an internationally renowned hydrologist and agricultural engineer in Arizona, with whom Ed had enjoyed working over much of his professional life. Ed grew up mostly in Tempe, Arizona, where he became co-vaedictorian of his graduating class at Tempe High and went on to receive a B.S. degree in Civil Engineering with a minor in Nuclear Engineering from Arizona State University in 1977. During a summer working as a student intern at Oak Ridge National Laboratory, a coworker mentioned that his daughter was learning tennis, a sport that Ed excelled in, and arranged a blind date. Patricia Gilpatrick became Ed's wife in 1979.

Ed completed his M.S. (1978) and Ph.D. (1982) in Environmental Engineering and Science at Stanford under the direction of Dr. Perry McCarty. He was honored early in his career, first by an NSF Graduate Fellowship in 1978 and then by the 1982-1983 AEESP Award for Best Doctoral Thesis Relevant to Environmental Engineering Practice. The latter was in recognition for pioneering work that was among the first in the world to demonstrate biodegradability of halogenated aliphatic organic compounds under both methanogenic and denitrifying conditions. His quick completion of his Ph.D. earned him the affectionate nickname of "Fast Eddie" among his Stanford peers.

Ed's first academic position was at the University of Houston, where he quickly earned an Outstanding Teaching Award, and in 1985 was among the first recipients of the National Science Foundation's Presidential Young Investigator Award. In this same year, Ed moved to Johns



Hopkins University, where he played a pivotal role in reinvigorating the department's longstanding tradition of excellence in environmental engineering. In 1992, he took a sabbatical as a Visiting Professor with Dr. Alexander Zehnder at Wageningen University in The Netherlands. After serving as Director of Graduate Studies for many years, Ed became chair of the Department of Geography and Environmental Engineering (DoGEE) in 2007 and served in that role for nine years, a period during which the department's graduate and undergraduate environmental engineering programs were ranked among the top 10 in the nation. The 2016 merger of programs in the Whiting School of Engineering and the Bloomberg School of Public Health to form the Department of Environmental Health and Engineering (EHE) drew heavily upon Ed's extensive knowledge and experience in environmental engineering education, research, and practice.

An expert in drinking water and wastewater treatment processes, as well as microbial process engineering and contaminant transport and fate, Ed has taught undergraduate and graduate courses in engineering microbiology and wastewater treatment (at both basic and advanced levels) for almost four decades and has worked to help plan and manage the department's environmental engineering senior design class since the creation of the major in the late 1990s. During this period, he played a major role in the advisement and education of hundreds of students, for whom he was a caring and talented teacher, mentor, and career advisor. Ed was a member and strong supporter of the AEESP (previously AEEP) throughout his career and served on its Board of Directors and as Secretary from 1993 through

1995. At the time of his death, he was looking forward to continued service as a new member of the AEESP's investment advisory committee as the organization's board representative to the American Academy of Environmental Engineers and Scientists (AAEES).

In his research efforts, Ed focused on factors that influence biotransformation of organic contaminants, bioremediation for control of organic contaminants at waste sites, biofilm kinetics, interaction between biotic and abiotic processes, groundwater contamination, biological processes design in wastewater, industrial and drinking water treatment, and transport and fate of microorganisms in porous media. His work on inorganic contaminants included depleted uranium at Aberdeen Proving Grounds and chromium from mine tailings in Baltimore Harbor. Ed has served on editorial boards for the journals *Biodegradation*, *Journal of Contaminant Hydrology* and *Environmental Engineering Science*. He served on at least six different committees of the National Research Council (NRC) since 1987 and has worked with NRC's Water Science and Technology Board for the past 22 years. In much of this work and in his teaching, Ed focused heavily on understanding human and ecological health risk data in the context of environmental risk management. As Director of the US EPA Center for Hazardous Substances in Urban Environments (2001-2005) and again as Director of a Honeywell and Maryland supported Center for Contaminant Transport, Fate, and Remediation (2005-2009), he led and organized his own work and that of students and other colleagues in

continued next page

studying the effects of contamination in Maryland's urban environments, sharing findings not only in peer-reviewed publications but also directly with government officials and the public in order to inform decisions about land use and environmental policy. Overall, he has been a central part of over 250 peer-reviewed technical publications. His work and that of his students has been honored with major national AEESP awards on five occasions, including (in addition to his own dissertation), the doctoral dissertation work of three of his students (Gordon Cobb in 1990; Robert Martin in 1991, and Laura Ehlers in 1998) and an Outstanding Paper Award in 1998 for his earlier publication with Perry McCarty. In 2007, he co-authored with Eric Rifkin *The Illusion of Certainty: Health Benefits and Risks*, a book that drew on his decades of experience as an environmental health researcher to help the public better understand health benefits and risks and empower people to make better decisions about their own health care. In 2008, Ed was named the Abel Wolman Professor of Environmental Engineering, a professorship named for the prominent American engineer and Johns Hopkins professor.

