The Periodical of the American Academy of Environmental Engineers and Scientists®

Winter 2019 | Volume 55, Number 1

ENVIRONMENTAL ENGINEER & SCIENTIST

2019 AAEES Kappe Lecturer, Dr. Nancy G. Love, P.E., BCEE

page 27

147 Old Solomons Island Road, Suite 303
Annapolis, MD 21401
http://www.aaees.org

AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS & SCIENTISTS®

Thank you to our Patrons for their support

CDM Smith®

environment LA SANITATION
CITY OF LOS ANGELES

dc water is life®

Geosyntec consultants

LA DWP Los Angeles Department of Water & Power

ORANGE COUNTY SANITATION DISTRICT · PROTECTING THE ENVIRONMENT ·

SANITATION DISTRICTS OF LOS ANGELES COUNTY

Converting Waste Into Resources

Stantec

wood.

Winter 2019 | Volume 55, Number 1

FEATURES

DEPARTMENTS

Quarterly Periodical of
The American Academy of Environmental Engineers and Scientists®

Address all communications on editorial, business and other matters to:

Editor-in-Chief,
Environmental Engineer and Scientist®
American Academy of Environmental Engineers and Scientists®
147 Old Solomons Island Road, Suite 303
Annapolis, Maryland 21401
410-266-3311

Postmaster: Please send address changes to AAEES, 147 Old Solomons Island Road, Suite 303, Annapolis, MD 21401.

Environmental Engineer and Scientist (ISSN 2325-842X) is published quarterly by the American Academy of Environmental Engineers and Scientists.

Subscriptions: Member dues are applied, in part, as a subscription to *Environmental Engineer and Scientist*. By way of membership, all members (BCEEs, BCEEMs, BCESs, AAEES Members, and Student Members) are automatically provided digital issues of *Environmental Engineer and Scientist* and must opt in to receive a hard copy (except for Student Members). Additional subscriptions, sold only to those not eligible for AAEES Membership are $20 ($50 outside North America); single copies are $10 ($20 outside North America).

Advertising: Advertising rates are available by contacting Yolanda Moulden at 410.266.3311 or by going to http://www.aaees.org/publications/environmentalengineerandscientist.php. In consideration of publication of an advertisement, the advertiser and agency, jointly and severally, agree to indemnify and hold harmless the Academy, its officers, agents, and employees against expenses and losses resulting from publication of an advertisement. The publisher reserves the right to reject any advertisement that, in its opinion, does not meet its ethical standards. Acceptance of any advertisement does not, in any way, constitute approval by the Academy of the product or services advertised.

PRESIDENT'S PAGE

Kristin Morico, P.E., BCEE

I am honored to be your President and colleague in the American Academy of Environmental Engineers and Scientists for 2019.

I have been Board Certified since 1999. The current backdrop for the Academy and its membership continues to be uncertain. While there is concern about the direction that the federal government is taking with environmental topics, there appears to be an increasing awareness building within the general population that we need to bring a heightened focus on our nation's environmental infrastructure. One would hope that recognition of the problem is the first step in growing our ability to develop and fund critical projects.

We have also been working to improve our ability to deliver value to members. As a board-certified member of the Academy, we want to remind you to be sure to include the BCEE, BCEEM, or BCES designation after your name in your email signatures and on business cards and other correspondence. You worked hard to earn this designation, so don't be reluctant to use it. After all, that is part of your mission in being a member of the Academy; making others aware of the work you put into earning your certification and encouraging them to consider doing so as well.

And don't forget to check out the AAEES Center online. The Center provides you with your own private online profile where you may renew your certification, update your information, purchase Academy products and services, search for other members in the Individual Directory, and more. To log in, visit www.aaees.org

Kris

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.

AAEES Patrons Program

The American Academy of Environmental Engineers and Scientists 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, and
- Public Agency/Government organizations.

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 and $6,000 for Public Agency/Government category.

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).

AAEES PATRONS

Public Agencies
City of Los Angeles Bureau of Sanitation
DC Water
Los Angeles Department of Water and Power
Orange County Sanitation District
Sanitation Districts of Los Angeles County

Consulting Firms
CDM Smith
Geosyntec
Stantec
Wood PLC

MEMBER NEWS

BOARD CERTIFICATION STATUS

Brian M. Karmasin, P.E., BCEE, was reinstated in 2018. He is a Board Certified Environmental Engineer in Water Supply and Wastewater. He was originally certified in 2007.

Harry L. Little, P.E., BCEE, was reinstated in 2018. He is a Board Certified Environmental Engineer in Water Supply and Wastewater. He was originally certified in 1992.

AWARDS AND RECOGNITION

Joel Burken, Ph.D., P.E., BCEE, was inducted into the Missouri S&T Academy of Civil Engineers. The academy recognizes outstanding alumni for their professional achievement and success, and it provides support and experience to help the civil, architectural and environmental engineering department at Missouri S&T to reach its collective mission and vision.

Dr. Burken is Distinguished Professor and Chair of Civil, Architectural and Environmental Engineering at Missouri University of Science and Technology. He has been a Board Certified Environmental Engineer in Hazardous Waste Management and Site Remediation since 2011.

Karen Pallansch, P.E, BCEE, was named the 2018 Water Finance & Management Award Winner. The Water Finance & Management Award was created in 2012 to recognize leaders in the water/wastewater/stormwater utility sector who are at the forefront of driving innovation and who have had a lasting and meaningful impact within their utility/field.

Ms. Pallansch is CEO/GM of AlexRenew. She has been a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering since 2000.

Dennis Truax, Ph.D., P.E., BCEE, received the 2018 NCEES Distinguished Service Award at the NCEES 97th Annual Meeting held in August 2018.

Dr. Truax is Professor and Department Head at Mississippi State University and is a member of the Mississippi Board of Licensure for Professional Engineers and Surveyors. He has been a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering since 1989.

AAEES INDUCTS ITS FIRST DUAL BOARD CERTIFIED INDIVIDUAL: DR. DAN OERTHER

Daniel Barton Oerther, Ph.D., P.E., BCEE, BCES, F.AAN, F.RSA, F.RSPH, F.CIEH, has become the first individual to earn dual AAEES board certification.

Dr. Oerther became a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering in 1995. In 2018, he became a Board Certified Environmental Scientist in Environmental Microbiology.

He earned his BCES by Eminence, which includes approval by the American Academy of Environmental Scientists Certification Board and demonstration of a minimum of 20 years of experience in environmental science.

Dr. Oerther is the John A. and Susan Mathes Chair of Environmental Health Engineering at Missouri University of Science & Technology. He currently serves as the AAEES Treasurer.

IN MEMORIAM

Larry W. Adams, P.E., BCEE, has passed away. Mr. Adams had attained Life status and had been a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering since 1979.

SHINING THE SPOTLIGHT ON YOU

The Academy has special features on its website and in electronic and print publications in recognition of you, **the Academy's honored professionals**. Send your submissions to YMoulden@aaees.org for:

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.

Notice of Board of Trustees Nominees

Following is the Notice of Nominees for the 2020 Board of Trustees. Full profiles of the candidates will appear in the Spring 2019 issue of *Environmental Engineer and Scientist*.

PRESIDENT-ELECT

- **Lilia Abron, Ph.D., P.E., BCEE**
  Owner and President
  PEER Consultants, P.C.

VICE PRESIDENT

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

- **R. Benson Pair, P.E., BCEE**
  Chief, Environmental Engineer
  KBR

TRUSTEE-AT-LARGE

- **Mary DeFlaun, Ph.D., BCES**
  Managing Principal
  Geosyntec Consultants

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

- **Jeffrey H. Greenfield, Ph.D, P.E., BCEE**
  Project Manager II
  Broward County

- **Sharon Yin, P.E., BCEE**
  Senior Engineer
  Orange County Sanitation District

ANNUAL CERTIFICATION RENEWALS

As of press time, over 400 individuals still had not renewed their AAEES Specialty Certification. The board certification issued by the Academy must be renewed annually. Specialty Certifications expire on December 31 each year, but a 30-day grace period is offered to allow our board certified individuals to renew without penalty. BCEEs, BCEEMs, and BCESs who miss the renewal deadline are not listed in the current edition of *Who's Who in Environmental Engineering and Science*® and are subject to a 10% late fee. It is never too late to renew your specialty certification! You earned it; don't lose it! If you have not yet renewed for 2019, you may still do so. Log in to the AAEES Center today!

2019 EXCELLENCE IN ENVIRONMENTAL ENGINEERING AND SCIENCE AWARDS LUNCHEON AND CONFERENCE

Save the Date! The AAEES Awards Luncheon and Conference will be held at the National Press Club in Washington, DC, on Thursday, April 25, 2019. The winners of the Excellence in Environmental Engineering and Science and the Environmental Communications awards competitions will be announced. Details will be posted to http://www.aaees.org as soon as they are available.

