

Women of the Month



Research. Community. Collaboration. Celebration.

Mote Marine Laboratory
Sarasota, Florida

September 29th - October 1st, 2023



We make aquaculture happen.

From developing innovative research, to managing environmental resources, and cultivating commodities – the legacy of women, gender-diverse folks, people of color, Indigenous and cultural heritage communities, and LGBTQIA+ individuals on the field of aquaculture is undeniable.

Over the course of two and a half days at this conference, we will explore the values of research, community, collaboration, and celebration while bringing together the current and future generations of leaders in aquaculture. **We aim to celebrate, uplift, and empower the underrepresented voices in this industry.**

Women of the Water was formed with a vision to build community through connection and empowerment, catalyze learning and interdisciplinary collaboration, and enhance professional development opportunities for marginalized and underrepresented groups in aquaculture.

We are thrilled that you are here, and look forward to hearing your stories, learning from you, and working together to find solutions for a more diverse, equitable, and inclusive aquaculture industry, now and into the future.

Conveners



Sponsors

Platinum

NATIONAL ACADEMIES *Sciences
Engineering
Medicine*

GULF RESEARCH PROGRAM

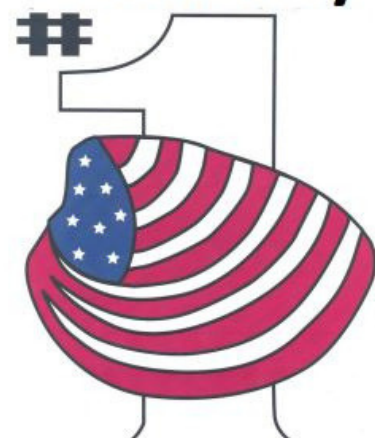


Silver



Bronze

Cedar Key



Aquaculture Association

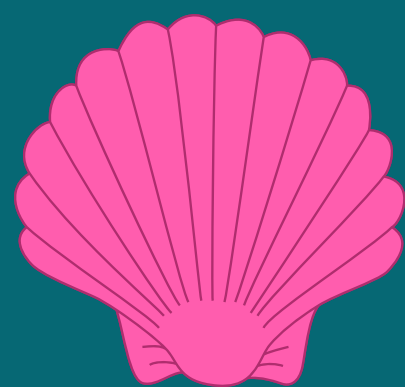
Nametag Ribbon Colors

To aid attendees in making initial connections and in facilitating interdisciplinary collaboration, we use nametag ribbons as visual identifiers of stakeholder groups. Attendees are given one or more ribbons based on their self-identified stakeholder group(s).

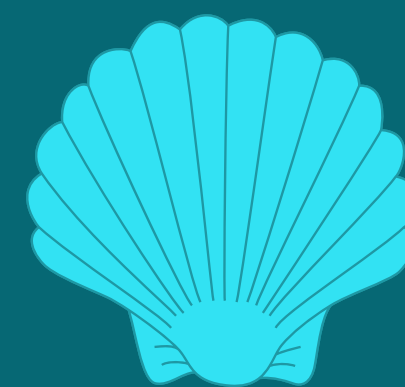
Use the legend below to see how your fellow attendees are involved in the aquaculture industry.



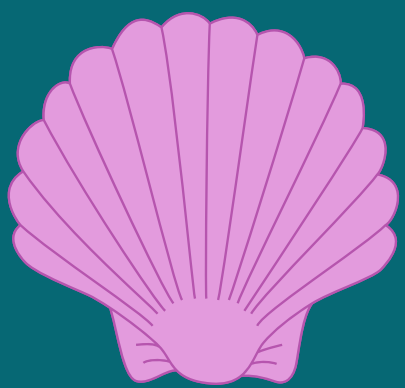
Students



Academia and Research



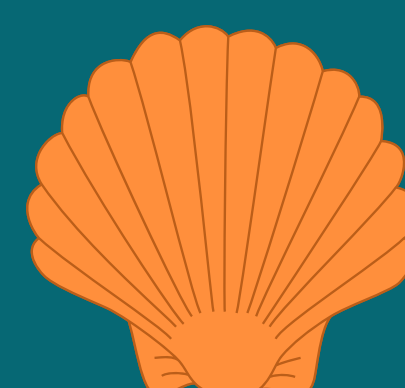
Education, Outreach, and Extension



Government, Policy, Management, and Restoration



Farmers, Producers, and other Industry



Communications, Marketing, and other Media

Steering Committee Members can be identified with a rainbow ribbon

CONFERENCE PROGRAM

All blocks are 30 minutes unless otherwise noted.

Friday September 29th, Mote Main Campus, New Pass Room	
Time	Activity
7:30-9:00 AM	Mentoring Breakfast <i>*By Invitation Only*</i>
8:00-9:00 AM	Registration Check-In <i>Morning Coffee and Refreshments, Presenter load in</i>
9:00 AM	Welcome & Opening Remarks <i>Opening Remarks by Dr. Nicole Rhody</i> <i>NAA presentation of McCraren Award to Dr. Kevan Main</i>
9:30 AM	Keynote Speaker <i>Dr. Megan Davis</i>
10:00 AM	
10:15 AM	Mid-Morning Break <i>Coffee and snacks provided</i>
10:30 AM	Oral Presentations
11:00 AM	
11:30 AM	
12:00-1:30 PM	Lunch & Networking <i>Provided for registered attendees</i>
1:30 PM	Oral Presentations
2:00 PM	
2:30 PM	
3:00 PM	<i>Break/Transition into workshops</i>
3:30-4:30 PM	Workshop Block A <i>(3:30-4:30)</i>
	<i>Transition to second workshop</i>
4:45-5:45 PM	Workshop Block B <i>(4:45-5:45)</i>
5:45 PM	<i>Transition to Reception</i>
6:00-8:30 PM	Networking Reception in Mote Aquarium Courtyard

CONFERENCE PROGRAM

All blocks are 30 minutes unless otherwise noted.

Saturday September 30th, Mote Aquaculture Park	
Time	Activity
8:00-9:00 AM	Registration Check-In <i>Morning Coffee and Refreshments, Poster Load In</i>
9:00 AM	Welcome & Opening Remarks
9:15 AM	Keynote Speaker <i>Imani Black</i>
9:30 AM	
10:00 AM	Mid-Morning Break <i>Coffee and snacks provided</i>
10:15 AM	<i>Instructions for round table discussions & prioritization exercise</i>
10:30 AM	Round Table # 1 <i>What challenges do women and people from marginalized communities face?</i> <i>What are potential solutions and opportunities to tackle these challenges?</i>
11:00 AM	
11:30 AM	
12:00 PM	Lunch & Networking <i>Provided for registered attendees</i>
12:30 PM	
1:00 PM	Poster Presentations / Round table #1 Prioritization <i>Additional Discussion & Networking</i> <i>(75 minutes)</i>
1:30 PM	
2:15 PM	<i>Transition for Round Table #2</i>
2:30 PM	Round Table #2 <i>What does the future of aquaculture look like?</i> <i>How can we make it more inclusive? What are opportunities for action?</i>
3:00 PM	
3:30 PM	
3:45 PM	Round Table #2 Prioritization / Prepare for MAP Tour <i>(45 minutes)</i>
4:30 PM	Tour of Mote Facilities <i>Optional early departure</i>
5:00 PM	
5:30 PM	Adjourn

CONFERENCE PROGRAM

All blocks are 30 minutes unless otherwise noted.

Sunday October 1st, Mote Main Campus	
Time	Activity
8:00-9:00 AM	Registration Check-In <i>Morning coffee and refreshments</i>
9:00 AM	Welcome
9:30 AM	Review preliminary outcomes from round table prioritization exercise
10:00 AM	
10:30 AM	Participant Feedback and Engagement Surveys
11:00 AM	Presentation of Student Awards
11:30 AM	Closing Remarks & Adjourn

INDIGENOUS LAND ACKNOWLEDGEMENT

As we open the conference, we would first like to start by acknowledging that this meeting is being held on the traditional homelands of the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, and many other tribes and cultural heritage communities including the Calusa and the Mascogo. These tribes and communities have been stewards and healers, farmers and fishers of these lands and waters for thousands of years. We recognize and honor them and their ancestors, their past and present work, and commit to honoring their legacy in our work here at *Women of the Water*. These communities continue to farm, fish, and tend the land throughout Florida, and elsewhere in the U.S.