Ed was an especially caring student advisor and mentor. He truly excelled at advising freshmen and enjoyed those interactions immensely, was

very good about knowing exactly what the requirements were in the different areas and helping students navigate their way through registration, and was an extremely conscientious and thoughtful advisor of graduate students, who was instrumental in launching many students' careers. As noted by Andrew Douglas, JHU's current executive vice dean and former Vice Dean of Faculty for the engineering school: "In all of his pursuits, Ed demonstrated his dedication to his colleagues, to the many partners with whom he worked across the university, and to the generations of students he mentored. And beyond Johns Hopkins, Ed also was dedicated to ensuring that his work had a direct and positive impact on the world." And in the words of Marsha Wills-Karp, chair of the recently formed Department of Environmental Health and Engineering, "Ed embodied the true spirit of a professor—always willing to help fellow faculty members and students with any number of issues, in order to bring new knowledge to the world. I have admired his kindness and devotion to his work and his family. Even during his illness, he continued to work and interact with students. His passion for his work and students was unsurpassed."

A former Eagle Scout, Dr. Bower also spent more than a decade volunteering as Assistant Scoutmaster with his sons' Boy Scout troop,

chaperoning monthly camping trips even on sub-zero winter weekends, and continuing service as a Unit Commissioner in Maryland after his two sons, Scott and Christopher, had also reached the rank of Eagle. For hobbies, Ed enjoyed tennis, skiing, hiking, white-water rafting, and amateur photography, being well known as a reliable and talented photographer for documenting student field trips, departmental events, and personal travel. After he was diagnosed with myeloma, Ed and his wife Pat took trips to the Galapagos Islands and Antarctica, where Pat reports they relished (and Ed photographed) the snowy mountains, seals and "thousands and thousands of penguins."

Ed is survived by his wife of 40 years, Patricia; sons Scott and Christopher; two grandchildren; and two siblings, Arch Bower of Portland, Oregon, and Annette Bower Flegenheimer of Chandler, Arizona. Services will be held at 2 p.m. on Sunday, Nov. 3, at Central Presbyterian Church, 7308 York Rd., in Towson. In lieu of flowers, the family requests that those wishing to honor Ed's life do so by contributing to the Chesapeake Bay Foundation (tribute donation form available under "donate" tab at www.cbf.org), to Central Presbyterian Church (Towson, Maryland), and/or to the Bower Memorial Gift fund within the Whiting School of Engineering (410-516-8723).

2019 Gordon Research Seminar and Conference on Water Disinfection, Byproducts and Health

Submitted by Susana Y. Kimura and Carsten Prasse

The third edition of the Gordon Research Seminar (GRS) on Water Disinfection, Byproducts and Health was held July 27-28, 2019 at Mount Holyoke College in South Hadley, MA. Held in conjunction with the Gordon Research Conference (GRC), the GRS welcomed more than 50 students, post-docs, and young scientists from Australia, Austria, Canada, China, Switzerland, South Africa, the United Kingdom, and the United States. The keynote speaker, Dr. Benedikt Warth from the University of Vienna, gave a talk titled "Exposomics: A New Paradigm for Investigating Food and Environmental Contaminants". Attendees presented their latest research through 12 oral and 34 poster presentations and took part in the numerous networking opportunities. The GRS concluded with a mentorship session featuring five panelists from industry and academia.

At the student poster competition, presentations were judged based on poster appearance, scientific quality, novelty, and student engagement. Congratulations to the top three graduate students: Yegyun Choi from Gwangju Institute of Science and Technology (Korea), Ze-Chen Gao from Tongji University (China), and Tessoria Young from the University of Washington (USA). In addition, a special acknowledgement to Michael Rose from Johns Hopkins University (USA) for his outstanding GRS abstract which was selected for a short presentation at the GRC.

We would like to acknowledge our GRS sponsors for their support: AEESP, LECO, National Science Foundation, Environmental Protection Agency, and Carollo Engineers.

University of New Mexico receives \$5 million NSF Center Grant

Submitted by Kerry Howe (University of New Mexico)

The Center for Water and the Environment (CWE) at the University of New Mexico has been awarded a 5-year, \$5 million Center for Research Excellence in Science and Technology (CREST) grant from the National Science Foundation (NSF). This new NSF grant will allow the CWE to continue its work on watershed processes, treatment technologies, and interactions between water and energy that was started under its previous (Phase I) NSF CREST grant, which was awarded in 2014.

