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2019 AAEES President, Kristin Morico, P.E., BCEE

Included in this issue:

The 2018 Summary Member Activity Report

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FEATURES

DEPARTMENTS

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PRESIDENT'S PAGE

C. Hunter Nolen, P.E., BCEE

"Ambassadorship" for AAEES - What Does This Mean?

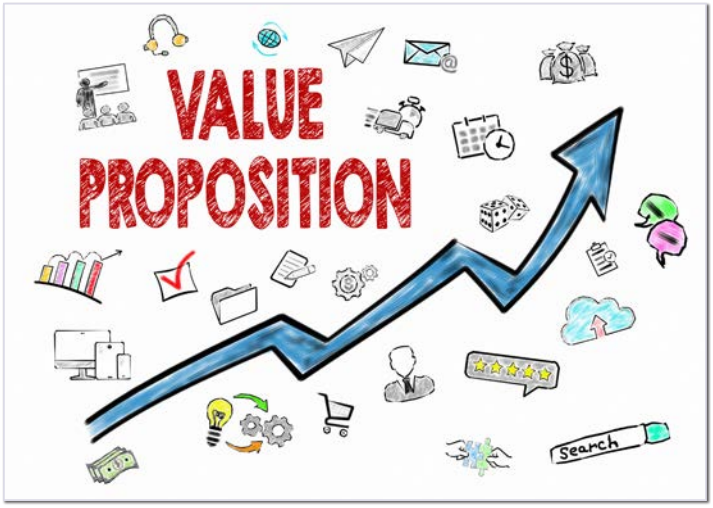
When someone asks you what do the initials BCEE, BCES, or BCEEM behind your name mean, what do you say? This is an opportunity for action! I hope you take it and promote their great meaning! These initials mean that you have striven for and achieved effectively the highest level of specialty certification available in environmental engineering and science. You have gone the extra mile in building the necessary credentials and accomplishing the Board-Certified proof of your expertise, so you can bring superior solutions for the benefit of society and the natural environment. You have a right to be proud of this fine accomplishment; and, I hope you agree, a responsibility to promote these credentials to others who might also pursue them – a responsibility to be an "Ambassador" for AAEES.

Why are we all needed as ambassadors of AAEES? Because it is up to us who have achieved these credentials to promote this level of expertise in our industry to help assure high excellence in the field, and to support the very organization that makes this all possible: The American Academy of Environmental Engineers and Scientists. With a healthy and growing membership, the Academy can continue to deliver its mission successfully and indefinitely. As a reminder, the AAEES mission is:

Protecting public health and the environment by:

- Recognizing leadership and excellence through board certification of environmental engineers and scientists.
- Providing professional development opportunities for students, engineers, and scientists.

Please make note especially of the words: public health, environment, leadership, excellence, and professional development. These words represent the lifeblood of our continuously advancing profession, and the AAEES helps us to make sure that environmental engineering and science continue to advance for those of us in the profession and those who are affected by it.



So, please **promote the value of board certification! There is no more important time of the year than over the next few months to actively do this!** This is because AAEES engages in a once-annual process of applicant review, testing and Board Certification and the annual deadline for new applications is March 31st.[1] March 31, 2019, is fast approaching and now is the time to refer colleagues and recommend they apply for Board Certification. Please take the time to do this in exercising your role as an AAEES ambassador! This is a very easy process and a simple referral can be done in just a couple of minutes utilizing the AAEES Nomination Form, which can be found at http://aaees.org/_downloadcenter/members/NominationForm.pdf. So make some nominations, pick up the phone to encourage your nominated colleagues, and acquaint them with the AAEES Value Proposition by providing them with the following Value Proposition Presentation at http://www.aaees.org/_downloadcenter/members/AAEESValueProposition.pdf. While explained in detail in the presentation, a summary representation of the Value Proposition is also provided below:

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, includ-

[1] Board Certification by Eminence occurs twice per year and is described in the following link: http://www.aaees.org/becomeboardcertified/eminence.php

> With a healthy and growing membership, the Academy can continue to deliver its mission successfully and indefinitely.

ing: 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 out industry
- **Enhanced technical respect** amongst our peers and clients and for expert witness credentials
- **Networking and comradery** 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 the 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 organizations abilities to deliver highest-value services and solutions
- Enhances project **reliability, cost efficiency, profitability**, helping to assure organizational success in the marketplace
- 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

> All advanced practitioners and educators in our field should pursue Board Certification and AAEES membership.

To the many of you who are already AAEES Members, you will have experienced many of these benefits; and to those who will consider 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. Please:

1. cherish your credential for the outstanding accomplishment it is,
2. consider participating in AAEES committees and other activities, and
3. actively promote AAEES membership and Board Certification to all your qualified colleagues.

Finally, as outgoing President of AAEES, it has been the greatest honor of my career to serve in this role and I thank all of you who supported me in this endeavor and wish you all the greatest fulfillment of your own careers in our most honorable profession of environmental engineering and science.

C. Hunter Nolen, P.E., BCEE

MEMBER NEWS

IN MEMORIAM

Richard Gabrielse
July 17, 1927 - October 12, 2018

Richard Steven Gabrielse, P.E., BCEE, passed into his heavenly home on October 12, 2018. Born on July 17, 1927, in Sheboygan, Wisconsin, to Steve and Annetta Gabrielse, he was the eldest of five children. Richard grew up on a farm in Sheboygan County, where he was responsible for farm chores, helping his father with his excavating business, and tending to younger siblings Steve, Ruth and twins Melvin and Milton.

After graduating from Central High School, he enlisted in the U.S. Navy, where he proudly served in the Pacific and in Okinawa, Japan. Upon returning, Richard attended the Wisconsin Institute of Technology, and then was accepted into the University of Missouri School of Mines and Metallurgy, Rolla, Missouri, from which he received a degree in Mechanical Engineering. Following this, he attended Calvin College, Grand Rapids, Michigan, where he met his wife, then Idelle Ruiter, of Chicago Heights, Illinois. The two were married on November 2, 1951, and Richard began to work with Stiles Construction Co. The couple lived in Quebec, Canada, Irvington, Kentucky, and Benton Harbor, Michigan, before settling in Sheboygan, Wisconsin, where they were active in community, church and school. The couple had four children: Linda, Thomas (Tom), Laurel and Michael.

In 1964, Richard founded his company, Midwest Mechanical Contractors, Inc., and the family moved to Dearborn, Michigan. Richard loved his career as an environmental engineer, specializing in water and wastewater treatment systems. His work took him (and Idelle, as a traveling companion) to numerous states and foreign countries. Midwest eventually became a subsidiary of the Tutor Perini Corporation of Boston, Massachusetts, where he served as VP of Special Projects, Construction Division. Upon retirement, he and Idelle moved to Spring Lake, Michigan, a community they loved, and where Richard enjoyed fishing, church, school and community involvement, and where he began work as an environmental and engineering consultant.

Richard's professional memberships, awards and achievements are too numerous to list, but include the American Academy of Environmental Engineers and Scientists, Association of General Contractors (AGC), Water Pollution Control Federation, Mechanical Contractors of America and others. Richard was awarded an Honorary Doctorate in Environmental Engineering, and received the 1996 Award of Outstanding Engineer in Construction. He served as Vice President of Construction for the NSPE (National Society of Professional Engineers) and received the President's Citation and Assembly of Fellows, NSPE. Richard testified before the U.S. House of Representatives and the U.S. Senate in Washington, D.C., being instrumental in the passage of the Clean Water Act.

Richard Gabrielse, with Sammi Olmo and Debra Reinhart, at the 2009 AAEES Fall Board of Trustees Meeting

Always an active church member, Richard was a passionate advocate for missions and for Christian education. He was a member of Gideons International. Richard served as an elder in the Dearborn Christian Reformed Church, Dearborn, Michigan, and as chairman of the building committee for a new church and the Dearborn Christian School facility. He also served on the Board of Covenant College, Lookout Mountain, Georgia, and as chairman of the building committee for the construction of a college chapel/educational facility. In addition, he served as the chairman of the construction task force for the remodel/expansion of the Grand Haven Christian School, Grand Haven, Michigan. Almost to a fault, Richard was generous with his talents and resources. He was a giver.

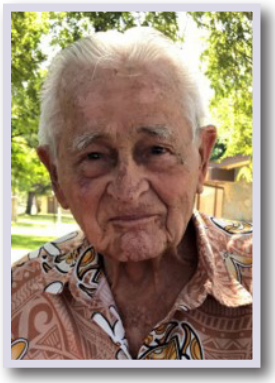
Richard was a curious and lifelong learner, with many different interests. He was an avid reader and a lover of books, classical music and singing. For several years, he sang with the University of Michigan Choral Union, Ann Arbor, Michigan. He loved the great hymns of the Christian faith. Richard also

loved planning and executing activities with his family including lots of travel, camping, hunting with his sons, reunions, and especially fishing and sharing his boat with anyone who would enjoy it with him. Richard was a devoted son, brother, husband, father, grandfather, great-grandfather and friend to many. He was a follower of Jesus and loved his Savior.

Published in Grand Rapids Press on October 16, 2018

Mr. Gabrielse had been a Board Certified Environmental Engineer in Water Supply and Wastewater since 1984 and had earned Life status. He served on the AAEES Board of Trustees as the NSPE representative from 2004 to 2009.

Russell George Ludwig
October 8, 1919 - August 11, 2018



Russell George Ludwig passed away peacefully in his sleep on August 11, 2018, in Rio de Janeiro, Brazil, at the age of 98. Burial at São Francisco Xavier Cemetery in Rio de Janeiro followed a private service.

Russell was born in Saskatoon, Saskatchewan, Canada on October 8, 1919, the seventh child of his parents, Rudolf F. and Emily H. Ludwig. The family moved to California when he was two and a half and Russell grew up in San Pedro, graduating from San Pedro High School in 1937 and Compton Junior College in 1939. He then attended the University of California at Berkeley, studying Civil Engineering with an emphasis on Sanitary Engineering. Throughout his education, Russell had an exemplary scholastic record. At Compton, he joined Beta Phi Fraternity and held several school offices. During his senior year at UC Berkeley, he was awarded the James Monroe McDonald Fellowship in Sanitary Engineering. After graduating in May 1941 with a Bachelor of Science Degree, Russell continued his studies, having been chosen as a Tau Beta Pi Fellow for the 1941-1942 period. He was elected to membership in several Greek letter societies including Tau Beta Pi (National Engineering Society), Chi Epsilon (Civil Engineering), Phi Beta Kappa (National Honorary Society) and Sigma Xi (Science). He obtained his Master's Degree from UC Berkeley in May 1942. After graduating, Russell worked at North American Aviation, assisting in the production of B-25, P-51, and AT-6 aircraft. In 1943, he joined the U.S. Public Health Service, which is a Military Service during war years. He served a tour of duty from October 1943 to June 1946.

