

AEES QUARTERLY

The Official Newsletter of the American Ecological Engineering Society

Sharing our stories, building networks, and growing together.

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Inside This Edition

President's Notes

AEES's new 2022-2023 President, Stephanie Lansing, provides her welcome address. She introduces the newly elected executive committee, provides highlights from the 2022 Annual meeting, and progress made by the Society's committees.

Page 2

AEES 2022 Annual Meeting

Major highlights from the 2022 annual meeting are recapped in this edition.

Page 3

AEES 2022 Student Poster Winners

Learn about the three 2022 Annual Meeting's student poster winners, their research, and interesting facts.

Page 4-6

Committee Updates

Each of the Society's Committees provide updates on the important work they are doing to grow and improve the society.

Page 7

AEES is Now on Social Media

Follow the American Ecological Engineering Society on the social media another opportunity to stay updated on the great work the Society is doing.

Pages 8

Career Opportunities

Learn about the latest career opportunities available relating to ecological engineering.

Page 8

President's Notes



Greetings from your new AEES President!

I am honored to be your 2022-2023 AEES President. I hope to build off the great momentum from this past year, which included launching the [Journal of Ecological Engineering Design](#), AEES quarterly [newsletters](#) and [webinar series](#), and movement towards ABET accreditation in Ecological Engineering. I am excited to work with our amazing Executive Committee - Dr. David Blersch (Vice President), Dr. Tiffany Messer (Secretary), Dr. William Strosnider (Treasurer), Dr. Michael Burchell

(past-President) and Ana Gabriela Itokazu (student representative), as we grow and engage our membership in meaningful ways.

At this year's AEES Business Meeting, we reaffirmed the need for everyone to become paid members each calendar year (<https://www.ecoeng.org/membership>). I encourage everyone to take a minute and renew your membership for 2022, if you have not already done so. We are actively working to rejuvenate our AEES committees and Certified Ecological Design (CED) workshops. During the conference, the student committee presented their Tool Kit for starting new student AEES chapters and launched their new communication and networking plans for our student members. Please look for more information on the [AEES website](#) in the coming weeks on these new efforts by our Student Committee. The Body of Knowledge committee is working hard on starting an ABET accreditation for Ecological Engineering at the undergraduate level. The Membership and Awards Committee is creating our inaugural AEES Fellows Program, and our Conference committee is busy preparing for our 2023 conference in Tampa, FL. Both committees could use help in planning these initiatives. Our Diversity, Equity, Inclusion, and Justice (DEIJ) committee is committed to continuing the great momentum from the stories shared at our closing Keynote on DEIJ and start working on new DEIJ initiatives for our membership. The work of each of our AEES committees is detailed in this newsletter. Being on a committee is a great first step to get more involved in improving the services provided by AEES and is also a great way to make new connections with other Ecological Engineers throughout the country. Anyone can join a committee: students, faculty, post-docs, industry professionals, and government employees. All perspectives are needed and welcomed.

It was so great to reconnect with everyone in Baltimore. I am hopeful and excited to work together to build AEES as we encourage the development of sustainable ecosystems that integrate human society with its natural environment - for the benefit of both!

Sincerely,

Stephanie Lansing, AEES President
Professor, Environmental Science & Technology
University of Maryland
slansing@umd.edu

2022 Annual Meeting Highlights

Baltimore, Maryland

In June 2022, we welcomed over 180 participants to our Annual AEES Meeting in Baltimore. The conference started with an inspiring Keynote speech by Dr. Peter Goodwin on the importance of building bridges with policy makers, industry, NGOs, and other scientific communities when engaging in restoration efforts. Our Keynote panelists, Sadie Drescher, Joe Berg, and Rebecca Stack, reiterated the importance of these community connections in their work in industry/NGOs to fulfill ecological engineering goals.

We had over 65 technical presentations given and 50 posters presented at the conference, with 3 student poster awards (and cash prizes) given. Participants split into five engaging field trips on best management practices in streams, watershed management, aquaculture, and oyster reefs. On our first night, the epic Baltimore band, “The Dive Bombs” rocked the night away, as we feasted on amazing local food on the Living Classrooms Pier that jetted out into the iconic Baltimore Harbor. We held our first Diversity, Equity, and Inclusion, and Justice (DEIR) session, with powerful stories on the potential impact of Native American inclusion in ecological engineering practices, the continual impact of past injustices, and the benefits of inclusive collaborations from our closing Keynote speakers: Rico Newman, Dr. Priscilla B.R. Alves, and Kelly Fleming. Finally, we hopped on a boat across the Harbor to the American Visionary Art Museum to view exhibits that combine art, science, philosophy, humor, and social justice, with artwork inspired by ecological connections.