We acknowledge that settler colonialism continues to oppress Tribal nations, cultural heritage communities, Indigenous, native, and First Nations people globally. We acknowledge that as beneficiaries of colonialism on this land and in this space - both physical space and in our scientific institutions — we must commit to learning and action. We must work to decolonize our scientific spaces — by valuing indigenous, cultural, and traditional ecological knowledge in our science; and by building meaningful partnerships to learn from, collaborate with, and build with these communities. The mission of *Women of the Water* seeks to set an example for this work — in even a small way — by empowering and uplifting marginalized voices.

Let us commit to learning more about these communities and to lending our voices to action in the places we live and work, wherever that may be. Let us commit to deepening the connections and relationships that may align us in powerful solidarity with Indigenous and cultural heritage communities, and renew our commitment to being active participants in the repair, healing, and caring stewardship of the lands and waters in the places we live.

KEYNOTE SPEAKERS



Dr. Megan Davis

Research Professor

Florida Atlantic University, Harbor Branch Oceanographic Institute

For more than 40 years, Dr. Megan Davis, Research Professor and lead for FAU's Harbor Branch Queen Conch Lab, has been studying the queen conch life cycle and innovating ways to save the species. She has become the world's foremost expert on queen conch aquaculture, or farming, and has designed, implemented, and operated community-based queen conch hatcheries throughout the Caribbean. Her philosophy is to work in the communities with the fisherfolk and citizens to empower them to grow their own conch for restoration and conservation. Her work enhances the blue economy by providing jobs for local staff and diversified incomes for fisherfolk. In addition, she proposes that restoration of this keystone herbivore into seagrass habitats will assist with carbon sequestration, aiding in important international climate change mitigation efforts. Dr. Davis and her team are currently involved in projects in Florida, The Bahamas, Puerto Rico, Curacao, Jamaica and several other Caribbean nations. More than ever, communities are seeking her knowledge as a way to bring a solution to the escalating species decline.

Imani Black

CEO and Founder

Minorities in Aquaculture

Imani Black was born and raised on the Eastern Shore of Maryland in Chestertown. She has always had a passion for restoration and conservation since she was a young girl and found great interest in the rapidly growing shellfish aquaculture industry, after completing an aquaculture training program at Virginia Institute of Marine Science in 2016. Since then, Imani has worked on oyster farms, nurseries and hatcheries along the Eastern Shore of Virginia and Maryland. From 2018 to 2020, she was the Assistant Hatchery Manager for Hoopers Island Oyster Company, having the opportunity to work in all aspects of shellfish growout.



Through her love for her career, Imani founded Minorities In Aquaculture (MIA), a nonprofit organization that strives to empower and support the underrepresented demographics in the aquaculture industry by providing opportunities such as paid internship, technical skills training and career development resources. Over the last two years, MIA has focused its efforts and resources toward supporting women of color in their aquaculture careers, starting with Imani's demographic which is also least engaged in this space. Overall, Minorities In Aquaculture is recognized as an impactful network focused on sustainable seafood education, aquaculture workforce development, and active engagement approaches not only for the minorities in aquaculture, but the industry as a whole in its effort towards a more diverse aquaculture field.

In addition to developing the nonprofit, Imani is also pursuing a Master's degree at the University of Maryland's Center for Environmental Science, researching the historical coastal communities of color in commercial fisheries in the Chesapeake Bay, while highlighting the approaches and methods toward active minority engagement and participation in coastal regions.

Joseph P. McCraren Award for Outstanding Contributions in Promoting the Growth of U.S. Aquaculture



Dr. Kevan Main, 2023 McCraren Award Recipient

Annually, the National Aquaculture Association asks its voting membership for nominations for two awards given in honor of our first Executive Director, Joseph P. McCraren. [This year's award recipient for outstanding contributions to the growth of U.S. aquaculture is Dr. Kevan Main, Mote Marine Lab Emeritus Senior Scientist.](#)

In 1991, Joe accepted the challenge of being the first Executive Director for the National Aquaculture Association when he was also the Executive Director for the U.S. Trout Farmers Association. This was no small task. He had retired in 1988, after an exemplary career with the U.S. Fish and Wildlife Service in their hatchery program.

During his agency career, Joe constantly searched for a better way of doing business. Many of our “standard” methods of handling and hauling fish originated from Joe’s practical experience and desire to “find a better way”. Joe’s leadership, experience, and creative talents eventually led him to the director chair at the San Marcos Fish Culture Development Center, Head of the Division of Technical Development, Aquaculture Extension Coordinator, and Secretary of the Joint Subcommittee in Aquaculture (JSA). He was a co-author of the “Fish Culture Bible” and he published numerous scientific and technical papers on topics from general fish culture to fish health to fish nutrition. He will best be remembered, however, as the “Father of a United Aquaculture Industry.”

More than any other individual, Joe had the vision and the ability to bring to reality the concept of “One Industry-One Voice” for the National Aquaculture Association. [When we recognize individuals with a Joseph P. McCraren Award, we are recognizing them as having attained a standard of excellence and accomplishment established by Joe McCraren. This is no small accomplishment.](#)

Please join us in congratulating one of our founding Women of the Water, Dr. Kevan Main, as she accepts the 2023 McCraren Award!

The National Aquaculture Association (NAA) is a U.S. producer-based, non-profit trade association founded in 1991 that supports the establishment of governmental programs that further the common interest of our membership, both as individual producers and as members of the aquaculture community. For over 32 years NAA has been the united voice of the domestic aquaculture sector committed to the continued growth of our industry, working with state and federal governments to create a business climate conducive to our success, and fostering cost-effective environmental stewardship and sustainability.

CODE OF CONDUCT

The Steering Committee for *Women of the Water* (the “Committee”) is committed to providing safe and welcoming environments for all who participate in conference events and other *Women of the Water* community activities, whether in person or in virtual spaces. **We will not tolerate any form of harassment, bullying, or discrimination.**

As the mission of *Women of the Water* focuses on the lived experiences and perspectives of women, gender-diverse folks, and people from marginalized and underrepresented communities, uncomfortable topics and differing viewpoints are likely to be discussed. Therefore, it is of utmost importance to embrace a culture of collaboration, compassion, and active listening. Together, we can ensure that our community supports free expression and exchange of ideas in an environment that is positive and productive for all.

Purpose and Scope

The Committee has established this Code of Conduct (the “Code”) to serve as a guideline for the conduct of anyone attending or participating in *Women of the Water* events or activities, whether in-person or virtual (“Activities”), as well as the consequences for unacceptable behavior. We expect everyone to follow this Code so that all participants can enjoy Activities responsibly and with respect for the rights of others. Failure to abide by this Code is subject to corrective action and sanctions, including but not limited to refused admission, ejection from events without refund, refusal of admission for future events or activities, and/or other penalties consistent with this Code. The Code applies to all attendees, media representatives, speakers, exhibitors, sponsors, staff, contractors, volunteers, award recipients, organizers, and other guests (collectively referred to as “Participants”) who attend or participate in Activities. By attending *Women of the Water* Activities, you agree to abide by this Code.

Expected Behavior

The following behaviors are expected of all Participants:

- Treating all participants with respect, dignity, and consideration, in the spirit of valuing a diversity of views and opinions;
- Behaving in a courteous and professional manner;
- Welcoming all voices and perspectives;
- Listening and learning with respect, empathy, and curiosity;
- Refraining from demeaning, discriminatory, or harassing behavior and speech;
- Reporting suspected inappropriate behavior directed at yourself or others to a member of the Steering Committee;
- Respecting the rules, policies, and property of event facilities and vendors; and
- Complying with the directions of meeting organizers, and all applicable laws and regulations.