Russell then returned to California where he obtained a position as Sanitary Engineer with the County Sanitation Districts of Los Angeles County. In early 1949, he joined his brothers Harvey and Gordon, and Ludwig Brothers Engineers (LBE) was created. From 1951-1952, he worked as an independent sanitary engineer managing projects involving extensive design work for the city of Escondido, California, including design of an activated sludge treatment plant, as well as a trickling filter plant and ocean outfall at Dana Point. Then in 1952, he joined with Carl Pascal and Roy Coble to form RCR Corporation which was able to obtain larger projects, while retaining the engineering consulting arm under the name Cal Engineers. In 1959, Ludwig Engineering and Science (ES) was formed. During the 1960s, Russell designed sewerage facilities in California and took over as President of ES International, managing their overseas projects in Calcutta, India, Accra, Ghana, Port au Prince, Haiti and Rio de Janeiro, Brazil. In 1971, he moved to Brazil, acquired the assets of ES, and formed Engineering Science do Brasil S.A (Encibra), which still operates, with his son Russell R. Ludwig as Executive Vice President. Up until his death, Russell still maintained a position as a Director for Encibra.

From 1980-2000, Russell served as a Consultant for the siting and design of submarine outfalls and diffuser systems for the World Health Organization, Pan American Health Organization, World Bank and US AID for projects in Lebanon, the Cook Islands, Micronesia, the Ivory Coast, Morocco, South Korea, the Philippines and Thailand.

Russell lectured and organized seminars and congresses throughout his career sharing his knowledge of the field with younger generations. He was a Life Member of several American and International Associations and Societies including ASCE (American Society of Civil Engineers), receiving the Rudolph Hering Medal for the Most Valuable Contribution to the Sanitary Engineering Division of ASCE in 1955, AAEE (American Academy of Environmental Engineers); IWA (International Water Association) and AWWA (American Water Works Association).

Courtesy of his daughter, Sandra (Ludwig) Lehnhard

Mr. Ludwig became a Board Certified Environmental Engineer in Sanitary Engineering in 1956 and had earned Life status.

Member News, *continued on page 16*

ACADEMY NEWS

2018 ANNUAL MEETING ACTIVITIES

The Fall 2018 Annual Meeting of the Board of Trustees was held in Austin, Texas, on October 25 and 26, 2018.

The festivities began on the afternoon of October 25. The BoT and invited guests toured the Meadows Center for Water and the Environment at Texas State University. That evening, at the Austin Marriott South, the President's Reception and Installation Dinner were held. And a special thank you to Sammi for doing double-duty as the staff photographer.

The BoT Meeting was held at the Wood Environment & Infrastructure Inc., in Austin, Texas, on October 26. The meeting included four guest members: Jason A. Kirby, APWA Trustee-Elect, Wayne Klotz, ASCE Trustee-Elect, Andrew R. Shaw, WEF Trustee-Elect and Brian P. Flynn, Past President. Also attending were Burk Kalweit, AAEES Executive Director, and Sammi Olmo, Manager Special Projects. Highlights of the meeting appear below:

2019 Individual Award Recipients

The 2019 AAEES Honorees were selected. The presentation of the awards will take place at the 2019 Excellence in Environmental Engineering and Science Awards Luncheon and Conference, which will be held at the National Press Club in Washington D.C., on April 25. Congratulations to:

- Stanley E. Kappe Award - **R. Benson Pair**
- Edward J. Cleary Award - **Christopher Schultz**
- Gordon Maskew Fair Award - **David Dzombak**
- Honorary Member Award - **Gordon Maskew Fair** *(in Memoriam)*
- International Honorary Member Award - **Chilpin Huang**
- Science Award - **Joseph Cotruvo**

Approved 2019 American Academy of Environmental Engineers Certification Board

The American Academy of Environmental Engineers Certification Board (AAEECB) oversees the certification program for environmental engineers. The 2019 AAEECB is:

- Robert Williams, Chair
- Lamont Curtis, Vice Chair
- Jeanette Brown
- Christian Davies-Venn
- Hunter Nolen
- Wendy Wert
- Cecil Lue-Hing

Approved 2019 American Academy of Environmental Scientists Certification Board

The American Academy of Environmental Scientists Certification Board (AAESCB) oversees the certification program for environmental scientists. The 2019 AAESCB is:

- James W. Patterson, Chair
- James Clarke, Vice Chair
- Robert Schoenberger
- Brian Flynn
- Benson Pair
- Chriso Petropoulou

Lilia Abron, Wendy Wert, Jeanette Brown, David Gaddis, Richard Magee, Merlyn Hough, Sammi Olmo, Benson Pair, Hunter Nolen, and John Tobiason at the Meadow Center

The BoT at the Meadow Center

New Officers and Trustees

Congratulations to the 2019 Officers and Trustees who were installed during the Annual Meeting on October 26 and will take office January 1, 2019:

- **Kristin Morico**, President;
- **James W. Patterson**, President-Elect;
- **Lilia A. Abron**, Vice President;
- **Dan Oerther**, Treasurer; and
- **C. Hunter Nolen**, Past President.

Trustees serving their first three-year term:

- **Jason A. Kirby**, representing APWA,
- **Wayne Klotz**, representing ASCE,
- **Charles N. Haas**, representing ASEE,
- **Edward J. Bouwer**, representing AEESP, and
- **Andrew R. Shaw**, representing WEF.

Serving their first three-year terms as Trustees-at-Large are:

- **Richard P. Watson** and
- **James H. Clarke**.

Positions are still vacant are for trustees representing NSPE and SWANA.

AAEES would like to thank the following individuals who will be leaving the board on December 31:

- **Robert C. Williams**, Past President;
- **Gordon R. Garner**, representing APWA;
- **Kyle E. Schilling**, representing ASCE;
- **John E. Tobiason**, representing AEESP;
- **Christopher D. Jones**, representing NSPE;
- **Robert J. Schoenberger**, representing SWANA;

Academy News, *continued on page 14*

Kristin Morico and Jeanette Brown

Benson Pair, Hunter Nolen, Karen Nolen, Martha Hough, and Merlyn Hough

Wendy Wert and Lilia Abron

Lilia Abron, James Patterson, and Jason Kirby

EXECUTIVE DIRECTOR'S PAGE

Burk Kalweit

Boundaries Provide Insight

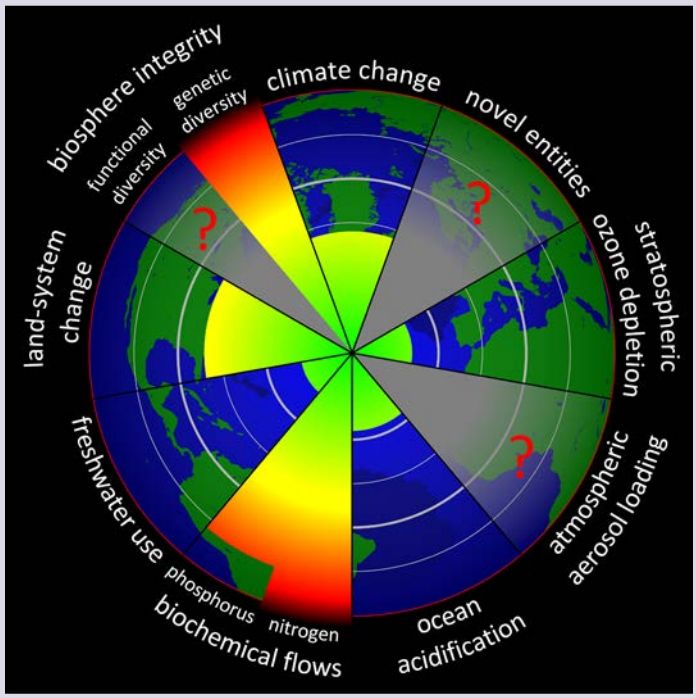
One of the things that makes working in the environmental industry so fascinating is that it is a beautiful study in complexity in which we learn that everything truly is connected. The apocryphal tale of the butterfly flapping its wings in the Amazon and creating a cyclone in the South Pacific is perhaps a bit overly dramatic, but it does make the point. That connectivity is most often cited these days by the growing public awareness of climate change and the impacts that can be seen compounding themselves on, what seems to be, an annual basis.

We have gotten to the point where the newly-established conventional wisdom appears to be holding sway over those who still doubt the reality of man-made increases in CO2 levels. If we believe that everything is ultimately connected, that means that the simplistic explanation of global warming and climate change are not blessed with enough explanatory power to make a compelling case that we have found the climate change culprit and know how to fix the problem.

Instead, we should be using the uncertainty we have uncovered to take a look at climate change through a fresh set of eyes. If we believe that everything is connected to everything else, then it behooves us to begin investigating what that 'everything else' is made of and how it works. Thankfully, someone has bothered to do just that. Actually, a collection of someones has been working on this problem since before 2009.

It was in 2009 that Johan Rockström, Director of the Stockholm Resilience Centre of Stockholm University, led a group of 28 internationally renowned scientists to identify the processes that regulate the stability and resilience of the Earth system. After narrowing the list down to nine major component systems, the scientists proposed quantitative planetary boundaries within which humanity can continue to develop and thrive for generations to come. However, they noted that crossing these boundaries increases the risk of generating large-scale abrupt or irreversible environmental changes.

The planetary boundaries framework has since then generated substantial interest within the scientific, political, and practitioner communities. The first scientific article on the framework was published in 2009 in the journal *Ecology and Society*. As of January 2018, this article had been cited 685 times. A feature article in *Nature* the same year generated more than 2,535 citations. New scientific insights on several of the processes were included in a 2015 update to the original study that was published in *Science*. It stated that society's activities have pushed climate change, biodiversity loss, shifts in nutrient cycles (nitrogen and phosphorus), and land use beyond the boundaries defined in the original work and into unprecedented territory. Research and debate continue on the other original boundaries for water-system change and chemical pollution.



