

FISHERIES

August 2019



SPECIAL ISSUE
Diversity and Inclusion

Marine Artificial Reef Research and Development

Integrating Fisheries Management Objectives

Stephen A. Bortone, editor

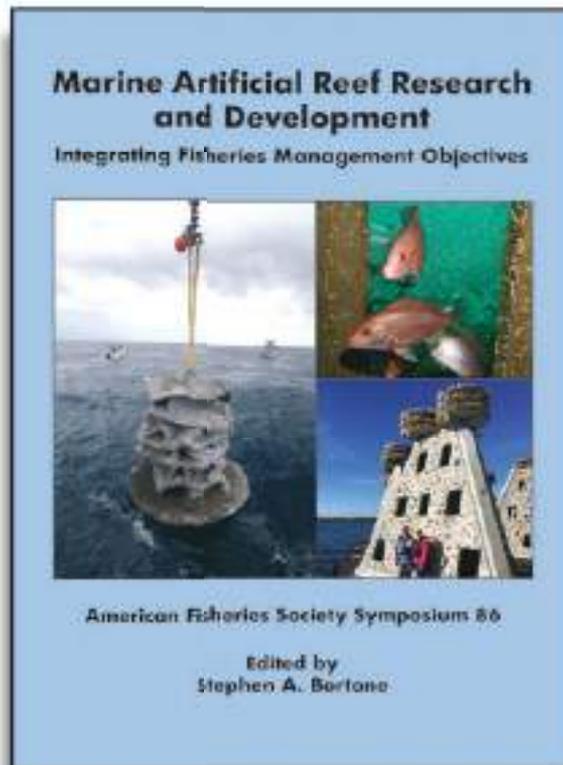


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Over the past forty years, marine artificial reef researchers have explored a variety of key questions about the ecology and function of manmade marine habitat. While artificial reefs have long been presumed to offer an alternative management option to resource managers, in practice artificial reefs are often not formally incorporated into fishery management plans.

This volume addresses many of these issues with papers based chiefly on presentations given at a symposium held at the American Fisheries Society annual meeting in Tampa, Florida and the 11th CARAH (Conference on Artificial Reefs and Related Habitats) in Terengganu, Malaysia, both held in 2017.

This topical work presents research results that address the incorporation of artificial reefs into fishery management strategies. The book will be invaluable to natural resource *researchers and managers*.

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Photo by Shanyn Fiske

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425 Barlow Place, Suite 110 • Bethesda, MD 20814-2199
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Introduction to Special Issue on Diversity and Inclusion

Kaja Brix | Fisheries Guest Editor | NOAA Fisheries Alaska, 709 W. 9th St., Juneau, AK, 99802 | International Arctic Research Center, University of Alaska Fairbanks. E-mail: kaja.brix@noaa.gov

“In everything that yields gracefully, G.K. Chesterton says somewhere, there must be resistance. Bows are beautiful when they bend only because they seek to remain rigid. Rigidity that slightly yields, like Justice swayed by Pity is all the beauty of the earth. Everything seeks to grow straight, and happily, nothing succeeds in so growing. Try to grow straight and life will bend you.”

Igor Stravinsky, *Poetics of Music*,
Harvard University Press. 1942



As fisheries professionals we strive to have our work seen and heard, disseminated widely in its details and nuances, to the benefit of our knowledge network and to the benefits it brings to the environment and society. Can we say the same when it comes to seeing and hearing each other, beyond the knowledge contributions we each make? Not long ago I was chatting with a male colleague about how we hear or don't hear women's voices in a professional setting, sharing some of my own experiences of not feeling heard. His candid response was, “I'm a loud New Yorker, I have no idea what it feels like to not have my voice heard.” These may not be the experiences of every one of us, yet I would venture that we each desire to be seen and heard, not only for the work that we do but for the whole person that each of us is.

It has been a privilege and a sobering responsibility to guest edit this special issue of *Fisheries* magazine on Diversity and Inclusion. To my knowledge the American Fisheries Society is the first professional organization to dedicate an entire magazine issue to the topic of Diversity and Inclusion. The credit for this effort goes to the leadership of Past President Steve McMullin, current President Jesse Trushenski, the editors of *Fisheries* magazine, and all those—too many to name—who have contributed to moving us all forward in diversity and inclusion. We are showing that as a society we can lead the way. Building our critical mass in this direction will certainly serve to inspire others.

While you may or may not see your point of view or ideas reflected in this issue, my hope is that we have provided food for thought and stimulus for further, enduring conversation and action. The central thrust has been to provide voices to the issues of diversity and inclusion. These are the voices of your colleagues: scientists, managers, educators, young professionals, seasoned experts. This issue is deliberately not the science voice of your colleagues. These are not scientific pieces coming from or about a diversity of people. They are the voices of who your colleagues are; as people who come to their work from many different perspectives, ideas, cultures, and

values. These characteristics are the foundation upon which they do the work they do.

By virtue of the many voices of who we are as a profession, we do not presume to cover the entirety of views on diversity. Our goal was to put a spotlight on the topic of diversity and inclusion from the unique angle of colleagues sharing their stories about who they are and what they think. If we step back to the very early days of biological research, the *Beagle*—the ship sailed upon by Charles Darwin—set sail to uncover the stories of natural history. The unique discoveries came not just from the scientific exploits but through the lens of those men as individuals with their own unique view of the world they were seeing.

Perhaps it is the very tension inherent in colliding notes that allows for the possibility of great composition. Such dissonance resolves, in some manner, if we dare to look deep enough. G.K. Chesterton—an early 20th-century writer, philosopher, and theologian—was a noted critic of Darwin, yet their opposing ideas took them into the same conversation, where their theories about humanity seem to be completely aligned. Proving that when we let go of big categories, as in “science” or “religion,” or whatever, and just dig down to our ideas about what makes us human, we find a remarkable synchrony in our differences.

This special issue sets about to generate some dissonance; to create some collision of notes for the possibility of what might be. It seeks to open our exploration into what is different to see how we might be the same. It rests on the idea that when we recognize the positive tension in the rigid nature of the bow and of its arc we arrive at places we might never have imagined.

The issue is organized into four distinct themes: The three contributions of the first theme are from your fisheries colleagues about “why we need diversity.” Each of these pieces was loosely guided by this question. You will see that each author took a different approach to that question. What you may perhaps see as some incongruity of theme precisely

generates the point of how we each see the question through a different lens. Ideally, this perceived incongruity will generate some positive dissonance from which comes reflection about differences.

The second theme touches on the demographic data in our profession. It does not aim to cover the full suite of analytics, which you can find in other publications. Rather, it strives to put diversity into a general demographic context. The third theme seeks to move us into the realm of "Action:" how do we get to a more diversely representative profession? This theme does not cover all nature of possible actions; rather it gives some ideas and concrete grounding for your own actions on increasing diversity.

Finally, the special issue comes to a close with six pieces from authors inside and outside our profession who were asked to answer in their own words the question: "What Does Diversity Require of Us?" The goal in this last theme was for the authors to *dig deep and be provocative*; inspiring us to contemplate how we each might answer that question ourselves. For, ultimately, the aim to make our profession more diverse and more representative of the constituents we serve will come from our own reflection and action that pushes us further forward as a professional society. It is not simply the quest for quantifiable diversity that will yield the rewards, it is in what that diversity can do for us all and for the endeavors we put our minds to.

This issue is not so much intended to provide information as it is to provoke thought, stimulate awareness, reflection, and in its ultimate aim, to generate conversation and action. As you move through this diverse array of contributions and something resonates with you, my hope is that you talk about it and take the ideas somewhere. As you move through this issue and it potentially feels uncomfortable, disconnected, not on point, unscientific, my hope is even greater that you will follow your curiosity to uncover why. Perhaps that is exactly the path upon which Darwin trod.

If even one of those thoughts generates a spark, I will consider our efforts to be a success. Each voice, each whole person, each action we take as individuals and as a collective, matters. It matters to the work that we do, it matters as a community, and it matters to the people and environment for whom we do the work we do.

Of final and important note, no small thanks goes to each of the contributors to this issue. Your voice has made a difference.

Thank you all for the opportunity to be part of this conversation. Let's keep going.

Kaja Brix
Guest Editor

Fisheries, Diversity and Inclusion Special Issue **AFS**



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Thoughts on Diversity, Diversity in Thought

Jesse T. Trushenski | AFS President, Riverence, 120 State Ave NE #1058, Olympia, WA 98501.
E-mail: jesse@riverence.com



“If you approach each new person you meet in a spirit of adventure, you will find yourself endlessly fascinated by the new channels of thought and experience and personality that you encounter.”

—Eleanor Roosevelt, *You Learn by Living*, 1960

Why do we value diversity? There are many reasons—some universal, some deeply personal. Directly or indirectly, we are all responsible for the conservation and wise use of natural resources held in public trust. Diversity in the fisheries disciplines is an essential element of resilience, relevance, and respect for the work we do within and among the communities we serve. Diversity is not about optics, it is about recognizing, understanding, and representing the needs and interests of the public whose resources we strive to understand and manage. No race, ethnicity, gender, or class has a monopoly on solutions to the complex problems we face in natural resource conservation and management—we are better together, sharing the counsel of our differing channels of thought, experience, and personality.

Talented, dedicated people have their choice of careers. They might choose fisheries science...or another STEM field...or another career path altogether. A welcoming environment and an inclusive workforce are fundamental to attracting the best and brightest to the fisheries profession and retaining them over the course of their careers. Diverse employees have proven themselves capable of challenging expectations, showing bravery, and not letting adversity dissuade them from their chosen career path. What employer wouldn't want to hire someone with these attributes? Who wouldn't want to work alongside someone with such drive? As noted in a recent text about the contributions of minority women professionals to the medical field (Olayiwola 2016), what makes women, people of color, those identifying as LGBTQ+, and members of other underrepresented groups different is not irrelevant in terms of their success, but rather a part of what makes them successful. Our roots and experiences, our differences are not something to ignore, but to embrace, as individuals and as a Society.