Prohibited Behavior

Violations of this Code include but are not limited to the following:

- Harassment, which is defined for purposes of this Code to include unwelcome or offensive verbal comments, visual displays, or physical contact directed at any Participant, including conduct, comments, or images that a person would reasonably find offensive, demeaning, or hostile;

- Sexual harassment, which is defined for purposes of this Code to include harassment on the basis on a person’s sex, gender identity, gender expression, or pregnancy status; unwelcome, unsolicited, and unreciprocated sexual advances, requests for sexual favors, and other physical conduct, comments, or gestures of a sexual nature that has or that might reasonably be expected or be perceived to offend, humiliate, or intimidate another person;
- Intentional or repeated mis-gendering of any person;
- Exhibiting behavior that is unruly or disruptive, or that endangers the health or safety of yourself or others;
- Discriminatory or defamatory conduct or language based on race, sex, sexual orientation, gender expression or identity, pregnancy status, age, national origin, disability, religion, marital status, veteran status, political affinity, or any other characteristic protected by law;
- Inappropriate use of nudity and/or sexual images;
- Deliberate intimidation, threatening, or stalking;
- Sustained disruption of any portion of the event;
- Actual or threatened pushing, shoving, or use of any physical force whatsoever against any person;
- Possession of a weapon or use of any item in a way that may cause danger or harm to any other Participant;
- Destruction, theft, dismantlement, defacement, abuse, or intentional misuse of venue, property, equipment, signage, or supplies;
- Failure to comply with directions of Event leaders and organizers, venue personnel, or staff regarding Event operations or emergency response procedures;
- Retaliation against Participants for reporting activity that they reasonably believed to be in violation of this Code; and
- Knowingly and falsely reporting violations of this Code in bad faith.

Moreover, this Code is not intended to be comprehensive, and it is likely there will be conduct issues that it does not specifically address. In that event, as in all others, Participants are expected to follow the direction of the Committee and Event staff who will take appropriate action to ensure the safety, security, and well-being of all Participants.

Reporting Unacceptable Behavior

If you believe you or someone else is being subjected to conduct that violates this Code or is otherwise inappropriate, or have any other concerns, please alert a member of the Steering Committee who will work to resolve the situation.

Approved May 2022; Updated August 2023

ORAL PRESENTATIONS

Oral presentations will run in the order they are listed below. Presenting authors are marked with an asterisk (*) and student presentations are denoted with an arrow (^).

1. ***Suaeda linearis* An Emerging Superfood Sea Vegetable: Evaluating Plant Biomass Production and Mineral Content Using Four Harvest Frequencies**

Amanda Matthews, Florida Atlantic University*

Co-Authors: Megan Davis, Paul S. Wills, Michael McCoy, and Richard Baptiste

Suaeda linearis is an edible halophyte crop with nutraceutical properties that is native to Florida. This study investigated how the biomass production and mineral content of aquacultured *S. linearis* was affected by harvest frequency during a 10-week period using four different harvest treatments. Under the first treatment (T1) plants received zero intermittent harvests, the second (T2) received harvests every five weeks, the third (T3) received harvests every 3.3 weeks, and the fourth (T4) received harvests every 2.5 weeks. Our results indicate that biomass production and mineral content were both strongly affected by harvest treatment. Intermittent harvesting decreased biomass production and conversely, intermittent harvesting increased the quantities of certain desirable minerals in *S. linearis*. Early harvests of the study plants were small, suggesting that 13-15 weeks after germination is the earliest time a harvestable yield can be achieved from *S. linearis*.

2. **Nutritional Value of Hempseed Meals For Pacific White Shrimp (*Litopenaeus vannamei*): An Assessment of Apparent Digestibility**

Aakriti Khanal, Kentucky State University*^

Co-Authors: Kasondra Miller and Waldemar Rossi

Among traditional and novel protein feedstuffs with potential for use in aquafeeds is industrial hemp. Dehulled and oil-expelled hempseed meal (HSM) is high in crude protein and amino acids and low in anti-nutritional factors. A digestibility trial was conducted to assess the nutritional value of industrial hemp for Pacific white shrimp (*Litopenaeus vannamei*). Four experimental diets were formulated by blending equal portions of a reference diet (35%CP and 10% lipid) mixture with each of three test ingredients, and conventional soybean meal (CSBM) at a 70:30 ratio. Each experimental diet was randomly assigned to four groups of twelve shrimps (10 ± 1.0 g/shrimp) stocked in 16, 110-L glass aquaria operating as a recirculating aquaculture system. Shrimp in each aquarium were fed four times daily. Water quality parameters were maintained within acceptable ranges for the shrimp. Fecal matter was collected four times throughout the day. To determine the apparent digestibility coefficients (ADCs) for crude protein, energy, and amino acids ~ 0.3% yttrium trioxide (Y₂O₃) was used in diet as an indicator. Based on our results, the calculated ADC for the test ingredients; HSM-P30, HSM-P50, and CSBM for crude protein was 84.90%, 88.93% and 90.30%, and for energy was 64.43%, 75.88% and 81.33%, respectively. Amino acid availability in the HSMs were variable but in general higher than that of CSBM. Based on our findings, the HSMs evaluated are well digested by the shrimp and comprise potential sources of nutrients and energy for commercial shrimp feeds.

3. **The Effects of System Type and Horizontal Substrate Addition On Pacific White Shrimp (*Litopenaeus vannamei*) Production and Water Quality in RAS**

Gyanu Rana, Kentucky State University*^

Co-Authors: Andrew James Ray, PhD

The objective of this project was to assess the effects of two different types of RAS (clear water and hybrid), along with horizontal substrate on intensive Pacific White Shrimp

production and water quality. In this study, two levels of each experimental factor were used, i.e., system type (Clear Water vs Hybrid Water) and presence of an artificial substrate versus absence of substrate. There were a total of 4 treatments: Hybrid water with substrate, Hybrid water without substrate, Clear water with substrate, and Clear water without substrate. Four layers of horizontal cloth net, each layer covering 0.5 m² area, 20 cm apart from each other, and square in shape were installed as substrate in the eight circular 1 m³ tanks. Shrimp at the rate of 450 m³ were stocked in the experimental tanks and reared for 53 days. Results from this study demonstrated that water quality parameters were significantly different between the levels of the system types while shrimp production metrics were significantly different between the levels of substrate. Hybrid water with substrate treatment did a better overall performance in terms of water quality and shrimp production followed by Clear water with substrate treatment. These findings indicate that Hybrid system with substrate could enhance production and help in water remediation in intensive indoor shrimp farming.

4. The Effect of Stocking Density On the Production and Health of Olive Flounder (*Paralichthys olivaceus*) in Nursery-level RAS

Sagun Chhetri, Kentucky State University*[^]

Co-Authors: Andrew J. Ray

The olive flounder, (*Paralichthys olivaceus*) sometimes referred to as Japanese flounder, is a high-value flatfish with increasing aquaculture demand due to its rapid growth, excellent aquaculture performance and high market value. This species has been produced intensively in Korea since the 1980's and has potential as a lucrative aquaculture candidate in United States. Recirculating aquaculture systems (RAS) reduce the amount of water and space required to intensively produce seafood products. Rearing nursery-stage olive flounder in clear-water RAS ensures high productivity and optimum water quality of the culture system although expensive equipment and operational cost can be associated with clear-water production systems. kg/m³, 2.4 kg/m³ and 3.6 kg/m³ into 1.2m³ fiberglass tanks with each stocking density replicated in three randomly assigned tanks. To assess the health of olive flounder, stress indicators including glucose level, plasma cortisol level, growth hormone and insulin-like growth factor (IGF-1) will also be analyzed using a Dynex DS2 System (Chantilly, Virginia, USA) an automated ELISA (Enzyme-linked immunosorbent assay) processor. Results from this experiment are pending but significant differences in the stress-hormone levels and production values including average weight, growth rate, total harvest, FCR, and condition factor in the treatments are expected. At harvest, the best suited stocking density will be determined which will result in higher overall productivity while ensuring better health of the olive flounder.