Planetary boundaries according to Rockström *et al.* 2009 and Steffen *et al.* 2015.

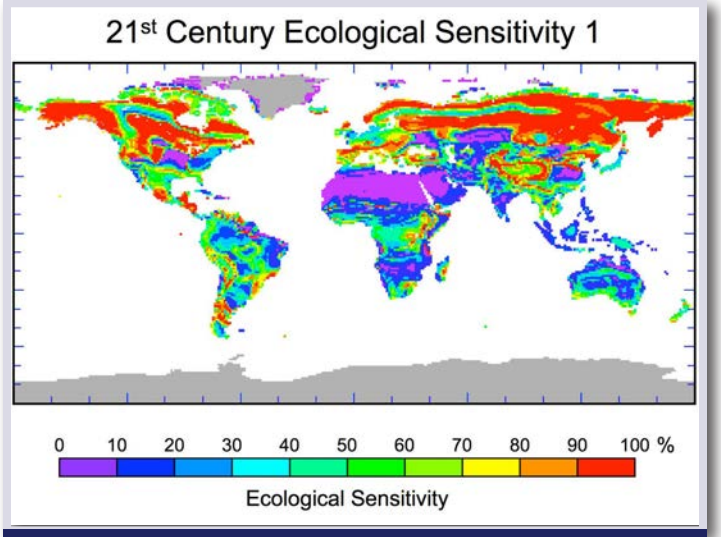
The green areas represent human activities that are within safe margins, the yellow areas represent human activities that may or may not have exceeded safe margins, the red areas represent human activities that have exceeded safe margins, and the gray areas with red question marks represent human activities for which safe margins have not yet been determined.

Stratospheric Ozone Depletion

The stratospheric ozone layer in the atmosphere filters out ultraviolet (UV) radiation from the sun. If this layer decreases, increasing amounts of UV radiation will reach ground level. This can cause a higher incidence of skin cancer in humans as well as damage to terrestrial and marine biological systems. The appearance of the Antarctic ozone hole was proof that increased concentrations of anthropogenic ozone-depleting chemical substances, interacting with polar stratospheric clouds, had passed a threshold and moved the Antarctic stratosphere into a new regime. Fortunately, because of the actions taken as a result of the Montreal Protocol, we appear to be on the path that will allow us to stay within this boundary.

Loss of Biosphere Integrity (Biodiversity Loss and Extinctions)

The Millennium Ecosystem Assessment of 2005 concluded that changes to ecosystems due to human activities were more rapid in the past 50 years than at any time in human history. The main drivers of change are the demand for food, water, and natural resources, causing severe biodiversity loss and leading to changes in ecosystem services. These drivers are either steady, showing no evidence of declining over time, or are increasing in intensity. The current high rates of ecosystem damage and extinction can be slowed by efforts to protect the integrity of living systems (the biosphere), enhancing habitat, and improving connectivity between ecosystems while maintaining the high agricultural productivity that humanity needs. Further research is underway to improve the availability of reliable data for use as the 'control variables' for this boundary.

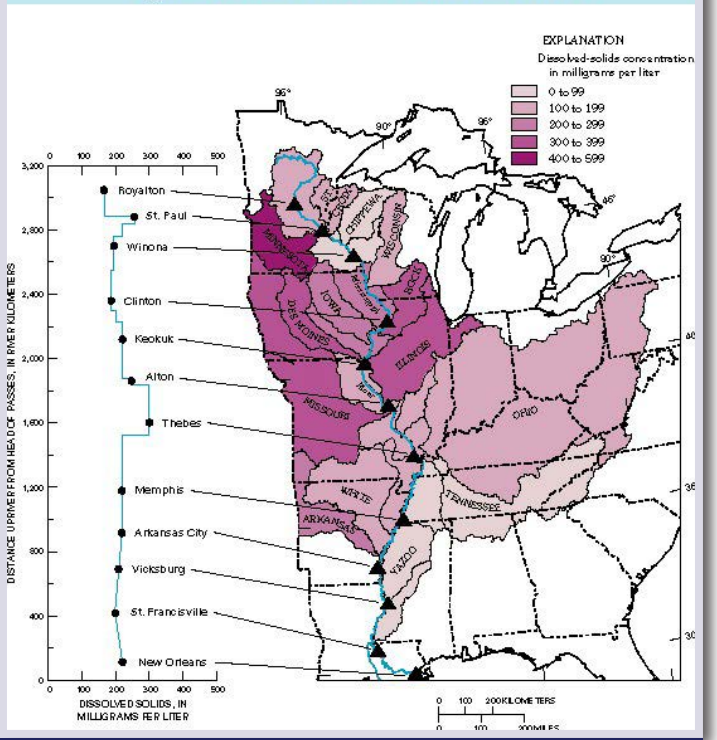


21st Century Ecological Sensitivity - Changes in Plant Species

Predicted percentage of ecological landscape being driven toward changes in plant species as a result of projected human-induced climate change by 2100.

Credit: NASA/JPL-Caltech

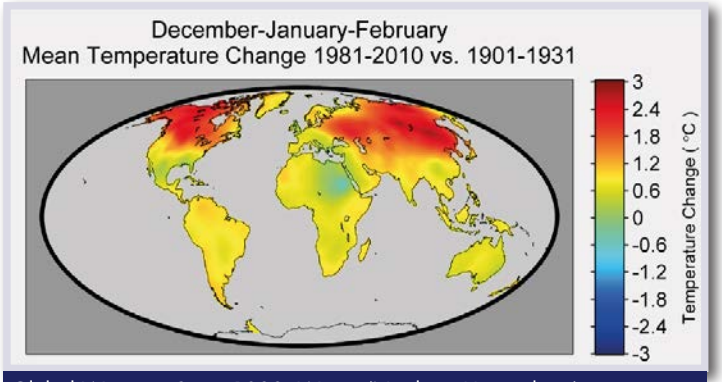
Figure 12--*Dissolved Solids in River Waters*



Credit: https://pubs.usgs.gov/circ/circ1133/chemsetting.html

Climate Change

Recent evidence suggests that the Earth, now passing 390 ppmv CO2 in the atmosphere, has already transgressed the planetary boundary and is approaching several Earth system thresholds. We have reached a point at which the loss of summer polar sea-ice is almost certainly irreversible. This is one example of a well-defined threshold above which rapid physical feedback mechanisms can drive the Earth system into a much warmer state with sea levels meters higher than present. The weakening or reversal of terrestrial carbon sinks, for example through the on-going destruction of the world's rainforests, is another poten-



Global Warming Since 1900: Winter (Northern Hemisphere)

This figure illustrates the change in temperature over the past 80 years during December-January-February (the Northern Hemisphere winter season). Warming during this season is not uniform across the globe, with maximum values occurring in the northern latitudes.

Credit: http://berkeleyearth.org/graphics/physical-effects-of-warming/

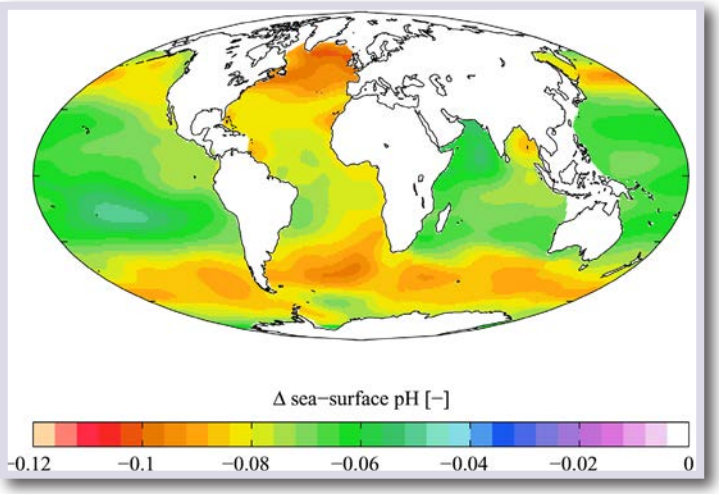
tial tipping point where climate-carbon cycle feedbacks accelerate Earth's warming and intensify the climate impacts. A major question is how long we can remain over this boundary before large, irreversible changes become unavoidable.

Chemical Pollution and the Release of Novel Entities

Emissions of toxic and long-lived substances such as synthetic organic pollutants, heavy metal compounds and radioactive materials represent some of the key human-driven changes to the planetary environment. These compounds can have potentially irreversible effects on living organisms and on the physical environment (by affecting atmospheric processes and climate). Even when the uptake and bioaccumulation of chemical pollution is at sub-lethal levels for organisms, the effects of reduced fertility and the potential of permanent genetic damage can have severe effects on ecosystems far removed from the source of the pollution. For example, persistent organic compounds have caused dramatic reductions in bird populations and impaired reproduction and development in marine mammals. There are many examples of additive and synergic effects from these compounds, but these are still poorly understood scientifically. At present, we are unable to quantify a single definitive chemical pollution boundary. Instead, the risk of crossing Earth system thresholds is considered sufficiently well-defined for it to be included as a priority for precautionary action and further research.

Ocean Acidification

Around a quarter of the CO2 that humanity emits into the atmosphere is ultimately dissolved in the oceans where it forms carbonic acid, altering ocean chemistry and decreasing the pH of the surface water. This increased acidity reduces the amount of available carbonate ions, an essential 'building block' used by many marine species for shell and skeleton formation. Beyond a threshold concentration, this rising acidity makes it hard for organisms, such as corals and some shellfish and plankton species, to grow and survive. Losses of these species would change the structure and dynamics of ocean ecosystems and could potentially lead to drastic reductions in fish stocks. Compared to pre-industrial times, surface ocean acidity has already increased by 30 percent. Unlike most other human impacts on the marine environment, which are often local in scale, the ocean acidification boundary has ramifications for the whole planet. It is also an example of how tightly interconnected the boundaries are, since atmospheric CO2 concentration is the underlying controlling variable for both the climate and the ocean acidification boundaries.



