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ENVIRONMENTAL ENGINEER & SCIENTIST

Artificial Intelligence and the Environment

Are We Ready for This?

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FEATURES

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PRESIDENT'S PAGE

C. Hunter Nolen, P.E., BCEE

AAEES Value Proposition

Several years ago, I heard a past president of the AAEES say: "Having been elected President of the Academy is the greatest honor of my career." I pondered that statement with surprise and curiosity, having not yet had much interaction with Academy leadership. My story was that, in 2001, I had largely been coerced into becoming Board Certified by executive leaders of my employer and the main thing I knew about the Academy was that if I wanted a promotion, I better do it. In hindsight, this was a gift of a lifetime….

For several years, I displayed the BCEE letters on my business cards and signature line while continuing to pay little attention to Academy activities. I did notice, however, that this credential made a positive impression on peers and clients, so I determined to learn more. Sometime in 2009, I discovered that Brian Flynn, from Austin, Texas was in line to become AAEES President. I also lived near Austin so I called him and over the next several years, I had the privilege of meeting Brian for lunch on a regular basis. Brian taught me about the Academy's history, purpose, and contributions to environmental engineering and science, and he was quick to recruit me to join, and then Chair, the AAEES Planning Committee as well as to facilitate several Academy programs and webinars. (Brian is a rather persuasive fellow.) I grew to love the Academy and was elected to the Board of Trustees for 2012 and began my most-privileged journey through the roles of Vice President, President-elect, and now President.

This has been quite an experience and, along the way, I have seen first-hand how some of the greatest environmental engineers and scientists in the world think, behave, and share their wisdom with those who are willing to pursue and acquire Board Certification and participate in AAEES activities. I began to understand the Academy's value more completely and determined to help promote this for the benefit of members and prospective members. Once during a Board of Trustees Meeting, we captured the Trustees' collective perspectives into the following AAEES Value Proposition:

VALUE TO MEMBERS

- **Highest level of credentials in environmental engineering and science** - the only Board Certification in environmental engineering and science jointly recognized by the AAEES Sponsoring Organizations, including: A&WMA, AIChE, APHA, APWA, ASEE, ASCE, ASME, AWWA, AEESP, NSPE, SWANA, and WEF
- **Pride in accomplishment** – proof of reaching highest honors in environmental engineering and science
- **Career advancement/marketability** due to advanced credentials recognized throughout our industry
- **Enhanced technical respect** amongst our peers and clients and for expert witness credentials
- **Networking and camaraderie** with most advanced technical leaders in our industry, providing many opportunities for shared learnings and relationship development
- Access to **leading-edge publications and workshops** provided by AAEES throughout each year
- Annual **awards program** provides top tier peer recognition for individuals and teams for some of the most important environmental engineering and science projects in the world
- Opportunity to provide **service to our most honorable profession**, helping to fulfill an important responsibility we all have

VALUE TO EXECUTIVE LEADERS (WHOSE EMPLOYEES ARE BOARD CERTIFIED)

- Demonstrates **commitment to excellence** within the organization and on behalf of the organization's customers
- Achieves **recognition by clients, regulators, public**, enhancing the reputation of the organization with the public and within the environmental profession
- Provides **access to leading edge technical knowledge**, increasing the organization's abilities to deliver highest-value services and solutions
- Enhances project **reliability, cost efficiency, profitability**, helping to assure organizational success in the marketplace

> All advanced practitioners and educators in our field should pursue Board Certification and AAEES membership, and all of us already engaged should advocate this to our colleagues and peers.

- Improves **environmental innovation and impacts**, reducing the environmental "footprint" of an organization on its surrounding environment and community
- Enhances **sustainability and brand**, bringing prestige and respect from within and external to the organization
- Supports **"employer of choice"** status, differentiating the organization from competitors less committed to technical excellence
- Annual **awards recognition opportunity**, providing an opportunity for an organization to share the limelight of the awards ceremony and spend valuable time with its clients and participating partners
- Opportunity to provide **service back to the profession**, helping to fulfill organizational responsibility to benefit the environmental industry

To the many of you who are already AAEES Members, you will have experienced many of these benefits; and to those of you considering joining, they are worth anticipating enthusiastically. All advanced practitioners and educators in our field should pursue Board Certification and AAEES membership, and all of us already engaged should advocate this to our colleagues and peers. AAEES welcomes all who have the necessary integrity, education, experience, knowledge and desire into the realm of Board Certification. This doesn't come easily, nor should it, and it is worth every bit of commitment it requires to achieve.

As Board Certified environmental professionals, we have obligations to society and global ecosystems to bring solutions, and as AAEES members we have obligations to be "ambassadors" for the Academy. I ask you all to do three things:

1. cherish your credential for the outstanding accomplishment it is,
2. consider participating in committees and other activities (you will not regret it), and
3. promote AAEES membership and Board Certification to all your qualified colleagues.

How many of you became Board Certified without first being encouraged by a colleague or supervisor? We need to act similarly. Finally, as a Board-Certified member of the Academy, be sure to include the BCEE, BCEEM, or BCES designation after your name on business cards and other correspondence. You worked hard to earn this designation and deserve to express it.

So, after all of this has been said and done, being President of AAEES is the greatest honor of my career. Please get more involved, wear your BCEE/BCEEM/BCES "badges of honor" with pride, and enjoy the journey.

EXECUTIVE DIRECTOR'S PAGE

Burk Kalweit

Artificial Intelligence and the Environment — *Are We Ready for This?*

One of the emerging trends that we seem to be hearing a lot about lately is the entire field of artificial intelligence (AI). Depending upon your inclination, some would have us believe that the evolution of artificial intelligence that will happen in the next 20 years will lead to a redefinition of everything -- both what we do and how we do it. Our work will be transformed and our lives will be improved. According to these experts, nothing is going to be able to escape the impact of artificial intelligence. So we say the words, but what do they mean in the context of the world as we currently know it?

The current/modern definition of artificial intelligence (or AI) is "the study and design of intelligent agents" where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success in achieving a pre-determined objective. Notice how this appears to be an updated version of the standard input - output construct. The things we do in a stepwise progression determines our ability to succeed in what we are doing.

A simple comparative example of AI versus the current status quo would be planting a garden in your backyard. We till the soil as required to plant the seeds at the appropriate depth and distance from each other. Then we cover the seeds with dirt and add fertilizer as we think is appropriate. Next, we water our garden and begin the process of monitoring what we've done so that we can deploy the other tools in our arsenal - insecticides and fungicides - to ensure that our garden will grow and yield the crop we desire. Finally, we make sure that we keep an eye on our garden to make sure that unexpected events do not sabotage our efforts. With luck, and a little TLC, we should have a nice crop of homegrown fruits and vegetables to enjoy in late summer or early autumn.