The girl in the picture hugging the fish (Figure 1) is exactly the kind of person we need in our profession, but not because she is a particular gender or ethnicity. This is not to say that these attributes are meaningless: her life experiences and perspectives will be informed and shaped by these and other aspects of who she is. The way we think and lead others, what we value, etc., are not defined by our identities, but they are influenced by them. If she chooses a career in fisheries science, the profession will benefit from insights and wherewithal that are uniquely hers. But that's not what you see in this picture. What you see is unbridled joy and someone who cares a whole

awful lot. What you see is someone who will give more than just 9 to 5, Monday through Friday, to her career and fisheries resources. Maybe what you see is a future officer of the American Fisheries Society (Figure 2). What we seek is diversity in thought, but that is best achieved through mainstreaming of diversity in our work and organizations:

Our thoughts and perspectives aren't developed in a vacuum. The way we think, problem-solve, communicate, lead, see the world...is largely shaped by our lived experiences, often rooted in our identities. The way we achieve real “diversity of thought” and reduce blind-spots in organizations is by ensuring people from all walks of life are given seats and actual power at the table

(Kim 2018).



Figure 1. This 2015 meme provides compelling evidence regarding the origin of the colloquialism, “fish squeezer.”



Figure 2. The author, conducting field work on the Snake River.

As my time as your President comes to an end, I think back to how it began. In my 2015 candidate's statement, I wrote about expanding our role as a voice for fisheries science in the public square. AFS kept science-based management of fisheries resources front and center this year, as decision makers in our nation's capital and stakeholders across the country have engaged on matters related to Waters of the United States rule-making, environmental impacts of the proposed Pebble Mine, reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act, and framing of the Recovering America's Wildlife Act. The Society also continued to bring science to the Beltway by hosting congressional briefings on the National Fish Habitat Partnership and marine aquaculture. When asking for your vote, I also wrote of the need to embrace change in order to sustain our strengths as a Society. Our upcoming joint meeting with The

Wildlife Society is an obvious example of trying something completely different, but there are other ways in which the Society has welcomed change. From restructuring our editorial boards and strengthening our publications, to establishing the e-newsletter and webinar series, the Society is evolving to help our members better meet the challenges of today and tomorrow. The Society is also preparing to implement a new forward-looking strategic plan to guide us in the coming years as we face new challenges in fisheries science and our profession. We have also developed a quantitative reporting system so that we may better gauge our effectiveness as an organization and align human capital and other resources with our priorities. Lastly, my candidate's statement reflected on the need for leadership that is representative of and responsive to our members. We have established standards of conduct and are addressing potential barriers to participation at our meetings. We are giving our members new opportunities to learn and grow as professionals, expanding our continuing education curricula to include workshops and courses aimed at developing "soft skills." We are calling on all of our members to be aware, decent, respectful, and encouraging... to be allies... to be your best. We have yet to reach the mountaintop, but I am proud of the progress AFS has made with respect to diversity and inclusion and creating a welcoming atmosphere. In these pages and the years to come, you will see the Society's commitment to being the home for *all* fisheries professionals.

When people ask me about my career and how I came to be a fisheries scientist, I tell them about the "quarter-life crisis" I experienced in my early 20s. I liked my classes in biology, chemistry, and math, but could not quite figure out how I was going to piece that together into a fulfilling career. And then I was introduced to aquaculture and what has become my life's work. The fisheries profession allows me to do meaningful science that makes a difference for fisheries resources and the countless lives and livelihoods that rely on them. I hope my time as an officer has also made a difference—in terms of our capacity as a professional organization and how we think, act, and present ourselves to the world. I know that it has made a difference for me, and that I am a better scientist and steward for having served as your President. Thank you for honoring me with your trust and the privilege of being the Society's standard-bearer.

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The Hutton Junior Fisheries Biology Program: An Innovative Summer Experience to Promote Diversity within the Fisheries Profession

Mary Webb Banning | AFS Educational Program Coordinator. E-mail: mbanning@fisheries.org

The American Fisheries Society's Hutton Junior Fisheries Biology Program is a hands-on, 8-week summer internship opportunity for high school students, specifically women and students from minority backgrounds. Selected students, known as Hutton Scholars, are paired with a fisheries mentor and participate in an exciting and unique summer experience. The main goal of AFS's Hutton Program is to inspire and engage students from underrepresented groups in the fisheries profession today. Students from minority backgrounds as well as women are encouraged to apply to the Hutton Program. AFS Hutton Program staff work to recruit these underrepresented groups so that there is a large and diverse pool of applicants for the internship positions. Students from the United States, Canada, and Mexico are all eligible to apply to the Hutton Program.

In 2020, the Hutton Program will be entering its 20th year of inspiring young and passionate students to experience the field of fisheries science and management. Since its inception in 2001, the Hutton Program has offered 716 students the opportunity to participate in this one-of-a-kind experience. Over the past 19 years of the program, students have been paired and mentored by over 700 fisheries professionals ranging from



Claire Vaage (front) is a 2018 Hutton Scholar who worked with the Idaho Department of Game and Fish in Meridian, Idaho.

federal employees to university graduate students. All are working to diversify and create equality and inclusion within the fisheries profession.

In 2019, we received 182 applications for just 30 internship spots. We heavily rely on our generous funding partners to offer each student a US\$4,000 stipend to go along with their amazing experience working side by side with both young and seasoned professionals.



Mentor Tomas Ivasuaskas (left) and 2018 Hutton Scholar Kerby Nulud (right) working with the Maryland Department of Natural Resources in Annapolis, Maryland.



Donte Salter (right) is a 2018 Hutton Scholar who worked with the Suncoast Youth Conservation Center in Apollo Beach, Florida.

It is the mission of the Hutton Junior Fisheries Biology Program to recruit and offer internship positions to women and students from minority backgrounds. The Hutton Program aims to influence these students and direct them towards pursuing a career in the field of fisheries science and management.

To find out more information about the Hutton Program, please visit our website at <https://hutton.fisheries.org/>. If you are interested in becoming a Hutton mentor or supporting the Hutton Program, you can direct all questions to Mary Webb Banning, Educational Program Coordinator, at mbanning@fisheries.org. AFS

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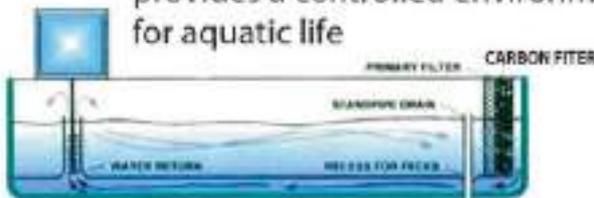


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ESSAY

Theme 1: Why Diversity?

Mamie Parker | Ma Parker Associates, 45788 Shagbark Terrace, Dulles, VA 20166.
E-mail: Maparkerassociates1@gmail.com

Mamie Parker is an African American biologist, environmentalist, and administrator, and a distinguished leader in the fisheries profession.



Several years ago, the American Fisheries Society (AFS) presented me with the prestigious Emmeline Moore Prize. Although I had also received the Presidential Rank Award, the Wildlife Society's Diversity Award, the William P. Reilly Environmental Leadership Award, and was enshrined in the Arkansas Outdoor Hall of Fame, the Emmeline Moore Prize really made my heart smile. During the award presentation, I cried one of those ugly cries with tears of joy. Emmeline Moore—the first female President of AFS—and I both worked to prevent fish disease and water pollution problems. Also, we both worked for the U. S. Fish and Wildlife Service. As pioneers, I can imagine that like me, she struggled with isolation, exclusion, underlying bias, discrimination, and the lack of role models. Diversity requires us to address these barriers and challenges with stronger leadership, increased personal commitments, mentoring opportunities, innovative communications, financial and human resources, and more collaborative efforts.

Having spent my formative years in the segregated South, being constantly told by my mother to stay positive, I suppressed a lot of feelings and anger and never spoke openly about the damages associated with the racial biases and discrimination. This approach made it easier for my supervisors, peers, and me to avoid the tension. However, reflecting on those bad encounters, what I really needed was a mentor to talk about it. I needed someone who faced the same challenges that I experienced. It made all the differences in the world to see or hear someone (usually a white professor, supervisor, or peer) stand up and speak up on the biases, inappropriate actions, or words. Diversity requires us to speak up, set the climate, and lay the foundation to have open communications, and provide mentoring programs and affinity groups to ensure the success of diverse populations. It requires us to focus on emotional intelligence, the soft skills needed to help others feel comfortable having the critical conversations regarding their unpleasant situations.

It is hard to believe that I joined this profession over 40 years ago at the Fish Health Laboratory and National Fish Hatchery in Genoa, Wisconsin. Neither can I believe that we still face many of the same problems related to workforce diversity and inclusion. Since my first days in Wisconsin, many diversity initiatives have been implemented. We have seen some progression in the profession with a few isolated instances of success. However, it is clear that one of the major machines on the assembly line is broken. We have not used the best approach to totally repair it. During the past decade or so, we have realized that we cannot aggressively attack sea level rise, improved resilience and flow mapping, riparian forest buffer protection, streambank restoration, stock assessments, ocean plastic pollution, and other challenges without a fully functioning machine with “all hands-on deck,” as one of my mentors, Audrey Peterman would say. Diversity requires us to use that same approach where all hands are on deck, with leaders, professionals, professors, and students using the same

approach to address other fisheries challenges to diversify our profession—to repair the broken machine. A large number in the conservation community have not made a diverse workforce a priority and truly embraced the value of human diversity the same way we promote biodiversity. Diversity requires us to maximize our personal productivity to add diversity to our profession.