Freshwater Consumption and the Global Hydrological Cycle

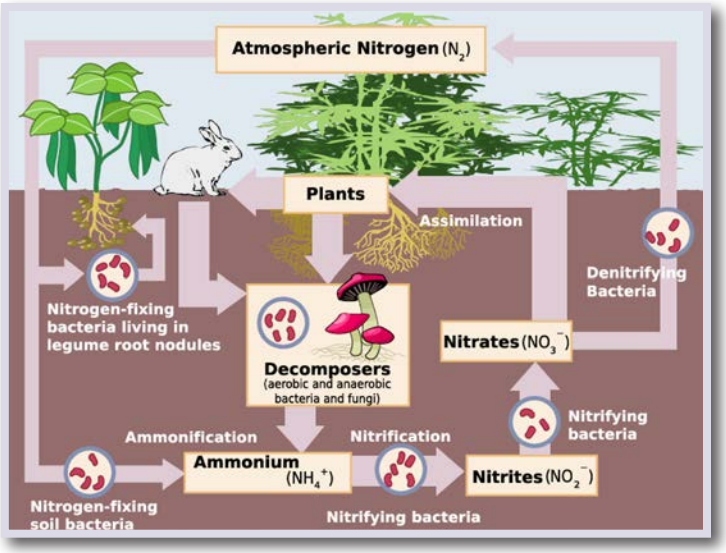
The freshwater cycle is strongly affected by climate change and its boundary is closely linked to the climate boundary, yet human pressure is now the dominant driving force determining the functioning and distribution of global freshwater systems. The consequences of human modification of water bodies include both global-scale river flow changes and shifts in vapor flows arising from land use change. These shifts in the hydrological system can be abrupt and irreversible. Water is becoming increasingly scarce - by 2050 about half a billion people are likely to be subject to water-stress, increasing the pressure to intervene in water systems. A water boundary, related to consumptive freshwater use and environmental flow requirements has been proposed to maintain the overall resilience of the Earth system and to avoid the risk of 'cascading' local and regional thresholds.

Land System Change

Land is converted to human use all over the planet. Forests, grasslands, wetlands and other vegetation types have primarily been converted to agricultural land. This land-use change is one driving force behind serious reductions in biodiversity, and it has impacts on water flows and on the biogeochemical cycling of carbon, nitrogen and phosphorus, and other important elements. While each incident of land cover change occurs on a local scale, the aggregated impacts can have global consequences for Earth system processes. A boundary for human changes to land systems needs to reflect not just the absolute quantity of land, but also its function, quality and spatial distribution. Forests play a particularly important role in controlling the linked dynamics of land use and climate, and are the primary focus of the boundary for land system change.

Nitrogen and Phosphorus Flows to the Biosphere and Oceans

The biogeochemical cycles of nitrogen and phosphorus have been radically changed by humans as a result of many industrial and agricultural processes. Nitrogen and phosphorus are both essential elements for plant growth, so fertilizer production and application is the main concern. Human activities now convert more atmospheric nitrogen into reactive forms than all of the Earth's terrestrial processes combined. Much of this new reactive nitrogen is emitted to the atmosphere in



various forms rather than taken up by crops. When it is rained out, it pollutes waterways and coastal zones, or accumulates in the terrestrial biosphere. Similarly, a relatively small proportion of phosphorus fertilizers applied to food production systems is taken up by plants. Much of the phosphorus mobilized by humans ends up in aquatic systems. These can become oxygen-starved as bacteria consume the blooms of algae that grow in response to the high nutrient supply. A significant fraction of the applied nitrogen and phosphorus makes its way to the sea, and can push marine and aquatic systems across ecological thresholds of their own. One regional-scale example of this effect is the decline in the shrimp catch in the Gulf of Mexico's 'dead zone' caused by fertilizer transported in rivers from the US Midwest.

Atmospheric Aerosol Loading

An atmospheric aerosol planetary boundary was proposed primarily because of the influence of aerosols on Earth's climate system. Through their interaction with water vapor, aerosols play a critically important role in the hydrological cycle affecting cloud formation and global-scale and regional patterns of atmospheric circulation, such as the monsoon systems in tropical regions. They also have a direct effect on climate by changing how much solar radiation is reflected or absorbed in the atmosphere. Humans change the aerosol loading by emitting atmospheric pollution (many pollutant gases condense into droplets and particles), and also through land-use change that increases the release of dust and smoke into the air. Shifts in climate regimes and monsoon systems have already been seen in highly polluted environments, giving a quantifiable regional measure for an aerosol boundary. A further reason for an aerosol boundary is that aerosols have adverse effects on many living organisms. Inhaling highly polluted air causes roughly 800,000 people to die prematurely each year. The toxicological and ecological effects of aerosols may thus relate to other Earth system thresholds. However, the behavior of aerosols in the atmosphere is extremely complex determined by their chemical composition and their geographical location and height in the atmosphere. While many relationships between aerosols, climate and ecosystems are well established, many causal links are yet to be discovered.

Summary

There they are. The nine slices of the environmental pie as defined by our friends in Sweden. One has to admire the amount of work and the type of critical thinking that went into the planetary boundaries concept and analytical implementation. Probably the most important take away is the effort by the authors to show that in the environmental arena connectivity is still a compelling concept. It seems like the more we learn about the environment around us the more we are humbled by our lack of knowledge.

What's interesting is that when one searches for criticism of the planetary boundaries construct, there is relatively little to be found. Instead, there appears to be general agreement with the framework. There is also a modicum of gratitude that the team from Stockholm took on the challenge of creating a new foundation from which to further our knowledge of the environment and the boundaries that we need to be aware of. In this case, the consensus appears to be that it doesn't really matter whether the framework is 100% correct. What's important is that someone made the effort to provide the platform for the future and did so in a way that is both useful to the scientific community as well as comprehensible for the general public. Since that is where the funding for future research comes from, one cannot overstate the importance of being able to provide cogent, easily-understood analyses to feed the political debates. These will determine how successful the world is in grappling with environmental uncertainty and the need to take action when the outcome of those actions cannot be guaranteed. The critical need being filled by the boundaries platform is the need to have stakes put in the ground that literally define the boundaries of the debate. By establishing starting points and directional constraints, our colleagues at the Stockholm Resilience Center enable the debate. What can be more important than that?

If you are interested, there is a TED talk from 2010 featuring Johan Rockström introducing the Planetary Boundaries framework. Simply go to the TED website and search for Rockström. A

- Jeanette A. Brown, representing WEF; and
- David M. Gaddis, Trustee-at-Large.

2020 Elections

The Board approved the following candidates for Vice President and Trustee-at-Large for 2020, as recommended by the Nominating Committee. Profiles of the candidates will appear in the Spring 2019 issue of *Environmental Engineer & Scientist*.

Vice President:
- Daniel Oerther
- Benson Pair

Trustee-at-Large:
- Mary DeFlaun
- Robert Gilbertsen
- Jeffrey Greenfield
- Sharon Yin

2019 KAPPE LECTURER

Dr. Nancy G. Love, P.E., BCEE, has been selected as the 2019 AAEES Kappe Lecturer. Dr. Love is a Professor at University of Michigan and served as President of AEESP in 2010. A profile and abstracts of the lecturers to be offered will appear in the Winter 2019 issue of *Environmental Engineer & Scientist*.

2019 AAEES President, Kristin Morico

The new board members and trustees are sworn in

Robert Schoenberger and Burk Kalweit

James Patterson, Wayne Klotz, and Kyle Schilling

AAEES NOW ACCEPTING ENTRIES FOR THE E3S AND ECOMM AWARDS COMPETITIONS

Excellence in Environmental Engineering & Science (E3S) Awards Competition

The Excellence in Environmental Engineering & Science (E3S) Awards Competition is the Gold Standard for identifying state-of-the-art projects in environmental engineering and science. Its criteria define what it takes to be the best in environmental engineering and science practices: a holistic environmental perspective, innovation, proven performance and customer satisfaction, and contribution to an improved quality of life and economic efficiency.

Entries are accepted in the following categories:

- Design
- Environmental Sustainability
- Industrial Waste Practice*
- Operations/Management
- Planning
- Research
- Small Firms
- Small Projects
- University Research

**The Grand Prize winner in Industrial Waste Practice also receives the The W. Wesley Eckenfelder Industrial Waste Management Medal sponsored by AquAeTer.*

Go to http://www.aaees.org/e3scompetition/ for more information. Entry deadline is February 1, 2019.

Environmental Communications (EComm) Awards Competition

The Environmental Communications (EComm) Awards Competition recognizes the efforts of organizations in communicating complex and challenging issues to environmental conservation groups, town councils, state and national legislative bodies, private sector companies, and the general public

John Tobiason, Andrew Shaw, Kristin Morico, and Jeanette Brown

Hunter Nolen and Robert Schoenberger

David Gaddis and Hunter Nolen

Jeanette Brown

by highlighting the value and importance of their projects and their economic and public health benefits.

The judging criteria for the Environmental Communications Awards includes:

- Innovative approach to messaging or branding
- Future value to the water engineering profession
- Creativity and clarity in portraying and communicating the messages
- Effectiveness in delivery and achieving desired outcome
- Integrated Design Approach - Narrative and visual elements work together to achieve the communication objectives.

Go to http://www.aaees.org/ecommcompetition for additional information. Entry deadline is March 1, 2019.

Entering either competition is easy and the submission process is done entirely online! It starts with simply downloading, completing, and submitted the respective reservation forms to Academy Headquarters. The reservation form acts as an intent to enter. You will then be assigned a personal and secured drop box for electronically submitting your projects.

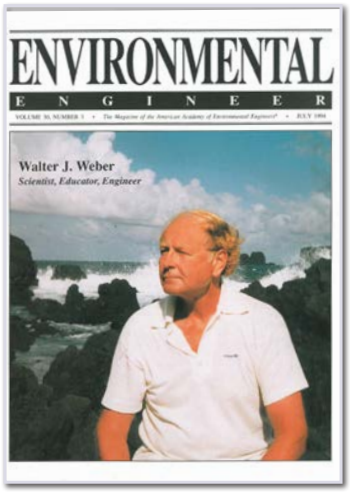
Winners are invited to the Excellence in Environmental Engineering and Science Awards Luncheon and Conference held annually at the prestigious National Press Club in Washington, D.C., to accept their trophies. The 2019 E3S Awards Luncheon and Conference will take place on April 25, 2019.

