Diverse Voices in Fisheries Science: Lessons Learned from an Insightful Seminar Series

Article *in* Fisheries · April 2022

DOI: 10.1002/fsh.10772

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STUDENT ANGLE

Diverse Voices in Fisheries Science: Lessons Learned from an Insightful Seminar Series

Katherine E. Dale | University of California–Santa Cruz, 130 McAllister Way, Santa Cruz, CA.
E-mail: kdale@ucsc.edu
Laura C. Goetz | University of California–Santa Cruz, Santa Cruz, CA
Katie M. Kobayashi | University of California–Santa Cruz, Santa Cruz, CA
Molly R. Lane | University of California–Santa Cruz, Santa Cruz, CA
Emily C. Nazario | University of California–Santa Cruz, Santa Cruz, CA

INTRODUCTION

Women and minority groups make up a small portion of the fisheries field. Over the past 30 years, increases in diversity of academic and governmental agencies have been slow, with only 25% of fisheries faculty being women and 10% being nonwhite (Arismendi and Penaluna 2016). The American Fisheries Society is included in this trend. From 1995 to 2015, the percentage of nonwhite members increased from 5.5% to just 8.0%. The cover for the August 2020 issue of *Fisheries* celebrating the 150th anniversary of the Society was striking—of the nearly 20 faces pictured, all are white, and just a handful are women.

AFS has made important strides towards increasing diversity within the organization and across the fisheries profession, including founding a Diversity, Equity, and Inclusion Committee, including diversity in the 2020–2024 strategic plan (https://bit.ly/395C8IB) and publishing papers with concrete actions to increase diversity in *Fisheries* (e.g., Penaluna et al. 2017). However, as of 2015, AFS was strikingly homogenous, with 91% of members classifying themselves as white, and just 25% classifying themselves as women (Penaluna et al. 2017).

To best protect the biodiversity we value in our waters, we need to institute broad transformations in fisheries science so all people who care deeply for aquatic species find our field welcoming. Accordingly, fisheries science must strive to cultivate diversity in our teams. Different perspectives directly stem from varied life experiences, which are shaped largely by our interactions with one another. A first step in fostering a diverse fisheries community requires listening to and elevating those voices that have been historically excluded from the field.

In the spring of 2021, we organized a seminar series featuring fish biologists from traditionally underrepresented groups entitled "Diverse Voices in Fisheries Science." This seminar was hosted by the Santa Cruz Monterey Bay Area Subunit of the American Fisheries Society (SCMBAS) and the Fisheries Collaborative Program (FCP) at the University of California–Santa Cruz (UCSC). The SCMBAS aims to provide professional development and networking opportunities for our members, as well as organize events centered around environmental restoration, community outreach, and educational presentations and programs for K–12 students. The Fisheries Collaborative Program helps foster research collaborations between the National Oceanic and Atmospheric Administration, the UCSC, and the Institute of Marine Science at UCSC to conduct research for the conservation and management of California's living marine resources.

The seminar series was organized by SCMBAS executive committee members and a graduate student researcher funded through FCP. The graduate student researcher position was created for and specifically tied to organizing and promoting diversity initiatives.

SERIES FORMAT

Speaker nominations were solicited by the SCMBAS and FCP communities and were collated by the graduate student researcher and SCMBAS executive committee and voted on by SCMBAS members. We ultimately hosted five speakers over 10 weeks, all from U.S. institutions, listed here in order of appearance (Figures 1–5): Solomon David (Nicholls State University), Sandra Correa (Mississippi State University), Gita Kolluru (California Polytechnic State University), Keith Parker (Yurok Tribe), and Maryam Kamran (Virginia Tech).

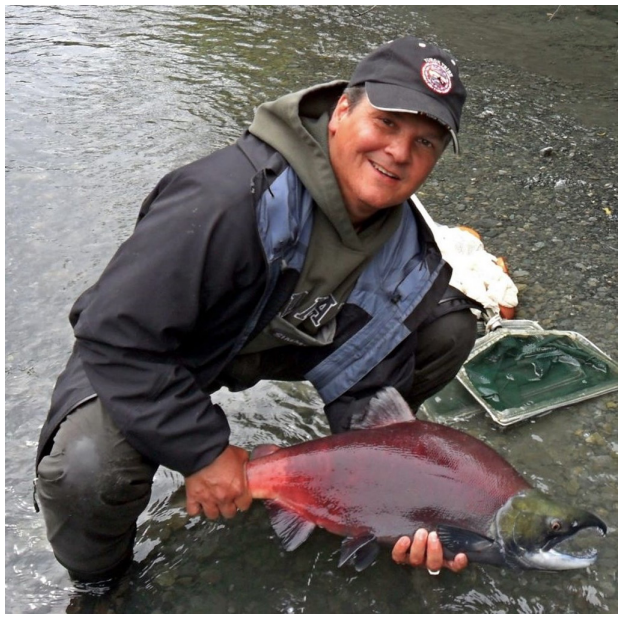

Figure 1. "I'm making a difference every single day, from inside the system." – Keith Parker, senior fisheries biologist, Yurok Tribe.