5. Building Communities of Practice - An Aquaponics Example

Laura Tiu, Ph.D., UF/IFAS, Florida Sea Grant*

A University of Florida Extension's high-priority initiative is "increasing the sustainability, profitability, and competitiveness of agricultural and horticultural enterprises." In order to address the increasing demand for information and training on small-scale food production methods, an Aquaponics Community of Practice was formed in 2016. In the following years, workshops, a demonstration system, one on one training and consulting and a communication listserv have been used to expand this initiative. This presentation will elaborate on the successes and challenges of this effort and how you might replicate the process for your own needs.

6. Aquaculture Advocacy: Can you do this?

Paul Zajicek, National Aquaculture Association*

Nationally, opportunities for part- or full-time engagement are limitless for aquaculture trade association leadership. Thirty national, regional, state and species aquaculture associations represent the farming and allied business communities at local, state or national levels. Successful associations feature leadership qualities focused on fearless initiative, skilled organizational talents, apolitical acumen and social media savvy supported by aquacultural experience and education. Possessing a nonprofit management MBA or being a registered lobbyist are not prerequisites.

7. National Estuary Programs: Partners in Sustainable Aquaculture

Blair Morrison, Mobile Bay National Estuary Program*

Co-Authors: Henry Perkins and Roberta Swann

From Washington to Puerto Rico, the National Estuary Program (NEP) is a collaborative and adaptable ecosystem-based network of organizations that protects and restores 28 estuaries of national significance. In this mission, NEP organizations can serve an important role in supporting aquaculture. The Mobile Bay National Estuary Program (MBNEP) has taken an active role in bolstering the sustainability of oyster aquaculture in coastal Alabama by addressing both the environmental and socio-economic needs of the industry. Over the past 2 decades, MBNEP has created Watershed Management Plans-which identify water quality/habitat concerns and priority restoration/monitoring projects-for all tidally influenced basins bordering Mobile Bay. These activities focus on ensuring high-quality surface waters for areas of extensive aquaculture. MBNEP has also invested in supporting the oyster industry by creating the Coastal Alabama Fisheries Fund (CAFF). Understanding the barriers that aquaculturists face in securing funding from traditional sources, CAFF provides financial assistance to oyster farmers and harvesters in the form of microloans (2,000 – 10,000 USD). CAFF provides financial literacy workshops to equip borrowers with tools to understand their capital commitments and has issued \$43,000 in loans thus far. Additionally, feedback from oyster industry stakeholders yielded the creation of OystersAlabama.com - a marketing website providing purchasers with farmer and processor profiles and wholesale information for Alabama oysters. By adopting a comprehensive approach, the work of MBNEP provides a case study for how NEP organizations can be valuable partners in conserving productive coastal waters, enhancing sustainable aquaculture, and supporting the heritage of fishing communities.

8. Kentucky State University: An Oasis of Diversity In Aquaculture Research and Extension

Jeffrey L. Warner, Kentucky State University*

Co-Authors: Noel Novelo, Chelsea Walling, and Cole Daleiden

While the aquaculture industry has historically been a male dominated field, there are fortunately some hidden oases of diversity and inclusion. Kentucky State University (KYSU), a historically black 1890's land grant university, is one such oasis within the seemingly barren southern states. As an 1890s institution of higher education in the United States, the KYSU mission is to reach a diverse audience including minorities and limited resource stakeholders. KYSU is home to a world-renowned aquaculture research center (ARC) that began in 1980s. The KYSU Aquaculture Program offers Certificate, Undergraduate, and Graduate Degrees and it strives to exemplify diversity and inclusivity for its students, employees, farmers, and stakeholders. One main objectives of the Tilapia Capacity Building Project is to research and provide genetically improved tilapia to limited resource minority farmers and collaborators. As part of this project, we have

donated fish to assist a female high school student with her FFA project on raising tilapia in a small recirculating system that she and her father built. Fish were also donated to assist a local female homestead farmer starting her aquaponic venture and fish were given to local nonprofit businesses that are focusing on educating about aquaponics in urban environments to reduce “Food Deserts”. With this project we are also working to make healthy and ethnic food “How to” recipe videos, adding potential diversity to the student and stakeholder’s palates and increasing food literacy. Just like in a coral reef, diversity is essential for health and continuation of the ecology. In a seemingly barren ocean, strive to be an oasis.

9. Gender Equity In Maine’s Working Waterfront: Diversifying the Aquaculture in Shared Waters training program

Jessica Veo, University of Maine*^

Co-Authors: Annie Fagan * and Jaclyn Robidoux*

Aquaculture in Shared Waters (AQS^W) is an aquaculture training course that has been offered in Maine since 2013. AQS^W is a comprehensive, once yearly, 8-14 week course that is free to Maine residents. The course provides training on a wide range of topics related to starting an aquaculture farm, including: site selection, biology, husbandry, equipment, permitting, marketing, and social license, among other topics. The course focuses on shellfish and seaweed aquaculture. The original goal of the course was to provide aquaculture training for commercial fishers as an economic diversification strategy, but later expanded to offering training to any interested Maine residents. Because most commercial fishers in Maine are male, the course attendance was entirely male for the first two years, with relatively low female attendance in subsequent years. However, because aquaculture is a relatively new industry, and has greater time flexibility than commercial fishing, there may be more opportunities for women to carve out their own spaces in this industry than in other working waterfront industries. We interview women who have previously taken the AQS^W course, to learn more about their experiences as a student as well as their experiences as a woman on the water. We hope to utilize this information to inform more diverse course offerings, in an effort to make aquaculture training as accessible as possible for women. Additionally, we will use our findings to share any inequities we discover in Maine's aquaculture industry.

10. The Importance of Joining And Engaging In Aquaculture Professional Societies (Particularly As Students!)

Michelle L. "MICK" Walsh, The College of the Florida Keys*

One of the most rewarding approaches to ensuring a productive and satisfying career in aquaculture is to join and engage in aquaculture professional societies. These societies play a crucial role in fostering collaboration, knowledge sharing, professional development, and innovation among stakeholders. Professional societies can influence decision-makers, raise awareness about environmental stewardship, and contribute to the development of science-based, sustainable aquaculture frameworks on local, regional, national, and international levels. Membership connects aquaculturists with their colleagues world-wide through meetings, publications, and online membership directories, shows a commitment to the profession, recognizes excellence in the field, and can make members more marketable to employers. Students are privy to competitive conference travel awards, best student abstract and presentation recognition, mentorship opportunities, special field trips, training, and skills workshops. There are financial incentives to joining as well: deep discounts on conference registration fees and full access to articles in professional journals for FREE. The highest pinnacle of engagement can be found in the opportunities for leadership through society-sponsored

special projects, programs, committees, conferences, or publications. Often different aquaculture professional societies partner to host conferences or create a unified voice that amplifies aquaculture messaging. Societies exist at local, state, regional, national, and international levels, and many professionals enjoy the benefits of membership among a number of societies. The investment in yourself as a professional is worth it. You will create new networks, meet potential colleagues, establish partnerships, have a built-in support group, and form lifelong friendships.