DISTINGUISHED ENGINEERS AND SCIENTISTS TO BE RECOGNIZED

The Academy will recognize distinguished environmental engineers, environmental scientists, and other environmental professionals at its Awards Luncheon to be held at the National Press Club in Washington, DC, on Thursday, April 25, 2019:

- Gordon Maskew Fair Award: **David A. Dzombak, Ph.D., P.E., BCEE**
- Edward J. Cleary Award: **Christopher R. Schulz, P.E., BCEE**
- Stanley E. Kappe Award: **R. Benson Pair, P.E., BCEE**
- Science Award: **Joseph Alfred Cotruvo, Ph.D., BCES**
- Honorary Member Award: **Gordon Maskew Fair, Ph.D. (in Memoriam)**
- International Honorary Member Award: **Chilpin Huang, Ph.D.**

The winners of the W. Brewster Snow Award, Excellence in Environmental Engineering and Science Education Award, W. Wesley Eckenfelder Graduate Research Award and the Innovyze Excellence in Computational Hydraulics/Hydrology Award will also be presented.

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

2019 ENVIRONMENTAL ENGINEERING AND SCIENCE RESOURCE GUIDEBOOK - SIGN UP FOR YOUR LISTING

The Academy invites you to sign up for a listing in the 2019 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 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's sales and marketing team to reserve its space by March 31, 2019. It provides great exposure for a small investment. For details, email JSOlmo@aaees.org. Go to http://www.aaees.org/publications/ for details.

COMMITTEE APPOINTMENTS

2019 President Kristin Morico 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. The following is a list of those who will chair the Academy's committees:

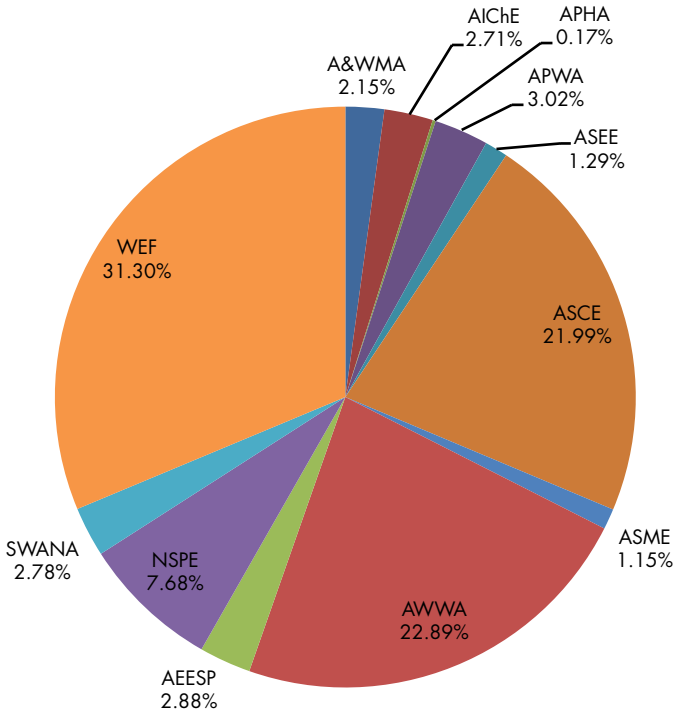
- Audit Committee - **Joseph J. Delfino**
- Awards Committee - **C. Hunter Nolen**
- AEESP/AAEES Joint Awards Committee - **Edward J. Bouwer**
- Bylaws, Policies & Procedures Committee - **Robert C. Williams**
- Admissions Committee - **Sandra L. Tripp**
- Certification by Eminence Committee - **Cecil Lue-Hing**
- Membership, Development & Outreach Committee - **C. Hunter Nolen**
- Re-Certification Committee - **Robert L. Matthews**
- Development & Upgrading of Examinations - **Robert H. Gilbertsen**
- Air Resources and Pollution Control Committee - **Mark P. Cal**

Academy News, *continued on page 13*

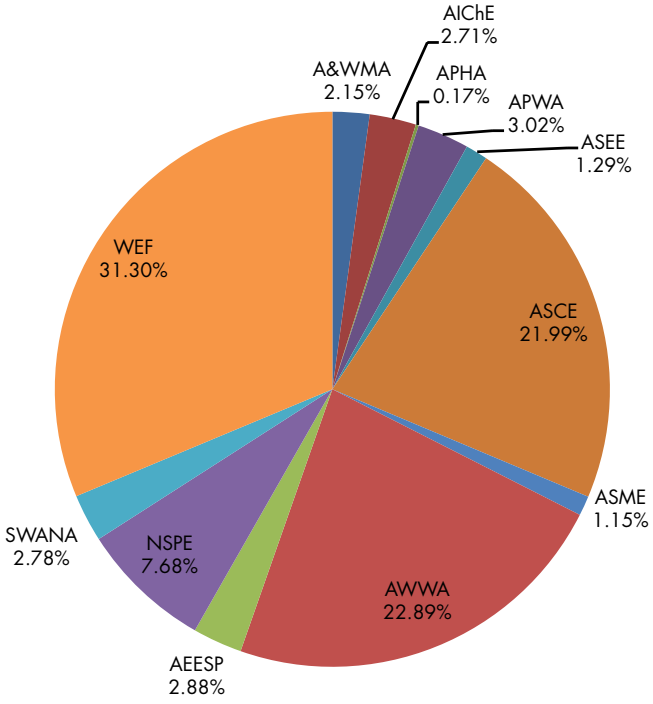
BOARD CERTIFICATION - AT A GLANCE

The Distribution of Board Certified Individuals amongst Sponsoring Organizations

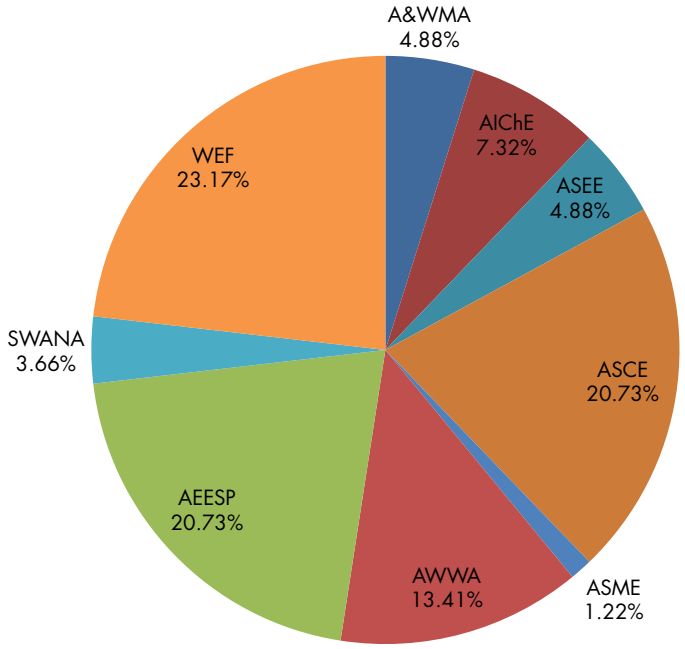
Overall Sponsoring Organization Membership



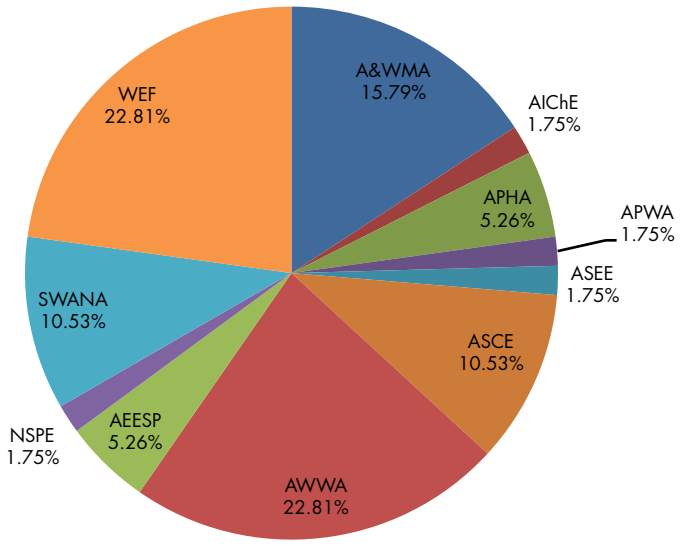
BCEE Sponsoring Organization Membership



BCEEM Sponsoring Organization Membership



BCES Sponsoring Organization Membership



A&WMA - Air and Waste Management Association
AIChE - American Institute of Chemical Engineers
APHA - American Public Health Association
APWA - American Public Works Association
ASEE - American Society for Engineering Education
ASCE - American Society of Civil Engineers
ASME - American Society of Mechanical Engineers
AWWA - American Water Works Association
AEESP - Association of Environmental Engineering and Science Professors
NSPE - National Society of Professional Engineers
SWANA - Solid Waste Association of North America
WEF - Water Environment Federation

Burk Kalweit

Environmentally Responsible Fish Farming

Environmental engineering is a relatively new discipline. The expanded form of environmental engineering as we know it has evolved since the early 1970s with the creation of the EPA and the Superfund program. Today, it definitely covers much more ground than does the sanitary engineering category which are environmental engineering's historical roots. But there is much more ground to be covered in the integration of environmental engineering in the hands-on sense of engineering the environment. We are driven to better understand how to accommodate human needs while still maintaining a sustainable macro-ecological balance. We fully expect this movement of the environmental tectonic plates will take us into some new and very different directions; directions that will see us expand the boundaries covered by environmental engineering to redefine how engineering and science come together.

What is most intriguing is the challenge to keep an open mind to new approaches to solving existing problems as well as being open-minded about using new approaches for addressing emerging concerns. We need to be able to not just think outside the box, but think in ways that create entirely new boxes or new technologies serving as boxes.