The Phase I CREST grant greatly expanded the capacity for water-related research at UNM, provided research funding for over 90 students and faculty who generated more than 140 publications, presentations and theses, and conducted outreach about STEM to thousands of participants during visits to local K-12 schools, public events, and professional conferences using custom-designed outreach activities built by the students. Phase II will build on previous successes while expanding and redirecting the water-related research with new research questions and new partnerships with institutions.

In addition to the research focus on water issues, the CREST program focuses on increasing the number of underrepresented minorities in STEM professions. The CWE developed an extensive outreach program with a variety of demonstrations during Phase I, including an augmented-reality sandbox that shows how water moves



through a watershed, which allows students to understand and experience water-related research in a hands-on way. The demonstrations and activities are taken to high schools and other venues in a trailer that was purchased as part of the grant. Phase II includes a new emphasis on recruiting and retaining Native American students, a population that may be under-represented even among CREST centers.

The Center Director and PI of the CREST grant

is Kerry Howe. Co-PIs include Andrew Schuler, José Cerrato, and Mark Stone (all of whom have received NSF CAREER awards) and Ricardo González-Pinzón. Several faculty from other disciplines are involved in the grant.

Students interested in graduate research assistantships, particularly those from underrepresented minorities in STEM, should contact Kerry Howe at howe@unm.edu. The CWE website can be accessed at cwe.unm.edu.

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Borchardt-Glysson Water Treatment Innovation Prize
and
2020 Borchardt Conference

25th Triennial Symposium on Advancements in Water & Wastewater
University of Michigan, Ann Arbor, MI
February 25-26, 2020

Nominations for the Borchardt-Glysson Water Treatment Innovation Prize are due on October 28, 2019. Detailed nomination guidelines and an application form are available at <https://cee.engin.umich.edu/borchardt-glysson-water-treatment-innovation-prize-and-2020-borchardt-conference/>.

The Borchardt-Glysson Water Treatment Innovation Prize is an honor consisting of a \$10,000 cash award to acknowledge a senior or mid-career professional whose accomplishments in the water or wastewater treatment fields have been nationally and internationally recognized. The Prize will be presented at the Borchardt Conference. As part of the award ceremony, the recipient is invited to deliver the Borchardt-Glysson Water Treatment Innovation Lecture.

Abstracts for oral and poster presentations for the 2020 Borchardt Conference are due on October 28, 2019. Detailed abstract submission guidelines and an abstract submission form are available at <https://cee.engin.umich.edu/borchardt-glysson-water-treatment-innovation-prize-and-2020-borchardt-conference/>.

Every three years, the Borchardt Conference brings together a diverse group of engineers, scientists, practitioners and students to present and discuss the latest issues and advances in water and wastewater science and engineering. In addition to the Borchardt-Glysson Water Treatment Innovation Lecturer and two invited keynote speakers, presenters for oral and poster presentations will be selected from submitted abstracts on recent developments in the drinking water and wastewater fields. Graduate and undergraduate students are encouraged to submit abstracts.

Keynote speakers:

Borchardt Keynote Lecturer: Dr. **Michèle Prévost**, Professor and Principal Chairholder, NSERC Industrial Chair on Drinking Water, Department of Civil, Geological and Mining Engineering, Polytechnique Montreal.

Glysson Keynote Lecturer: Dr. **Charles Bott**, Director of Water Technology and Research, Hampton Roads Sanitation District (HRSD) and Adjunct Professor at Virginia Tech and Old Dominion University.

Please direct technical questions to:

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**Environmental Research
& Education Foundation™**
Lighting a path to sustainable waste management practices

The Environmental Research & Education Foundation (EREF) Awards Three Recycling Research Grants in Response to Recycling RFP

EREF's Research Grants Program is led by its 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 of the solid waste industry. EREF funds research on all topics related to solid waste management with a recent focus on recycling. In order to meet industry needs, EREF released a targeted recycling RFP in 2018.

The EREF Board of Directors approved support for the following recycling research in 2019:

**Recycling, Contamination, Markets and
Material Recovery Facilities (MRFs):
Practical Strategies for Communities,
Non-Profits, and MRFs**

*Investigator: Skumatz Economic Research
Associates, Inc.*

Material Recovery Facilities (MRFs) can technically produce quality materials out of dual stream and single stream inputs, but were not designed or equipped to process material with 20% or more trash/contamination. This research addresses three main topics – what can be done to get cleaner materials, what makes sense to recycle (collect and process), and is there a sustainable recycling structure. The goal is to identify feasible (short and long term) strategies for developing a sustainable recycling system for small/medium/larger communities and non-profits, providing clean-enough “commodities” that meet the needs of end-users – both domestic and international.