11. A Rising Tide? The Role of Alternative Networks For Women Oyster Farmers In Maine and New Hampshire

Natalie Lord, NOAA Knauss Fellow, University of New Hampshire*^

Co-Authors: Catherine Ashcraft, Julia Novak-Colwell, and Lindsey Williams

Although women make up half of the global seafood workforce, their roles in the sector are poorly understood. Without demographic information such as gender incorporated into fishery and aquaculture datasets, we lack a comprehensive understanding of resource management, distribution of benefits, and equitable engagement in the industry. Here, we analyze women's experiences as oyster producers in Maine and New Hampshire, identify gender-specific institutional barriers and resources, and highlight the ways in which the use of a social network may support their businesses. A food system survey and photovoice case study were implemented with photography, narratives, interviews, and a focus group to accomplish the research objectives. Investigating aquaculture development through a gender lens provides insights to inform more socially equitable management and policy decisions for aquaculture development. We find that the gender norms of the aquaculture industry create systemic barriers that impact the oyster businesses owned by the women who participated in this research. These barriers include lack of funding opportunities, training that does not meet their needs and business goals, farm equipment and clothing that does not fit, and gender discrimination in the workplace. As a tool to address barriers, the women participants leverage alternative social networks of women oyster farmers. Based on the study findings, recommendations to address gender equity in the region's oyster industry include investing in women's informal networks, funding opportunities for women owned aquaculture businesses, and collecting demographic data to account for women's presence in the industry and to track change over time.

WORKSHOPS

Attendees should pick two workshops to attend. Workshops will be held concurrently, and each will run twice. Workshops will be capped at 20-25 participants.

1. Tell Your Own Story Online (New Pass B)

Workshop Lead: Sarah Curry

Overview: Use your phone to tell your own story. With social media being the ever present way to communicate your message and/or market your business, it's easier than ever to reach new audiences. But it can be hard. In this workshop you will learn how to think about visually communicating your message in a way that feels right for you and your business. Bring your phone and a few ideas on some basic stories you might like to share with the world. For example, who you are, the motivation for your work, the coolest thing you're working on, or an overview of the conference you're attending. This workshop requires use of your phone to record video.

2. Science Policy Careers (New Pass C)

Workshop Lead: Dr. Marcy Cockrell

Overview: Have you ever wondered what a career in science policy entails, or what science policy even is? Join this workshop to hear from an exciting and distinguished panel of professional women working at the intersection of aquaculture and science policy. In this moderated “fireside chat” style panel, workshop participants will learn more about what science policy is, what an educational and career path in science policy might entail, and discuss how science policy can be used to strengthen diversity, equity, and inclusion in science more generally. There will be ample time reserved for Q&A with the panelists.

3. Effectively Communicating Ocean and Climate Change (Classroom A)

Workshop Lead: Blair Morrison and Dana Henderson

Overview: Trying to communicate climate change, but people just don’t seem to respond to your facts and science? Come learn how to be a more effective and compelling climate communicator! Join us as we introduce the National Network for Ocean and Climate Change Interpretation (NNOCCI), a collective of over 500 climate communicators, and evidence-backed strategies for talking about climate change. In this workshop, attendees will learn how specific values and metaphors make audiences more receptive to ocean/climate change messaging and how we can change the national discourse to be more positive, civic-minded, and solutions-focused. We will also discuss (and practice!) strategic framing of sustainable aquaculture as a climate solution that can be woven into communications with a variety of stakeholders.

4. Photovoice: a community based approach to social science research (Classroom B)

Workshop Lead: Natalie Lord

Overview: Join this session to learn about a participatory research approach, the photovoice methodology! During this workshop, you will learn about how to conduct a photovoice project which includes a multi-step process: participant training, photo documentation, written narratives, one-on-one interviews, a focus group, and a community outreach event. Photovoice is a unique research method that allows the participants to take the lead in conducting data collection and guide the outcomes of the project. The workshop format will include a brief presentation of the methodology, time for questions and discussion about equitable engagement of research participants, and a mini photovoice focus group activity.

5. Gullah Geechee Foundations in Aquaculture (New Pass A)

Workshop Leads: Marilyn L. Hemingway and Victoria Smalls

Overview: Join executive directors from two organizations, The Gullah Geechee Cultural Heritage Corridor (GGCHC) and the Gullah Geechee Chamber of Commerce (GGCC), as they share the captivating intersection of Gullah Geechee heritage and the realm of aquaculture. In this enlightening session, we will delve into the profound impact of aquaculture on the lives of Gullah Geechee farming and fishing communities, shedding light on the collaborative efforts between GGCHC, GGCC and local communities, as well as federal agencies like NOAA, to champion sustainable marine aquaculture. The Gullah Geechee people are descendants of West and Central Africans enslaved in the lower Atlantic states during the era of slavery. Their distinctive heritage, nurtured on isolated coastal plantations, finds expression in their culinary traditions, arts, crafts, and the unique Gullah language. Join us to explore the enduring legacy of the Gullah Geechee people and uncover how aquaculture serves as a foundational pillar for cultural preservation, economic empowerment, and environmental sustainability. Our workshop promises to inspire,

educate, and deepen your appreciation for the indelible impact of the Gullah Geechee on American culture and history.

POSTER PRESENTATIONS

Posters will be displayed at the Mote Aquaculture Park on Day 2. Presenting authors are marked with an asterisk (*) and student presentations are denoted with an arrow (^).

1. **Prebiotics and Fermented Soybean Meal in the Diets of Largemouth Bass**

Michele Jones, University of Arkansas at Pine Bluff*

Co-Authors: Rebecca Lochmann and Steve Rawls

Developing a Largemouth bass diet that is sustainable and acceptable to the fish is an ongoing process. Many diets try to eliminate fish meal and replace it with plant protein sources like soybean meal. Soybean meal is a reasonable source of protein and has a fairly acceptable amino acid profile. Soybean meal is not always accepted by the fish and can sometimes hinder growth. The addition of a prebiotic or fermented soybean meal can improve digestion, absorption, and health factors. The products can manipulate gut microflora, gene expression, and immune function. The addition of a palatant can increase the acceptability of the diets to the fish. For this study, we developed diets with soybean meal, fermented soybean meal, soybean+prebiotic, fermented soy+prebiotic, soybean+palatant, and fermented soy+palatant. These diets should help us determine the effects of the products on the growth and health of the fish. The fish will be fed twice a day for 12 weeks while we monitor growth. At the end of the study, we will collect tissues for gene expression, microflora analysis, digestive enzyme activity, and proximate analysis.

2. **Students Develop Food Literacy and Culinary Skills Through The Use of Classroom Aquaculture Extension Programming**

Chelsea T. Walling, Kentucky State University*

Introducing aquaculture extension programming to students in their classrooms has potential to make complex science, technology, engineering and math (STEM) concepts more tangible and increase awareness of sustainable food production systems. Making real-world connections between where food comes from and how to make nutritious meal choices is essential for all consumers. Project based learning and other aquaculture curricula can allow youth to develop food literacy skills earlier. Kentucky State University (KYSU) is an 1890 land-grant HBCU with a mission to serve under-represented and minority stakeholders. The youth outreach division of the aquaculture extension program at KYSU delivers educational aquaculture programs, aquaponics systems and aquatic science curriculum to central Kentucky high schools. Locust Trace AgriScience Center in Lexington, Kentucky is a public high school agricultural education center that has career pathways in agricultural engineering, animal science, plant science, and environmental science and natural resources. As part of their aquaculture course, an approximately 1,000-gallon recirculating aquaculture system (RAS) in their greenhouse is used to demonstrate intensive fish rearing protocols including water quality management and optimal aquatic animal husbandry. Kentucky State University donated 40 channel catfish (*Ictalurus punctatus*) for stocking into the greenhouse RAS. Students helped with stocking the fish into the cycled RAS and monitored fish health for 2 weeks. Students were encouraged to try fish products, think about the sources of their foods and develop food preparation and culinary skills. Hands-on aquaculture extension activities can make lasting impressions on students by allowing experiential learners to immerse themselves

in the material and apply these lessons when faced with STEM problem-solving challenges.