Member News, *continued from page 7*

Passing of Walter J. Weber, Jr., Gordon M. Fair and Ernest Boyce Distinguished University Professor, University of Michigan
June 16, 1934 - October 18, 2018

by Burk Kalweit

Our community has lost one of the legends of our field with the passing of Walter J. Weber, Jr. Dr. Weber was the Gordon M. Fair and Ernest Boyce Distinguished University Professor of Environmental Sciences and Engineering at the University of Michigan.



Professor Weber received his Sc.B. degree from Brown University in 1956, his M.S.E. degree from Rutgers University in 1959, and his A.M. and Ph.D. degrees from Harvard University in 1961 and 1962, respectively. He joined the University of Michigan as an assistant professor in 1963, and was promoted to associate professor in 1965 and professor in 1968. In 1987 he was named the Earnest Boyce Professor of Civil Engineering, and in 1994, he was appointed the Gordon Maskew Fair and Earnest Boyce Distinguished University Professor of Environmental Sciences and Engineering. Professor Weber was Academy Board-certified in 1975, and was the 1995 recipient of the American Academy of Environmental Engineers and Scientists Gordon Maskew Fair Award.

His pioneering achievements in research and education in physical/chemical treatment processes have left a legacy of contributions to the environmental engineering and science field. Professor Weber was recognized internationally as a leader in the field of environmental process dynamics and system sustainability, and was one of the most distinguished environmental engineers in this field. More than 75 engineers and scientists completed their Ph.D. work under his tutelage and mentorship. Many of his protégés are themselves recognized internationally as leaders in the field of environmental sciences and engineering.

At Michigan, he was the founding director of the College of Engineering Academic Program of Concentrations in Environmental Sustainability ("ConsEnSus"). Professor Weber has received numerous awards, including the American Chemical Society's F.J. Zimmerman Award (1982), election to the National Academy of Engineering (1985), and the National Water Research Institute's Athalie Richardson Irvine Clarke Prize (1996).

His generous financial contributions include his endowment of the Walter J. Weber Jr. Distinguished Lecture in Environmental Science and Engineering, and of the Walter J. Weber Jr. Faculty Chair in Energy, Environment and Earth Systems Engineering in the College of Engineering.

Walter J. Weber, Ph.D., P.E., DEE, became a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering in 1975 and had earned Life status. Dr. Weber was featured as the cover story in the July 1994 (V30,N3) issue of *Environmental Engineer*.

AAEES Events Roundup

AAEES had another active year, as evidenced by the 2018 Member Activity Summary Report on page 21. In addition to those events, AAEES event activities and participation includes the list below and the articles on the following pages:

- AAEES Breakfast at New York Water Environment Association (NYWEA) 90th Annual Winter Meeting at the Marriott Marquis, Times Square, NYC. The guest speaker was Dr. Hossain M. Azam of Manhattan College with his topic being: *Sustainable Wastewater Treatment: Applications of Innovative Techniques, Process Control Strategies and Analytical Tools*
- AAEES's 10th Annual Breakfast and 9th Annual Workshop at the NJWEA John J. Lagrosa 103rd Annual Conference & Exposition, Atlantic City, NJ. The topic for the 2018 workshop was *Green Infrastructure for Stormwater Runoff*.
- Joint AAEES/AWWA Luncheon at AWWA ACE18 Conference, Las Vegas, Nevada. The 2018 speaker was David Rexing from Southern Nevada Water Authority. His topic was *Benefits of Conducting Public Water Agency Water Quality Research*
- AAEES/AEESP held a joint luncheon at WEFTEC 2018 which included the presentation of the 2018 Frederick G. Pohland Medal to Dr. Charles B. Bott, P.E., BCEE.
- A&WMA Trustee Merlyn Hough, P.E., BCEE, and Mark Rood, Ph.D., BCEEM, coordinated the running of the Academy's well-traveled booth at the Air & Waste Management Association's ACE 2018 *(photos above)*.

The AAEES Webinar Series

The AAEES Webinar Series are back with more winning projects from the 2018 Excellence in Environmental Engineering and Science Awards competition winners. Thanks to the support of the Environmental Engineering and Science Foundation, AAEES is able to continue the series to registrants free of charge. The following webinars have been held so far in 2018:

- *One Water LA 2040 Plan* presented by Azya Jackson, PE, ENV SP of City of Los Angeles, LA Sanitation and Anthony Tew, P.E. of Los Angeles Department of Water and Power
- *Owens Lake Environmental Protection and Dust Mitigation Program* presented by Nelson O. Mejia, P.E., and Jaime Valenzuela, P.E. Los Angeles Department of Water and Power
- *From Pilot to Full Scale: Development of STARx HottPad™* presented by Dave Majors, Ph.D., BCES, of Savron

AAEES has already scheduled additional webinars for 2019.

The USA Science and Engineering Festival

Richard J. Pope, P.E., BCEE

Another successful USA Science and Engineering Festival in Washington, DC! Thanks for the great booth positioning in Hall A and on a corner. Thank you to Joyce for packing up the magazines, books and banner; and Yolanda for helping provide a few extra hand out materials. I would say that we had just about the right amount of hand out "stuff", including the water droplet stress balls and pens. Although it is hard to estimate the number of people/children we encountered over the two days of the weekend, we did give away the 1250 water droplet stress balls and probably equivalent number of pens. And although I was talked out by the end of the conference, I still had a terrific time engaging the young children (and their parents) in a lively discussion on the various types of work environmental engineers and scientists do and how it plays a key role in their everyday life!

Richard Pope and Burk Kalweit

A big "Thank You" to Steve Lippy for stopping by and helping us address the masses on Saturday afternoon. He provided a welcome break to Burk and me in a crowd packed (Check out the photos of the crowds on Saturday) first day of the festival!

All it took was the first set of young visitors to set me straight and remind me why we were there!

Steve Lippy and Burk Kalweit; attendees of the 2018 USAF

2018 AAEES West Coast Event a Success

Wendy Wert, P.E., BCEE

On October 18, 2018, the American Academy of Environmental Engineers and Scientists (AAEES) hosted their annual West Coast Event titled *Climate Uncertainty; Is SoCal Ready to Invest in Sustainable Local Water Resources?* at the University of California Los Angeles (UCLA). The 2018 AAEES West Coast Event began with a networking dinner in Carnesale Commons. Guests then proceeded to a conference room for the technical portion of the program.

AAEES Past President Michael Selna welcomed attendees with a brief overview of the Academy. A primary objective of the Academy is to certify environmental engineers and Scientists in their area of expertise, which include, Air Pollution

Michael Stenstrom, Ph.D., P.E., BCEE, Mark Gold, D.Env., Deven Upadhyay, P.E., Dan Lafferty P.E., Traci Minamide, P.E., BCEE, Susan Rowghani, P.E.

Control, General Environmental Engineering, Hazardous Waste Management, Industrial Hygiene, Radiation Protection, Solid Waste Management, Water Supply/Wastewater Engineering and Sustainability. Board Certification is the next step beyond Professional Engineering licensure. Annually the Academy administers the Excellence in Environmental Engineering® Competition to identify and reward achievement in the field of environmental engineering. Michael Stenstrom, UCLA Professor of Civil and Environmental Engineering, then introduced the panelists.

The first panelist was, Mark Gold, Associate Vice Chancellor of Environment and Sustainability at UCLA and the leader of the Sustainable LA Grand Challenge. Dr. Gold challenged attendees to develop local water resources, by explaining that despite drought conditions, Californians are using just 1% less water compared with 2013.

In addition, our sources of imported water — from the Delta, the Colorado River, and the Los Angeles aqueduct — are vulnerable to politics, drought, climate change and crumbling concrete in recent years. Los Angeles sorely needs to transform its water infrastructure. In a proactive move, Mayor Eric Garcetti and the city of Los Angeles released the Resilient Los Angeles plan, which outlines 96 steps to strengthen the city. Among the smartest moves: reduce our reliance on imported water from the current 85% to less than 50% by 2035.

With a local supply portfolio — balanced between recycled water, captured stormwater, and groundwater — the city will survive catastrophes. Pumping less water from faraway sources has environmental benefits too. Moving water across the state uses huge amounts of energy. Leaving more water in the Delta, Owens Valley and the Colorado River watershed would reduce ecological impacts and the carbon footprint of our water supplies.

The bigger question is could Los Angeles become entirely water self-sufficient by 2050? Even as we face climate change and population growth? The answer is yes, but it will require a modern, integrated approach to water management.

The second panelist was Deven Upadhyay, Assistant General Manager Metropolitan Water District of Southern California. Mr. Upadhyay discussed a project by the Metropolitan Water District of Southern California and the Sanitation Districts of Los Angeles County that could become a beacon of hope as drought conditions and dwindling access to imported water continue to challenge Southern California.

The Regional Recycled Water Project in Carson is on tap to become one of the largest advanced water treatment plants in the world. Once fully operational, it will purify wastewater that will not only replenish groundwater supplies but be available for industrial and potentially potable uses.

The project's demonstration plant now under construction is expected to be complete and operational by late spring 2019. It will provide crucial data needed before work can begin on the full-scale recycled water plant, which will have the ability to recycle enough water for more than 335,000 homes.

The plan will provide an alternative supply of water that is drought resistant, scientifically feasible, and socially, environmentally and economically viable. The full-scale project is estimated to cost $2.7 billion to build and $129 million a year to operate. Once approved and designed, construction is expected to take 11 years.

The Regional Recycled Water Project is needed to augment other water supply sources including storm water capture, groundwater cleanup, consideration and ocean desalination. As the region continues its search for ways to conserve and provide reliable drinking water to an increasing population, officials hope the Regional Recycled Water Project will provide an educational opportunity for the public. This project that will help the region's local water supplies at all times and further drought-proof our area. MWD and the Sanitation Districts of Los Angeles County have worked together to help this region's water supply portfolio for many years.