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Figure 2. "By far the best part of my day is mentoring students, especially undergraduate students, in a research setting as well as in the classroom." – Gita Kolluru, professor, California Polytechnic Institute.

Historically, diversity initiatives have relied on volunteers, and participants have been unpaid. To thank participants, SCMBAS provided each speaker with a US$100 honorarium. Speakers were given the option of doing either a 30-min research talk followed by a 30-min question and answer session, or a 45-min talk, followed by 15 min of questions. All speakers opted for the former. The question-and-answer session was moderated by the SCMBAS executive committee. In addition to audience questions on research, we also asked questions about the speaker's advice to early career scientists, obstacles, and what their "science life" experience has been thus far. Recordings of most of the seminars are available on the SCMBAS website (https://bit.ly/3vxxGK7). In each of the subsections below, we highlight some anonymized quotes and thoughts from our speakers, organized into five thematic sections that organically emerged through our question-and-answer discussions with each person: things that drive you, giving and seeking mentorship, communication and outreach, obstacles, and advice to younger scientists. Quotes have been anonymized and edited for clarity/conciseness where appropriate. Our hope is that readers, especially students and early career professionals, find these tidbits helpful and inspiring.

SPEAKER RESPONSES

Things that Drive You

- I was inspired by the seminar work of Michael Goulding, *The Fishes and the Forests and visual observations of animal interactions during international field courses, tropical volunteerships, and local field work*.
- At first, I was initially driven by anger and depression about the insensitivity and arrogance by the fish kills, watching our river be destroyed, pollution, violence towards those trying to defend the system. But then I turned that anger into a strong empathy for the basin and a desire for it to be healthy. I'm making a difference every single day, from inside the system. No longer can the federal and state agencies call my traditional ecological knowledge (TEK) anecdotal or myth, as I now possess a STEM degree and can "speak" their language of science combined with my TEK and place-based identity.
- The best part of my day is mentoring undergraduates in one-on-one student-driven research. And teaching! I'm especially thrilled when a student lets me know they arrived at a major shift in their understanding of difficult concepts, or a major decision in their career goals, and especially if that is enhanced by my class.

Giving and Seeking Mentorship

- How to be an excellent mentor
  - Diversity and equity issues were front and center, prioritized alongside the research goals.
  - Good mentors acknowledge that everyone's lived experiences are different, and that mentees are whole individuals with dreams and aspirations.
  - My postdoctoral mentor treated me as an equal—there was no hierarchy.
  - Jacquelyn Bolman (Lakota Tribe), the former director of the Indian Natural Resource Science and Engineering Program (INSREP) at Humboldt State University, was wrongfully fired for being a vocal woman of color. Ultimately, a civil lawsuit awarded Bolman a sum of money for wrongful termination. She was/is inspiring in that even in her lowest times, she motivated students to give 110%. She is the one who facilitated my returning to college in 2011 through INRSEP and AISES (American Indian Science and Engineering Society).
- What to look for in searching for mentors
  - My PhD advisor (Paul Moore, BGSU) and postdoc mentor (David Noakes, Oregon State University) were incredible mentors. They were so supportive of all my endeavors and helped build my confidence as a scientist. I could always go to them for honest advice—research

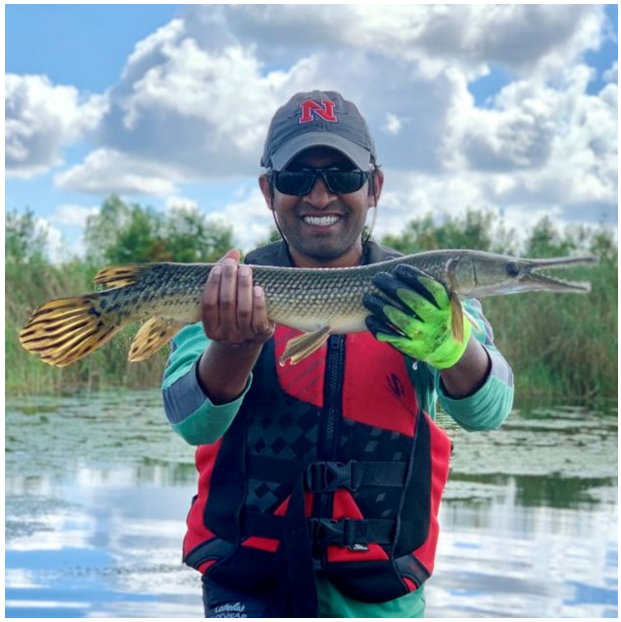

Figure 3. "Successful science communication can look different for everyone. You don't need to be an expert in every social media platform to be an effective communicator!" – Solomon David, assistant professor, Nicholls University.