More importantly, it requires an innovative internal communication messaging to motivate everyone to do more and be more in this arena. Most of us can explain what we do in our profession and how we do it; however, we have not spent the appropriate amount of time and resources explaining why we need to diversify the profession. We must refine our internal messages on why we must repair the broken machine.

Diversity requires consistent voices and cheerleaders like Dale Hall, John Rogers, Bill Taylor, Christine Moffit, and Past AFS Presidents Steve McMullin and Joe Margraf—champions and other progressive leaders setting priorities and responsibly, leveraging financial and human resources. It requires us to work in close collaboration with all partners like The Wildlife Society, the Diversity Joint Venture, and other organizations to increase representation.

Early in my career, family members jokingly teased me about being a tree hugger and often rolled their eyes in frustration while listening to my career goals. They often asked me, “Why don't you become a real doctor rather than a fish doctor?” Parents, family members, and influencers must be convinced to support students that are interested in our profession. We must put more emphasis on communicating with them, similarly to what my recruiter, Hannibal Bolton did prior to my joining the profession. In addition, diverse students and professionals must be willing to take risks and be open to move out of their comfort zone and work in different places in this country—not just their hometown.

Programs like the American Fisheries Society's Hutton Junior Fisheries Biology Program, the Connecting Kids to Nature movement, and the U. S. Fish and Wildlife Service's Urban Wildlife Refuge Partnerships network will result in more minorities entering the profession in the next decade. These programs have created *great memories* for the students, *mentors* for the teachers, and some *money* for programs and communities on a long-term basis. Diversity requires us to dispel some myths surrounding minorities' interest in this space. More funding and research will help us understand the minority population's thinking on the subject; however, recent studies are telling us minorities have more interest in the environment than we think. In fact, a National Academy of Sciences report (Pearson et al. 2018) indicated that 54% of Latinos are very or extremely concerned, while only 12% of a group of respondents thought that they were concerned. In addition, 67% of Hispanics said that they would be hurt

personally if nothing was done to reduce climate change impacts compared to 50% of the white population. Diversity requires us to provide financial support for more research to better understand diverse populations' interests and needs.

One of my personal challenges related to imposing self-limitations. There were so many moments when I felt that I was not good enough, talented enough, strong enough to continue to advance in my profession or, at times, stay in the profession. In several instances, I had someone that pushed me to the next level with encouraging words. I have vivid memories of that encouragement from my fellow third grade class member in Wilmot Elementary School in southeast Arkansas. Being the first African American girl in the class after many generations of segregation, I didn't think that I could survive the loneliness and just wanted out. My days were long and hard and the struggle was unbearable at times. One day, I sat at my desk during recess showing all signs of sadness when the most popular girl in the class, little Paula, came over and shared a piece of gum. She said "Here, try chewing this, it always makes me feel better." That symbolic gesture changed my whole attitude. It also changed the attitude of many of my classmates. That experience as a pioneer in the elementary school helped me navigate through many offices in this profession. Diversity requires us to have a little Paula, with small gestures of inclusion in our offices, at our local and annual meetings and in our communities. In some instances, we need someone that will give us an ultimatum.

This was the case of the former Director of the U.S. Fish and Wildlife Service, Jamie Clark. She gave me that push when it was time for me to leave her office to go to the Northeast Regional Office in Hadley, Massachusetts. Negative thoughts helped me stay in that comfort zone. I was stuck, stalled, and scared to take that quantum leap to that level of management in the agency. I also had some guilty feelings about others that felt that the job belonged to them and not me. She encouraged me to leave Washington, D. C., and endure the pains of change. This move eventually led to me becoming the first African American appointed as a regional director in the 135-year history of the agency.

Diversity requires all hands on deck from all walks of life to address current and future fisheries conservation challenges. It requires us to create more innovative messages for internal and external stakeholders in order to build a more robust, sustainable group of supporters, diverse students, and professionals. We need more mentors with emotional intelligence to help diverse populations face isolation, exclusion, underlying bias, and discrimination. Diversity requires us to gain a better understanding of diverse populations. Diversity requires us to see diversification as an opportunity for a multicultural organization with diverse ideas and strategies to address some tough conservation issues and *not* World War D! It requires more people like little Paula and Jamie Clark to push us in the right direction at the right time.

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Theme 1: Why Diversity?

Toward a More Diverse and Inclusive American Fisheries Society

Steve L. McMullin | Immediate Past-President of AFS, E-mail: mcmullintraining@gmail.com



When I stepped into the role of President of the American Fisheries Society (AFS), my highest priority objective focused on increasing diversity in AFS. We know that AFS lacks diversity. Our membership not only fails to meet the representativeness test when compared to the general population of the United States and Canada (where most of our members reside), but we also lag behind the STEM disciplines and other similar professional societies in both racial and ethnic composition and gender composition (Penaluna et al. 2017). We also must acknowledge that increasing diversity among our members will not just happen. We must make it happen. Leadership trainers have found that they should tailor leadership training for women to address gender-specific issues they face in the workplace to develop more gender-diverse leadership teams (Ely et al. 2011). Similarly, AFS must enhance existing programs (e.g., Hutton Junior Scholars; see below) and tailor new programs to address its diversity needs.

To address the need for increased diversity in AFS, I appointed the Special Committee on Diversity and Inclusion (Special Committee) immediately upon taking office and charged the committee with four specific tasks:

- 1) The committee should work closely with the Hutton Committee to develop strategies for expanding the Hutton program and linking the program with universities to expand opportunities for Hutton scholars to matriculate to fisheries and related programs.
- 2) The committee should explore possibilities and develop strategies for expanding AFS outreach to minority communities and minority-serving institutions of higher education to increase participation by underrepresented groups in the Society.
- 3) The committee should recommend strategies for improving the inclusive culture of AFS at its meetings and in its governance.
- 4) The committee should coordinate with, but not duplicate the efforts of the Diversity Joint Venture (see below).

This special issue of *Fisheries* and the work over the last 2 years by the Special Committee represent first steps in the effort by AFS to seriously address its lack of diversity. To succeed in this effort, we must actively recruit more diverse members and we must focus on retaining them as members after we recruit them. Each of these strategies warrants more discussion.

Gender diversity among AFS student members comes close to mimicking the US population (46% female), but the current gender mix becomes more imbalanced in the

non-student membership categories (39% women among Early Career Professionals and 20% women among Regular Members). Although this suggests that with respect to gender diversity, AFS has more of a retention problem than a recruitment problem, it also raises more questions. Do fewer female students get hired into entry-level positions than male students? Does AFS adequately meet the professional needs of women beginning their careers in fisheries? Does AFS have a culture that welcomes and supports diversity? Hopefully, the Diversity Joint Venture (a collaborative effort by federal and state agencies, nongovernmental organizations, foundations, and professional societies, including AFS) will address these questions and provide some answers.

The racial/ethnic composition of AFS members presents challenges in recruitment and retention. Racially and ethnically diverse members compose only 9% of total AFS members. If AFS wishes to remain relevant in a growing and increasingly diverse human population, it must begin to look more like the population it serves. We have relied primarily on the Hutton Junior Fisheries Biology Program (Hutton Program) to recruit underrepresented individuals into the fisheries field. Despite the generous support of our partners in the Hutton Program (especially the U.S. Forest Service and the Bureau of Land Management), and the rewarding and educational experiences of the Hutton Junior Scholars, we can fund only 35-40 students per year, and about half of those are diversity candidates. From its inception in 2001 through 2018, 646 students participated in the program. A survey of students who participated in the first 10 years of the program found that 12% went to work in fisheries, and another 64% ended up in a related biological field. So if you do the math, out of maybe 20 diverse Hutton Junior Scholars in a given year, 1 or 2 end up in fisheries and another 10 or so might end up in a related field—hardly enough to make a big difference. We should be able to do better than that.

Would the Hutton Program produce more future fisheries professionals if effective linkages existed in the pathway to a fisheries career? University fisheries programs also need to diversify and they should be competing to recruit Hutton Junior Scholars. Unfortunately, most university programs lack sufficient funding for scholarships to support underrepresented groups. Retaining underrepresented individuals in university fisheries programs will also require funding for internships and other experiential learning opportunities. Finally, when students graduate, they will need jobs in the

fisheries field. Federal agencies have programs that engage students in experiential learning and that lead to either a job or an enhanced opportunity to compete for jobs. Few state agencies, which collectively employ a large number of fisheries personnel, have similar programs and consequently, most state agencies lag far behind federal agencies in diversity.

We should also pursue linkages on the front end of the Hutton Program. In the past few years, AFS has added Student Subunits at the high school level. More effort in that direction, especially in localities with high proportions of underrepresented groups, may improve our ability to recruit more diverse students.

I believe AFS also needs to do more to serve Native Americans/First Nations. The currently inactive Native Peoples Section demonstrates how poorly we serve an important segment of the fisheries community. Native people conserve and manage many important fisheries resources and

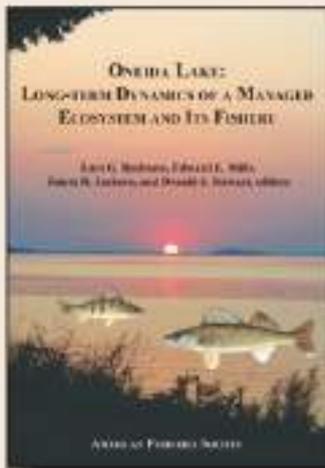
employ a significant number of fisheries personnel. Their professional home should be in AFS.