What follows below is a description of one such opportunity area where an expansive perspective on what environmental engineering has enabled researchers from a variety of fields to work together in defining how to think about a problem as well as how to define and construct solutions that are applicable, sustainable, and entirely unique to a given set of alternatives. What is especially noteworthy is that the definition of the problem, as well as the definition of the solution, is driven by both environmental engineering and environmental science. Better yet, the solution is also driven by a smattering of economics and finance. What we end up with is a holistic environmental approach in which multiple groups have a role to play and each has a set of unique skills to bring to the table.

The core problem lies with a growing global appetite for seafood, an appetite that has already stressed many wild fisheries to the breaking point.

With this in mind, a team of researchers led by scientists from University of California at Santa Barbara's Bren School of Environmental Science & Management and the Marine Science Institute (MSI) looked at the feasibility of fish farming, or aquaculture, in the Caribbean. The team focused specifically on a new type of fish farming called offshore mariculture, the term of scientific art for ocean-based operations done far from shore. This approach offers a promising alternative to land-based and coastal aquaculture where space is limited and localized environmental impacts are often high.

Utilizing a combination of skills in defining the myriad factors that go into successful aquaculture, and applying them to the more extensive mariculture activities being discussed here, the group discovered that even under conservative estimates, the region could produce over 34 million metric tons of seafood per year. This potential yield is more than two orders of magnitude larger than the region's current seafood production. The researchers believe that they will be able to generate this significant increase in fish harvest because the Caribbean has a potential for offshore mariculture that is largely untapped.

According to the researchers' analysis, meeting this potential can be accomplished by developing mariculture in a relatively

Mariculture occurs in large nets like those at this kampachi, or Almaco jack, farm in Kona. Credit: Lennon Thomas

small amount of ocean space. The researchers' model predicts the region could produce 40 million metric tons of seafood in less than 1.5 percent of its countries' exclusive economic zones. By way of comparison, this is roughly half of the current global wild fisheries catch. Another way to look at it is that the Caribbean could match its current seafood production by farming in just 179 square kilometers, or a mere 0.006 percent, of its available existing marine space.

The research team used a species of fish called cobia as their model species for estimating the Caribbean's potential for commercial mariculture. Cobia is a fish with high market value that is well suited to being farmed in warmer waters. By combining factors such as fish growth rates and habitat suitability, with factors such as producers' profitability and investment risk, the model developed by the group provided well-grounded estimates of the local mariculture's economic potential. By analyzing the effect of a variety of inputs on total output, the researchers were able to refine a complex process which gave results that were able to more accurately include the interplay between a host of variables. It's the difference between a simple model and one that is more complex. Estimated outputs were therefore not focused solely on biology or the commercial aspects of growing and harvesting large quantities of fish.

The team also considered socioeconomic and political factors to estimate the risk levels associated with investing in mariculture in each of the countries in the Caribbean region. To assess the relevant impacts on an accurate and equivalent footing, the researchers built three alternate scenarios. The first considered the results of farming in all suitable areas. The second considered only areas that would be profitable over a 10-year time frame, at a 10-percent discount rate. The third was the most conservative case. It mirrored the second, but with risk adjusted discount rates of between 10 and 25 percent, based on a formula that estimated the relative risk of investment.

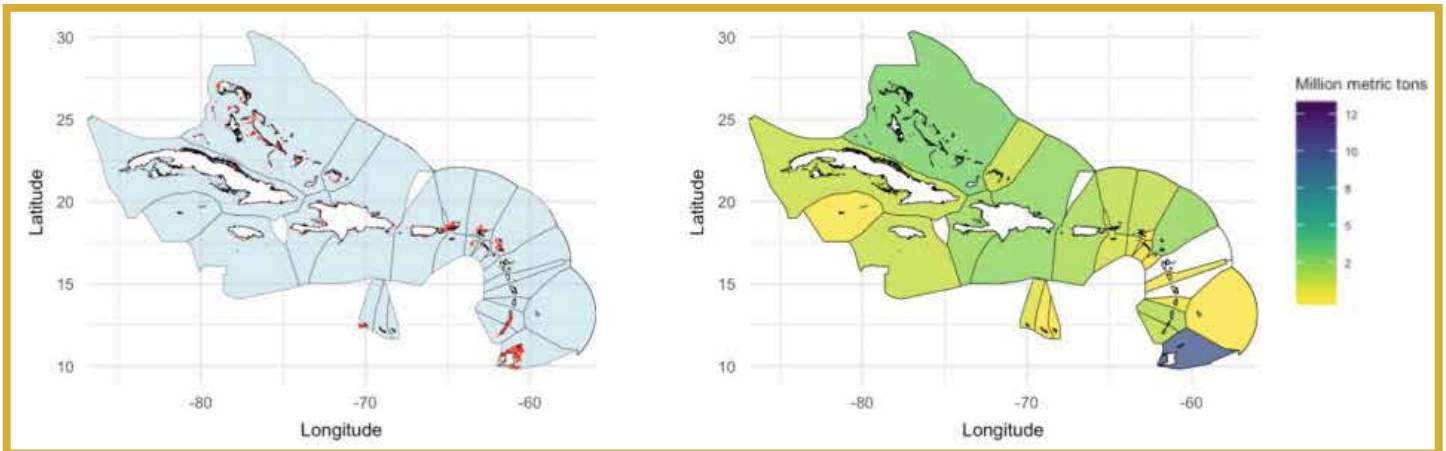
Other researchers have examined the physical and environmental factors influencing mariculture production potential on a global level. Some have applied bio-economic models to individual farms. The work done by the UCSB team is one of the first to analyze mariculture potential from a bio-economic angle at a regional level. This enabled the researchers to construct a better understanding of the tradeoffs that must be acknowledged when developing farms in different areas within and across countries.

> " We need to be able to not just think outside the box, but think in ways that create entirely new boxes or new technologies serving as boxes.

The results in all scenarios are promising. Even accounting for the economics of an expensive operation like farming a premium species of fish, the models indicate that there are large areas of the Caribbean that could be profitable for off-shore aquaculture. Trinidad and Tobago and the Bahamas have the largest potential, with roughly 8,500 and 4,100 square kilometers, respectively, of area that the models indicate should be profitable for mariculture.

Areas suitable for cobia mariculture appear in red on the below map on the left. The right depicts the researchers' most conservative estimates of how much seafood each region could produce, according to economic and risk scenario three.

One significant barrier to mariculture development in the Caribbean is a lack of local capital. Offshore mariculture is a relatively new, and therefore risky, industry. This means that investment capital for local development must be sourced from foreign investors. Those who are willing to lend to the area are familiar with its political and economic instability and require a high risk premium for any loans they are willing to make. In practical terms, this means that aquaculture investment must be more lucrative than competing alternatives in order to gain the financing required to move the project to fruition. As more



Areas suitable for cobia mariculture appear in red on the map on the left. The map to the right depicts the researchers' most conservative estimates of how much seafood each region could produce, according to scenario three. Credit: Lennon Thomas

projects are approved and operating, the risk premium tends to go down as the activity becomes proven.

The UCSB team also acknowledges that many people distrust aquaculture, believing it is bad for the environment. The researchers suspect the industry suffers this negative reputation because most of it is currently done on land or near the shore. This leads to the farms' feed, waste and other process effluent streams having negative impacts on surrounding ecosystems.

While limited in experience, offshore mariculture appears to overcome many of the shortcomings and potential negative impacts that people associate with coastal or inland aquaculture. Deeper water and stronger offshore currents can prevent negative water quality impacts from aquaculture, while also operating in sensitive areas adjoining nearshore habitats such as coral reefs and seagrass meadows.

The research has proven that mariculture is very space efficient. This means that there are substantial offshore ocean areas that can be exploited without disturbing any adjoining sensitive locations. This enables mariculture farmers to be very selective about where they locate their fish farms; choosing locations where profitability is high and environmental impacts can be minimized.

While the team looked specifically at cobia production in the Caribbean, the model could be applied to other species and regions as well. The research team intends to consider these in future work. They also plan to explore how climate change and the potential for increases in ocean temperatures might affect offshore aquaculture.

In the Caribbean, as is the case globally, seafood demand is increasing, leading to many wild fisheries being chronically overfished. What's perverse is that many Caribbean countries import large amounts of seafood. Aquaculture offers the potential for economic development that has a decided environmental component. In order to be successful over the longer run, the mariculture industry must come to grips with the environmental challenges it is facing, or soon will be forced to face on a broader basis.

Which throws down the gauntlet for the environmental industry and its many faces. You might say that we have come full circle in a small circle in this article. It is an interesting test case demonstrating the value of the environmental component to the success of a larger scale endeavor. The bottom line is that there will be no successful implementation without the ability and skills of the environmental sector being applied to this transformative opportunity. It will take a team of environmental engineers and environmental scientists. It will also take input from many other disciplines including biologists, hydro engineers, the financial sector, and the mariculture industry. Using the researchers own statistics, one has to wonder how anyone could pass up the opportunity to increase the Caribbean's fish production by two orders of magnitude.