**The Influence of Social Norms on
Recycling Behavior in Urban Multifamily
Buildings**

Investigator: Stony Brook University

The primary goal of this proposal is to test the influence of social norms on recycling behavior in multifamily buildings in the New York City area. Recycling rates for multifamily buildings are lower than single family homes, and even when residents are knowledgeable about what is recyclable, knowledge of non-recyclables lags, leading to significant contamination. While multifamily recycling research strongly emphasizes the role of convenience in increasing recycling, once such structural characteristics are in place there is a need to look to behavioral factors to see further gains. While social norm-based interventions are well-studied in the energy field, there is less work in this area for recycling research, highlighting an important gap. This research will specifically assess the effectiveness of social-norm based interventions on household recycling behavior in multifamily buildings and determine if significant differences in effectiveness exist between two different social norm-based interventions – peer pressure and competition.

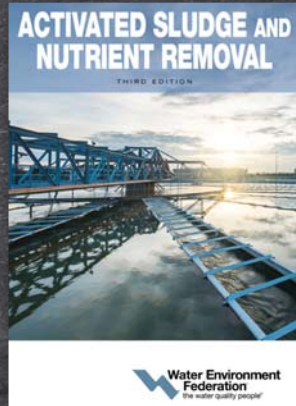
**Development of Recognizable Recycled
Paper Based Containerboard
Products and Their Ability to Promote
Positive Brand Recognition**

Investigator: North Carolina State University

There is a growing interest in sustainable packaging given the public's increasing awareness of packaging environmental issues. At the same time, recent waste import restrictions by China are destabilizing the demand for low quality waste materials. This research proposes that paper based packaging with obvious recycled content from low quality waste can instill positive perceptions from consumers about a product or brand, making these containers more desirable. The overall goal of this research is to develop systems to effectively utilize low-grade paper wastes in innovative containers, with recognizable recycled content, in order to increase and stabilize the demand for low-grade recovered paper.

HIGHER EDUCATION RESOURCES FROM WEF

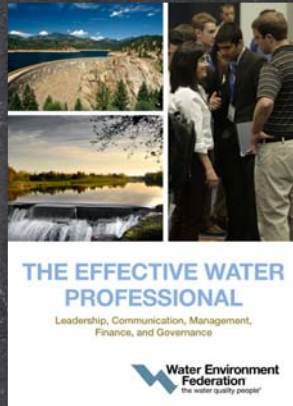
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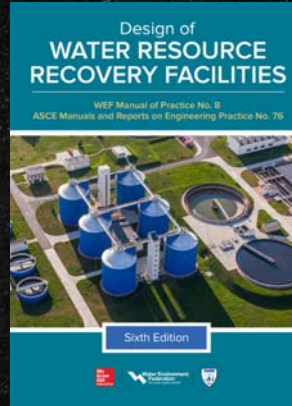
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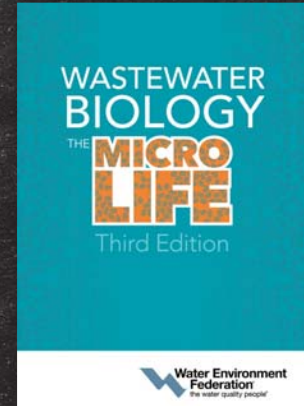
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Membership in AEESP offers important benefits to educators, researchers, students, professionals, corporations and organizations engaged in the environmental engineering and science profession. All who are eligible for membership are welcome to join the Association and to participate in the full range of benefits and opportunities. Membership categories and fees are described below, with complete definitions provided in the AEESP Bylaws. Applying online is easy! We welcome your participation!

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Rank	Annual Fee
Full Professors	\$100
Associate Professors	\$75
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**Members residing in low and middle income countries as identified by the World Bank may request a discount by contacting the Business Office.*

Applying for Regular membership is made by submitting a completed application form and a brief two page curriculum vitae online with payment. Alternatively, application materials may be mailed to the Business Office with a check enclosed.

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Affiliate Membership is open to individuals who are not eligible for regular membership including:

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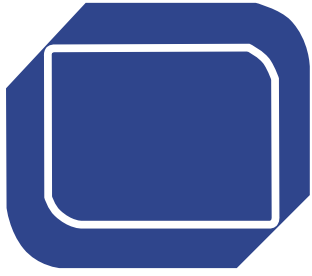
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Association of Environmental Engineering and Science Professors Newsletter

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