We cannot build and maintain a more diverse AFS unless we also build and maintain an inclusive AFS. Several of the Special Committee's recommendations focus on establishing a more welcoming and inclusive culture in AFS. Building a more diverse and inclusive AFS won't happen overnight, but with dedication and effort we can get there. We should get there—not because it is the politically correct thing to do, but because it is quite simply, the correct thing to do.

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ONEIDA LAKE: LONG-TERM DYNAMICS OF A MANAGED ECOSYSTEM AND ITS FISHERY



Edited by
Lars G. Rudstam,
Edward L. Mills,
James R. Jackson, and
Donald J. Stewart

541 pages
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Studies on the fish populations, fisheries, and limnology of Oneida Lake, NY started in the late 1950s at the Cornell University Biological Field Station. Early research concentrated on Walleye, Yellow Perch, and their interactions but was soon expanded to include interactions with the lake ecosystem, an early example of the ecosystem approach. Research on Oneida Lake has continued for 60 years and the resulting data series that couples fish ecology and limnology is one of the best available anywhere.

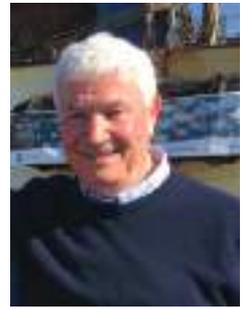
In this book, collaborators worldwide have contributed insights into the functioning of the lake's ecology and fisheries, and by extension to the functioning of similar freshwater lakes elsewhere. The book is divided in three sections. The first set of chapters provides an historical and landscape context to the studies, the second set analyzes the long-term data, and the third set uses those data in modeling analyses.

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Theme 1: Why Diversity?

Understanding the Mechanisms of Diversity



Richard Beamish | Emeritus Scientist, Pacific Biological Station, 3190 Hammond Bay Rd, Nanaimo, BC V9T 6N7, Canada. E-mail: Richard.Beamish@dfo-mpo.gc.ca

Richard Beamish is a distinguished scientist and recipient of the Order of Canada and Order of British Columbia for his scientific accomplishments. He received the Award of Excellence from the American Fisheries Society in 2017.

Diversity and inclusion may be the most effective way for fisheries professionals to ensure that there is responsible stewardship in a future of quickly changing ecosystems. Recently, I proposed that an efficient way to discover the mechanisms that regulate Pacific salmon *Oncorhynchus* spp. production is to work as international teams (Beamish 2018). Just as diversity is important for population success, teaming up internationally to solve major issues in fisheries science should be an effective use of scientific talent and resources. International communication among team members is now straight forward, but

there needs to be encouragement for teamwork. Teamwork is tough, but international scientific diversity could provide resilience for reliable stewardship. It is a combination of professional diversity and an understanding of the relevance of biological diversity that I think should be the focus for fisheries research. Let me explain by looking at diversity as it relates to Pacific salmon. A number of studies such as Schindler et al. (2015) and Moore et al. (2014) as well as our own common sense tell us that the more diversity exists in an aggregate of populations, the better chance the regional production of a



Photo caption: The international team of scientists that participated in the 2019 winter study of the mechanisms that regulate Pacific salmon abundance. The 21 scientists are from Korea, Japan, Russia, the United States, and Canada. The Russian ship *Professor Kaganovsky* was privately chartered by Dick Beamish with funds raised from private donors, foundations, and governments. Photo credit: Chrys Neville.

Pacific salmon species will not only be maintained, but may also produce a harvestable surplus. The problem is that we do not actually understand how diversity works. What is the biological mechanism that is operating when one population is surviving in the ocean much better than other populations?

Declining abundance trends of Chinook Salmon *Oncorhynchus tshawytscha* off the west coast of North America (Riddell et al. 2018) and in the Strait of Georgia (Beamish et al. 1995; Beamish and Neville 2016) are good examples of the need to understand the basic mechanisms that regulate marine survival. In the Strait of Georgia, prior to the late 1970s, marine survival averaged about 5% (Beamish et al. 1995). The survival from 1978 to 1988 (Beamish et al. 1995) and to the present (Riddell et al. 2018) is now about 1%. This 4% increase in mortality from 95% to 99% is a 4% decline in survival from 5% to 1%, but an 80% decline in abundance. The stewardship response has been to try to “rebuild” abundances by fixing freshwater habitats, limiting fishing, and building hatcheries. It is fair to say that some well-intended measures that started in the 1980s have not succeeded. In fact, this year, in 2019, the declining abundances of Chinook Salmon are the major fisheries management issue on Canada’s Pacific coast.

There are a small number of populations of Chinook Salmon that are surviving much better than all other populations that rear as juveniles in the Strait of Georgia (Beamish and Neville 2016). These better-surviving populations have a much later ocean entry time than all other populations, which is most likely associated with their better survival. However, the diversity of a late ocean entry time is not the mechanism; but it is a clue to discovering the mechanism.

One hypothesis for the mechanism is that fish that grow faster—quicker in the first weeks in the ocean—survive better. This means that finding abundances of food immediately after entering the ocean allows a fish to focus energy on growth, which at a critical time during the early marine period exceeds a threshold that directs metabolism to store more lipids (Beamish and Mahnken 2001; Beamish and Neville 2016; Beamish 2018; Neville and Beamish 2018). There is recently published support for the hypothesis that growing faster in the early ocean period improves the survival of Chinook Salmon. Litz et al. (2018) concluded that feeding rates contribute most to growth rate variability in the early marine residence of Chinook Salmon and Graham et al. (2019) found that first-year marine growth of Chinook Salmon from two large rivers in Alaska was positively related to marine survival and productivity. If the interpretation of “growing fast or dying young”—as one author summarized—is generally supported, it provides an explanation for the mechanism associated with diversity in general and Chinook Salmon ocean survival in particular. Importantly, knowing how diversity works to improve production allows for a more effective use of Chinook Salmon hatcheries. Discovering the mechanisms that make biological diversity important will be made faster with a diverse team of researchers.

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Theme 2: Status of Diversity in the Fisheries Profession: Demographics

Megan Hillgartner | University of Alaska Fairbanks, 2160 N. Koyukuk Drive, Fairbanks, AK 99775. E-mail: mmgodfrey@alaska.edu

Sorina Stalla | University of Alaska Fairbanks, AK 99775.

Demographic data indicate that very little diversity exists within fisheries science professions (Arismendi and Penaluna 2016). To date, women and minorities comprise a small portion of the United States fisheries workforce. A recent demographic survey (Arismendi and Penaluna 2016) of 498 faculty members from 56 institutions of higher education and 1,717 federal employees highlighted the systematic lack of diversity throughout fisheries professions finding that, “across the fisheries science workforce, [...] only 1 in 4 fisheries faculty or scientists is a woman, and 1 in 10 is nonwhite.” The survey reveals that the lack of gender and racial diversity in the field paralleled the lack of diversity among U.S. government fisheries scientists and professionals (Figure 1), indicating the broad and pervasive challenge associated with advancing towards a fisheries workforce reflective of actual U.S. demographics.

From a regional demographics perspective, diversity in fisheries professions is lagging across all regions of the United States. The Northeast shows the most progress towards the inclusion of women, while the Midwestern and southern United States fall behind. The western United States holds the largest gap between what is reflected in the demographic makeup of the region, and what is reflected within fisheries professions (Figure 2).

The lack of diversity in fisheries science and management careers across the nation is in contrast with STEM graduation statistics. Women constitute 50% of the population graduating with a degree in biological sciences (Oregon State University 2016), a statistic that is not reflected in hiring or employment rates. Despite fairly equal graduation rates, employment positions in both academia and in federal fisheries and science careers show that the vast majority—around 74%—are held by men (Arismendi and Penaluna 2016). When graduation demographics and employment rates were examined from a racial and ethnic diversity perspective, the findings indicated an even greater divide in which, “only roughly 10% of all fisheries science, manager, and faculty positions were occupied by minorities” (Oregon State University, 2016).

Racial, ethnic, and gender demographic data indicate significant progress must be made to increase diversity in fisheries professions. Organizations, governments, academia, and professional societies must continue taking action in their strategic planning and program development to ensure their practices are leading towards changes that will reflect and represent the realities of population demographics. The American Fisheries Society recognizes this need and

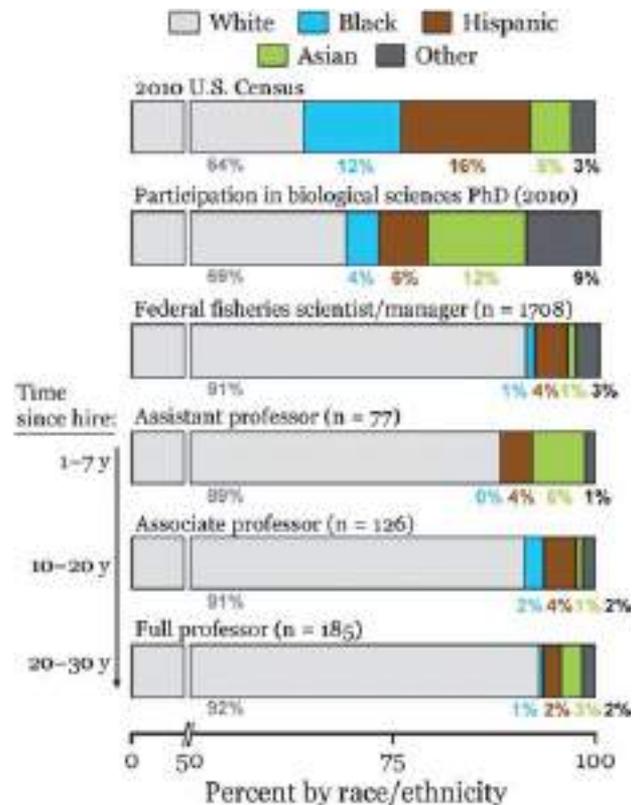


Figure 1. Percent participation by race or ethnicity in the U.S. fisheries science workforce (Arismendi and Penaluna 2016).

has taken a position of strong leadership to address this issue, including a symposium on Diversity and Inclusion at the 2017 and 2018 Annual Meetings. The AFS membership has also received strong direction from Past President Steve McMullin, and current President Jesse Trushenski, on the need for diversity to ensure the fisheries profession and the work it conducts remains relevant to the communities it serves.