But this is supposed to be an article talking about artificial intelligence. So let me rewind and shift tracks. What's the difference between a homegrown human-tended kind of garden, and one that we turn over to our AI gardener? Well, in the garden that is properly wired for artificial intelligence with an array of sensors that are either static or mobile, all the standard gardening steps still happen – obviously – but the significant difference is that we, as the gardeners, have the option to set it and forget it until it's time to harvest.

Once planted, the AI will take care of sensing and responding to all aspects of the garden's microenvironment as it grows. If things are too dry, it will turn on the sprinklers. If the growth of our crop appears to be stunted, it will determine a corrective

> What's the difference between a homegrown human-tended kind of garden, and one that we turn over to our AI gardener?

game plan of fertilization. If there are infestations of insects or subterranean threats such as grubs or worms, the AI will step forward and implement what it knows to be the correct palliative measures. And just so the gardener doesn't feel totally left out, the AI will prepare daily reports on the status of critical growth criteria and what activities the system is undertaking to ensure that everything remains nominal.

The above scenario depends on whether or not we have the robotics required to actually make these adjustments in our microenvironment over time that would result in the 'set it and forget it' notion mentioned above. But even if we don't have the robots required to implement this ideal scenario, what we will have is a hybrid system in which the AI does the hard part. It takes sensor data to determine what's happening. It then develops a forecast of the impacts of a continuation of the current environment, and from that knowledge, directs the gardener regarding what needs to be done immediately and what potential measures may be required in the near future to keep all things at the desired state.

This is where the hybrid system comes into play. The AI knows exactly what to do, but unless it is fully roboticized, it can't actually do anything except make recommendations. That's where we need the human gardener to physically implement the recommendations of the AI. It looks like a pretty good partnership. The AI does what it does best and the gardener ends up with the optimized fruits of his labors. What makes this even more powerful is the fact that the AI is continually learning and adapting. It does the calculations of the impact of the recommended steps that the gardener has implemented, and then 'learns' to determine how effective that given solution was relative to the stated objective. The AI knows that it developed an irrigation scheme that yielded certain results and then was able to compare these results to what it expected to modify its set of prescriptives when the time comes to plant the next garden.

This is where it gets interesting. The case we have just described is self-limiting in that the AI only works on our small baseline garden. Because of that, its perspective of the universe of all the gardens in the neighborhood is a null set. It has no data on what's happening in the neighbor's backyard much less what's going on two or three blocks, or two or three miles away. It's easy to see where this is headed. If every garden in a 5-mile radius were wired into the AI, we suddenly have a much larger perspective of gardening activities. We also have a much different perspective on what is happening in our garden. We

can then instantaneously determine whether we are doing better than, or not as well as, the rest of the gardeners in our microenvironment. We also have the ability to explore the inputs and activities of our neighbors to see how well his pumpkins are doing without being fertilized while ours have been the beneficiaries of a program of careful organic fertilization.

Just to show you that this technology is more real than you think, look at the picture at the bottom of this page. It's not obvious, but that is a double-armed robotic cucumber picker that was developed by the Fraunhofer Institute in Germany. While you don't hear that much about it, Germany does have a significant labor problem in its agricultural sector. If German consumers want to continue eating homegrown cucumbers that are turned into pickles, it needs to keep labor costs down. The surest way of doing that is introducing automation, and for the purposes of this article, we can assume that that goes into the entire process. This first wave of automation in the

© Photo Fraunhofer IPK
A prototype of the dual-arm robot system during the first field tests.

Editorial credit: TK Kurikawa / Shutterstock.com

German pickle industry has been reported to save as much as 50% of harvesting labor costs.

The agricultural sector is just one example of the application of AI into an existing system that used significant benefits. It's also a great example of how the process of machine learning is a critical element to the application of AI in multiple settings.

Let me give you another example, this one from a very different area of activity. I will not share the name, but there is a city in Florida that has one of the worst pedestrian fatality rates in the nation. Local officials had tried a variety of things to better understand the reasons behind this continuing problem. There was one locale that proved to be stuck at intractably high levels of pedestrian-motor vehicle incidents.

Faced with this conundrum, local officials decided to go with a technology approach to finding out what was going on so they might be able to design and implement a long-term solution. The site in question was a section of street that adjoined the local bus terminal. Because of this, there was a lot of what appeared to be relatively random pedestrian traffic on all sides of the terminal.

To get a clearer picture of what was going on, the city installed video cameras that were connected to an artificial intelligence application that turned the images on the screen into data flows. These, in turn, were presented as maps that showed the pedestrian traffic flows on a second-by-second basis around the clock. This helped to highlight where the collisions occurred and how the vehicle and the individual pedestrian involved in the collision came from. That was the perfect job for the AI system -- converting data into maps that showed how the victims of an accident got to a particular point. What the system learned was that the highest accident location was in the middle of the block on which the bus terminal was located. The preponderance of the accidents were occurring in the middle of the block where pedestrians were jaywalking.

Since there was no traffic control for the entire length of the block, the pedestrians did what came naturally -- they took the earliest opportunity to cross the street. The solution turned out to be surprisingly simple. The city created a crosswalk in the middle of block. That way, pedestrian traffic was channeled to the one official opportunity to cross the street. Equally as important, drivers of vehicles recognized that there was a designated crosswalk and knew to be on the alert for pedestrian traffic in the crosswalk and the traffic not in the crosswalk as well.

What makes this a compelling AI story is that the system was able to digest and analyze traffic flows in a way that no skilled traffic engineer could do. And then copious amount of data crunching led to the simplistic but highly effective solution to the problem. In the first six months after the new crosswalk was installed pedestrian-involved vehicular accidents were also down significantly.

So we planted a garden using AI and were able to harvest an optimized crop at the end of the growing season. We also used AI to reduce the number of traffic fatalities in a problematic location by turning data into a complex 3-D perspective. With their ability to understand, reason, and learn, AI-based systems and technologies have the potential to be our powerful ally in reshaping the world as we know it.

So now we have to come full circle so that we can use these two examples to make a connection to environmental engi-

> "The hard part will be ensuring that the people who build the systems and employ them will be able to learn as rapidly as the machines do.

neering and science. While there are countless ways in which the technology will be applied in the future, let's just see if we can summarize the primary areas of impact that will be employing artificial intelligence in the near future. Here are four key applications for AI that should be leading the way.

1. Better conservation of natural resources. By combining satellite imagery, real-time sensing and machine learning, companies and governments will be able to reduce water usage in their operations. One winery created a 'smart' irrigation system that can deliver water in a way that's situational, hyper-local, and automated. The system helped curtail water use by 25 percent over three years.
2. Earlier pollution detection. Advanced machine learning and self-organizing sensor networks are helping organizations pinpoint the sources of pollution faster and more accurately. This enables targeted mitigation actions that are better for business and the environment.
3. Accelerating the development of sustainable options. AI based technology is accelerating more sustainable energy and product choices for consumers. The technology can also assist with environmental regulation compliance in real time as it tracks the composition of outflows from government and industrial activities.
4. Learning from nature's ecosystems. By using the technology to establish a baseline, policy makers and companies that manage natural resources will have a powerful tool in its arsenal to use to develop a fuller understanding of natural systems and the interactions that they embody.