The third panelist was Dan Lafferty, Deputy Director of the Los Angeles County Department of Public Works. Mr. Lafferty explained that stormwater is another local source we haven't adequately tapped. Based on a DWP study, urban runoff can provide an additional 58,000 acre-feet of water, or about 11% of current annual use. But the potential is there for much more: In an average rainfall year, 270,000 acre-feet per year of stormwater ends up flowing down the L.A. River into

Michael Selna, P.E., BCEE (lt) Michael Stenstrom Ph.D, P.E., BCEE (ctr) Attendees (rt)

the ocean. Funding for green stormwater infrastructure could come from the L.A. County Safe Clean Water Measure (Measure W), which passed in November.

Measure W, a parcel tax of 2.5 cents a square foot of "impermeable space," is projected to raise hundreds of millions of dollars annually to capture and clean up stormwater.

The tax, which had been in the works for two years, will help cities across Los Angeles County meet their obligations under the federal Clean Water Act and associated permits given out by the state. Supporters said it would also help make the region more "water resilient" in the face of drought and climate change.

The third panelist was Traci Minamide, Chief Operating Officer LA Sanitation. Ms. Minamide explained that currently, only 1% to 2% of the city's water supply comes from recycled water, but that could supply roughly 40%. All the wastewater going to the Terminal Island Treatment Plant gets recycled, but that's not the case at the Tillman, Glendale or Hyperion treatment plants. Those three discharge into the L.A. River and Santa Monica Bay.

If all the treatment plants were upgraded, their recycled water could be injected or filtered into our local groundwater basins.

The fourth panelist was Susan Rowghani, Director Water Engineering & Technical Services Los Angeles Department of Water and Power. Ms. Rowghani explained that in the future highly treated wastewater could be pumped to the Los Angeles Department of Water and Power's drinking water filtration plant for additional treatment distribution to customers.

Another resource could be our local groundwater basins. If Los Angeles can improve rainwater absorption with green streets and alleys, infiltration basins, biofilters and other nature-based solutions, local aquifers can provide approximately 114,000 acre-feet per year. An essential first step is already underway: the remediation of the San Fernando Valley aquifer. Our primary local aquifer, it became so contaminated with industrial chemicals that it's a Superfund site. But the city, with support from the state, has begun a $600-million project to clean it up. By cleaning the groundwater, DWP could provide residents and businesses with up to 20% of local water supply.

If we tally all those sources — recycled wastewater, captured stormwater and new groundwater — Los Angeles has about 372,000 acre-feet of local water that it could bring online by 2050. That's still not quite enough for a population likely to be 4.5 million.

The mayor's plan uses a consumption rate goal of 98 gallons per capita per day. To achieve complete water self-sufficiency, Angelenos would need to decrease consumption to approximately 75 gallons per capita per day. Numerous Australian, Southeast Asian and Western European cities have managed that. For Los Angeles to join them, all properties within the city will need to replace turf with native, climate-appropriate landscapes.

Residents will need to use water-efficient washing machines and dishwashers. Commercial properties will need to install water-efficient cooling technologies. Also, DWP customers should get individual smart meters that provide real-time consumption information.

A reoccurring theme thoughout the evening was that developing local water resources be challenging. But it can be done. These integrated solutions that will rely on collaboration between regional agencies, such as those represented at this event. A critical component of sustainable practices is appropriate investment.

A fundamental component of Certification is the Academy's continuing education requirements. The 2018 West Coast Event provided the membership with an enlightened and inspired opportunity to contemplate the sustainability of our water supply. By exploring Climate Uncertainty with regional experts our profession, continues its journey toward making universal access to safe water a reality.

The video and presentations are accessible on the AAEES Website at: http://www.aaees.org/resourcecenter/westcoast-summit-2018.php.

2018 Summary MEMBER ACTIVITY REPORT

Establishing More Student Chapters | Expanding the ABET Relationship Driving the Patrons Program | Holding Member-driven Conferences in CA and NY Defining the Mission of the Environmental Engineering and Science Foundation

AAEES – Celebrating Over 60 Years of Service to the Community of Environmental Professionals

2015 marked the 60th anniversary of the founding of the organization that evolved to become the Academy, but we were all too busy to stop and celebrate. Instead, we saluted the Academy's story and recognized where the Academy and its members have played an integral role in both recognizing significant environmental challenges and developing solutions for them. While there is a great history built by the Academy and its members, we cannot lose sight of the fact that the challenges facing environmental professionals now are as daunting as any that were faced in the past 60 years. We don't need to look much farther than our favorite cable news channel to get a sense that there is something going on in our environment. We may argue about impacts and causes, but there can be no denying that the past 20 or 30 years have seen environmental changes unlike anything in our recorded history. The challenge to us, as scientists, is to figure out exactly what is going on. The challenge to us, as engineers, is to create and proliferate the mechanisms that will enable us to adapt and prosper.

Committee and Staff Accomplishments

Academy volunteerism is being maintained at impressively high levels. This means that, put quite simply, the Academy is YOUR organization. We rely on the over 300 members who are serving as volunteers on over 25 committees and work groups to craft the programs and products that provide maximum value to you. The Academy's officers and members serving on committees, with the support of Academy staff, work diligently to assure that we are meeting our members' needs. If you are interested in participating, step up and give us a call and let us know which area or areas you would like to work in. You are needed and there is a place for you. Beyond committee work, you can be an ambassador for the Academy every time you give a presentation – just mention AAEES and what it means to you.

Dr. Karl Rockne, Keynote Speaker, 2018 Excellence in Environmental Engineering and Science Awards Luncheon and Conference.

Growing the Patrons Program

AAEES has been in existence for over 60 years, credentialing professionals in environmental engineering and science, educating the public about the value of environmental systems, working with the ABET (the Accreditation Board for Engineering and Technology) as the Lead Society in the accreditation of 80 college and university Environmental Engineering programs, and providing recognition for noteworthy, creative, and innovative projects and programs in the annual Excellence in Environmental Engineering and Science (E3S) competition.

To sustain the Academy's programs and enhance their effectiveness, the Academy created the Patrons Program as a new model for fiscal support. Participation is being offered in two 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 from the organizations in which they work, creates a powerful success model that will enable the Academy to better implement its organizational goals and mission.

The Patrons Program is far-reaching. Its intent is to have our patrons co-brand with the Academy for everything that we do in outreach to members, other environmental organizations and practitioners, and the general public.

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

- Featured recognition of Patrons on the AAEES website with a direct link to the Patron's website. AAEES staff works with Patrons' staff to structure their content and format. This aspect of the program benefits both the Patron and the Academy by publicizing the profession, its relevance, and its accomplishments.
- Signage/logo at all AAEES events
- Prominent Signage/Logo recognition in *Who's Who in Environmental Engineering and Science*
- Prominent Signage/Logo recognition 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 Signage/Logo recognition in the *Environmental Engineer and Scientist* quarterly magazine.

The Patrons Program is very effective in providing consistent recognition for our Patrons. Feel free to contact the Academy find out more about the Patrons Program and its significant benefits.

Other Academy Accomplishments in 2018

ABET Evaluations

Thanks to the countless hours spent by Academy ABET evaluators, there are now 80 university programs accredited in Environmental Engineering and 3 accredited in environmental engineering technology. The Academy is also working with ABET to create a new accreditation for environmental science programs. This activity has been moving forward over the past eighteen months. The objective of this activity is to ensure that there is a solid and consistent foundation underpinning the curricula and academic rigor of environmental science programs. We look forward to working with our colleagues at ABET and in the ABET community to meet this challenge. If things go according to plan, we should have our first one or two environmental science programs accredited before the end of 2019.

2018 Excellence in Environmental Engineering and Science Luncheon and Conference - *Presenting the Best of the Best*

The annual E3S event was focused on developing solutions that do more than just overcome technical challenges. The annual conference and associated luncheon showcased the award winning projects, and also highlighted the increased role that multi-disciplinary approaches play in designing and implementing meaningful, game-changing projects. What is becoming apparent is that our profession can no longer get by on just technical solutions. Instead, the work we do is increasingly regarded in the context of societal impacts, both positive and negative. Gone are the days in which project boundaries and objectives are driven by a small project team of engineers and other direct stakeholders. The state of the art now includes an evaluation that is multi-faceted and frequently inter-generational. That adds to

A NOTE FROM AAEES PRESIDENT 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

Kristin Morico, P.E., BCEE

the challenge, yet also adds to the rewarding feeling when it all comes together at the project's completion.

This theme was reinforced by the speakers of our morning conference, Paul Zofnass and Deb Frodl.

Paul Zofnass, president of the Environmental Financial Consulting Group, was our first speaker. His presentation, entitled *The Environmental and Infrastructure Engineering/ Consulting Industry: Trends, Changes, and Challenges*, summarized the current state of the industry and suggested ways that environmental practitioners need to redefine how they create solutions by borrowing liberally from other disciplines. Boosting productivity and profitability will require that the industry finds ways to remove the traditional boundaries between research and implementation.

Our second speaker was Deb Frodl, who most recently served as Global Executive Director of GE's Ecomagination initiative. Her presentation, entitled *The World Cannot Wait: Innovations for the Energy Transition*, focused on the program's design to establish partnerships with its customers to tackle their most pressing environmental challenges. By doubling GE's research spending to accelerate the development of the products and services they need, the expectation is that this long- term project that will use the technologies created to improve nationwide energy efficiency and environmental performance. She noted that Ecomagination's bottom line is the corporate bottom line with a mission to prove that going green is good for business and, increasingly, just plain good business.

Our luncheon featured a presentation by our keynote speaker, Dr. Karl J. Rockne, Director of the Environmental Engineering Program at the National Science Foundation. His presentation was entitled *The Engineering Grand Challenges – Where Environmental Engineering Fits Into the Landscape of Transformative Research*. The focus of his comments were on the rapid evolution of environmental engineering as a stand-

David Pettijohn and Penny Falcon of Los Angeles Department of Water and Power, 2018 Superior Achievement for Excellence in Environmental Engineering and Science (E3S) winner for *LA's Water Conservation Potential Study Targets a Sustainable Future.*

alone engineering discipline that has occurred in the last 50 years. Launched by the creation of the EPA, there has been continual growth in the field as the general public has become better educated in environmental topics and more willing to spend significant amounts of money to ensure that their environment is safe and clean.

Dr. Rockne's comments, as well as the other presentations, can be found at http://www.aaees.org/resourcecenter/.