3. The Effects of Climate Change on Larval Stone Crab Swimming Behavior

Eliza Patty, Eckerd College*[^]

Co-Authors: Rebecca Meberg*, George Xue, Daniel Holstein, and Philip Gravinese

The combined effects of coastal acidification and warming seawater temperatures are changing species' behaviors, altering their physiology, and reducing their survival. One species that may be affected by these stressors is the Florida stone crab, *Menippe mercenaria*, which is a \$30 million per year fishery. This study determined the impacts of reduced seawater pH and warmer seawater temperatures on the larval swimming response to gravity (geotaxis). We measured the swimming speed and direction of larval stone crabs when they were raised in treatment combinations of reduced seawater pH (pH = 8.0 and 7.6) and elevated temperature (28°C and 32°C). Larvae were harvested at each larval stage (stages 1-5, n = 13 independent broods for stages 1-3; n = 6 for stage 4; n = 3 for stage 5) for geotaxis experiments, which were performed in a darkroom. Our results show that there was no difference in larval upward swimming speeds. The majority (> 65%) of stage 1 and 2 larvae swam upwards in all treatments; however, there was a significant change in the swimming direction for stage 3 larvae in the combined temperature and pH treatment (only 28% swam upwards). Later-stage larvae also oriented downward. The change in swimming direction in the combined temperature and pH treatment (stage 3) suggests that stone crab populations may have difficulty migrating beyond their current range as coastal waters become more acidic and continue to warm.

4. Women of the Aquaculture and Fisheries Department at UAPB

Hannah Knuckles, University of Arkansas at Pine Bluff*[^]

Co-Authors: Ele Jones

Women represent a minority in the University of Arkansas at Pine Bluff's aquaculture and fisheries department, but this does not mean they are not contributing significantly to the work and research being done. Not only are women working on the scene in the field and lab but women are working behind the scenes to make everything happen. These jobs are often overlooked but without them our research would be impossible. It is my goal with this presentation to showcase how important women are to the research done in the AQFI department and how diverse their work is.

5. Teaching our Youth Aquaculture

Jessie Appelhans, College of the Florida Keys*[^]

The College of the Florida Keys Jr. Tropical Hobbyist Summer Camp teaches kids ages 6-12 about saltwater fish tanks and aquacultured fish. Campers spend a week setting up and learning how to take care of a saltwater fish tank that they take home at the end of the week with a CFK Aquacultured Clownfish (*ocellaris*). During the week campers also engage in fun games and activities that teach them about aquaculture and gives them skills to maintain fish tanks.

6. Manipulating Algal Parameters to Improve the Survival, Growth, and Feeding Incidence of Larval *Neocirrhites armatus*

Olivia I. Markham, Tropical Aquaculture Lab, University of Florida*[^]

Co-Authors: Casey A. Murray, Sarah W. Hutchins, and Matthew A. DiMaggio

The flame hawkfish (*Neocirrhites armatus*) is a marine ornamental fish endemic to the Indo-Pacific and is popular in the aquarium trade due to its bright coloration, small size,

and behavior. Due to their popularity, captive rearing of hawkfish is of great interest, but is limited by difficulties in broodstock spawning and larval rearing. The stage of “first-feeding” at 3 DPH, where endogenous reserves are exhausted and the larvae must switch to exogenous feeding, is critical for development and survival. Mass mortality of larvae is common during this period from lack of appropriate nutrition. Attempts to culture these larvae have been successful until 12 DPH, with significant mortality observed at 10 DPH. Mortality at this developmental stage could be due to other developmental bottlenecks, such as swim bladder inflation or notochord flexion, which occur at 7 DPH and 9 DPH, respectively. There is no current information on larval rearing of *N. armatus* and initial experiments evaluated effects of environmental conditions on survival, growth, and feeding incidence from 0 – 5 DPH. The effects of algal density (150,000 – 600,000 cells mL⁻¹) were evaluated for larvae at 3 DPH. Results of this experiment showed significantly higher survival and feeding incidence at 150,000 cells mL⁻¹ compared to other treatments. Evaluation of effects due to algae species compared *Tisochrysis lutea* and *Nannochloropsis oculata*, with *Nannochloropsis* showing significantly higher survival. Other environmental conditions of interest include copepod species, copepod density, and prey type. These experiments will all focus on improving survival at first feeding.

7. The Gulf Shellfish Institute’s Vision for Shellfish Restoration Aquaculture in Southwest Florida

Sarah W. Hutchins, Gulf Shellfish Institute*

Co-Authors: Olivia N. Blondheim and Stephen G. Hesterberg

The Gulf Shellfish Institute (GSI) is a non-profit organization that envisions a future where coastal restoration and commercial shellfish aquaculture mutually benefit. To demonstrate the efficacy of a shellfish restoration aquaculture model in Southwest Florida, GSI is embarking on the five-year ‘All Clams on Deck’ initiative to co-restore seagrass habitat using native bivalves produced by the Florida shellfish aquaculture industry. Initiative success will depend upon the expertise of local shellfish hatcheries and farmers to spawn and grow-out millions of southern hard clams (*Mercenaria campechiensis*) for large-scale restoration. One co-restoration approach will be the direct planting of *M. campechiensis* with shoal grass, *Halodule wrightii*, in a fully factorial design, across multiple sites, and at management level scales (i.e., hectares). GSI and project partners will monitor seagrass and hard clam growth and survival, water quality parameters, sediment characteristics, and nutrient dynamics for at minimum two years post-construction. This applied research will (1) provide empirical support for incorporating positive interactions into seagrass restoration designs and (2) justify shellfish restoration aquaculture in Southwest Florida as a novel economic opportunity for the industry.

8. How Do Caribbean King Crabs Find a Home

Taylor Queen, Eckerd College*^

Co-Authors: Jason Spadaro and Philip Gravinese

Many coral reefs have been degraded over the past several decades due to the combination of human and natural disturbances. In the Florida Keys, coral habitats have been in the decline since the 1970s due to multiple stressors that include coral bleaching, disease, severe hurricanes, and extreme cold snaps. As a result, coral-dominated communities are now becoming increasingly dominated by macroalgae, which are associated with lower economic, ecological, and aesthetic value. Herbivory, or the grazing of macroalgae, helps maintain coral-dominated states and can potentially reverse macroalgal shifts on degraded reefs. The Caribbean king crab (*Mithrax spinosissimus*) is a voracious algae consumer, making them a promising restoration species of interest for

many coral restoration organizations. Therefore, understanding the environmental cues that promote or deter settlement may serve as a management tool for local restoration efforts in the Florida Keys. In this experiment, larvae were exposed to five different chemical cues (treatments) that include a: a) control (no cue, purified seawater), b) chemically defended algae (*Dictyota spp.*), c) conspecifics (*M. spinosissimus*), and d) spiny lobster (*Panulirus guttatus*, predator). Caribbean king crab larvae were more likely to metamorphose and settle when in the control and conspecific cue. Larvae had a higher mortality and lower settlement when exposed to predator and algae cue treatments. Our results suggest that delaying settlement may come with costs such as reduced survival and lower settlement. Restoration and aquaculture efforts might facilitate greater survival and settlement by raising king crab larvae in the presence of conspecific cues.

Round Table 1:

What challenges do women and people from marginalized communities face in the industry?



What challenges have you faced in your journey in aquaculture?

What aspects of the industry present the largest challenges?