We want to thank our AEES sponsors who made this conference possible, including our **Gold** ([RES, LLC](#)), **Silver** ([Water & Land Solutions, LLC](#), Nokose Farms, [Maryland Stream Restoration Association](#) (MSRA), [Tennessee Water Resources Research Center at University of Tennessee-Knoxville](#), [Van Essen Instruments “Diver,”](#) and [Chesapeake and Coastal Service at the Maryland Department of Natural Resources](#)), and **Bronze** ([Jacobs](#), [Underwood Associates](#), and [Biohabitats](#)) sponsors, and our host sponsor the University of Maryland’s Department of Environmental Science & Technology and College of Agriculture and Natural Resources.



Opening Keynote Address at AEES 2022 in Baltimore, MD



Social Dinner and Band on the Baltimore Harbor at AEES 2022



Oyster Reef Restoration Field Trip Near the Baltimore Harbor

AEES 2022 Student Poster Winners

Jessica Demarco

Institution: Kansas State University

Department: Biological & Agricultural Engineering

Degree: Ph.D. Candidate in Biological & Agricultural Engineering

Advisor: Dr. Stacy L. Hutchinson



Research Poster Summary: My poster research focuses on better understand the impact of using different terms and evaluate the connections and differences amongst the terms Environmental engineering, Ecological engineering, Nature-based solutions, Engineering with nature, Constructed wetlands, Green engineering, and Ecological systems through a bibliometric analysis. We believe that the creation and use of different terms resulting from attempts to find the most advantageous term politically, environmentally, and economically may have impacted the overall success of these initiatives, since it is difficult to search for a specific solution if there is an inconsistent use of terms. Although these terms represent and express the same idea of a sustainable ecosystem design, the hypothesis of this study is to test if the use of different terms referring to ecological engineering systems would weaken the ability to improve science and communicate the progress that has been done in this subject. Perhaps the more important question is whether either paradigm will be the right approach as we enter an age of more environmental issues now complicated by climatic shifts, more populated and more dense urban complexes, and a good possibility that we are running out of conventional energy resources that we have depended on.

Most Exciting/Surprising Part of Jessica's Research: The most surprising part of this research is that as theoretically sound, the term Constructed wetlands was chosen to be an example of Ecological engineering while providing ecosystems services and being a self-organizing ecosystem design, however, the strongest link appeared to be between Constructed wetlands and Environmental engineering. Furthermore, it is noteworthy



the importance that Nature based solutions is gaining in the sector from a strategic point of view. This term covers a whole range of ecosystem-related approaches and Ecological engineering seems to be one of these approaches that appears to make up the current scope of Nature based solutions.

Connections of Jessica's Research to Ecological Engineering: Ecological engineering is the term that at first appears attractive, marrying engineering and ecological scientific methods under the banner of increasing respect for nature. However, the growth of this term is somewhat stagnant, which can be tied to the Environmental engineering remaining the predominant area over time and to the term Nature-based solutions gaining popularity in lieu of Ecological engineering.

Fun fact about Jessica: My favorite activities are the ones that I can be connected with nature, such as hiking, camping, and paddle boarding. It does my heart and soul good and it is my way of recharging.

AEES 2022 Student Poster Winners

Sara Plude

Institution: Central Michigan University

Department: School of Engineering and Technology

Degree: B.S. in Environmental Engineering

Advisor: Dr. Roderick Lammers



Research Poster Summary: My research project was in conjunction with a biology professor, Dr. Daelyn Woolnough, at Central Michigan University. Dr. Woolnough analyzes Snuffbox mussel populations in Michigan rivers. The Snuffbox mussel is a rare, federally endangered species that favors coarse bed material in rivers. Showing a correlation between bed-grain size and Snuffbox presence could help Dr. Woolnough and other researchers locate Snuffbox and identify suitable habitat for future mussel reintroduction.