It will be interesting to see what kind of progress can be made - in the short term and in the longer term. You'll know things are going well when cobia becomes the fish of choice in the seafood section of your local grocery. It will be even more interesting to see how that progress was created and what it took to go from early-stage enterprise to full-scale industry. Stay tuned. We suspect there will be a much more detailed story to be told in the not-too-distant future. A

Burk

Academy News, *continued from page 8*

- Environmental Chemistry Committee - **Farhana Mohamed**
- Environmental Life Sciences Committee - **Masahiro Dojiri**
- Environmental Sustainability Committee - **Steven A. LaMere**
- General Environmental Engineering Committee - **Findlay Edwards**
- Hazardous Waste Management & Site Remediation Committee - **James D. Fitzgerald**
- Industrial Hygiene Committee - **Frederick W. Boelter**
- Radiation Protection Committee - **Jafir Abbas Jaferi**
- Solid Waste Management Committee - **Robert B. Gardner**
- Surface and Groundwater Resources Committee - **Leslie Lopkee Chau**
- Water Supply and Wastewater Committee - **Jeffrey H. Greenfield**
- Engineering Education Committee - **David A. Chin**
- Excellence in Environmental Engineering and Science Committee - Vacant
- Finance Committee - **Daniel B. Oerther**
- K-12 Committee - **Richard J. Pope**
- Nominating Committee - **C. Hunter Nolen**
- Planning Committee - **Kristin Morico**
- Publications Committee - **C. Herb Ward**
- Seminars and Workshop Committee - **Shuang (Sharon) Yin**
- Students & Young Professionals - **David Vaccari**

The full roster of the 2019 AAEES Committees can be found at http://www.aaees.org/contactus/.

2019 CERTIFICATION AUDIT

The 2019 Certification Audit will start in May 2019. We select 2% of the membership randomly for the audit. If you are selected for the audit, you will receive a package by email. Forty PDH's are required for a 2 year period, and members in the Active and Life Active class are included. Those who were audited within the past 10 years are exempt from the current cycle. If you have any questions, please let Joyce Dowen know at JDowen@aaees.org.

Stand Out from the Crowd!

Be Recognized Among the Best Environmental Engineers and Scientists in the World

The American Academy of Environmental Engineers and Scientists identifies highly skilled environmental engineers and environmental scientists for the benefit of the public. These unique professionals are readily recognized through Academy credentials:

Board Certified Environmental Engineer (BCEE) and Board Certified Environmental Scientist (BCES).

Those with a degree in environmental engineering (or related engineering degree), at least 8 years of experience, and a P.E. license may qualify to take written and oral specialty examinations to obtain the BCEE credential.

Those with a degree in environmental science (or related science degree) and at least 8 years of experience may qualify to take written and oral specialty examinations to obtain the BCES credential.

Federal, state, and local agencies, educational institutions, and consulting firms recognize individuals holding Academy credentials as trustworthy, ethical experts with a strong commitment to protecting public health and the environment through their leadership and excellence in the practice of environmental engineering and science.

For more information, go to http://www.aaees.org/becomeboardcertified/.

AMERICAN ACADEMY
OF ENVIRONMENTAL ENGINEERS & SCIENTISTS®

147 Old Solomons Island Road, Suite 303
Annapolis, MD 21401
410.266.3311, FAX: 410.266.7653
http://www.aaees.org

The Class of 2018

Compiled by J. Sammi Olmo

From the first applicants more than 60 years ago 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 2018 are comprised of highly-qualified environmental engineers and environmental scientists from a wide range of backgrounds including university professors, water program managers, environmental consultants, vice presidents, principal engineers, principal scientists, senior associates, and program directors.

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 certified 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

LEGEND

Board Certified Environmental Engineer

Board Certified Environmental Engineering Member

Board Certified Environmental Scientist

The Class of 2018

Leonel Almanzar — WW
Ph.D., P.E., BCEE

CDM Smith
11811 North Tatum Boulevard #3030
Phoenix, AZ 85028

Dr. Almanzar received his B.S. in Civil Engineering from the Technologic Institute of Santo Domingo and M.S. and Ph.D. in Civil Engineering from the University of Puerto Rico. He is a licensed PE in Puerto Rico, Arizona and eight more other states with more than 22 years experience.

Samik Bagchi — EM
Ph.D., BCES

R&D Engineer
Black and Veatch
2624 Elderberry Drive
Okemos, MI 48864

Dr. Bagchi received his BSc in Microbiology from the University of Calcutta, India and MSc and Ph.D. in Microbiology from the R.T.M. Nagpur University, India. He has more than 14 years experience.

Donald Greene Bray — EB
BCES

FSD QA Manager
MDEQ
1542A Old Whitfield Road
Pearl, MS 39208

Mr. Bray received his BS in Biology from the Mississippi College. He has more than 26 years experience.

Derick G. Brown — WW
Ph.D., P.E., BCEE

Professor
Lehigh University
1 West Packer Avenue
Bethlehem, PA 18015

Dr. Brown received his BS in Aerospace Engineering from Boston University, MS in Mechanical Engineering from the University of California and MA and PhD degrees in Civil/Environmental Engineering from Princeton University. He is a licensed PE in California and Pennsylvania with more than 32 years experience.

Zachary Campbell Canody — WW
P.E., BCEE

Director of Engineering
Virginia Port Authority
600 World Trade Center
Norfolk, VA 23510

Mr. Canody received his B.S. and M.S. degrees in Civil/Environmental Engineering from Virginia Tech. He is a licensed PE in Virginia with more than 10 years experience.

Andrea Giuseppe Capodaglio — WW
Ph.D., BCEEM

University of Pavia
Department Civil & Architect Engineering
Via Ferrata 3
Pavia 27100 Italy

Dr. Capodaglio received his MSc in Civil Engineering from the University of Pavia, Italy and PhD in Environmental Engineering from Marquette University. He has more than 33 years experience.

Gary Carlton — WW
Ph.D., P.E., BCEE

Environmental Engineer
Air Force Civil Engineer Center
PSC 557 Box 2751
FPO, AP 96379-0028

Dr. Carlton received his B.S. and M.S. degrees in Chemical Engineering from the University of California Los Angeles and PhD in Environmental Science and Engineering from the University of North Carolina Chapel Hill. He is a licensed P.E. in Texas and has more than 40 years experience.

Louis Carnevale — WW
P.E., BCEE

Water Program Manager
PSC 817 Box 1735
FPO, AE 09622

Mr. Carnevale received his BA in Politics, Economics and Society from the College at Old Westbury and BS in Civil Engineering from the University of Buffalo. He is a licensed P.E. in New York with more than 30 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Lynne Carol Chicoine — WW
P.E., BCEE

Capital Program Manager
4035 Serango Court
West Linn, OR 97068

Ms. Chicoine received her BS and MS degrees in Civil Engineering and Environmental Engineering from the University of Illinois. She is a licensed PE in Illinois and Oregon with more than 40 years experience.

Sajana Chitrakar — WW
P.E., BCEE

Engineer IV
Fairfax County
5123 Portsmouth Road
Fairfax, VA 22032

Ms. Chitrakar received her BS in Civil Engineering from the Tribhuvan University, Nepal and MS in Civil Engineering from Bradley University. She is a licensed PE in Virginia and Michigan with more than 15 years experience.

Christos Christodoulatos — WW
Ph.D., BCEEM

Director, Center Environmental Systems
Stevens Institute of Technology
Castle Point on the Hudson
Hoboken, NJ 07920

Dr. Christodoulatos received his BE and ME degrees in Chemical Engineering from the City College of New York and PhD in Environmental Engineering from Stevens Institute of Technology. He has more than 36 years experience.

Lee William Clapp — WW
Ph.D., P.E., BCEE

Professor
Texas A&M Kingsville
917 West Avenue B
Kingsville, TX 78363

Dr. Clapp received his BS in Engineering Physics from the University of Maine and MS in Water Resources Management, MS and PhD degrees in Civil and Environmental Engineering from the University of Wisconsin-Madison. He is a licensed P.E. in Texas with more than 31 years experience.

Stephen Clark — HW
P.E., BCEE

Project Manager
CH2M
100 Great Meadow Road #707
Wethersfield, CT 06119

Mr. Clark received his BS degree in Civil Engineering from Purdue University and MS in Environmental Engineering from the University of Massachusetts. He is a licensed P.E. in Connecticut with more than 14 years experience.

Helen Patricia Corley — GW
BCES

Senior Associate
Wood Environment & Infrastructure Solutions, Inc.
2801 Yorkmont Road #100
Charlotte, NC 28208

Ms. Corley received her BS in Geology from Boston College and MS in Hydrogeology from the San Diego State University. She has more than 31 years experience.

Timothy Carroll Dean — WW
P.E., BCEE

458 Monmouth Drive
Cranberry Township, PA 15219

Mr. Dean received his BS in Geography, Geomorphology/Remote Sensin and M EPC in Soil Physics/Geomorphology from The Pennsylvania State University. He is a licensed PE in Virginia and Pennsylvania with more than 35 years experience.

Dionysios D. Dionysiou — WW
Ph.D., BCEEM

Co-Chair Water Access and Sustainability
University of Cincinnati
Environmental Engineering & Science Program
705 Engineering Research Center
Cincinnati, OH 45221-0012

Dr. Dionysiou received his BS in Chemical Engineering from the National Technical University Athens, Greece, MS in Chemical Engineering from Tufts University and PhD in Environmental Engineering from the University of Cincinnati. He has more than 27 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Rajesh Babu Doppalapudi — WW
P.E., BCEE

Project Manager
Carollo Engineers, Inc.
3150 Bristol Street #500
Costa Mesa, CA 92626

Mr. Doppalapudi received his BTech in Civil Engineering from the Indian Institute of Technology, India and MS in environmental Engineering from the University of Cincinnati. He is a licensed P.E. in California and has more than 20 years experience.