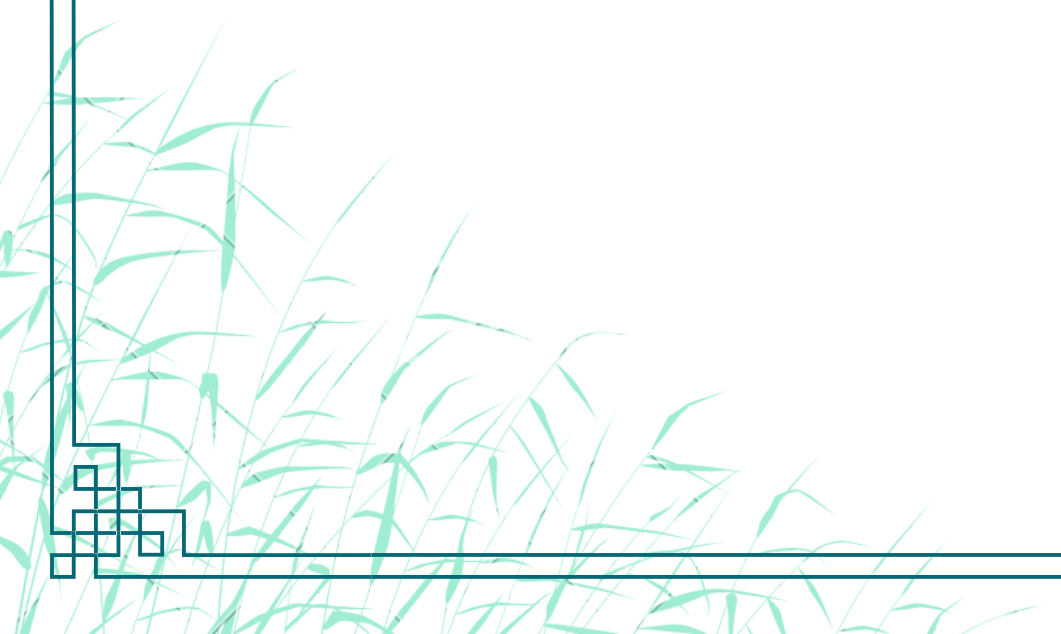
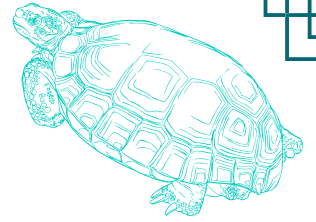


How have you worked to overcome these issues?

How can we address these issues as individuals?

How can we address these issues as a collective?

Round Table #1 Summary:



Round Table 2:



What does the future of
aquaculture look like?



What do you think will be the biggest advances in the field over the next decade?

How do you view your role in the future of aquaculture?

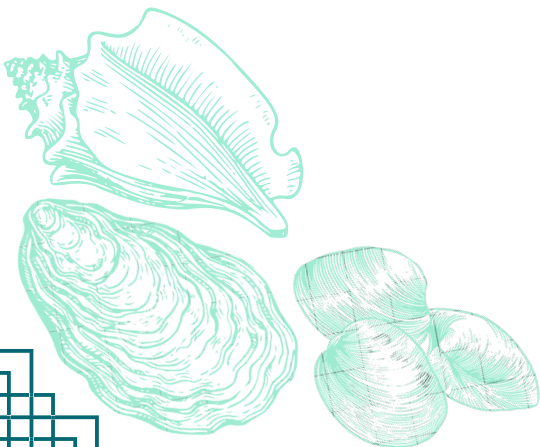
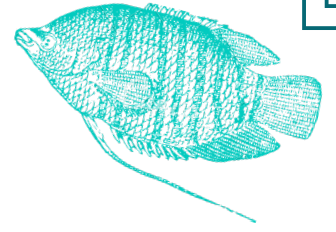


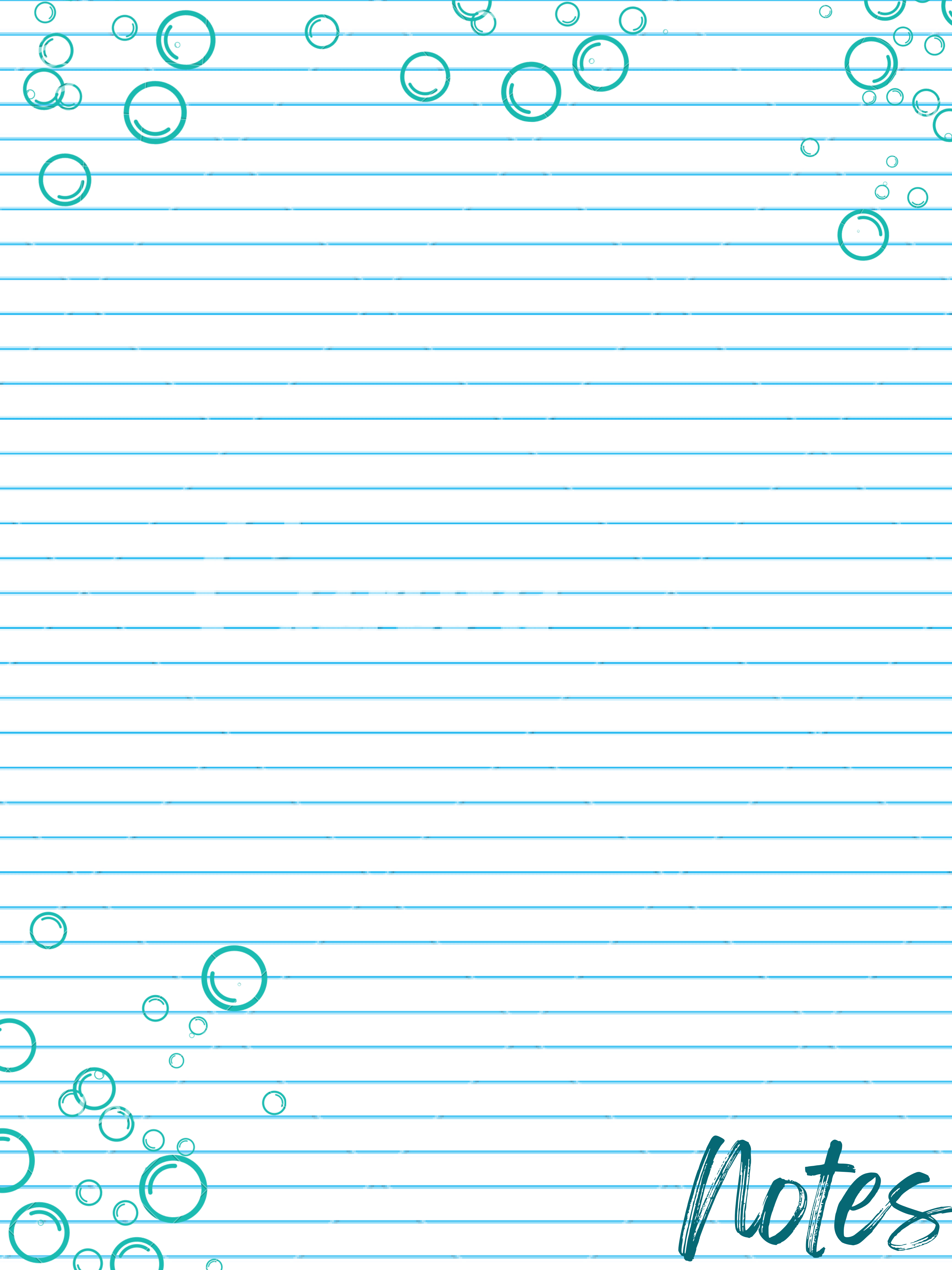
What is needed to make the industry more inclusive?

What kinds of collaborations should we foster moving forward?