Dr. Woolnough's research team identified two live Snuffbox in the Tobacco River (located in mid-Michigan). We wanted to see a correlation between bed-grain size in this river with the location of the two live Snuffbox. Due to the limited time we had to conduct this research, we used stream power as a proxy for bed-grain size. I created two hydraulic models using ArcMap and HEC-RAS to show stream power values in comparison to river mile along the segment of river where the Snuffbox were found. The results showed high stream power values in the same general location for both ArcMap and HEC-RAS, but it did not show a correlation between stream power and Snuffbox presence.

Most Exciting/Surprising Part of Sara's Research: The most exciting part of my research was being able to collaborate with Dr. Woolnough's lab and connect principles I had learned in my environmental engineering coursework with our natural environment.

Connections of Sara's Research to Ecological Engineering: Finding a correlation between stream power and Snuffbox presence has the potential to increase the discovery of the Snuffbox mussel in other rivers with similar conditions, and researchers may also be able to successfully reintroduce the Snuffbox if desirable conditions are found.

Fun fact about Sara: I am serving in AmeriCorps NCCC for 10 months. My team just finished building a rock bridge for the South Carolina State Parks!



AEEES 2022 Student Poster Winners

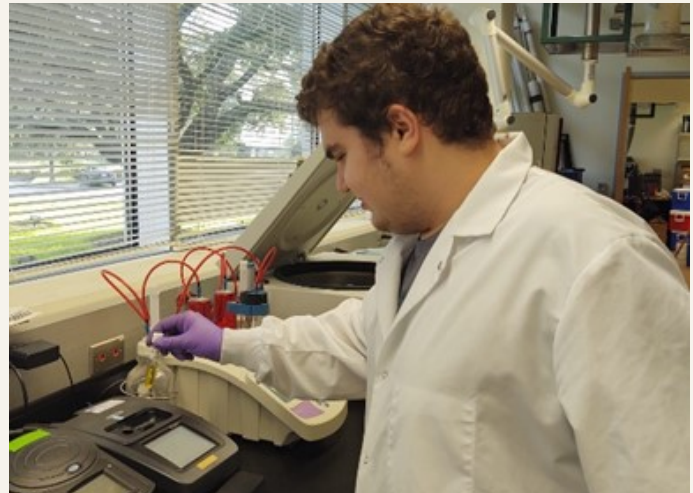
Bruno Fulco Mancini

Institution: University of South Florida

Department: Civil and Environmental Engineering

Degree: B.S. in Chemical Engineering

Advisor: Dr. Maricio Arias



Research Poster Summary: The poster discusses a membrane-based technique called Pressure Retarded Osmosis (PRO), which can help mitigate issues related to the high energy consumption in desalination processes. It is based on the salinity gradient between a dilute source, which could be treated wastewater effluent and a concentrated source, which could be Reverse Osmosis Concentrate (ROC), typically generated by seawater desalination plants. The research poster showcased the effects of water quality variability on PRO performance, which was evaluated through 2 different case studies scenarios, which were Santa Barbara in California and St. Thomas in the Virgin Islands, since those two regions have specific logistic factors that could make PRO feasible. Synthetic versions of the treated wastewater effluent and the ROC were produced in the lab through data provided by the plants. The effectiveness of different pretreatment methods, such as Ultraviolet Disinfection and Microfiltration was also evaluated, since wastewater effluent contains bacteria and organic matter that tend to cause membrane fouling, which is the accumulation of unwanted substances in the membrane, causing water flux decay over time and impacting system performance. Different water quality parameters were also measured to determine how the PRO system affects all these different parameters as the system runs.

Most Exciting/Surprising Part of Bruno's Research: The most exciting part of this research was to contribute to the solution of a problem the world is currently facing in several regions, which is limited water availability. Due to the high demand of water by society, industry and agriculture, seawater desalination is usually seen as an alternative, but the problem usually lies on the high energy consumption of the process. PRO is a technique that aims to address such issues by using two waste products and using the salinity difference in them to produce energy.

Connections of Sara's Research to Ecological Engineering: This research is connected to ecological engineering since Pressure Retarded Osmosis solves an issue related to brine management. When brine is disposed on water bodies, its high salinity causes the DO levels in these places to go down, which severely harms the aquatic life. PRO dilutes the brine during the process, which makes it a lot less harmful when discarded. PRO also aims to reduce the need for fossil fuels and is a renewable source of energy, which can help mitigate climate change.