Award winners presented their projects in a technical conference setting in the morning before the awards luncheon and in the afternoon following the luncheon address. Nearly 150 people attended the event at the National Press Club in Washington D.C. This is a truly unique forum that spans the spectrum from large to small projects, from large to small organizations, and across all environmental disciplines. We suggest that you make your plans now to attend next year!

2018 - Other Activities

In addition to its featured event in Washington, DC, the Academy also does annual events in New York State and southern California. These events are organized by Academy members located in those areas with support from the Academy for logistical and promotional activities. This works well because it enables these meetings to structure their agenda to topics that are of particular concern to stakeholders in their regional and local communities. The Academy is working to expand this program to other areas because it is an excellent way to raise the awareness of their given region to the challenges facing their own environmental situation.

California: *In This Era of Climate Uncertainty, is SoCal Ready to Invest in Sustainable Local Water Resources?*

The Academy assembled an audience for an evening session that included the stakeholders from the public water agencies in the Southern California area to share information on how they are revising their practices in the face of growing uncertainty about the reliability of supply. The program enabled attendees to learn about the strategies that these agencies are employing in addressing the limitations that the current 500 year drought is imposing on Southern California and its ability

2018 AAEES Annual West Coast Event *In this era of Climate Uncertainty; Is SoCal Ready to Invest in Sustainable Local Water Resources?*

The American Academy of Environmental Engineers and Scientists (AAEES) is presenting a dinner and networking seminar on Thursday, October 18, 2018, at the University of California Los Angeles (UCLA).

5:00 PM Check In 5:30 PM Dinner 6:30 PM Presentations 7:30 PM Panel Discussion 8:00 PM Adjourn

The **American Academy of Environmental Engineers and Scientists (AAEES)** is dedicated to excellence in the practice of environmental engineering to ensure the public health safety and welfare. In Southern California a key component of the practice focuses on meeting the challenge of securing future water supplies. Historically, water purchased from outside the region provided a reliable source. However, reduction in imported water supplies, combined with recurring droughts and population growth, indicate that demand for water will overwhelm supply unless new regional sources are developed.

General Manager Jeff Kightlinger will discuss progress on the Regional Recycled Water Program, a partnership with the Sanitation Districts of Los Angeles County to purify wastewater and produce high quality water that could be used again. The program will start with a demonstration facility and could eventually become one of the largest advanced water treatment plants in the world. **Vice Chancellor Mark Gold** will discuss the vulnerability of water sources to politics, drought, climate change and crumbling concrete. **Assistant Deputy Director Dan Lafferty** will discuss what it would take to capture all LA Countywide Stormwater for local beneficial reuse. **Chief Operating Officer Traci Minamide** will discuss how the City of Los Angeles is supporting the development of local sources. This interactive forum on developing local water supplies will be moderated by professor **Michael Stenstrom**.

Cost: $60 Students: $30

Register online at http://bit.ly/2018WestCoastConference

The West Coast Conference Sold Out Last Year!

Email Yolanda at YMoulden@aaees.org if you need assistance.

Dinner includes: Grilled Salmon, Roasted Potatoes, Rice Pilaf, Classic Caesar Salad, Fruit Salad, Rolls & Butter, and Assorted Dessert Bars.

~PLEASE POST~

CNY ENVIRONMENTAL SYMPOSIUM AAEES

2018 ENVIRONMENTAL SYMPOSIUM

Challenges Now and in the Future

Thursday, October 11, 2018 • Red Barn 20 • Cazenovia, NY

The American Academy of Environmental Engineers and Scientists (AAEES) is hosting a one-day environmental symposium in Cazenovia, New York. Leading professionals from Central New York with environmental specialties of water, wastewater, and solid waste will speak on current and future challenges and how to manage them in a sustainable, resilient, and cost-effective way. Attendees can earn up to five PDH credits.

Schedule for the Day

8:00 – 8:25 am	**Registration and Coffee**
8:25 – 8:30 am	**Welcome** Howard LaFever, PE, BCEE, Associate, GHD AAEES Past-President
8:30 – 9:30 am	**Current Challenges Facing Central New York from a Regulatory Perspective** Matthew Marko, PE, BCEE, Regional Director NYSDEC – Region 7
9:30 – 10:30 am	**Protecting Drinking Water from Harmful Algae Blooms** Stephen Waldvogel, PE, Associate GHD Seth Jensen, PE, Director of Municipal Utilities City of Auburn
10:30 – 10:45 am	**Break**
10:45 – 11:45 am	**Water Utilities of the Future** Geoffrey Miller, PE, BCEE, Deputy Executive Director Onondaga County Water Authority (OCWA)
11:45 – 1:00 pm	**Lunch and Networking** Students from Clarkson, Colgate, and SUNY ESF
1:00 – 2:00 pm	**Food Waste to Energy** Bill Rabbia, Executive Director Oneida-Herkimer Solid Waste Authority
2:00 – 2:30 pm	**Putting the "Great" Back into Great Lakes Fisheries** Jim Howe, Director Nature Conservancy's Central and Western New York Chapter
2:30 – 3:00 pm	**Anaerobic Digestion of High Strength Wastes: Managing Ammonia Inhibition** Stefan Grimberg. Ph.D., PE, BCEE Professor, Clarkson University
3:00 – 4:00 pm	**Control Phosphorus in Your Watershed: From a Fresh Water Perspective** Jim Cunningham, President New Water Technologies
4:00 – 4:05 pm	**Summary and Adjournment** Peter Radosta, PE, BCEE, Senior Vice President Koester Associates, Inc.

REGISTRATION FEES

Members.....$100.00
Non-Members.....$125.00
Students.....$25.00

Register online now at:
http://bit.ly/2018AAEESEastCoastConference

HOTEL INFORMATION

The Lincklaen House
79 Albany Street
Cazenovia, NY 13035
315.655.3461

$80.00 per night
Room block available 10/10/18 and 10/11/18

SYMPOSIUM ADDRESS

Red Barn 20
2527 NYS Route 20
Cazenovia, NY 13035
315.345.9174

Attendees of the NYS Conference at the Red Barn Inn in Cazenovia, NY

to meet water demands. More importantly, the speakers also focused on the options available for defining a 'new normal' with a focus on sustainability, and what that means for planning, designing, and building a water infrastructure that will accommodate their evolving reality.

There were close to 100 attendees and speakers at the session. It was a valuable lesson in the Academy's ability to stage a unique event that built on the foundation of knowledge, and the industry leadership, that its Board Certified members provided.

The entire set of speaker presentations and a video of the conference is available at http://www.aaees.org/resourcecenter/.

New York State: *Challenges Now and in the Future*

Being located in a rural environment means that the AAEES's New York State event was not as large as the California event, but the lack of size did not undercut the value being provided to stakeholders. Attendees included leading professionals from central New York State with environmental specialties in water, wastewater, and solid waste. Speakers presentations covered a variety of topics with a special emphasis on current and future challenges and how to manage them in a sustainable, resilient, and cost-effective way. The conference organizers made a special effort to attract attendees from three universities that were within an hour's drive radius of the site of the event, enabling both students and their professors to attend and network.

Getting involved in events like this is something that the Academy is uniquely qualified to do. Plans are currently being prepared to stage similar events at other locations in the Midwest or the southern states next fall. If you're interested in finding out more, feel free to call the Academy. We would be pleased to assist you in setting up a program that is specific to your location and the areas of expertise that those local stakeholders represent.

Student Chapters

There are now 24 chapters operating in the US and abroad. There are also over 500 student members participating in the program. Our focus for the year was on determining the program elements that would provide the most value for the student chapters and for the Academy. In addition to meeting the students' academic needs, we also want to give Academy members the opportunity to interact with our students at the local level. Revising the program in this way is expected to yield substantial benefits in professional development for the students, as well as building networking and mentoring opportunities for Academy members.

Young Professionals Program

The Academy is in the initial stages of establishing a young professionals program. The intent of the program is to enable early career professionals to maintain a connection to the Academy during the time period between when they first graduate from college and when they are eligible to apply for certification by the Academy. The program will feature components that target the areas that we have been told are the most important to our intended audience.

The Clarkson University Chapter of TXA attending the NYS Conference. *Photo Credit: Jamie Howard*

Social Media

We are continuing our efforts to integrate social media into the promotional program we are building for the Academy. We are working with a number of our partners to determine ways we can create meaningful social engagements at the professional level. We are all facing the issue of information overload, so our target is to reduce the quantity to the extent possible while simultaneously increasing the quality of the items that we post. Stay tuned as we launch various initiatives in this ongoing effort. And don't forget to 'like' us on our Facebook page and also check out what we are doing on Linked In.

Webinars

The Academy launched its first webinar series during 2014 and we have since worked on adjusting our program to make webinars an integral part of the student chapters and our Young Professionals offering and related activities. Just as we are looking to make better use of social media, we are looking for ways to take those things that are unique and special to the Academy and convert them into useful content and the foundation of unique educational experiences. We want to make this approach successful for both our membership and for those who fit within our public education mission.

Our webinar series aims to bring our E3S Conference to a wider audience. We have been working with our E3S award winners to tell the story of their award winning projects and expect that we can develop an audience for these sessions that draws upon interest from all elements of the environmental community. We did four webinars in the 2014-15 year. Our average attendance during the early phase was between 25 and 30 attendees. During 2018, we held eight webinars and had an average registration of around 180.

Another special emphasis has been on reaching out to the memberships of ASME, AIChE, A&WMA, APHA, ASEE, AWWA and SWANA – these are all organizations that have an active webinar program. We are working with these partners to make them aware of the state of the art in environmental solutions development. We have some great stories to tell. We are looking forward to making a broad cross-section of the public aware of the impacts that environmental engineering and science have on their lives.

If you would like to participate with us in this effort, feel free to give us a call. We look forward to working with you to improve the quality and the value of the Academy's programs.

The Environmental Engineering and Science Foundation

The Environmental Engineering and Science Foundation's primary purpose is to recognize and promote excellence in Environmental Engineering and Science. As a result, the public will become more aware of the important role Environmental Engineers and Scientists play in managing global, national and regional environmental challenges. To accomplish its goals, the Foundation dedicates its resources to education and awards focused on outstanding Environmental Engineering and Science achievement.