All indications are that this technology will be upon us in wide-scale applications sooner rather than later. The question that we need to consider is what kind of changes in skills will be required to incorporate the new technologies into new systems, systems that will be expected to perform at unprecedented levels of operational efficiency. There is a reason that these things are sometimes called adaptive artificial intelligence systems. Once you crank them up for the first time, the process of learning begins.

The hard part will be ensuring that the people who build the systems and employ them will be able to learn as rapidly as the machines do. A critical concern is the question of leadership in the field of AI. It seems that the academic sector is leading hardware and software systems development at present. How we transition from the lab to full systems is anyone's guess. All we can say with certainty is that this is a huge opportunity that environmental professionals are going to be in the middle of for the foreseeable future. Is your organization ready?

It's not getting any easier, is it?

Notice of Board of Trustees Nominees

Following is the Notice of Nominees for the 2019 Board of Trustees. Full profiles of the candidates will appear in the Spring 2018 issue of *Environmental Engineer and Scientist*.

PRESIDENT-ELECT

➲ **James W. Patterson, Ph.D., BCEEM**
Principal
Patterson Environmental Consultants, Inc.

VICE PRESIDENT

➲ **Lilia Abron, P.E., BCEE**
Owner and President
PEER Consultants, P.C.

➲ **Daniel B. Oether, Ph.D., P.E., BCEE**
John A. and Susan Mathes Chair of Environmental Health Engineering
Missouri University of Science & Technology

TRUSTEE-AT-LARGE

➲ **James Clarke, Ph.D., BCES**
Professor of the Practice of Civil & Environmental Engineering
Professor of Earth and Environmental Sciences
Director of Graduate Studies for Environmental Engineering
Vanderbilt University

➲ **Robert H. Gilbertsen, P.E., BCEE**
Senior Manager
Ramboll Environ

➲ **David M. Gaddis, P.E., BCEE**
Associate
CDM Smith

➲ **Richard P. Watson, P.E., BCEE**
Chief Executive Officer
Delaware Solid Waste Authority

ACADEMY NEWS

NOMINATIONS OPEN FOR AEESP/AAEES/EESF AWARDS

The Association of Environmental Engineering and Science Professors, the American Academy of Environmental Engineers and Scientists, and the Environmental Engineering and Science Foundation are now seeking nominations for the following awards:

William Brewster Snow Award

This award is given annually to recognize an environmental engineering graduate student who has made significant accomplishments in an employment or academic engineering project.

For additional information and to submit your nomination for this award, go to http://www.aeesp.org/awards/william-brewster-snow.

W. Wesley Eckenfelder Graduate Research Award

This award is given annually to recognize an environmental engineering or environmental science graduate student whose research contributes to the knowledge pool of wastewater management.

For additional information and to submit your nomination for this award, go to http://www.aeesp.org/awards/eckenfelder-graduate-research.

Innovyze Excellence in Computational Hydraulics/Hydrology Award

This award is given annually to recognize a student whose research contributes to the knowledge pool of in the area of Computational Hydraulics & Hydrology.

For additional information and to submit your nomination for this award, go to https://aeesp.org/innovyze-excellence-computational-hydraulicshydrology-award.

The Frederick George Pohland Medal

This award honors an individual who has made sustained and outstanding efforts to bridge environmental engineering research, education, and practice. Only members of AEESP and/or the American Academy of Environmental Engineers and Scientists (AAEES) are eligible to receive this award.

For additional information and to submit your nomination for this award, go to https://aeesp.org/awards/frederick-george-pohland-medal.

Excellence in Environmental Engineering and Science Education Award

The E4S Award will be granted to an educator who has made a significant contribution to the profession in the area of educating practitioners.

For additional information and to submit your nomination for this award, go to https://aeesp.org/awards/e4.

Nominations for each award are open until March 15, 2018.

2018 EXCELLENCE IN ENVIRONMENTAL ENGINEERING AND SCIENCE AWARDS LUNCHEON AND CONFERENCE

The 2018 Excellence in Environmental Engineering and Science Awards Luncheon and Conference will be held on Thursday, April 19, 2018, at the National Press Club in Washington, D.C. The day's festivities will include honoring the following distinguished individuals.

- Gordon Maskew Fair Award:
  Debra R. Reinhart, Ph.D., P.E., BCEE
- Edward J. Cleary Award:
  Karen L. Pallansch, P.E., BCEE
- Stanley E. Kappe Award:
  Daniel B. Oerther, Ph.D., P.E., BCEE
- The Inaugural Science Award:
  Joel G. Burken, Ph.D., P.E., BCEE
- Honorary Member Award:
  Rita Rossi Colwell, Ph.D.
- International Honorary Member Award:
  Steve Burnage, CEng CEnv

As of press time, the recipients of the W. Brewster Snow, Wesley Eckenfelder Graduate Student Research Award, Excellence in Environmental Engineering Education Award, and Innovyze Excellence in Computational Hydraulics/Hydrology Award have yet to be determined.

In addition, winners of the 2018 Excellence in Environmental Engineering and Science Competition and the 2018 Environmental Communication Awards will be presented with their trophies.

The AAEES Keynote Speaker for the Awards Luncheon will be announced very soon.

For additional information and to purchase tickets to the event, go to http://bitl.ly/2018AAEESAwards.

2018 ENVIRONMENTAL ENGINEERING AND SCIENCE RESOURCE GUIDEBOOK - SIGN UP FOR YOUR LISTING

The Academy invites you to sign up for a listing in the 2018 Environmental Engineering and Science Resource Guidebook. We are releasing the Guidebook in both electronic and print format to make this year's edition easier to use and easier to distribute to individuals and organizations looking to connect

Academy News, continued on page 20

ENVIRONMENTAL ENGINEERING AND SCIENCE FOUNDATION LAUNCHES PLANNED GIVING PROGRAM

As part of its effort to continue to grow its ability to promote environmental engineering and science, the Environmental Engineering and Science Foundation has launched of a planned giving program.

Making the announcement was the Foundation's Chairman, Dr. Cecil Lue Hing, P.E., BCEE. "We have gone this route in order to do a better job of meeting our organizational mandate, and to make it easy for our donors to make a gift of any size to the Foundation," stated Lue Hing.

"Our mission is to promote advancement of environmental practice, including education, in the engineering disciplines as well as environmental science."