Fun fact about Bruno: I am from Brazil and I love traveling around the world, having visited 10 countries so far.

Committee Updates

Joining a AEES committee at any time of the year is strongly encouraged. Please contact the Committee Chair if you are interested.

Conference Planning Committee

Chair of Committee – Maurico Arias mearias@usf.edu

The Conference Planning Committee is gearing up for the 2023 Annual meeting, to be held in Tampa, Florida and hosted in partnership by the University of South Florida, Jacobs Engineering, and the University of Florida. The committee is currently discussing dates, venues, and themes for this year's meeting. Stay tuned for additional updates in the next newsletter.

Diversity, Inclusion, Equity, and Justice (DIEJ) Committee

Chair of Committee – Ani Jayakaran anand.jayakaran@wsu.edu

The DEIJ committee greatly appreciates the support and feedback we got back from the phenomenal meeting in Baltimore hosted by UMD. The concluding plenary session on DEIJ featured three powerful speakers and their stories. The DEIJ committee also recruited several new members and now stands at 12 people. To continue the critical work that needs to be done, the DEIJ committee will meet once every two months starting in September. Ani Jayakaran will continue as Chair until the committee bylaws are finalized, and new leadership can be voted in. Eugene Law has agreed to serve as Secretary.

Membership and Awards Committee

Chair of Committee – Michael Burchell mike_burchell@ncsu.edu

Membership and Awards Committee - formerly known as the Recruitment and Membership Committee - has been renamed to better reflect its diverse charge that will include member relations, recruitment, retention, and membership awards. We are happy to report that membership this year is slightly up, and the committee has drafted requirements for the new AEES Fellows program, with the first class to be inducted at the 2023 AEES meeting.

Body of Knowledge Committee

Chair of Committee – Tricia Moore tlcmoore@ksu.edu

The BOK committee thanks the AEES community for their thoughtful feedback on both accreditation efforts and the body of knowledge document during the 2022 annual meeting in Baltimore. On the accreditation front, the BOK committee continues engagement with ABET and ABET member societies (ASABE and the American Academy of Environmental Engineers and Scientists) to work through details for accrediting ecological engineering programs. On the BOK document, the committee continues to work through application areas and skill levels appropriate to undergraduate ecological engineering students and is incorporating feedback from the annual meeting. The BOK committee meets bi-weekly and will welcome new members.

Student Chapter Committee

Chair of Committee – Ana Gabriela Itokazu gabi@auburn.edu

We are grateful for an amazing experience during the conference this year and energized for this upcoming term. We will have our meetings every second Fridays of each month, at 2 PM CST, hoping we can accommodate everybody. One of our first tasks this year is to figure out how to better keep track of our student chapters and build a better communication channel with all AEES students. As we move our communication from GroupMe to Discord (which will happen soon, hopefully next month), if you are out of the loop and want in, as always let us know!

We've Gone Social!

AEES is now on social media! Please follow the American Ecological Engineering Society on the social media platforms below for another opportunity to stay updated on the great work the Society is doing.

Twitter: [@AmericanEcoEng](https://twitter.com/AmericanEcoEng)

Instagram: [@ecologicalengineeringsociety](https://www.instagram.com/ecologicalengineeringsociety)

Get Featured in the Next Edition

We are always looking for new stories to tell, highlighting ecological engineering in academic, industries, locally and abroad. If you have a project you would like highlighted, know someone we should interview, or have pictures of groundbreaking research, please send them to our website manager, Brittany Santore (bmsantore@gmail.com) to be featured in our next edition of the AEES Quarterly.

Career Opportunities

Post-Doctoral Scholar: Hydrologic and Geomorphic Data Scientist

University of Vermont - Posted 08-31-2022

Research Analyst: Hydroinformatics

University of Vermont - Posted 08-31-2022

Post-Doctoral Scholar: Nature-based Solutions for Mitigating Flood Impacts

University of Vermont - 08-31-2022

Assistant Professor in Environmental Engineering or Environmental Science

University of Oklahoma Norman Campus: Gallogly College of Engineering: School of Civil Engineering and Environmental Science - Posted 08-02-2022

To see full descriptions, contact information, or to post an opportunity, please visit

<https://www.ecoeng.org/job-postings>