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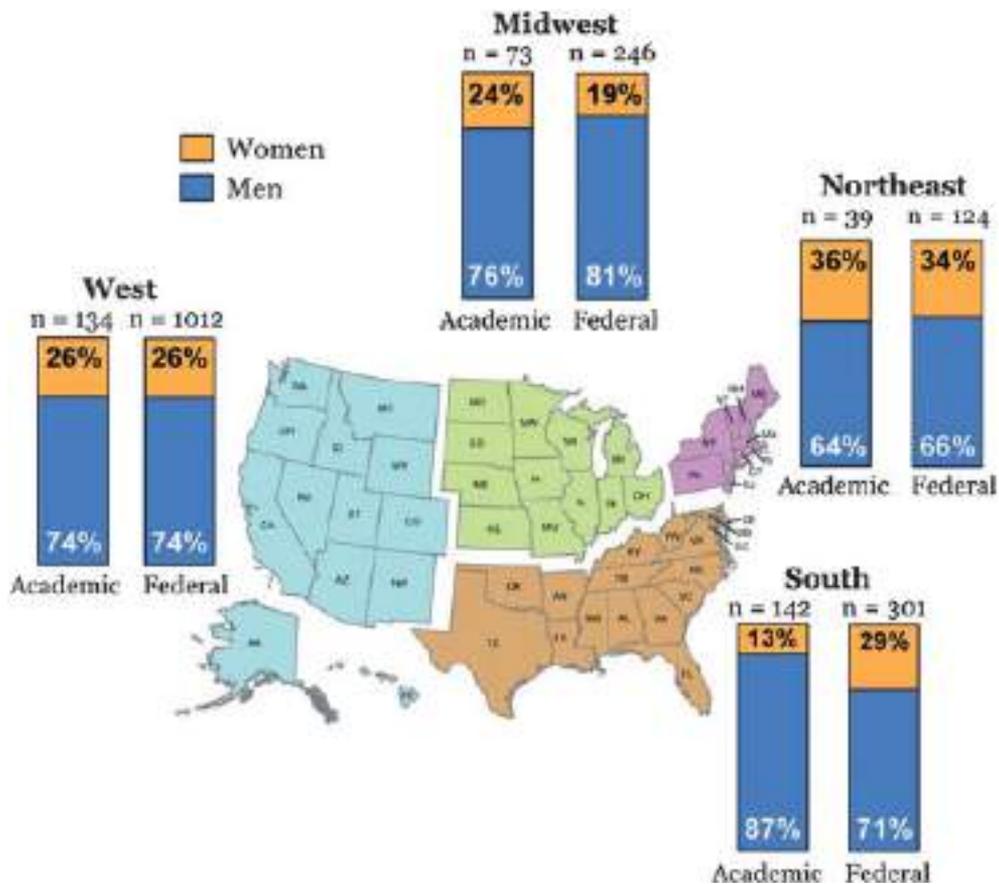
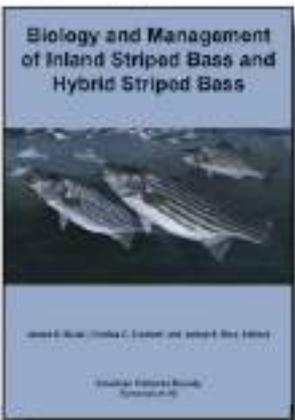


Figure 2. Participation by race or ethnicity in the U.S. fisheries science workforce by region (Arismendi and Penaluna 2016).

Biology and Management of Inland Striped Bass and Hybrid Striped Bass



James S. Bulak, Charles C. Coutant, and James A. Rice, editors

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Theme 3: Actions on Diversity in the Fisheries Profession



Megan Hillgartner | University of Alaska Fairbanks, International Arctic Research Center, 2160 N Koyukuk Dr, Fairbanks, AK 99775. E-mail: mmgodfrey@alaska.edu

Sorina Stalla | University of Alaska Fairbanks, International Arctic Research Center, Fairbanks, AK

Sorina Stalla and Megan Hillgartner are early career professionals in the International Arctic Research Center at the University of Alaska Fairbanks. They have designed and implemented PEP AK.

The American Fisheries Society (AFS) is the world's largest and oldest fisheries organization committed to advancing fisheries science, strengthening fisheries professions, and promoting conservation. With almost 8,000 international members in a wide array of professional and academic disciplines, AFS recognizes the important role diversity plays in meeting the continually evolving needs and challenges of the fisheries world. During the 148th AFS Annual Meeting plenary address, President Steve McMullin reiterated the organization's commitment to investing in measures that will increase diversity and inclusion both within AFS and more broadly throughout fisheries professions.

To address this call to action on diversity and inclusion, AFS is pursuing diversity through multiple fronts: through the Diversity Joint Venture for Conservation Careers, the AFS Equal Opportunity Section, the AFS Diversity and Inclusion Special Committee, and through continued investment in education–workforce development programs that engage underrepresented groups in conservation and fisheries sciences.

DIVERSITY JOINT VENTURE

The Diversity Joint Venture (DJV) is a collaborative partnership between universities, non-governmental entities, professional organizations, and federal and state agencies that aims to “strengthen the conservation workforce by increasing diversity, equity, and inclusion” (<https://diversityinconservationjobs.org/about/>). The DJV partnership efforts focus on connecting prospective students interested in conservation internships or career opportunities to potential employees in the field, and on providing both groups with resources that support women and people of color in the process. The DJV provides resources for employers on how to design and implement structural changes that promote greater inclusion and diversity in the workplace, as well as advice on overcoming stereotypes and challenging assumptions and bias. The DJV also provides students and job seekers information and guides related to conservation career opportunities, tips on applying for government jobs, and suggestions for building a successful resume and networking skills (Diversity Joint Venture for Conservation Careers: Resources for Students and

Job Seekers; available: <https://diversityinconservationjobs.org/resources-job-seekers/>). As a partner of the DJV, AFS demonstrates its engagement and commitment to strengthen diversity and inclusion within the Society.

THE EQUAL OPPORTUNITY SECTION OF AFS

The Equal Opportunity Section (EOS) is a section within AFS that aims to, “increase the representation and involvement of diverse ethnic and racial groups and females in the American Fisheries Society” (<https://equalopportunity.fisheries.org/>). Like the DJV, the EOS promotes interaction between minority students and professionals in the fisheries realm, and provides important information pertaining to scholarship, education, and employment opportunities to students. The EOS works to engage stronger interaction and collaboration between minority-serving institutions and research institutions, and works to increase the participation of women and underrepresented groups at AFS Annual Meetings through sponsoring travel grants and awards. The EOS also administers the Frances Allen Scholarship, which provides female fisheries PhD students conducting research relevant to AFS objectives with a financial scholarship (<https://equalopportunity.fisheries.org/other-eos-supported-awards/>).

AFS DIVERSITY AND INCLUSION SPECIAL COMMITTEE

The AFS Diversity and Inclusion Special Committee was appointed by 2018 AFS President Steve McMullin to identify opportunities and recommendations for increasing diversity, equity, and inclusion within AFS. In 2017, the Committee produced a report outlining *9 Proposed Action Areas to Enhance Diversity and Inclusion in the American Fisheries Society* (Penaluna et al. 2017). These calls to action seek to effect multilevel change for advancing diversity and inclusion throughout the Society. The report proposes the following actions:

- (1) Entrench diversity and inclusion as a core value of AFS,
- (2) Undertake self-reflection and evaluation,
- (3) Identify and eliminate structural biases,

- (4) Promote diverse talent into leadership roles and prepare leaders to be agents of change,
- (5) Develop targeted sessions on communication, inclusion, and recognition of unconscious bias at AFS meetings,
- (6) Highlight family-friendly opportunities at AFS meetings,
- (7) Incorporate diversity and inclusion in fisheries pipelines and programs, and at meetings,
- (8) Develop a diversity and inclusion scorecard for AFS and the fisheries workforce, and
- (9) Establish equal opportunity committees within AFS units.

A primary action objective of the AFS Special Committee on Diversity and Inclusion is to grow and strengthen linkages between educational programs and professional opportunities. Diversity-oriented education and workforce development programs are critical for exposing students from diverse backgrounds to professional experiences, solidifying student interest in fisheries careers and connecting talented students to employment opportunities. AFS has invested in this effort through sponsoring and participating in a number of initiatives and educational programs, including the Hutton Junior Fisheries Biology Program. The Hutton Junior Fisheries Biology Program is a national paid summer internship and mentoring program designed to stimulate interest in careers in fisheries science and management among groups underrepresented in the fisheries professions, including minorities and women. The program has been successful in connecting students to mentors and launching students into fisheries careers and related fields of study (<https://hutton.fisheries.org/>).

AFS continues to advocate for measures that will promote and address diversity at multiple levels within the Society, including supporting education pathways and professional development opportunities that promote ethnic, socioeconomic, and disciplinary diversity within the organization and in the fisheries realm (AFS 2015-2019 Strategic plan; <https://fisheries.org/about/governance/strategic-plan-2015-2019/>). Focusing efforts on the link between education and the workforce is a critical point for engaging women and minorities in fisheries and conservation sciences.