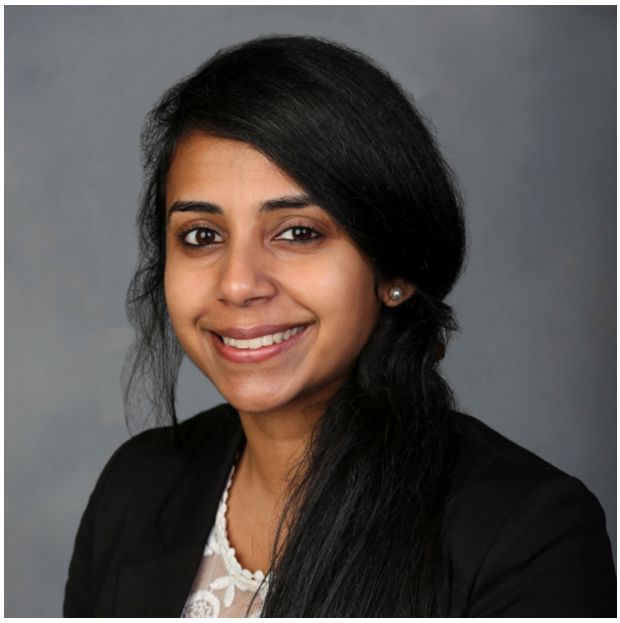

Figure 4. "Oftentimes I wondered why I was having a different experience than other people, and I didn't know how to communicate that, until a year-and-a-half into my postdoc when I met another person-of-color that was doing something similar." – Maryam Kamran, director of inclusion and diversity, Virginia Tech.

or otherwise. I think it's important to mention that as white men in positions of power, they used their power to be allies to support students and individuals from minoritized groups. They helped amplify my voice and the voices of others like me.
    - Good mentors give you confidence in the face of imposter syndrome.
    - Good mentors push you to get credit for "extra" or non-research activities.
    - Recognize that mentorship can come from multiple people and don't hesitate to reach out to others for support.
    - My MS, PhD, and postdoctoral mentors had overlapping strengths: how to succeed in academia, how to design experiments and rigorous statistical analysis, how to write—I'm grateful to have learned in all of these areas thanks to them. So, maybe no one mentor excels in all areas, and it's wise to seek out multiple mentorship opportunities.

Communication and Outreach

- Diversify your outreach for different goals
    - "Success" in science communication can look different for everyone. You don't need to be an expert in every social media platform to be an effective communicator!
    - Be interactive. Work to create connections with others on your chosen platform by interacting with others' content through asking questions, providing comments, resharing, etc.
- Tell what you know and research what you don't
    - Spend time to understand what message you want to communicate, what your goals of communicating are, and what your medium is capable of.
    - As the only nonwhite person (and often times outsider) in the room, I did outreach partly to make connections with the local community.
- Spread messages of diversity
    - If we're going to fix problems for Pacific fisheries, it is going to take a team effort. It's like a recipe: All of us have an ingredient that we have to combine to ultimately transform our rivers and our ecosystems and our ecosystems.
    - When we discovered two new subspecies of Pacific lamprey and the gene locations which differentiated them, I had the amazing opportunity to name each ecotype using words from the Yurok language.

Obstacles

- Transitional obstacles
    - When I came to the United States, I barely spoke any English and was required to teach in my first semester. I got many harsh reviews from my students. But other students who were kinder told me that I was so excited, it made them excited too and eager to discover. One remarkable memory is of a female student who told me that she was a history major and a few semesters later told me that she decided to become a biology major, in part thanks to the experiences in my lab. I am grateful for the patience and dedication of my mentors that provided a lot of feedback to help me become a better writer.
- Representation obstacles
    - Diversity and lack thereof in academic circles.
    - I was always the only person of color in the room.
- Practical obstacles
    - Sometimes access to research organisms is the biggest obstacle, because of permitting issues, difficulty traveling to and exporting from other countries, etc. This may be especially true of systems that have "space"—i.e., are not already being studied by many other labs. Finding the right system to both address the questions one is interested in and that is also feasible to collect and work with in the field can be challenging.

Figure 5. "I got here thanks to many mentors, collaborators, students, and people who have believed in me and supported me along the way. What keeps me going is passion. My advice to you is to follow your passion and the rest will come too." – Sandra Correa, assistant professor, Mississippi State University.