The Foundation impacts education ranging from K-12 to university levels. In K-12, the Foundation provides support for the American Academy of Environmental Engineers and Scientists to host an exhibit at the US Science and Engineering Festival and provides resources for awards to deserving students and teachers. Board Certified Environmental Engineers and Scientists are also provided support in the form of educational materials displayed and handed out at career fairs held at high schools across the country.

The Foundation is also working, in collaboration with other organizations, to supply Environmental Engineering and Science curricular programs to K-12 classrooms. At the university level, the Foundation works with the Academy to support the formation of student chapters of the Academy and provides resources for student conferences and speaking engagements for Board Certified Engineers and Scientists. Public education is provided in the literature, events, and web-based materials supported by donations to the Foundation.

Telling the Academy's Story

One of the challenges we continually face is explaining exactly what the Academy is and what it does for its membership and the general environmental community. We have a variety of materials available that we use to promote the Academy. Our website is, we believe, pretty good. Our magazine does a great job of summarizing and reporting on our activities. But the truth of the matter is that what the Academy does is not intuitively obvious to the average person, much less the average environmental engineer or scientist. So one of our key activities in 2018 was to create something that would tell the Academy

story as well as explain in concise terms the benefits of becoming a board certified environmental engineer or scientist.

This became a team effort involving over 20 people representing their professional technical specialty as well as their specific interaction with the Academy and its programs. These inputs were compiled into a document that we called the *Academy Value Proposition*. Rather than attempt to summarize what is contained in the document, we suggest that you go to the Academy website and click on the link under *Member Center* to access the value proposition document. There you will see two different versions of this publication. One is the long version which describes the history of the Academy as well as its current structure of activities ranging from the basic board certification services that we provide and extending to our array of conferences and award platforms.

There is also a shorter version of the value proposition document available at http://www.aaees.org under *Member Center*. This summarizes the basic value and benefits of the Academy program. The short version of the document explains the specific benefits of board certification to the individual applicant as well as the benefits available to the firm that the applicant is employed by. In addition to the descriptive mission, these documents are intended to be used as a recruiting tool by members when they want to encourage colleagues to consider board certification. Please take a look at the document and let us know what you think. Did we cover everything that needed to be covered? What else could we add that would do a better job of telling the story? Is there anything that we have included that is superfluous? We would be pleased to hear from you.

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

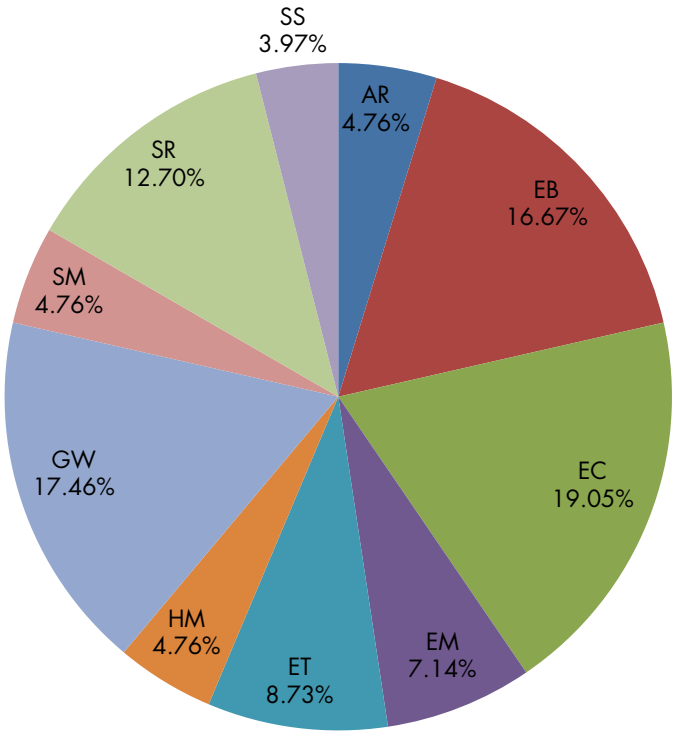
Part of the Academy's success lies with the selfless work of its members. Do you know of a member that always goes above and beyond? Then send a 350-word nomination for **Volunteer of the Month**.

Side Tracks

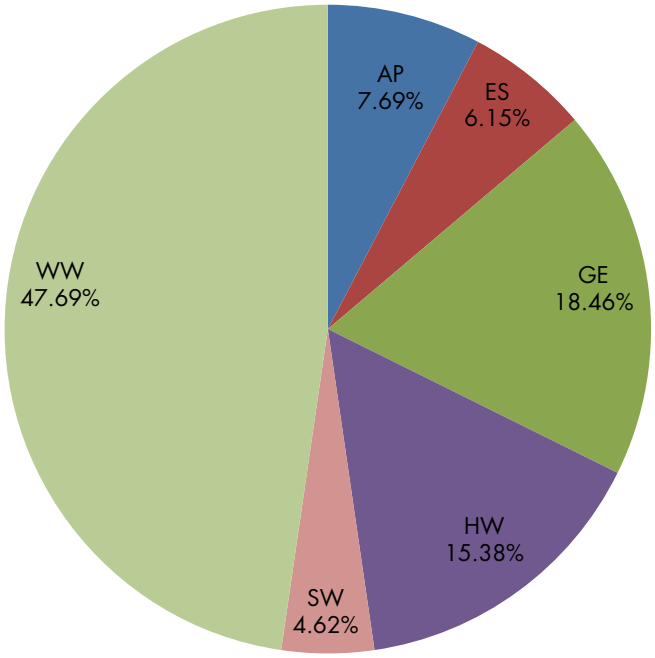
Interested in knowing about the extracurricular activities of your fellow Academy members? Or do you have fun (or possibly funny) stories you'd like to share? *Side Tracks* is intended to provide a vehicle for learning about the outside interests of your colleagues.

AAEES Board Certification – At a Glance

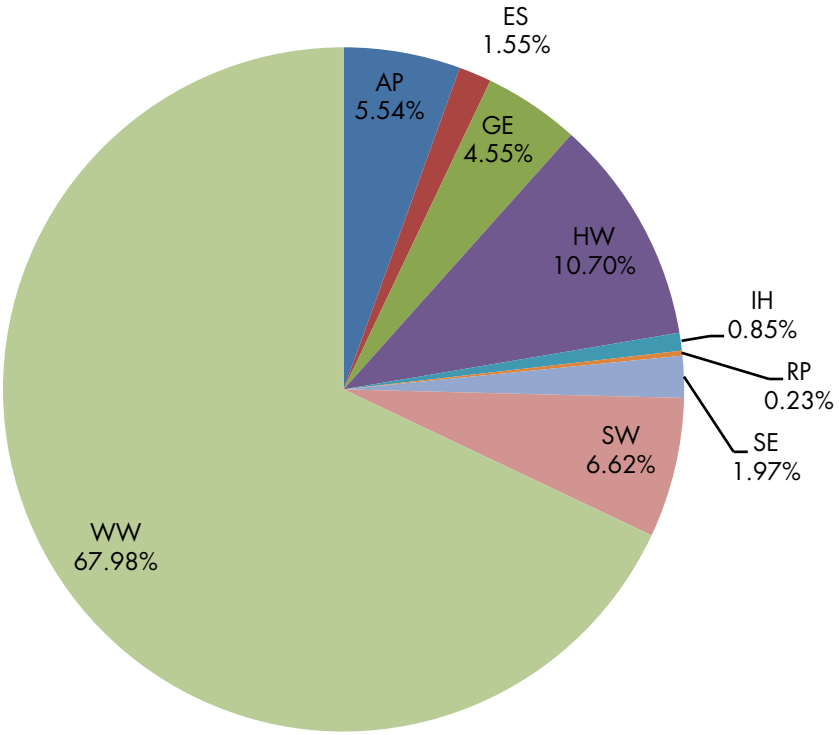
BCES Specialty Breakdown



BCEEM Specialty Breakdown



BCEE Specialty Breakdown



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

Data is based on current Board Certified Environmental Engineers, Board Certified Environmental Engineering Members, and Board Certified Environmental Scientists as of December 1, 2018.

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/.

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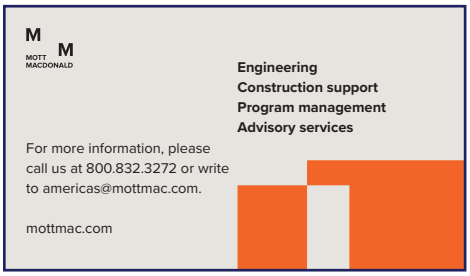
Professional Services Directory



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Environmental Communications Award

Your organization has been especially successful in communicating complex and challenging issues to the public and other important audiences. Through your efforts, citizens, environmental conservation groups, town councils, state and national legislative bodies, private sector companies, and others have come to realize the value and importance of your projects, and their economic and public health benefits. If that sounds familiar to you, get the recognition you deserve by entering the AAEES Environmental Communications Award competition.

Here are the criteria for judging the Environmental Communications Award:

Innovative approach to messaging or branding
- Future value to the water engineering profession
- Creativity and clarity in portraying and communicating the messages
- Effectiveness in delivery and achieving desired outcome
- Integrated Design Approach

This Award is designed to recognize environmental communication efforts by industrial entities; municipal, state and federal governments; and consulting firms who work to convey the important environmental messages to their constituencies and other interested parties.

The deadline to submit all entries is March 1, 2019.

Entry guidelines, submission forms, and previous winning entries available at http://www.aaees.org/ecommcompetition/.

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Start planning your entry now!

2019 Excellence in Environmental Engineering & Science

The Excellence in Environmental Engineering & Science (E3S) Awards competition is the **Gold Standard** for identifying state-of-the-art projects in environmental engineering and science. Awards and presentations are held in late spring at the National Press Club, Washington, DC.

Entries are accepted in the following categories:

- ❖Design
- ❖Industrial Waste Practice*
- ❖Planning
- ❖Small Firms
- ❖University Research
- ❖Environmental Sustainability
- ❖Operations/Management
- ❖Research
- ❖Small Projects

**The top prize for Industrial Waste Practice will also be presented with the W. Wesley Eckenfelder Industrial Waste Management Medal sponsored by AquAeTer*

To see profiles of the 2018 winning projects, go to
http://www.aaees.org/e3scompetition/

Entries must be submitted by February 1, 2019.

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