The DJV, EOS, and the AFS Special Committee emphasize the importance of partnership and investment in education, leadership, and professional development to advance multi-level impact on diversity and inclusion efforts in the fisheries world at a broad level. At a more regional level, programs such as the Alaska Native Science and Engineering Program, the Partnership Education Program, and the Partnership for Education Program in Alaska also embody and practice these principles, paving the way for greater opportunity, diversity, and inclusion in science and resource management careers for current and future professionals.

The challenges and barriers associated with diversity, equity, and inclusion are as multifaceted and complex as the individuals they seek to serve. Initiatives that work for one region or community may not work for another, and success often means very different things to different people. Coupling the efforts of regionally focused programs with those at the national or international level can encourage functional linkages to form, promoting greater programmatic adaptation to local resident or broader student diversity and inclusion needs. The following section highlights several examples of how regionally focused education initiatives are supporting efforts to change STEM education and the science workforce to become more reflective and representative of regional and national demographics.

ACTION THROUGH EDUCATIONAL INITIATIVES - THREE EXAMPLES FROM ALASKA AND MASSACHUSETTS

The Alaska Native Science and Engineering Program (ANSEP), the Partnership Education Program (PEP), and the Partnership Education Program Alaska (PEP AK) are education and workforce development program initiatives that have been successful in connecting students to mentors and creating meaningful professional pathways for students. Similar to the Hutton Junior Fisheries Biology Program, ANSEP, PEP and PEP AK place strong emphasis on recruiting, retaining, and supporting students from underserved and underrepresented minority groups. With a strong regional focus, ANSEP and PEP AK emphasize engaging with Alaska Native and rural Alaskan students. PEP in Woods Hole partners directly with minority-serving institutions and historically black colleges and universities to pull from a wide pool of students to bring them to the influential science community of Woods Hole, Massachusetts.

ANSEP, PEP in Woods Hole, and PEP AK have successfully enhanced connections between professional organizations and diverse student pools and have done so through developing key programmatic actions and principles that work for students as well as the communities and regions in which they are based. The success of these programs provide insight into the important actions and processes that designing and engaging with diversity-oriented education and workforce development programs requires. The following excerpts provide an overview of each program, highlighting key outcomes and best practices for creating successful diversity-oriented education and workforce development programs.

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Theme 3: Actions on Diversity in the Fisheries Profession

The Alaska Native Science and Engineering Program



Elizabeth Spangler | Alaska Native Science and Engineering Program, 3211 Providence Drive, Anchorage, AK 99508.
E-mail: easpangler@alaska.edu

Beth Spangler is the National Partnership Director for the Alaska Native Science and Engineering Program.

Alaska Natives are the poorest people in the nation and are underrepresented in the science and engineering professions due to a range of systemic problems resulting in poor academic and social preparation for college. In 1995, Herb Schroeder, an engineering professor at the University of Alaska Anchorage, observed there were no Alaska Natives pursuing engineering degrees. He was inspired to create a systemic change that is now known as the Alaska Native Science and Engineering Program (ANSEP).

The Alaska Native Science and Engineering Program is dramatically improving the quality of education and increasing student academic and social preparation for college while reducing costs for families and government. Faculty in ANSEP begin working with students in sixth grade and work with them every year through middle school, high school, and university. At the program's conception in 1995, there was a single student. Today there are 3,000 ANSEP students enrolled from sixth grade all the way to PhD programs, and more than 600 alumni working with federal and state agencies, industry, philanthropic organizations, and educational institutions.

The approach of ANSEP is a longitudinal educational pathway that leads Alaska Native students through a series of program components: Middle School Academy, Middle School Career Explorations, Acceleration Academy (summer), Acceleration High Schools, Summer Bridge (between high school and university), and University/Graduate Success.

The Middle School Academy is a 2-week, residential science and engineering experience during which students build a top-end personal computer from scratch and earn the right to keep it by successfully completing algebra 1 prior to eighth grade graduation. Additionally, they must complete hands-on science and engineering projects in teams, live in the university residence halls, and experience what it is like to be a scientist or engineer. Middle School Career Explorations keeps these students excited and engaged each subsequent year they are in middle school by bringing Middle School Academy graduates back to campus for an intense 5-day, hands-on, project-based exploration exercise. The Acceleration Academy engages students with hands-on engineering and science projects, while enrolling in college-level classes taught by university faculty. The ANSEP Acceleration High Schools build upon the summer-time ANSEP Acceleration Academy. In the schools, university faculty are instructors supported by K-12 teachers, graduate and undergraduate students, as well as practicing

STEM professionals from partner organizations. Students earn dual (high school and university) credit. During the Summer Bridge program, new high school graduates live on the University of Alaska Anchorage campus; work full time in paid professional internships with state and federal agencies, Native organizations, industry, philanthropic organizations, or university and agency laboratories; and complete 160 h of calculus or science instruction for university credit. The University and Graduate Success components include an academic community composed of students, faculty, staff, and external partners who are focused on the academic success as well as the personal and professional development of each student. They are co-enrolled in classes, participate in organized study groups, partake in peer and professional mentoring, and work summer internships with partner organizations.

The Alaska Native Science and Engineering Program is a dynamic and evolving model that continues to adapt as the program expands and develops. Leadership continually evaluates the program and explores new ways to engage students. The program keeps what works and discards what doesn't. The Urban Institute has found that ANSEP students exceed state and national averages at each academic level (Bernstein et al. 2015). We use these data to measure success.

- Nationwide, 26% of all students successfully complete algebra 1 prior to eighth grade graduation. ANSEP students successfully complete algebra 1 prior to eighth grade graduation at a rate of 77%.
- Ninety-five percent of participating ANSEP high school students advance one full level in math and science coursework each summer by completing college classes taught by university professors.
- Ninety-five percent of high school graduates selected for the ANSEP Summer Bridge successfully transition to BS-level science and engineering degree programs.
- Seventy-five percent of ANSEP university students who have participated have graduated or are currently enrolled (Bernstein et al. 2015).

Sustainability

The Alaska Native Science and Engineering Program has partnered with a team of over 100 educators, Native organizations, philanthropic organizations, government agencies, firms, contractors, and research laboratories. Everything done at ANSEP is based on the fundamental indigenous principle

that stresses the importance of community. Before ANSEP, there were few Alaska Native scientists and engineers in professional STEM positions. The Program is changing this statistic and bringing highly qualified students with cultural values and insights into the workforce of partner organizations. Together, the partnership is doing what none of us can do alone.

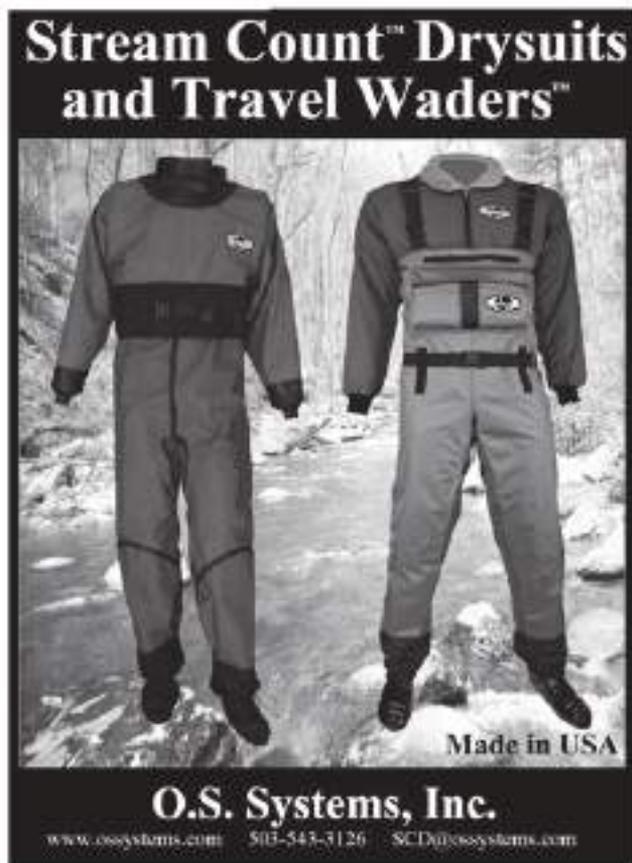
Key Lessons

One of the key lessons learned through ANSEP is to engage students, faculty, and practicing STEM professionals in a community focused on having fun with science and engineering. Young students are natural scientists and engineers. They want to know how things work and to understand the world we live in. We create real world challenges and opportunities for them to experience that moment when many students decide, "This is cool; this is what I want to do in my life." That excitement propels students forward in an upward spiral of success.

The other lesson learned is to take small steps, stick with it, and work towards transformational, systemic change to broadly demonstrate the capabilities of Native students.