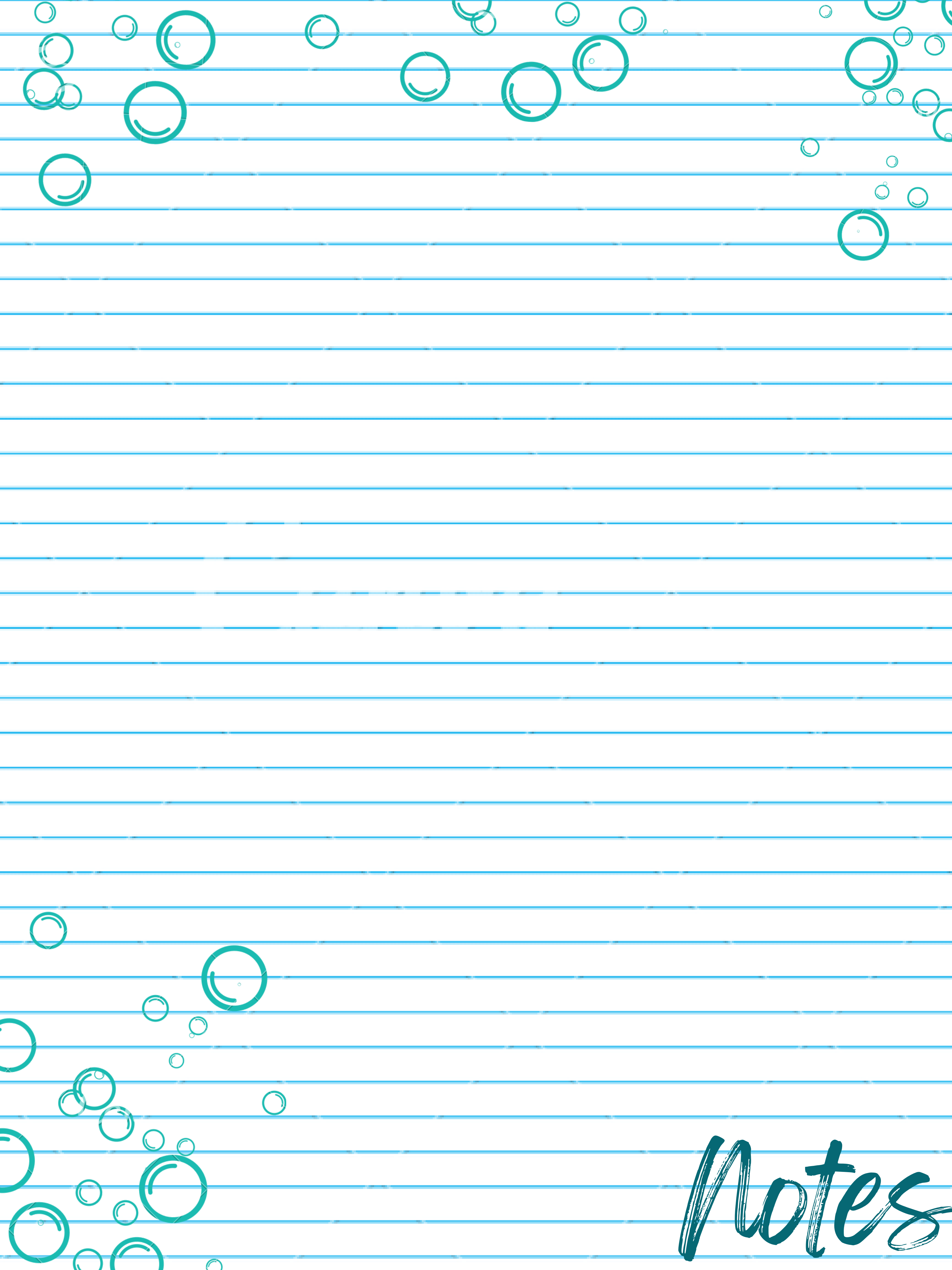
Who still needs to be at the table?

Round Table #2 Summary:

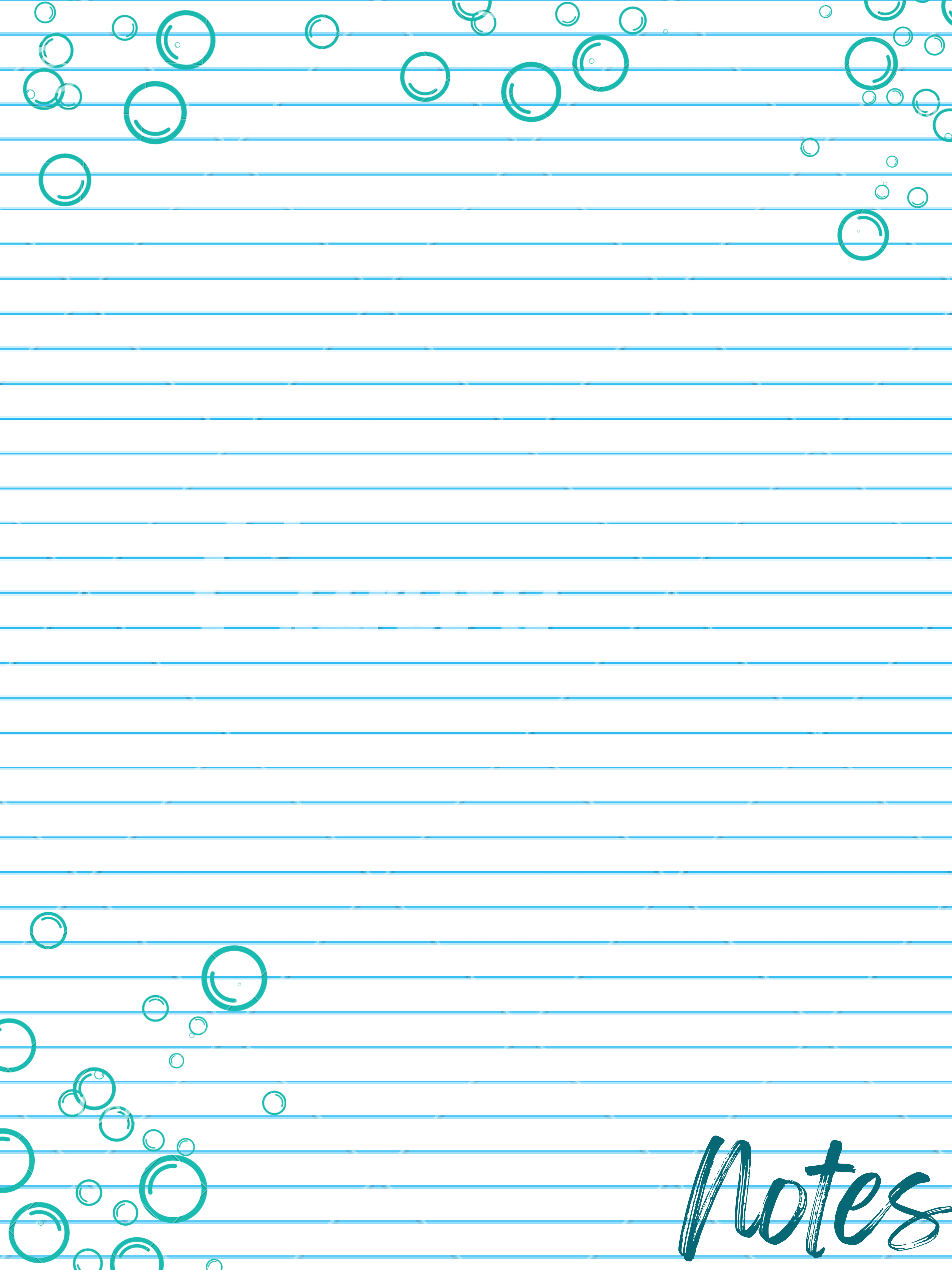




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2023 Steering Committee

Dr. Marcy Cockrell (Co-Director)

Science Coordinator, NOAA Fisheries Office of Aquaculture

Blair Morrison (Co-Director)

Science and Monitoring Program Lead, Mobile Bay National Estuary Program

Dr. Nicole Rhody

Senior Scientist and Director, Mote Aquaculture Research Park

Dr. Kevan Main

Emeritus Senior Scientist, Mote Marine Lab and Aquaculture Park

Dr. Laura Tiu

UF/IFAS Walton County Extension Director, Florida Sea Grant Agent

Kaitlyn Theberge

Knauss Policy Fellow, Seafood Resources, National Sea Grant

Hayley Lemoine

Florida State University PhD candidate, Florida Sea Grant Graduate Student Fellow

Maeesha Saeed

Program Officer, National Academies Gulf Research Program

Nicole Martin

Biologist, Shellfish and Aquaculture Policy Branch, U.S. Food & Drug Administration

Sharon McBreen

CEO, Independent Environmental Policy Consulting

Natalie Lord

Knauss Policy Fellow, NOAA Ocean Acidification Program

Portia Sapp

Director, FDACS Division of Aquaculture