"We know there are many people who are prepared to provide support to our mission as a way of giving back to the profession that has provided them the opportunity to do interesting, meaningful work, as well as the opportunity to do well financially," Lue Hing observed. "But we have not done a very good job of making giving easy for them. The planned giving program is our way of remedying that situation."

"We invite anyone with an interest in environmental engineering and science to take a look at our planned giving website at: www.eesfoundation.org/plannedgiving/. We have put a lot of work into building a program that accommodates different styles of giving and gifts of varying sizes," continued Lue Hing. "We can now support people making a series of small monthly contributions. Similarly, we can also support people who are looking to include donations to the Foundation as part of their estate planning and the larger size of bequests such giving typically involves," stated Lue Hing.

"However, the most important element of our planned giving program is that it should do a much better job of generating donations that we will turn into expanding support for the advancement of environmental practice, including environmental engineering and science education programs.

"The environmental education field is competing with a host of other academic disciplines to attract the best and brightest; the students who will be the next generation of leaders in the field they choose. Our job is to make sure they consider an environmental engineering or science career. That is why I am very enthusiastic about the prospects for the planned giving program and what we expect it will do," concluded Lue Hing.

Find out more at http://www.eesfoundation.org/plannedgiving/. Please forward inquiries to: info@eesfoundation.org. Or call 410.266.3390.

STUDENT CHAPTER NEWS

UCI 2018 CONFERENCE | Fifth Annual AAEES Conference at UCI

The University of California-Irvine (UCI) Student Chapter of the American Academy of Environmental Engineers and Scientists is dedicated to providing students in engineering and science with opportunities to better themselves professionally, academically and socially.

We host an environmental conference each spring quarter at UCI to help our members learn about environmental topics as well as to network with professionals and fellow students.

We would like to invite you to be a speaker at our conference this year on Thursday, May 24, 2018, from 5:00 PM to 9:30 PM at Doheny Beach BCD in the UCI Student Center. Each speaker will be given a 45-minute frame to present on his or her topic.

We provide guest speakers with parking passes as well as with dinner at the conference. You are free to specify a preferred topic, but topics may need to be adjusted or changed if it conflicts with another speaker's.

If you are interested in this speaking opportunity, please feel free to email us back at aaees.uci@gmail.com or to contact me, the UCI-AAEES Student Chapter President, Connie Loo, at clloo@uci.edu and (626) 325-4047.

TEXAS A&M UNIVERSITY – KINGSVILLE

Check out our AAEES student chapter leaders at Texas A&M University – Kingsville. Notice they are sporting their AAEES T-shirts! President - Andrew Medrano, and Vice President - Jose Soria. Thank you for your continued support!

with environmental specialists. We are expanding the content that each listing receives – enabling web links in the e-version and providing more room to post information on your specialties in both versions. We expect to print and distribute the new publication more widely than we have in the past, with a special focus on outreach at the trade events and conferences we attend during the year. We are also planning an expanded role for the Guidebook in making federal, state, and local agencies aware of the capabilities of our members in helping deal with current environmental engineering needs.

Ask your organization to reserve its space by March 31, 2018. It's great exposure for a low cost. For details, go to http://www.aaees.org/publications/resourceguidebook.php.

COMMITTEE APPOINTMENTS

2018 President Hunter Nolen has finalized committee appointments for the Academy's next program year (January 1 to December 31) and appointment letters will be mailed to those newly appointed this year. Following is a list of those who will chair the Academy's committees:

- Audit Committee - **Joseph J. Delfino**
- Awards Committee - **Robert C. Williams**
- AEESP/AAEES Joint Awards Committee - **John Tobiason**
- Bylaws, Policies & Procedures Committee - **Robert C. Williams**
- Admissions Committee - **Sandra L. Tripp**
- Certification by Eminence Committee - **Cecil Lue-Hing**
- Membership, Development & Outreach Committee - **Hunter Nolen**
- Development & Upgrading of Examinations - **Robert H. Gilbertsen**
- Air Resources and Pollution Control Committee - **Mark P. Cal**
- Environmental Chemistry Committee - **Farhana Mohamed**
- Environmental Life Sciences Committee - **Mary F. DeFlaun**
- Environmental Sustainability Committee - **Brent M. Jones**
- General Environmental Engineering Committee - **Findlay Edwards**
- Hazardous Waste Management & Site Remediation Committee - **James D. Fitzgerald**
- Industrial Hygiene Committee - **Frederick W. Boelter**
- Radiation Protection Committee - Vacant
- Solid Waste Management Committee - **Robert B. Gardner**
- Surface and Groundwater Resources Committee - **Steven S. Turner**
- Water Supply and Wastewater Committee - **Jeffrey H. Greenfield**
- Engineering Education Committee - **David A. Chin**
- Excellence in Environmental Engineering Committee - **David M. Gaddis**
- Finance Committee - **Daniel B. Oerther**
- K-12 Committee - **Richard J. Pope**
- Nominating Committee - **Robert C. Williams**
- Planning Committee - **Kristin Morico**
- Publications Committee - **C. Herb Ward**
- Seminars and Workshop Committee - **Shuang (Sharon) Yin**
- Students & Young Professionals - **David Vaccari**

Committee Openings

The following committees have openings on their rosters. Please contact Sammi at jsolmo@aaees.org if you are interested in filling one of these important positions.

- Re-Certification Committee - Chair plus one member
- Radiation Protection Committee - Chair plus one member
- Excellence in Environmental Engineering and Science Committee - Chair
- International Relations Committee - Chair

DATES TO REMEMBER

April 19, 2018, AAEES Awards Luncheon and Conference, National Press Club, Washington, DC.

April 20, 2018, AAEES Board of Trustees Meeting, Arlington, Virginia.

May 7, 2018, AAEES's 10th Annual Breakfast at NJWEA's Conference. For registration or exhibitor information, visit http://www.njwea.org

May 8, 2018, AAEES's 9th Annual Workshop (with TCHs, PDHs and CEUs); includes breakfast and/or lunch at NJWEA's Conference, Atlantic City, NJ: For registration or exhibitor information, visit http://www.njwea.org

June 25 - 28, 2018, AWMA's 111th Annual Conference & Exhibition (ACE), Hartford, Connecticut. For details for to awma.org.

June 11 - 14, 2018, AWWA ACE18 Conference: Las Vegas, Nevada. For details go to awwa.org.

The Class of 2017

Compiled by J. Sammi Olmo

From the first applicants in 1956 to the Board Certified Environmental Engineers (BCEE), Board Certified Environmental Engineering Members (BCEEM), and Board Certified Environmental Scientists (BCES) listed on the following pages, the Academy has undergone growth and change, but has never wavered from it's core objective to "identify and credential persons with special capabilities in environmental engineering and environmental science."

The Class of 2017 are comprised of highly-qualified environmental engineers and environmental scientists from a wide range of backgrounds including senior vice presidents, project engineers, principal hydrogeologists, project managers, construction coordinators, environmental health scientists, and planning and development managers.