Alesandro Franchi — WW
Ph.D., P.E., BCEE

Senior Engineer
Parsons
100 West Walnut Street
Pasadena, CA 91124

Dr. Franchi received his BSE in Civil/Environmental Engineering from the University of Maryland and MSE and PhD degrees in Environmental Engineering from Johns Hopkins University. He is a licensed P.E. in Maryland and California and has more than 28 years experience.

Andrea Resch Gardiner — GE
P.E., BCEE

Environmental Consultant 1
TDEC, Division of Solid Waste Management
711 RS Gass Boulevard
Nashville, TN 37216

Ms. Gardiner received her BS in Environmental Engineering from Cal Poly-San Luis Obispo and MS in Environmental Science/Engineering from Colorado School of Mines. She is a licensed P.E. in California and Tennessee with more than 18 years experience.

Amando Garza — WW
P.E., BCEE

Senior Principal Engineer
Cannon Corporation
1050 Southwood Drive
San Luis Obispo, CA 93401

Mr. Garza received his BS in Civil Engineering from the California State University and MS in civil Engineering from the University of California. He is a licensed P.E. in California with more than 27 years experience.

Steven Lee Goodbred, Jr. — SS
Ph.D., BCES

Professor and Chair
Vanderbilt University
Department Earth and Environmental Sciences
Nashville, TN 37235

Dr. Goodbred received his BA in Geology from Boston University, MS in Marine Science from the University of South Florida and PhD in Marine Science from the College of William & Mary. He has more than 27 years experience.

Daniel Robert Grogan — HW
BCEEM

Vice President
Wood Environment & Infrastructure Solutions
1075 Big Shanty Road #100
Kennesaw, GA 30144

Mr. Grogan received his BA from Mercer University and BE from the Georgia Institute of Technology. He has more than 25 years experience.

Mark Joseph Gutberlet — SW
P.E., BCEE

EA Engineering, Science, and Technology, Inc.
225 Schilling Circle #400
Hunt Valley, MD 21031

Mr. Gutberlet received his BSCE and MSCE in Civil Engineering from Virginia Tech. He is a licensed P.E. in Maryland with more than 24 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Nathan Hagelin — HM
BCES

Senior Principal Scientist
Wood Environment & Infrastructure Solutions, Inc.
511 Congress Street
Portland, ME 04101

Mr. Hagelin received his BS in Geology from the University of Connecticut and MS in Geology from the City College of New York. He has more than 36 years experience.

Robert Hartwell — WW
P.E., BCEE

Senior Associate Engineer
Wood Environment & Infrastructure Solutions, Inc.
8745 West Higgins Road #300
Chicago, IL 60631

Mr. Hartwell received his B.S. in Chemical Engineering from Purdue University. He is a licensed P.E. in Indiana, Illinois and five other states with more than 34 years experience.

David Leon Hasty — WW
P.E., BCEE

Wood Environment & Infrastructure Solutions, Inc.
15933 Clayton Road #215
Ballwin, MO 63011

Mr. Hasty received his BS and MS degrees in Civil Engineering from the University of Missouri-Rolla. He is a licensed P.E. in Missouri and has more than 32 years experience.

Harmonie A. Hawley — WW
Ph.D., P.E., BCEE

Environmental Engineer
Bluestone Environmental Group
675 Lancaster Boulevard
Berwyn, PA 19312

Dr. Hawley received her BS and MS degrees in Civil/Environmental Engineering from Worcester Polytechnic Institute and PhD in Civil/Environmental Engineering from Rutgers University. She is a licensed P.E. in New Jersey and has more than 16 years experience.

Michelle R. Hetherington — WW
P.E., BCEE

Process Engineer
Orange County Sanitation District
10844 Ellis Avenue
Fountain Valley, CA 92708

Ms. Hetherington received her BS in Civil Engineering from the California State University-Long Beach. She is a licensed P.E. in California and has more than 28 years experience.

Amy Marie Hightower — SW
P.E., BCEE

Project Engineer/Manager
CDM Smith
621 NW 53rd Street #265
Boca Raton, FL 33487

Ms. Hightower received her BS and ME degrees in Environmental Engineering from the University of Florida. She is a licensed P.E. in Florida with more than 10 years experience.

Gary Allen Howard, Jr. — EB
BCES

Environmental Scientist IV
MDEQ
1542 Old Whitfield Road
Pearl, MS 39208

Mr. Howard received his BS in Geography from the University of Central Arkansas and MS in Geography from the University of Southern Mississippi. He has more than 25 years experience.

Elaine Wallace Howe — WW
P.E., BCEE

Principal Engineer
Trussell Technologies, Inc.
6109 Pueblo Verde ME
Albuquerque, NM 87111

Ms. Howe received her BS in Environmental Engineering Sciences from the University of Florida and MS in Environmental Health Engineering the University of Texas at Austin. She is a licensed P.E. in New Mexico and has more than 38 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Glenn Nicholas Iosue — ES
P.E., BCEE

President
ioSue, llc
2340 Blackledge Drive
Quakertown, PA 18951

Mr. Iosue received his BS in Bioenvironmental Engineering from Rutgers University. He is a licensed P.E. in Virginia and Pennsylvania with more than 21 years experience.

Seth Jelen — WW
P.E., BCEE

Principal Engineer
Wood Environment & Infrastructure Solutions, Inc.
7376 SW Durham Road
Portland, OR 97224

Mr. Jelen received his BS in Engineering & Applied Science/Chemistry from the California Institute of Technology and MS in Civil Engineering/Environmental from Stanford University. He is a licensed P.E. in Oregon and six other states with more than 28 years experience.

Ramanitharan Kandiah — WW
Ph.D., P.E., BCEE

Associate Professor
Central State University
1400 Brush Row Road
105 C.J. McLin Building
Wilberforce, OH 45384

Dr. Kandiah received his BS in Civil Engineering from the University of Peradeniya, Sri Lanka, MS in Environmental/Water Resources Engineering from Hohai University, China, MS in Environmental Engineering from Marquette University and PhD in Civil Engineering from the Tulane University. He is a licensed P.E. in Ohio and has more than 28 years experience.

Jennifer Kay Kelley — AR
BCES

Senior Environmental Expert
General Electric (GE)
2600 Lake Austin Boulevard, Unit 7207
Austin, TX 78703

Ms. Kelley received her BS in Environmental Science, Biology from the University of Houston, Clear Lake. She has more than 21 years experience.

Hardat Shivcharan Khuball — WW
P.E., PMP, CCM, BCEE

CIP Project Manager
Orange County Sanitation District
10844 Ellis Avenue
Fountain Valley, CA 92708-7018

Mr. Khuball received his BS in Civil Engineering from University of Guyana and MS in Civil Engineering from the New Jersey Institute of Technology. He is a licensed P.E. in New Jersey and California and has more than 38 years experience.

Wayne Klotz — WW
P.E., BCEE

President
Klotz Strategies
1607 Mission Springs
Katy, TX 77450

Mr. Klotz received his BSCE in Civil Engineering from the Texas A&M University and MS in Civil Engineering from the University of Houston. He is a licensed PE in Texas with more than 43 years experience.

George P. Korfiatis — HW
Ph.D., BCEEM

McLean Chair Professor Environmental Engineering
Stevens Institute of Technology
Castle Point on the Hudson
Hoboken, NJ 07030

Dr. Korfiatis received his BS in Civil Engineering, MS in Water Resources Engineering, MS in Philosophy and PhD in Water Resources/Environmental Engineering from Rutgers University. He has more than 40 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Michael Robert Kuhn — WW
P.E., BCEE

Vice President of Operations
Veolia North America
2301 Regional Water Lane
Tampa, FL 33619

Mr. Kuhn received his BS Civil/Environmental Engineering from the University of Illinois and MS in Technology/Innovation Management from the University of Tampa. He is a licensed P.E. in Florida with more than 25 years experience.

Vijay Kumar — WW
P.E., BCEE

Vice President
CH2M
150 Spear Street #750
San Francisco, CA 94105

Mr. Kumar received his BE in Civil Engineering from the University of Mysore and MS in Civil/Environmental Engineering from the University of Hawaii-Manos. He is a licensed P.E. in California with more than 33 years experience.

Natalie Chrisman Lazarr — HW
P.E, BCEE

Senior Associate Engineer
Wood Environment & Infrastructure Solutions, Inc.
4600 East Washington Street #600
Phoenix, AZ 85034

Ms. Lazarr received her BS in Civil Engineering and MS in Environmental Engineering from the University of Arizona. She is a licensed P.E. in Arizona and has more than 25 years experience.

John Robert Loper — HW
P.E., BCEE

President
The Loper Group, Inc.
PO Box 569
Seabrook, TX 77586

Mr. Loper received his BA and BS degrees in Applied Science and Chemical Engineering from Lehigh University and MS in Chemical Engineering from West Virginia College. He is a licensed P.E. in Pennsylvania and ten other states and has more than 45 years experience.