Advice to Early Career Scientists

- Practical tips
  - Read as many papers as you can! Get to know your system and similar topics.
  - To help with lab turnover, encourage lab members to generate a living document "lab manual" with very detailed lab protocols, including images, QR codes for training videos, screenshots, etc. It's also nice for senior undergraduates to be able to pass the torch and practice mentorship as well.
  - If teaching is important to you, I highly recommend positions at liberal arts or primarily undergraduate institutions—just know that you will teach a lot more than your peers at R1 (doctoral-granting) institutions!
- Encouragement
  - Don't give up! You are going to find many challenges at all levels (in your courses, while designing and executing research, etc.). In these moments, there will always be someone to support you and help you keep moving forward. But if you give up, achieving success will no longer be possible.
  - There are jobs out there—everyone I know who wanted an academic job has one. Don't be discouraged! At the same time, don't feel pressured to stay in academia if that isn't the right environment for you. There are many other exciting careers that require a graduate degree.
  - It's okay to have some final career uncertainties and be open to the possibilities of what that might look like.
  - Learn to lean on others (applicable in many life situations). Graduate school can be isolating—take care of yourself!

MOVING FORWARD AND FINAL TAKEAWAYS

In efforts to increase diversity in science, we often consider only basic demographics (race, gender, etc.). In our seminar series, diversity emerged not only in the speakers themselves, but also in their research topics, lived experiences, institutions, and areas of expertise beyond science. After the series concluded, we asked each speaker to provide three words that they might have used to describe scientists when they were younger, and three words to describe themselves now (Figure 6). In general, speakers encouraged collaboration, respect, passion, perseverance, and representation.

We additionally sent a post-event survey to each of the speakers, attendees, and SCMBAS members to reflect on the successes of the event and how we can improve in the future. Responses to the series were positive to very positive. Audience members requested more question-and-answer time, as well as more questions relating to advice, personal obstacles, and mentorship, rather than questions solely focused on the speaker's research. Accordingly, we suggest extending the format by 15–30 min, allowing for longer, deeper discussions. We would also like to provide the speakers with a list of suggested topics and potential questions in advance, so that they have the opportunity to incorporate these into their talk. Moving forward, we also aim to highlight the research of graduate students, who represent the next generation of fisheries scientists, as well as scientists from other related fields.

Our seminar series highlighted the demand for these discussions in relation to fisheries work, and we hope it will provide inspiration for other subunits and organizations looking to organize something similar. However, while providing a platform for these voices is a great first step towards promoting an updated vision of who fisheries scientists are, it does not replace the necessary changes to encourage and maintain diversity in fisheries science. We are encouraged by the recent diversity initiatives within AFS and other professional societies, and look forward to participating and uplifting these activities moving forward.

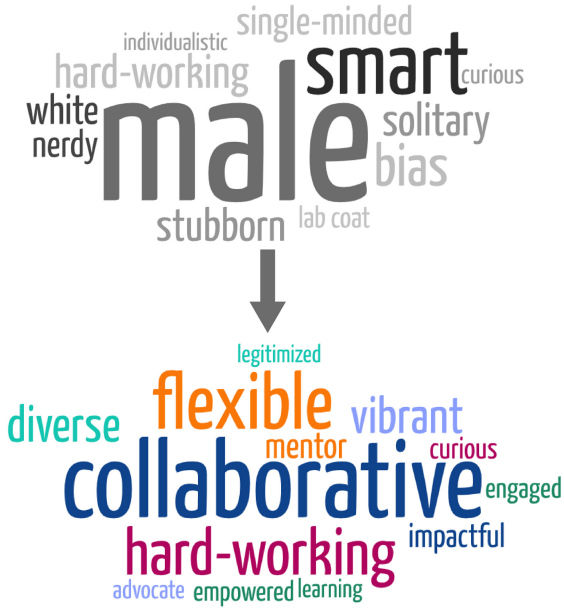

Figure 6. We asked our speakers to list three words to describe how they viewed scientists when they were younger (top), and three words they would use to describe themselves now (bottom).

Finally, please join us for this year's seminar series in spring 2022! To receive information about how to attend, follow SCMBAS on Twitter or Instagram (@scmbas_afs), visit our website (ucsc.fisheries.org) or subscribe to our bi-weekly newsletter (https://ucsc.fisheries.org/contact-us/).

ACKNOWLEDGMENTS

We would like to extend our sincerest thanks to our seminar speakers for sharing their time and wisdom with us. We would also like to acknowledge the Fisheries Collaborative Program and Eric P. Palkovacs (FCP director) for cosponsoring this seminar series. There is no conflict of interest declared in this article.

ORCID

Katherine E. Dale https://orcid.org/0000-0002-8544-1571
Laura C. Goetz https://orcid.org/0000-0001-7071-9924
Katie M. Kobayashi https://orcid.org/0000-0002-8900-9479
Molly R. Lane https://orcid.org/0000-0002-9899-3682
Emily C. Nazario https://orcid.org/0000-0003-2372-8742

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