Please join us in welcoming the new class of environmental engineers and environmental scientists.

Minimum qualifications for Board Certification include requisite degree and 8 years' experience (4 years in responsible charge).

- **Board Certified Environmental Engineer (BCEE):** environmental engineering or related engineering degree plus P.E. license.
- **Board Certified Environmental Scientist (BCES):** environmental science or related science degree.
- **Board Certified Environmental Engineering Member (BCEEM):** environmental engineering or related engineering degree plus 20 years' experience (no P.E. required). BCEEMs are cetified through Eminence only.

Applicants with fewer than 16 years experience sit for a written examination and a peer review in their selected specialty area. Those with 16 or more years of experience may request a waiver of the written examination. A Master's and Ph.D. each count as 1.5 years toward the years-of-experience requirements.

For detailed requirements for specialty certification, go to http://www.aaees.org/becomeboardcertified.

The areas of specialty certification for Board Certification are:

ENVIRONMENTAL ENGINEERS

AP	Air Pollution Control
ES	Environmental Sustainability
GE	General Environmental Engineering
HW	Hazardous Waste Management and Site Remediation
IH	Industrial Hygiene Engineering
RP	Radiation Protection Engineering
SW	Solid Waste Management
WW	Water Supply/Wastewater Engineering

ENVIRONMENTAL SCIENTISTS

AR	Air Resources
EB	Environmental Biology
EC	Environmental Chemistry
EM	Environmental Microbiology
ET	Environmental Toxicology
GW	Groundwater and the Subsurface Environment
HM	Hazardous Waste Management and Site Remediation
SM	Solid Waste Management
SR	Surface Water Resources
SS	Sustainability Science

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- ■ Board Certified Environmental Engineer
- ♦ Board Certified Environmental Engineering Member
- ● Board Certified Environmental Scientist

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Valerie E. Alley, BCES — EB

Water Quality Assessment Branch Chief
Mississippi Department of Environmental Quality
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Jackson, MS 39201

Ms. Alley received her B.S. in Biology from the University of North Alabama and M.S. in Biology from the University of Louisiana Monroe. She has more than 16 years experience.

Amber M. Baylor, BCES — SR

South Orange County Wastewater Authority
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Dana Point, CA 92629

Ms. Baylor received her BS in Biology from Lindsey Wilson College and MS in Environmental Science from the Johns Hopkins University. She has more than 12 years experience.

Hassan Amini, Ph.D., BCES — HW

Principal Hydrogeologist
Wood Environment & Infrastructure Solutions
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Dr. Amimi received his B.S. degree in Geology from the University of Tahriz, Iran and M.S. and PhD degrees in Geology Science from the University of Colorado-Boulder. He has more than 27 years experience.

Christina B. Brown, P.E., BCEE — HW

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Ms. Brown received her BS degree in Chemical Engineering from the University of Colorado-Boulder. She is a licensed P.E. in Tennessee and has more than 20 years experience.

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Mr. Archer received his BS in Environmental Engineering and MS in Civil/Environmental from the California Polytechnic State University. He is a licensed P.E. in California and has more than 9 years experience.

Joseph D. Brown, Ph.D., BCES — EC

Chief Chemistry Section
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Florance J. Bass, P.E., BCEE — WW

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Ms. Bass received her BS in Bio Engineering from Mississippi State University. She is a licensed P.E. in Mississippi with more than 17 years experience.

Jeffrey W. Chambers, P.Eng., BCEE — WW

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Mr. Chambers received his BS in Civil Engineering from the University of Waterloo, Ontario. He is a licensed P.Eng. in Canada and has more than 27 years experience.

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☐ Jarad L. Champion, P.E., BCEE — HW

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Mr. Champion received his BS in Chemical Engineering from the University of Illinois at Urbana Champaign and MS in Civil Engineering from Northwestern University. He is a licensed P.E. in California and Illinois and has more than 11 years experience.

☐ James Howard Clark, P.E., BCEE — WW

Senior Vice President
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Mr. Clark received his BS in Civil Engineering and MS in Environmental Engineering from Washington State University. He is a licensed P.E. in Washington and California with more than 40 years experience.

☐ Jeffrey W. Cochran, Ph.D., P.E., BCEE — WW

Senior Engineer
Birmingham Water Works Board
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Dr. Cochran received his BS, MS and PhD degrees in Civil Engineering from the University of Alabama at Birmingham. He is a licensed P.E. in Alabama and has more than 14 years experience.

○ Tony Cox, BCES — SR

Environmental Administrator II
Mississippi Department of Environmental Quality
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Mr. Cox received his BS in Environmental Science from Della State University. He has more than 18 years experience.

☐ Jignesh Desai, P.E., BCEE — WW

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Mr. Desai received his B.S. in Chemical Engineering from the University of Baroda, India and M.S. in Chemical Engineering from the University of Southern California, Los Angeles. He is a licensed P.E. in California and has more than 22 years experience.

☐ Richard W. DiMassimo, P.E., BCEE — WW

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Mr. DiMassimo received his B.S. in Chemical Engineering from North Carolina State University. He is a licensed P.E. in North Carolina and has more than 23 years experience.

○ Sandra Lee Dowty, BCES — GW

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Ms. Dowty received her BS in Geology from the University of Colorado. She has more than 35 years experience.

☐ Birger L. Fernandez, P.E., BCEE — WW

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Mr. Fernandez received his BS and MS degrees in Civil Engineering from the Colorado State University. He is a licensed P.E. in California and has more than 20 years experience.

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Mr. Finnegan received his BS in Civil Engineering and MS in Environmental Engineering from the University of Illinois at Urbana-Champaign. He is a licensed P.E. in Illinois, Montana and Texas with more than 8 years experience.

Heather M. Ford, BCEEM — GE

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Ms. Ford received her BS in Civil Engineering and MS in Engineering Management from Northeastern University. She has more than 38 years experience.

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Ms. Francis received her BS in Civil Engineering from California State University-Long Beach. She is a licensed P.E. in California and has more than 25 years experience.

Linda G. Gaines, Ph.D., P.E., BCEE — GE

Environmental Health Scientist/Engineer
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Dr. Gaines received her BS in Chemical Engineering from the Colorado School of Mines, ME in Civil Engineering from the Texas A&M University and PhD in Environmental Science from the University of North Carolina at Chapel Hill. She is a licensed P.E. in Texas and Virginia and has more than 11 years experience.

Boyd W. Green, BCES — EB

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Mississippi Department of Environmental Quality
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Mr. Boyd received his BS in Biology Science from Southwestern Oklahoma State University and MS in Environmental Biology from the University of Southern Mississippi. He has more than 21 years experience.