James Martin — WW
Ph.D., P.E., BCEE

Kelly Gene Cook Chair and Professor
Mississippi State University
235 Walker Engineering Building
Department of CEE
Mississippi State, MS 39762-9546

Dr. Martin received his BS in Wildlife Science, BS in Civil Engineering, PhD in Civil/Environmental Engineering from the Texas A&M University and MS in Biology from the Southwest Texas State University. He is a licensed P.E. in Mississippi with more than 48 years experience.

Danielle D. Maurizio — WW
P.E., BCEE

Project Engineer
Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601

Ms. Maurizio received her BS in Civil/Environmental Engineering from the California State Polytechnic and MS in Civil/Environmental Engineering from the University of California-Los Angeles. She is a licensed P.E. in California with more than 21 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Alex Simon Mayer — WW
Ph.D., P.E., BCEE

University Professor
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931

Dr. Mayer received his BS in Civil Engineering from Brown University and MS and PhD degrees in Environmental Engineering from the University of North Carolina at Chapel Hill. He is a licensed P.E. in California with more than 37 years experience.

Jason M. Mills — GW
BCES

Senior Geologist
CDM Smith
101 Southhall Lane #200
Maitland, FL 32701

Mr. Mills received his BS in Geology from the University of Florida. He has more than 33 years experience.

Erin Keli Moore — WW
P.E., BCEE

Project Manager
Tighe & Bond
47 West Market Street
Thinebeck, NY 12572

Ms. Moore received her BS in Environmental Engineering from Wentworth Institute of Technology and MS in Environmental Engineering from Worcester Polytechnic Institute. She is a licensed P.E. in Massachusetts and New York with more than 18 years experience.

Taraneh Dawn Nik-Khah — SR
BCES

Environmental Supervisor 1
City of Los Angeles
Bureau of Sanitation
2714 Media Center Drive
Los Angeles, CA 90065

Ms. Nik-Khah received her BS in Biology from the University of California-San Diego. She has more than 12 years experience.

Daniel Barton Oerther — EM
Ph.D., P.E., BCEE, BCES, F.AAN, F.RSA, F.RSPH, F.CIEH

John A. and Susan Mathes Chair of Environmental Health Engineering
Missouri University of Science & Technology
Civil Engineering
1401 North Pine Street
Rolla, MO 65409

Dr. Oerther received his BS in Environmental Engineering from Northwestern University and MS and PhD degrees in Environmental Engineering from the University of Illinois. He is a licensed P.E. in Ohio and two other states and has more than 23 years experience.

Oladele A. Ogunseitan — EM
Ph.D., BCES

Professor and Founding Chair
University of California, Irvine
Program in Public Health
Department Population Health & Disease Prevention
Irvine, CA 92697-3957

Dr. Ogunseitan received his BSc in Microbiology from the University of lfe, Nigeria, MPH in Environmental Health Sciences from the University of California-Berkeley and PhD in Microbiology from the University of Tennessee-Knoxville. He has more than 38 years experience.

Lola Olabode — GW
BCES

Program Director
Water Research Foundation
119 North Fairfax Street #900
Alexandria, VA 22314

Ms. Olabode received her BS in Chemistry from the Tougaloo College and M.PH in Environmental & Occupational Health from The George Washington University School of Medicine and Health Sciences. She has more than 23 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Rebecca M. Oliva — WW
P.E., BCEE

Project Manager
CDM Smith
2002 North Lois Avenue #200
Tampa, FL 33607

Ms. Oliva received her BA in Spanish, BS in Environmental Engineering and ME in Environmental Engineering Sciences from the University of Florida. She is a licensed P.E. in Florida and has more than 11 years experience.

Monica Palomo — WW
Ph.D., P.E., BCEE

Associate Professor
California State Polytechnic University-Pomona
Civil Engineering Department
3801 West Temple Avenue
Pomona, CA 91768

Dr. Palomo received her BS in Civil Engineering from the University of Guanajuato, Gto, Mexico, MS and PhD degrees in Civil Engineering from Kansas State University. She is a licensed P.E. in California and has more than 23 years experience.

Stuart Carter Pearson — HW
P.E., BCEE

Senior Associate Engineer
Wood Environment & Infrastructure Solutions, Inc.
511 Congress Street #200
Portland, ME 04101

Mr. Pearson received his BS in Civil Engineering from Worcester Polytechnic Institute and MS in Civil Engineering from the University of California at Berkeley. He is a licensed P.E. in Maine and five other states with more than 28 years experience.

John George Petito — WW
P.E., BCEE

Associate Vice President
AECOM
125 Broad Street, 14th Floor
New York, NY 10004

Mr. Petito received his BE in Civil Engineering from Manhattan College. He is a licensed P.E. in New York and one other state with more than 39 years experience.

Ioannis Martinos Polematidis — WW
P.E., BCEE

Project Manager
CDM Smith
8381 Dix Ellis Trail #400
Jacksonville, FL 32256

Mr. Polematidis received his BS in Civil Engineering and MS in Agricultural and Biological Engineering from the University of Florida. He is a licensed P.E. in Florida with more than 13 years experience.

Jesse Pompa — ES
P.E., BCEE

Deputy Manager of Grants
Inland Empire Utilities Agency
6075 Kimball Avenue
Chino, CA 91708

Mr. Pompa received his BS and MS degrees in Mechanical Engineering from the University of California-Irvine. He is a licensed P.E. in California and has more than 14 years experience.

Craig T. Reinsch — WW
P.E., BCEE

Senior Engineer
Olsson Associates
601 P Street #200
Lincoln, NE 68508

Mr. Reinsch received his BS in Civil Engineering and MS in Environmental Engineering from the University of Nebraska-Lincoln. He is a licensed P.E. in Nebraska and four other states with more than 15 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Lily Vuong Sanchez — EC
BCES

Supervising Chemist
Orange County Water District
18700 Ward Street
Fountain Valley, CA 92708

Ms. Sanchez received her BS in Chemistry from the California State University-Long Beach. She has more than 28 years experience.

Amanda Lee Sheposh — WW
P.E., BCEE

Senior Environmental Engineer
Johnson Controls, Inc.
132 Whispering Lake Drive
Palos Park, IL 60464

Ms. Sheposh received her BS in Civil/Environmental Engineering MS in Environmental Engineering from the University of Illinois at Urbana-Champaign. She is a licensed P.E. in Illinois and has more than 10 years experience.

Patrick Michael Sherlock — WW
P.E., BCEE

Management Engineer
Onondaga County Water Authority
200 Northern Concourse
PO Box 4949
Syracuse, NY 13221-4949

Mr. Sherlock received his BS in Civil/Environmental Engineering from Clarkson University. He is a licensed P.E. in New York with more than 23 years experience.

George A. Sorial — GE
Ph.D., BCEEM

Professor and Department Head
University of Cincinnati
PO Box 210012
Department Chemical/Environmental Engineering
Cincinnati, OH 45221-0012

Dr. Sorial received his BS and MS degrees in Chemical Engineering from the University of Khartoum, Sudan and PhD in Chemical Engineering from University of Bradford, United Kingdom. He has more than 44 years experience.

James Mark Stapleton — HW
Ph.D., P.E., BCEE

Technical Director
Bhate Environmental
7027 Old Madison Pike #108
Huntsville, AL 35806

Dr. Stapleton received his BS in Chemical Engineering from the University of Maryland-College Park and MS and PhD degrees in Civil/Environmental Engineering from the Michigan Technological University. He is a licensed P.E. in Texas and 16 other states with more than 28 years experience.

Joseph Allan Strauch — WW
P.E., BCEE

Senior Project Manager
Gannett Fleming Inc.
207 Senate Avenue
Camp Hill, PA 17011

Mr. Strauch received his BS in Mining Engineering from the University of Pittsburgh. He is a licensed P.E. in Pennsylvania and four other states with more than 37 years experience.

Susan Kathleen Stuver — AR
Ph.D., BCES

Senior Environmental Scientist
GSI Environmental
104 San Michelle Cove
Georgetown, TX 78628

Dr. Stuver received her BS in Biology from the Missouri State University and MS and PhD degrees in Environmental Science/Engineering from the University of Texas-San Antonio. She has more than 24 years experience.

Hala Z. Titus — WW
P.E., BCEE

Director, West Pacific Region
CDM Smith
2300 Clayton Road #950
Concord, CA 94520

Ms. Titus received her BSc in Civil Engineering from the University of Alexandria, Egypt. She is a licensed P.E. in New York with more than 32 years experience.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

The Class of 2018

Rao Mallikarjuna Uppu — ET
Ph.D., BCES

James and Ruth Smith Endowed Professor
Southern University & A&M College
18235 Manchac Place Drive
Praineville, LA 70769

Dr. Uppu received his BS in Chemistry from Hindu College, India, MS in Biochemistry from Andhra University, India and PhD in Biochemistry from the Osmnia University, India. He has more than 42 years experience.

Rajendra D. Vaidya — WW
Ph.D., P.E., BCEE

Environmental Engineer
CDM Smith
1715 North Westshore Boulevard #875
Tampa, FL 33607

Dr. Vaidya received his BE in Civil from WIT, India, MS in Environmental Engineering from Virginia Tech and PhD in Environmental Engineering from the University of Central Florida. He is a licensed P.E. in Florida and has more than 22 years experience.

Barbara Jean Viskup — EB
Ph.D., BCES

Environmental Administrator II
MDEQ
1141 Bayview Avenue #208
Biloxi, MS 39530

Ms. Viskup received her AS in Science from Virginia Western Community College and BS and MS degrees in Biological Science from the University of Southern Mississippi. She has more than 30 years experience.