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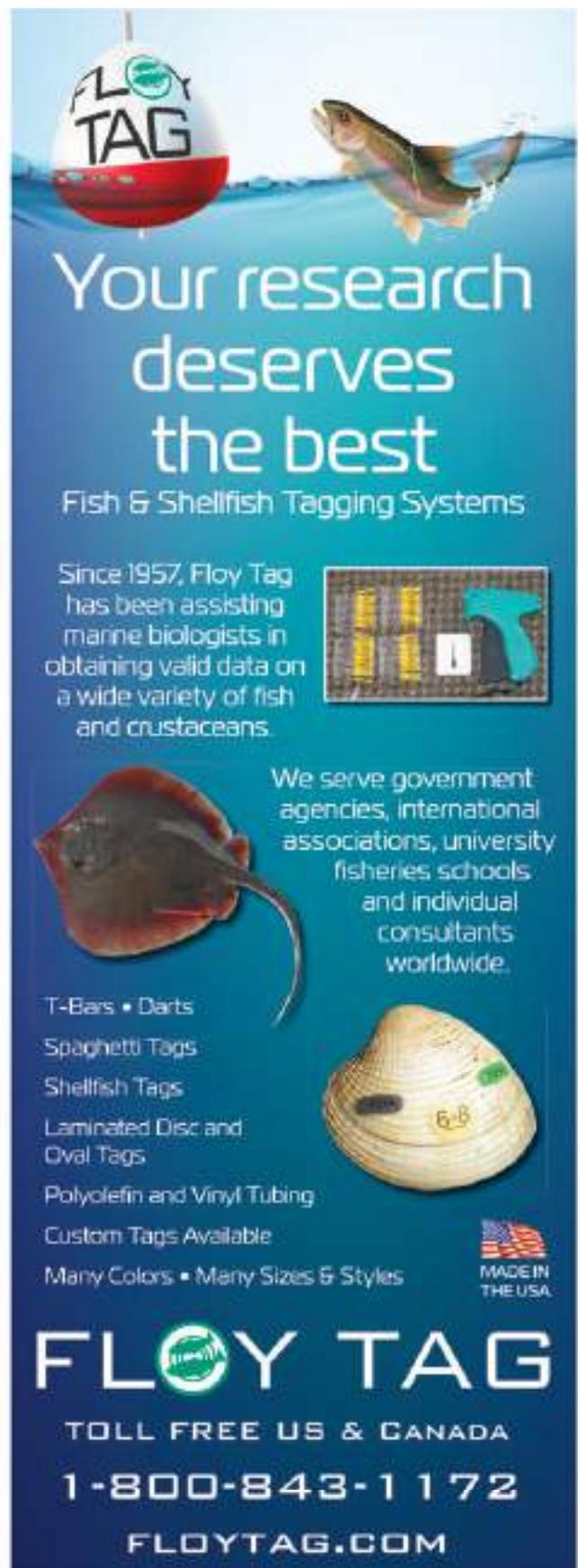
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Theme 3: Actions on Diversity in the Fisheries Profession



The Partnership Education Program in Woods Hole, Massachusetts

George Liles | Director, Partnership Education Program, Woods Hole, MA. E-mail: George.Liles@noaa.gov

George Liles is the Academic Program Director for the Partnership Education Program in Woods Hole, MA.

The Woods Hole Partnership Education Program (PEP) was established in 2008 to recruit talented undergraduates from populations under-represented in the scientific research community. The Woods Hole Diversity Initiative, a consortium of six Woods Hole-based research institutions, created PEP in partnership with the University of Maryland Eastern Shore.

The village of Woods Hole has been a center for scientific research since the late 1800s, attracting scientists from across the country and around the world, but very few scientists from those populations historically under-represented in the U.S. STEM enterprise: African American, Hispanic, Native American, and Pacific Islander. Six partner institutions formed the Diversity Initiative in 2004 to work collectively on the issues of diversity and inclusion. The Woods Hole Partnership Education Program is the Diversity Initiative's flagship program to extend the Woods Hole community's reach to attract students from previously untapped talent pools—especially minority-serving institutions (MSI).

Each summer, PEP brings 15 undergraduates (primarily rising juniors and seniors) to Woods Hole for course work, research projects, and a suite of career building workshops, seminars, and activities. The goal of PEP, and the long-term measure of its success, is twofold: (1) to attract talented under-represented minority students into Woods Hole areas of science and ultimately to careers with Woods Hole institutions; (2) to help the Woods Hole institutions build a more welcoming, inclusive, supportive community.

In 2018, PEP completed its 10th summer, and the PEP staff and Woods Hole community are now preparing for a 10th anniversary observation and the launch of a second decade in 2019. The program has now graduated 153 students, many of whom have gone on to earn advanced degrees, including at least four PhDs and one DVM. Many others matriculated in MS and PhD programs, and others are working in science or science related careers (teaching, education). The 153 PEP graduates are a diverse cohort that came to the program from more than 90 colleges or universities, including more than 30 MSIs. Just over half (79) of the 153 PEP students have come from MSIs. PEP graduates include 81 women and 52 men from minority groups under-represented in science. Additionally, PEP has provided career-building opportunities for three graduate students (all African-American) who served as PEP coordinators in 2010–2017.

The Partnership Education Program in 2019 is a multi-institution program with direct costs of US\$250,000 per year, two-thirds of which is NOAA funding. Hosting institutions work to incorporate PEP by making significant in-kind contributions of funding, space, ship time, course faculty, research mentors, or program staff. Adequate funding has been a key to sustaining the program, with NOAA taking the funding lead and Sea Education Association providing the home campus and financial management. The partnership aspect of PEP has been essential—each institution brings a strength, capability, or resource that others are lacking. None of the institutions could have created and sustained the program alone. Staff at PEP refer to the program as a “Stone Soup” program, a reference to the folktale that highlights the power of sharing (Box 1).

Another key to the program's success has been a cadre of committed individuals. The core PEP staff is a small team (less than six individuals) that founded the program and has remained with the program throughout its first decade. The core staff includes some senior level administrators, and all the core staff has “skin in the game” (i.e., they have personal interest in and commitment to building a diverse and inclusive community). When an institution views diversity work as collateral duty to be taken on by volunteers or assigned to staff who have little experience with diversity issues, the effort is not likely to succeed. Institutions that do succeed at becoming more diverse have experienced, knowledgeable individuals working at the level of a vice president or dean. The work PEP does was possible because the partner institutions allowed several senior level employees to spend significant portions of their time working on the program. Other critical staffing commitments have included the hire of contract staff for day-to-day coordination of the summer program, an annual training seminar for PEP staff and mentors, and a professional program evaluator to conduct a thorough program review every year.

Perhaps the single most notable strength of PEP has been the diversity of the team that designed and has delivered the program. The core PEP staff includes individuals from the under-represented populations the program seeks to serve. Business case arguments for diversity stress that diverse organizations are better able to engage a variety of communities, and PEP is a testament to this argument. The founding director of the program is an African American scientist, and half

BOX 1

Stone Soup is an old folk story in which hungry strangers convince the people of a town to each share a small amount of their food in order to make a meal that everyone enjoys. Some travelers come to a village, carrying nothing more than an empty cooking pot. Upon their arrival, the villagers are unwilling to share any of their food stores with the hungry travelers. Then the travelers go to a stream and fill the pot with water, drop a large stone in it, and place it over a fire. One of the villagers becomes curious and asks what they are doing. The travelers answer that they are making "stone soup," which tastes wonderful and which they would be delighted to share with the villager, although it still needs a little bit of garnish, which they are missing, to improve the flavor. The villager, who anticipates enjoying a share of the soup, does not mind parting with a few carrots, so these are added to the soup. Another villager walks by, inquiring about the pot, and the travelers again mention their stone soup which has not yet reached its full potential. The villager hands them a little bit of seasoning. More and more villagers walk by, each adding another ingredient. Finally, the stone (being inedible) is removed from the pot, and a delicious and nourishing pot of soup is enjoyed by travelers and villagers alike. Although the travelers have thus tricked the villagers into sharing their food with them, they have successfully transformed it into a tasty and nutritious meal which they share with the donors (Wikipedia 2017).

of the staff is African American or Hispanic. The diversity of the PEP staff has been essential in understanding the needs of the communities PEP seeks to engage, and has been critical in recruiting and then mentoring students. Collectively, the PEP staff has a sensitivity to and understanding of the issues PEP students face as they seek careers in science and in Woods Hole.

One of PEP's most important benefits is easy to overlook and hard to quantify. Diversity programs are designed to provide opportunity to students—success in this outreach can be measured by counting degrees, publications, employment—but a successful diversity program will also contribute to changing the hosting community in ways that are harder to quantify, but no less important. If the hosting community does not learn how to be more inclusive, how, for instance, to recognize and remove the barriers that have been keeping

the community homogenous, the diversity effort will founder. Through PEP, the Woods Hole community has received an opportunity to learn about itself—how it mentors, how it does or does not welcome newcomers, how others (especially people of color) experience the Woods Hole community. Partners in PEP recognize that bringing under-represented minority students to Woods Hole is only one element in solving the village's diversity problem. The other critical task is creating a community that is welcoming and supportive, a community in which the students can fulfill their potential and where they will want to build their careers.

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Fishery Resources, Environment, and Conservation in the Mississippi and Yangtze (Changjiang) River Basins

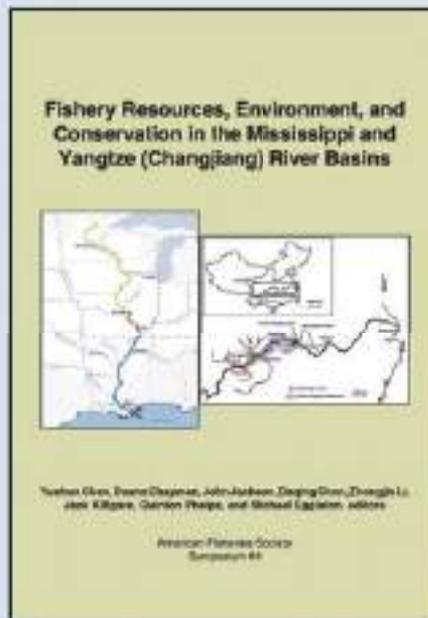
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The Mississippi and Yangtze (Changjiang) River basins, the largest basins of North America and Asia, serve as the principal navigational waterways and main water sources and play important economic, social, cultural, and ecological roles in the two continents. Maintaining healthy and productive fisheries and the integrity of aquatic ecosystems are important for achieving sustainability in both basins. The basins share many taxa and have experienced some of the same environmental challenges to their fisheries.

This book examines fishery resources and environment of the two basins. It provides an overview of fishery resources, geology, land use, hydrology, and environment; evaluates endangered and invasive species, biodiversity, and conservation; and assesses anthropogenic stressors, floodplains, and river restorations in the two basins.