Edward Greenwood, P.Eng., BCEE — WW

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Mr. Greenwood received his BS Chemical Engineering from Western University, London, Ontario. He is a licensed P.Eng. in Canada with more than 20 years experience.

Melissa A. Harclerode, Ph.D., BCES — SS

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Ms. Harclerode received her BS in Biology from Muhlenberg College, MS in Environmental Science from Rutgers University and PhD in Environmental Management from Montclair State University. She has more than 11 years experience.

Max H. Hueftle, P.E., BCEE — AP

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Mr. Hueftle received his BS in Chemical Engineering from the University of Idaho, Moscow. He is a licensed P.E. in Washington and Oregon and has more than 21 years experience.

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☐ Kenneth Stephen Johnson, P.E., BCEE — ES

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○ Michael Jordan, BCES — AR

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☐ Srikanth Koduri, P.E., BCEE — WW

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☐ Krista P. Larsen, P.E., BCEE — WW

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The Class of 2017

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Dr. Marotta received a BS in Math from Sienna College, BS in Mechanical Engineering from Manhattan College, MS in Mechanical Engineering from Union College and PhD in Mechanical Engineering from the University of Tennessee. He is a licensed P.E. in New York and four other states with more than 37 years experience.

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Dr. Liner received his BS in Economics from Virginia Tech and MS and PhD degrees in Environmental Engineering from George Mason University. He is a licensed P.E. in Virginia with more than 21 years experience.

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□ Robert Nerenberg, Ph.D., P.E., BCEE — WW

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□ Rolando Nigaglioni, P.E., BCEE — WW

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Mr. Nigaglioni received his BS in Civil Engineering from Polytechnic University of Puerto Rico. He is a licensed P.E. in Florida and has more than 18 years experience.

□ Rosaleen B. Nogle, P.E., BCEE — WW

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□ David W. Oerke, P.E., BCEE — WW

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Mr. Oerke received his BS in Civil Engineering from the University of Cincinnati and MS in Environmental Engineering from Marquette University. He is a licensed P.E. in Colorado and has more than 37 years experience.

○ Eileen J. O'Neill, Ph.D., BCES — EC

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Dr. O'Neill received her BS in Soil Science from the University of Newcastle-Upon-Tyne, UK and PhD in Soil Science from the University of Aberdeen, UK. She has more than 36 years experience.

◇ Avinash Sadashiv Patwardhan, Ph.D., BCEEM — WW

Vice President
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Dr. Patwardhan received his B.Tech in Agricultural Engineering from MPAU University, India, MS in Agricultural Engineering from the University of Manitoba, Canada and PhD in Biosystems/Agricultural Engineering from the University of Minnesota. He has more than 35 years experience.

The Class of 2017

☐ Malarmagal Perinpanayagam, P.E., BCEE — WW

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☐ Thomas J. Phelan, Ph.D., P.E., BCEE — HW

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☐ Jean M. Prendergast, P.E., BCEE — WW

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Ms. Prendergast received her BS in Civil Engineering from California State University-Long Beach and MS in Business Administration from Peter F. Drucker & Masatoshi Ito School of Management. She is a licensed P.E. in California with more than 24 years experience.

☐ Stanley G. Puszcz, P.E., BCEE — WW

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☐ Gary J. Riley, P.E., BCEE — HW

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☐ Professor Karl John Rockne, Ph.D., P.E., BCEE — HW

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Dr. Rockne received his BS and MS degrees in Civil/Environmental Engineering from the University of Minnesota and PhD in Civil/Environmental Engineering from the University of Washington. He is a licensed P.E. in Minnesota with more than 27 years experience.

☐ James R. Romer, P.E., BCEE — HW

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Mr. Romer received his BS in Civil Engineering from Memphis State University. He is a licensed P.E. in Oregon, Tennessee, Kentucky, Florida, Maryland and Idaho with more than 29 years experience.

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☐ Shannon N. Schaeffer, P.E., BCEE — WW

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☐ Kelly Ann Rusch, Ph.D., P.E., BCEE — WW

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Dr. Rusch received her BS in Bio-Chemistry from the University of Wisconsin and MS and PhD degrees in Civil Engineering from Louisiana State University. She is a licensed P.E. in Louisiana with more than 22 years experience.

☐ Jeremy Seiden, P.E., BCEE — WW

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○ Robert J. Shebuski, BCES — GW

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Mr. Shebuski received his BS in Environmental Studies from Central Michigan University and MS in Environmental Science from Miami University. He has more than 10 years experience.

☐ Arnel A. Santos, P.E., BCEE — WW

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☐ Chad M. Simmons, P.E., BCEE — WW

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The Class of 2017

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Dr. Singh received his BS in Agricultural Engineering from Punjab Agricultural University India, MS in Environmental Science from GJ University India and PhD in Chemical Engineering from the Indian Institute of Technology India. He is licensed P.E. in Washington and has more than 16 years experience.

○ Charles R. Stack, BCES — SS

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☐ Lisa M. Sterling, P.E., BCEE — SW

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☐ Louis Storino, P.E., BCEE — WW

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Mr. Storino received his BS in Chemical Engineering and MS in Environmental Engineering from Illinois Institute of Technology. He is a licensed P.E. in Illinois and has more than 17 years experience.

☐ Matthew A. Streicher, P.E., BCEE — WW

Interim Executive Director/Engineer
Glenbard Wastewater Authority
21W551 Bemis Road
Glen Ellyn, IL 60137

Mr. Streicher received his BS in Civil Engineering from the University of Iowa. He is a licensed P.E. in Illinois with more than 13 years experience.

☐ Tracy Lofton Tomkins, P.E., BCEE — WW

Chief Water I Branch, Environmental Permits Division
Mississippi Department of Environmental Quality
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Ms. Tomkins received her BSCE in Civil Engineering from the Mississippi State University. She is a licensed P.E. in Mississippi with more than 22 years experience.

☐ Marleen A. Troy, Ph.D., P.E., BCEE — ES

Professor
Wilkes University
EEES Department
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Dr. Troy received her BS in Biological Science and PhD in Civil Engineering from Drexel University and MS in Microbiology from the University of Rhode Island. She is a licensed P.E. in Pennsylvania and has more than 26 years experience.

The Class of 2017

Jennifer G. Ulmer, BCES — EB

Environmental Scientist IV
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Ms. Ulmer received her BS and MS degrees in Biological Science from the University of Southern Mississippi. She has more than 22 years experience.

Chetan P. Zaveri, MSCE, BCEEM — SW

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Mr. Zaveri received his BS in Chemical Engineering from the Institute of Chemical Technology and MS in Civil Engineering from the California State University. He has more than 27 years experience.

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Mr. Voigt received his BS and MS degrees in Chemical Engineering from Michigan Technological University. He is a licensed P.E. in Virginia, Maryland, New Jersey, Pennsylvania and Connecticut with more than 22 years experience.