Blake F. Weindorf — WW
P.E., BCEE

Director of Distribution
Central Arkansas Water
5300 South Shakleford
Little Rock, AR 72204

Mr. Weindorf received a BS in Civil Engineering from the Louisiana Tech University. He is a licensed P.E. in Arkansas with more than 19 years experience.

Terry Wayne Williamson, Jr. — EB
BCES

Monitoring Program Manager
Brevard County Natural Resources Management Department
2725 Judge Fran Jamieson Way #A219
Viera, FL 32940

Mr. Williamson received his BS in Animal Science from Berry College and MS in Biology from the University of Central Florida. He has more than 22 years experience.

Yinhui Xu — WW
Ph.D., P.E., BCEE

Project Manager
CPH, Inc.
500 West Fulton Street
Sanford, FL 32771

Dr. Xu received his BS and MS degrees in Environmental Engineering from the Donghua University, China and PhD in Civil Engineering from Auburn University. He is a licensed P.E. in Florida with more than 19 years experience.

UPCOMING EVENTS

April 25, 2019, AAEES Awards Luncheon and Conference, National Press Club, Washington, DC. Details will be posted to http://www.aaees.org/events.

May 6, 2019, AAEES's 10th 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.

May 7, 2019, AAEES's Annual Breakfast at NJWEA's Conference. For registration or exhibitor information, visit http://www.njwea.org.

June 10 - 12, 2019, AWWA ACE19 Conference: Denver, Colorado. The AAEES/AIDIS/AWWA Luncheon will be held on Wednesday, June 12th at the Colorado Convention Center. The Keynote Speaker is Robert Renner, Chief Executive Officer (Retired), The Water Foundation. His presentation is: "Water and the Foundation: Past, Present and Future". For details, go to http://www.awwa.org.

June 25 - 28, 2019, A&WMA's 112th Annual Conference & Exhibition (ACE), Quebec City Convention Centre. For details, go to https://www.awma.org/.

Board Certified Environmental Engineer | Board Certified Environmental Engineering Member | Board Certified Environmental Scientist

Are you reinvesting in the infrastructure of your organization?

Hiring the right people is key to your success. Bringing in qualified environmental engineering and environmental science candidates will strengthen your organization and provide you with the talent you need. Visit the **AAEES Career Center** today to find that perfect fit.

The American Academy of Environmental Engineers and Scientists can help move along your candidate search. By posting a job on the **AAEES Career Center** at **careers.aaees.org**, you will get unparalleled exposure within the engineering and scientific communities. As a part of the Engineering & Science Career Network, AAEES ensures that your job posting will be seen by thousands of qualified candidates relevant to your industry. And with access to all resumes posted to the network, you can widen your reach to find the right candidate today!

When it comes to making career connections in the **Environmental Engineering** and **Environmental Science** industries, more and more job seekers are turning to the AAEES Career Center to find their next position. Where better to post a job and search for qualified candidates? Visit the AAEES Career Center to post your Environmental Engineering and Environmental Science jobs today!

The ESCN is a strategic industry alliance formed by AAEES and other top trade and professional associations that serve companies searching for engineering and science professionals.

AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS & SCIENTISTS®

careers.aaees.org

ENGINEERING & SCIENCE CAREER NETWORK

The 2019 Kappe Lecturer

Nancy G. Love, Ph.D., P.E., BCEE

Borchardt and Glysson Collegiate Professor,
Department of Civil and Environmental Engineering,
University of Michigan

Adjunct Professor, Addis Ababa University Institute of Biotechnology, Ethiopia

Education

- BS, Civil Engineering, University of Illinois, 1984
- MS, Civil Engineering, University of Illinois, 1986
- PhD, Environmental Systems Engineering, Clemson University, 1994

Professional Associations

- Board Certified Environmental Engineer, American Academy of Environmental Engineers & Scientists (AAEES)
- Fellow, Association of Environmental Engineering and Science Professors (AEESP)
- Fellow, Water Environment Federation (WEF)
- Fellow, International Water Association (IWA)

Dr. Nancy G. Love is the Borchardt and Glysson Collegiate Professor of Civil and Environmental Engineering at the University Michigan, and an adjunct Professor at the Institute of Biotechnology at Addis Ababa University. She has B.S. and M.S. degrees in Civil Engineering with an emphasis on Environmental Engineering from the University of Illinois, Urbana-Champaign, and a Ph.D. degree in Environmental System Engineering from Clemson University.

She has advised over 70 graduate students and post-doctoral research associates. In collaboration with her students, Dr. Love works at the interface of water, infrastructure, and both public and environmental health in both domestic and global settings. They focus on assessing and advancing public and environmental health using chemical, biological and analytical approaches applied to water systems using both physical experiments and computational models. Specifically, they: evaluate the fate of chemicals, pathogens and contaminants of emerging concern in water with relevance to public health and the environment; use technologies to sense and remove these constituents; and advance technologies that recover useful resources from water.

Dr. Love has co-authored: over 100 peer reviewed papers, chapters and reports; over 250 conference presentations; and the 2011 textbook *Biological Wastewater Treatment, 3rd Edition* by Grady, Daigger, Love and Filipe.

Dr. Love has held leadership positions in multiple organizations, including with the Water Environment Federation (WEF), the International Water Association (IWA), and the Association of Environmental Engineering and Science Professors (AEESP). She is a Fellow of all three of these organizations as well. She is a licensed professional engineer (P.E.) in the state of Michigan and a Board Certified Environmental Engineer (BCEE).

Abstracts of Lectures Offered

Rethinking America's Urban Water Infrastructure: Resource Efficiency, Access, and Public Health

Water infrastructure renewal is receiving significant attention today as many of our systems are meeting (or exceeding) design life. Cities in countries with well developed economies like the U.S. enjoy economic prosperity in part due to the development of heavily centralized water systems that create high levels of water quality and public health, on average.

While centralized water infrastructure has served us well, I argue that we should not be constrained to applying 20th century thinking as we plan for the future. The current revolution in information technologies (IT: software, hardware and devices) has the potential to transform urban water infrastructure by creating more resilient and flexible hybrid systems comprised of an interacting collection of centralized and decentralized physical & IT systems.

I contend that the development of IT-enabled "smart" hybrid water system solutions has the potential to: improve the efficiency with which we use resources (e.g., water, power, nutrients); enhance equitable access to water services; change consumer and provider behavior around water; and ensure that we sustain a high level of public health, even as more people live in close proximity to each other. In this talk and through the use of case studies from across different regions around the globe, I will explore these scenarios and the changing ways in which people live.

As an example, one case study will include the development of "smart" distributed nutrient recovery systems that have been deployed and are being tested at the University of Michigan.

Environmental Engineering and Science Academic Scholarship in Service to Society: Our Role and Responsibility

Academic scholarship in environmental engineering and science is most often associated with research around environmental science and technology - research that often involves physical or computational experiments - and sometimes occurs in nature or with full-scale engineered systems.

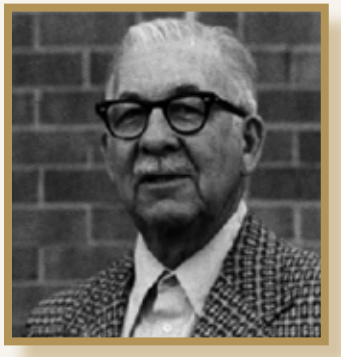
Our discipline also has a growing contribution around the scholarship of learning and teaching, which has driven pedagogical advancements to the betterment of students and the organizations that hire them. A third wave of scholarship in the environmental engineering and science discipline that is seeing rapid growth relates to community-engaged research, learning and outreach.

An increasing number of colleges are advocating that faculty and students do more work in service to society; in this way, universities are helping to motivate the third wave. Community-engaged work takes various forms, from research in partnership with communities, service-learning oriented courses, and professional outreach through institutions (e.g., civic organizations, professional associations). Many

faculty and students undertake this third kind of scholarship with good intentions; however, they have typically received little to no training for it, and few to no processes, standards or certification methods are in place that explicitly focus on ensuring our work in communities is done in a manner that is respectful, mutually beneficial and does harm to none. During this talk, I will review the history and status of standards, ethics codes and other methods that are designed to protect the public while allowing for valid modes of public scholarship in service to society, with an emphasis on environmental engineering and science academia.

I will use case studies to highlight exemplary projects that met the community and academic goals in a mutually beneficial way. I will close with recommendations that highlight needs as our discipline more fully embraces scholarship in service to society.

What is the Kappe Lecture Series?



The Kappe Lecture Series was inaugurated by the Academy in 1989 to share the knowledge of today's practitioners with tomorrow's environmental engineers and scientists. It is an annually recurring series of lectures presented on college campuses during the Fall academic term. This focus enables it to complement the lecture series sponsored by the Association of Environmental Engineering & Science Professors, which brings renowned research engineers to universities in the Spring term.

The Academy's Awards Committee chooses lecturers from the practicing engineering community in the year preceding presentation of the lectures. An abstract of the lectures offered and a biographical profile of the lecturer is circulated to universities teaching environmental engineering together with an invitation to host the Kappe Lecturer. From among those universities expressing interest, the Awards Committee typically selects up to ten host universities. Host university responsibilities include payment of a nominal fee and publicizing the lecture to ensure widespread exposure of the lecturer to the academic and surrounding professional community.