Wen Zhang, PhD., P.E., BCEE — WW

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Dr. Zhang received his BS and MS degrees in Environmental Engineering from Tsinghua University and PhD in Environmental Engineering from Georgia Institute of Technology. He is a licensed P.E. in Delaware with more than 12 years experience.

Shayne Wood, P.E., BCEE — WW

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Dr. Zhou received his BS and MS degrees in Environmental Science from Nanjing University, China and PhD in Civil Engineering from the University of Illinois at Urbana-Champaign. He is a licensed P.E. in California with more than 12 years experience.

Congratulations to the 2017 Class of
Board Certified Environmental Engineers,
Board Certified Environmental Engineering Members,
and
Board Certified Environmental Scientists!

MEMBER NEWS

SPECIALTY CERTIFICATION STATUS UPDATE

Andrew W. Cressman, P.E., BCEE, has updated his certification status from Inactive to Active. Mr. Cressman is Project Manager with Weston Solutions, Inc., and has been a Board Certified Environmental Engineer in General Environmental Engineering since 2002.

Carl W. Stone, P.E., BCEE, has updated his certification status from Inactive to Active. Mr. Stone is Senior Technical Leader - Wastewater with Weston & Sampson, and has been a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering since 2005.

ON THE MOVE

Jonathan B. Meyers, P.E., BCEE, has joined Barton & Loguidice (Lanham, MD) as Senior Managing Engineer. He has been a Board Certified Environmental Engineer in Solid Waste Management since 2013.

IN MEMORIAM

DONALD B. AULENBACH, PH.D., P.E., BCEE

Donald B. Aulenbach, 89, of Clifton Park, beloved husband of Marie Wertz Aulenbach, died August 19, 2017, at Ellis Hospital in Schenectady. Donald was born in Berwick, Pa., the second son of the late Henry and Mildred Schlasman. His older brother Richard predeceased him.

Donald graduated from Franklin and Marshall College, and continued his education at Rutgers University, earning his Ph.D. in environmental engineering.

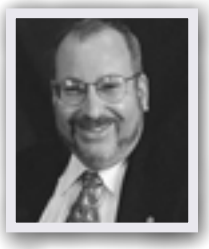
After working as a chemist / bacteriologist for the Delaware Water Pollution Commission, Donald began his thirty-year teaching career in 1960 as a professor of environmental engineering at Rensselaer Polytechnic Institute in Troy. At R.P.I., he authored numerous articles on environmental engineering, led annual investigative trips with his engineering students to Lake George, and was a consultant on many projects, including a two month stay in China assisting that country on waste-water disposal facilities.

He was a professional engineer and a member of the American Chemical Society, the Water Pollution Control Association, the American Water Works Association, the Association of Environmental Engineering and Science Professors, and the American Academy of Environmental Engineers. Donald loved his family and he organized biannual get-togethers with his four children and their families at diverse locations throughout the United States. Donald was also passionate about education and music. In addition to nurturing environmental engineers at R.P.I., Donald served as a regional coordinator of the New York State Mathcounts, a yearly math competition for middle school students. He played bass in a band well into his eighties and he sang weekly in the choir at Christ Community Reformed Church. He is survived by Marie, his wife of 65 years; and four children, Louise Trakimas and her husband Robert, of Winchester, Mass., Bruce Aulenbach and his wife, Sole, of Monroe, Ore., Nancy Baker and her husband, James, of Highland, Calif., and Brent Aulenbach and his wife, Nancy, of Lilburn, Ga. He is also survived by numerous grandchildren and great-grandchildren.

Dr. Aulenbach had attained Life status with AAEES and had been a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering since 1980.

Published in Albany Times Union on August 27, 2017.

KENNETH S. STOLLER, P.E., DEE, QEP



Kenneth Stoller (Monroe, NJ) passed away on December 14, 2017.

Ken Stoller's long and distinguished career spanned 5 decades. Born in Brooklyn, NY, Ken obtained his Bachelor of Science (Engineering) from Cooper Union and his Master's Degree Sanitary Engineering) from New York University. He was a registered professional engineer in several states. Ken worked for several consulting firms, including Hazen and Sawyer and Jacobs Engineering, and also with the USEPA and the Delaware River Basin Commission.

During his career with the USEPA Region 2 he was a leader in developing the cutting edge programs that have been successful the country's efforts in restoring the nation's air, water and land environments resulting in the improvement in protect public health and the environment. In the early 70's and 80's, Ken served as a Branch Chief in the Wastewater Construction Grants Program in USEPA Region 2, managing efforts that provided billions of dollars in Federal funds to communities in NJ & Puerto Rico to plan, design and construct wastewater treatment facilities that are still protecting our waterways and ocean.

In the mid-80's Ken served as a Deputy Director in several of Region 2 divisions having responsibilities for hazardous waste programs, and the regional laboratory and pesticides and toxics programs. During that time he was appointed as the Niagara Program Director, managing the studies and activities of the infamous Love Canal: the site that eventually led to the passage of the National Superfund legislation for the clean-up of the nation's hazardous waste site legacy. Upon the enactment of the Superfund legislation, Ken organized Region 2's hazardous waste program.

From 1988-1996 Ken worked with private consulting firms where he developed and implemented numerous environmental investigations/studies dealing with air emissions soil and groundwater contamination compliance requirements, liability issues and Superfund activities. In 1996, Ken returned to the USEPA, Region 2 to once again directly serve the public until his "retirement" in 2010.

Ken was an active member of the WEF & the NJWEA and other professional organizations such as the American Academy of Engineers and the Institute of Professional Environmental Practice. He has served the NJWEA with distinction in many capacities including: NJWEA delegate to the Water Environment Federation; chair and a member of numerous association committees; USEPA Region 2's representative to the NJWEA & most recently as the DRBC representative to the NJWEA.

He was responsible for NJWEA's creation of the Site Remediation Committee. The program developed & implemented under Ken's leadership established the NJWEA as a leader in providing training and information in the hazardous waste site cleanup program. The program success led to the NJWEA establishing the "Kenneth S. Stoller Graduate Scholarship for Hazardous Waste Studies" in his honor. Ken provided his invaluable service to the NJWEA, serving as the Regulatory Representative on NJWEA's Executive Committee & Chair of the Special Programs Committee.

Ken was the recipient of NJWEA Heukelekian Award & Professional Advancement of Hazardous Waste Management Award, and the WEF's Arthur Sidney Bedell Award, Outstanding Service Award & Membership Incentive Award. He was also the recipient of a Gold & 2 Bronze medals from USEPA Region 2 and was named to the NJWEA Wastewater Hall of Fame in 2014.

Mr. Stoller had attained Life status with AAEES and had been a Board Certified Environmental Engineer in Hazardous Waste Management since 1994.

Published by the New Jersey Water Environment Association.

ARNOLD VERNICK, P.E., BCEE

Arnold Vernick passed away on July 22 following a long illness. He was 84 years old.

Born in Jackson Heights, NY, Arnold resided with his family in Elizabeth and River Vale before retiring to Franklin Township 13 years ago.

Mr. Vernick graduated from Queens College, went on to Columbia University for his Civil Engineering degree and received his Master's degree from NYU. During his 45 years of experience as a consulting environmental expert in the emerging environmental engineering field, he was employed by Burns and Roe of Oradell and went on to become a Vice President at ARCADIS Geraghty and Miller in Rochelle Park.

Arnold was very active in working on the original EPA regulations that today protect water quality in our environment, and contributed to various textbooks and handbooks that are used in the environmental engineering field. He was a Diplomate in the American Society of Civil Engineers and served in the US Public Health Service Reserve Corps for many years. He was also Trustee on the Board of the Association of NJ Environmental Commissions.

In his home towns, Mr. Vernick served as a member of the River Vale Planning Board and Board of Adjustment for over 15 years. After moving to Somerset Run, he was appointed chairman of the Franklin Township Environmental Commission and served for over 10 years.

Arnold was an avid sports fan who enjoyed golfing, biking, and his first love, NY Giants Football. He loved to travel and did so extensively in business consulting with governments in Europe, Asia, South America and Africa regarding environmental issues.

He is survived by Lynne, his wife of 54 years, and his two sons Jeffrey and Kenneth Vernick. He is also survived by his in laws, Nitra McAuliffe, Alan and Ellen Bowin, Mark and Diane Bowin; nieces and nephews Robb and Jill Kushner, Leslie Brittle, Dr. Robert Scharfman and his wife Linda, Drs. Renee and Phillip Kohanski, niece Mira Bowin and great nieces and nephews Matt and Lauren Kushner, Frannie Brittle, Liz and Ethan Dropkin, and Katie and Matt McKenzie, David and Anna Kohanski and Adam and Matthew Scharfman. Mr. Vernick was pre deceased by his sister Milani Lee.

Mr. Vernick had attained Life status with AAEES and had been a Board Certified Environmental Engineer in Sanitary Engineering since 1970.

Published by the Franklin Report & Advocate on July 25, 2017.

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Volunteer of the Month

Part of the Academy's success lies with the selfless work of its members. Do you know of a member that always goes above and beyond? Then send a 350-word nomination for **Volunteer of the Month**.

Side Tracks

Interested in knowing about the extracurricular activities of your fellow Academy members? Or do you have fun (or possibly funny) stories you'd like to share? *Side Tracks* is intended to provide a vehicle for learning about the outside interests of your colleagues.

AAEES Patrons Program

The American Academy of Environmental Engineers and Scientists (AAEES – aaees.org) has been in existence for 60 years, credentialing professionals in environmental engineering and science, educating the public about the value of environmental systems, working with ABET (the Accreditation Board for Engineering and Technology) as the Lead Society in the accreditation of over 60 college and university Environmental Engineering programs, and providing recognition for noteworthy projects and programs in the annual Excellence in Environmental Engineering and Science competition.

The Academy has greatly benefited from the collaborative spirit and active participation of its sponsoring societies. However, from the standpoint of economic support, the Academy's endeavors have focused on individual membership and the actions of these individuals in implementing its goals. To sustain the Academy's programs and enhance their effectiveness, the Academy is implementing a Patrons Program that is being offered in three categories:

- Corporate/Consulting firms,
- Public Agency/Government organizations, and
- Academic institutions.

It is the Academy's firm belief that the synergistic impact of individual membership activities, coupled to support by the organizations in which they work, will create a powerful success model that will enable the Academy to better implement its organizational goals and mission.

The Patrons Program umbrella is expansive. Its intent is to have our patrons effectively co-brand with the Academy for everything that it does in outreach to either members or the general public.

The list below is a summary of the Patrons Program elements that participants receive.

- Featured recognition of Patrons on the AAEES website with a direct link to the Patron's website. We will establish a rotating schedule of all Patrons' content that features a noteworthy event or project undertaken within their overall portfolio. AAEES staff will work with Patrons' staff to structure their content and format. This aspect of the program benefits both the Patron and the Academy in publicizing the profession, its relevance, and its accomplishments.
- Oral and visual recognition (signage/logo) for Patrons at all AAEES events.
- Prominent recognition/logo display in *Who's Who in Environmental Engineering and Science*.
- Prominent recognition/logo display in the Environmental Engineering and Science Resource Guidebook.
- A listing in the *Environmental Engineering and Science Resource Guidebook*, featuring the Patron organization's Board Certified staff and its overall capabilities, at no-charge.
- Two complimentary tickets to the annual Excellence in Environmental Engineering and Science Awards Conference and Luncheon (E3S) in Washington, DC.
- Two complimentary entries for the E3S competition.
- Waiver of certification application and examination fees for a Patron's employees.
- Prominent publication space/logo recognition in the *Environmental Engineer and Scientist* quarterly magazine.

The Patrons Program is much more effective in providing consistent recognition for our Patrons. Wherever the Academy goes and wherever Academy materials appear, those of its Patrons also appear.

In establishing the Patrons Program the Academy acknowledges and appreciates the past economic support of corporate, agency, and academic entities. Their support for individual events and programs has been beneficial to the Academy. We believe that the Patrons Program outlined here will be more effective in achieving the goals of the Academy in developing its programs, and more effective in providing the recognition that our Patrons seek for their sponsorship of the Academy.

Administratively, the Patrons Program enables Patrons to support the full slate of Academy activities through one annual contribution. We are setting annual Patron contribution commitments of: $8,000 for Corporate/Consulting category; $6,000 for Public Agency/Government category; and $2,000 for Academic institutions participating in the program.

We invite you to consider having your organization become an Academy Patron. Your decision to participate will trigger our sending you a simple 'Patrons Program Participation Agreement' that lists the program features and benefits. This will be followed by contact from the Academy staff to determine your preferred invoicing and form of payment information. We will also need to have Patrons' staff contact information to ensure that we have requisite materials -- accurate logos, entity identification, website links, and other items -- to enable us to create the content we will use to maximize your exposure and recognition as an Academy Patron.

Should you have questions please contact: Burk Kalweit, AAEES Executive Director (BKalweit@aaees.org).

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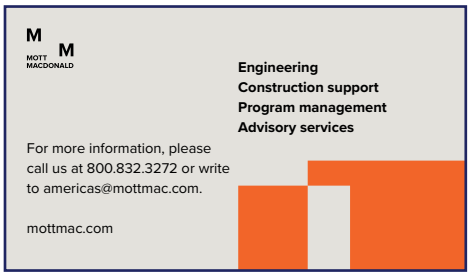

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