This program was inspired by a grant from the estate of Stanley E. Kappe, P.E., DEE, a successful environmental engineer, who believed that he owed a debt to the profession that rewarded him so well. During his life, he gave of himself to his university and to his profession through countless hours of volunteer activity. And, through this Lecture Series, he continues to share his good fortune with tomorrow's environmental engineers and scientists.

He graduated from Pennsylvania State University in 1930 with a bachelor's degree in sanitary engineering. He served with the Pennsylvania State Health Department and the U.S. Army Corps of Engineers before joining the Chicago Pump Company as its Eastern Regional Manager in 1935. In 1945, he founded Kappe Associates, Inc., a water supply and wastewater equipment company headquartered in Rockville, Maryland, and continued as its Chief Executive Officer until his death in 1986.

His peers recognized his contributions to the profession by numerous awards, including the AWWA Fuller Award, the WEF Arthur Sidney Bedell Award, the WPCAP Ted Moses and Ted Haseltine Awards, and the AAEES Gordon Maskew Fair Award. In 1985, Pennsylvania State University named him Outstanding Engineer Alumnus.

Stanley E. Kappe was an activist member and leader in several national and Chesapeake region professional societies. He served as the Executive Director of the American Academy of Environmental Engineers (now the American Academy of Environmental Engineers and Scientists) from 1971 to 1981.

AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS & SCIENTISTS®

147 OLD SOLOMONS ISLAND ROAD, SUITE 303, ANNAPOLIS, MD 21401

Phone 410/266/3311
Fax 410/266/7653
info@aaees.org
www.aaees.org

2019 KAPPE LECTURE SERIES RESERVATION FORM
Nancy G. Love, Ph.D., P.E., BCEE

University: _____

Address: _____

_____

Official Contact: _____

Telephone: _____ FAX: _____ Email: _____

Preferred Dates & Locations

1. _____
   Date City State
2. _____
   Date City State
3. _____
   Date City State
4. _____
   Date City State

Cooperating Universities

1. _____
2. _____
3. _____
4. _____

If our school is selected to participate, we will pay to the **American Academy of Environmental Engineers & Scientists®** $1,225 and assume any other incidental on-campus expenses connected with the Lecturer's visit. The **American Academy of Environmental Engineers & Scientists®** will assume travel and off-campus expenses incurred by the Speaker.

Name: _____ Date: _____

Signature: _____

Printed: _____

Fax form to 410.266.7653 or email to Sammi Olmo at JSOlmo@aaees.org by March 15, 2019.

SPONSORED BY:

AIR & WASTE MANAGEMENT ASSOCIATION
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS
AMERICAN PUBLIC HEALTH ASSOCIATION
AMERICAN PUBLIC WORKS ASSOCIATION
AMERICAN SOCIETY FOR ENGINEERING EDUCATION
AMERICAN SOCIETY OF CIVIL ENGINEERS
AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AMERICAN WATER WORKS ASSOCIATION
ASSOCIATION OF ENVIRONMENTAL ENGINEERING AND SCIENCE PROFESSORS
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
SOLID WASTE ASSOCIATION OF NORTH AMERICA
WATER ENVIRONMENT FEDERATION

Professional Services Directory

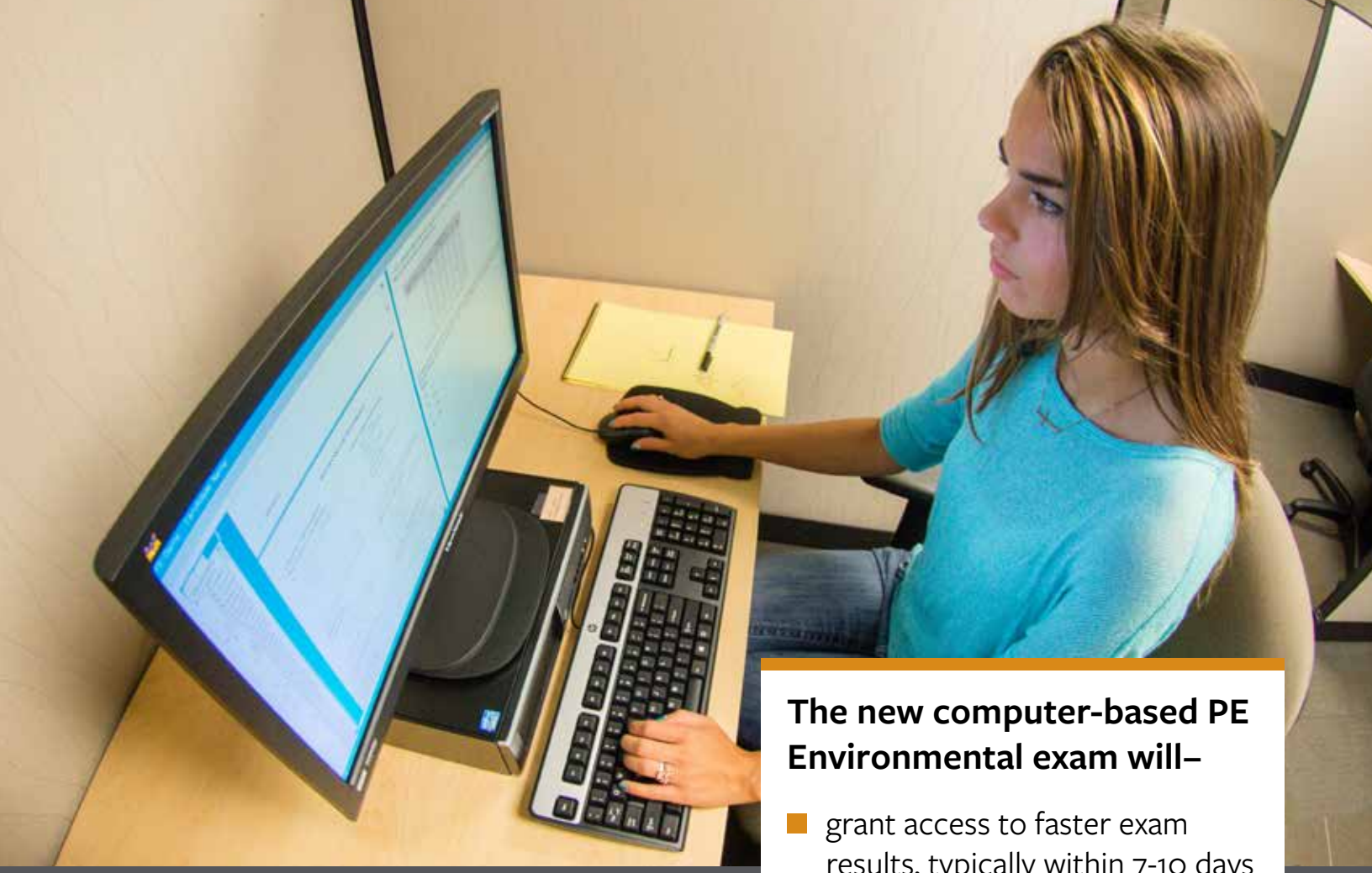
Ad Size	1 Time Rate (Color)	4 Time Rate (Color)/issue	4 Time Rate (B&W)/issue	Online/Digital Edition
Double Page Spread	$2,500	$2,000		FREE
Full Page Back Cover	$1,800	$1,600		FREE
Full Page Inside Cover	$1,500	$1,300		FREE
Full Page	$1,000	$900		FREE
2/3 Page	$725	$700		FREE
1/2 Page	$675	$600		FREE
1/3 Page	$500	$425		FREE
1/4 Page	$400	$350		FREE
Professional Services Directory 1 Height*		$160	$140	FREE
Professional Services Directory 2 Height*		$220	$200	FREE

*Professional Services Directory is a special section for employers of Board Certified Environmental Engineers, Board Certified Environmental Engineering Members, Board Certified Environmental Scientists, and AAEES Members only. Rates start at only $140. For other advertising opportunities in *Environmental Engineer and Scientist*, call Yolanda Moulden at 410.266.3311 or email YMoulden@aaees.org.

REACH OUR ADVERTISERS

Company/Organization	Page	Telephone	Website
Alaimo Group Consulting Engineers	31	609-267-8310	www.alaimogroup.com
Carollo Engineers	31	800-523-5822	www.carollo.com
CDM Smith	31	617-452-6000	cdmsmith.com
FOX Engineering	31	800-433-3469	www.foxeng.com
Mott MacDonald	31	800-832-3272	www.mottmac.com
NCEES	Back Cover	800-250-3196	https://ncees.org/

Please Support Our Advertisers. It's Good Business!



EXAMS

Registration is now open for the new computer-based PE Environmental exam

Registration and scheduling is now open for the new computer-based Principles and Practices of Engineering (PE) Environmental exam. **The first testing appointments are available starting April 1, 2019.** Register for the new PE Environmental exam by logging in to your MyNCEES account and following the onscreen instructions.

The new computer-based PE Environmental exam will–

- grant access to faster exam results, typically within 7-10 days
- allow for year-round testing at approved Pearson VUE testing centers
- provide a digital PE Environmental Reference Handbook

Discover more.
ncees.org/CBT

NCEES
advancing licensure for engineers and surveyors

National Council of Examiners for Engineering and Surveying®
P.O. Box 1686, Clemson, S.C. 29633
864.654.6824