Theme 3: Actions on Diversity in the Fisheries Profession

Partnership Education Program Alaska

Sorina Stalla | University of Alaska Fairbanks, International Arctic Research Center, 2160 N Koyukuk Dr, Fairbanks, AK 99775

Megan Hillgartner | University of Alaska Fairbanks, International Arctic Research Center, Fairbanks, AK. E-mail: mmgodfrey@alaska.edu

Vladimir Alexeev | University of Alaska Fairbanks, International Arctic Research Center, Fairbanks, AK.

The Partnership Education Program Alaska (PEP AK) is a regionally focused and regionally based marine education and workforce training program that addresses the need for greater workforce diversity in NOAA Fisheries, modeled after the PEP program in Woods Hole, Massachusetts. The concept for this program emerged from a 2-day meeting held in Anchorage, Alaska in January 2018. In this meeting, representatives from the NOAA Fisheries and two educational institutions came together to share lessons learned and best practices, and discuss how to build a diverse coalition that solves problems in a dynamic way. NOAA representatives included the Alaska Regional Office, West Coast Regional Office, Northeast Fisheries Science Center, while the educational institutions included the Woods Hole Partnership Education Program and the University of Alaska Fairbanks International Arctic Research Center. The 2-day meeting focused on how each respective region could create additional emphasis or multiply forces on diversity and inclusion efforts and take action, both as individuals and as a collective, to identify, assess, and understand diversity and inclusion problems to solve them. By pulling together people working on diversity initiatives in different regions, PEP AK, was established.

Supported by NOAA Fisheries Alaska Region, PEP AK is an Alaska-based marine education and workforce training program that partners with the University of Alaska system and Alaska Native and rural Alaskan serving programs as means to build a more diverse, inclusive, and effective NOAA workforce. The program fosters understanding and practical use of knowledge and policy to provide education, training, and technical work experience for Alaska youth entering marine related professions.

The Partnership Education Program Alaska consists of two key components: (1) education and (2) practical work experience internships. The education component consists of a 2-week summer course, including instruction in marine and Arctic related issues, and NOAA research priorities. The university course is co-taught by university instructors, resource managers and scientists (guest lecturers from NOAA), and indigenous knowledge holders. The course seeks to strengthen the connections between place-based research/challenges and complex system change. The internship component consists of an 8-week internship in NOAA offices and labs in Alaska. Agency internships provide

students with practical experience and exposure to NOAA activities and career trajectories. Students produce a deliverable at the conclusion of the internship.

The regional focus of PEP AK allows the program to have maximum local impact while still meeting larger regional and national goals of increased workforce diversity. By connecting with programs such as ANSEP, PEP AK connects, expands upon, and leverages the strengths of existing education and workforce initiatives throughout the state of Alaska to create a more direct connection between education and practical work experiences in the agency. For example, ANSEP successfully (Box 1) engages students in STEM education, but is challenged with accessing internship opportunities in NOAA. PEP AK connects ANSEP students to NOAA internships, strengthening ANSEP's science internship component, exposing students to policy and creating stronger and more direct pathways into marine resource management careers. By prioritizing mentorship and involving NOAA in course creation and instruction, PEP Alaska creates efficiencies by targeting



Students from the Partnership Education Program Alaska work with scientists at Toolik Field Station, part of the Institute of Arctic Biology at the University of Alaska Fairbanks to support research and education that creates a greater understanding of the Arctic and its relationship to the global environment. Photo Credit: Vladimir Alexeev.

BOX 1

Section 305j of the Magnuson-Stevens Fisheries Management and Conservation Act has not yet been fully achieved. The Partnership Education Program Alaska directly addresses the mandates of 305j by establishing a Western Pacific and Northern Pacific Regional Marine Education and Training Program that “fosters understanding, practical use of knowledge (including Alaska Native-, Hawaii-, and other Pacific-Islander-based knowledge) and technical expertise relevant to stewardship of living marine resources.” Section 305j mandates that the Secretary of Commerce shall establish, “marine science and technology education and training programs focused on preparing community residents for employment in marine related professions, including marine resource conservation and management, marine science, marine technology, and maritime operations.”

themes and teaching students the skills that are needed in the NOAA workforce, best preparing students for a possible career within the agency.

COMMON ELEMENTS OF SUCCESS IN THESE INITIATIVES:

Increasing institutional diversity and inclusion is a complex and multifaceted challenge. ANSEP, PEP, and PEP AK illustrate key elements that make education–workforce development programs successful: (1) partnership, (2) longitudinal engagement, (3) creating a cohort of students, (4) mentorship, and (5) individual commitment, including commitment from leadership.

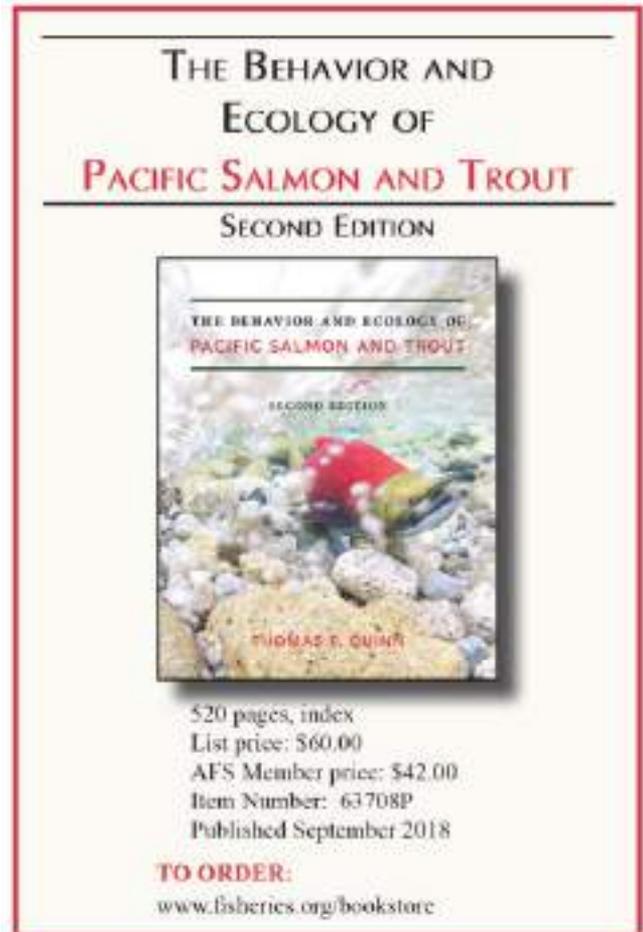
Partnership: Different institutions have different strengths and capabilities. Partnering with programs that have similar goals but different areas of expertise allow entities and programs to leverage each other’s strengths to create maximum impact. For example, partnering academic institutions to the workforce provides a strong framework for connecting students to opportunities and designing programs to prepare students for current and “real-world” problems.

Early and longitudinal engagement: Engaging with students from an early age ensures that students have the skills required to be successful and “on-track” to take advantage of opportunities. Early engagement also shows students from a young age what careers in different fields looks like and helps them visualize and understand the steps needed to enter into different jobs. This also helps develop key skills that will allow them to be successful in their chosen careers.

Creating a cohort of students: Inclusion must be a priority in program design and not supplemental to increasing workforce diversity. Creating a cohort of students that support each other is a way in which both ANSEP and PEP have been successful in supporting their students both during and after their programs.

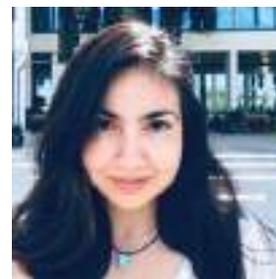
Mentorship: Having a mentor is key for both support, guidance, and insight into the workforce.

Individual commitment, including from leadership: Leadership is essential for buy in and long term sustainability. ^{AFS}



Theme 4: What Does Diversity Require of Us?

Angelica Moncada  | PhD student in Geosciences, Florida International University, 11200 SW 8th St, Miami, FL 33199 E-mail: amonc002@fiu.edu



Most of the time, calling a wrong number is an inconsequential event in our lives, but 10 years ago, it was precisely that which led me to the world of scientific research. I had recently started classes and a part-time job at the local community college and I was looking for a way to connect with nature in the busy city life. I saw a flyer calling for volunteers for an animal shelter, so I called. A very nice woman answered, but she knew not of the animal shelter, nor how her phone number had ended up on that flyer! After a few minutes of puzzling over this, she told me of a job opening at a termite research lab across the street, to which I answered, “What is termite?” The next day, I gathered my courage and went for my first official job interview for that mysterious lab position. This is how I met the late Paul Ban, the man who would later become my supervisor, my mentor, my friend, and the very first person to give me an opportunity in the field based on perceived potential rather than merit.

Prior to this day, I was not aware of what biological research entailed, the size of the scientific community, and least of all, that it is possible to get paid for accumulating knowledge on a topic that you love! Recently, I was asked to speak about being a “traditionally underrepresented person in science,” so I reflected on my path and how I became interested in research. After many hours of thinking about specific circumstances that led me to my current path, including that fortunate wrong phone number, I identified a common factor: in every opportunity, someone gave me a chance even when I was not the ideal candidate. This might not sound life changing, but I am certain these otherwise unreachable opportunities were essential for my discovery of a passion I did not know I had.

I learned about the inner workings of scientific research as a technician for the Termite Research Lab at the University of Florida and later on at the Invasive Plant Research Lab at the U.S. Department of Agriculture. My interactions and conversations about biological research with graduate students and principal investigators at these institutions greatly influenced my decisions about my career path. Even though I was never involved in the intellectual process at these research facilities, the exposure to seminars and talks on numerous research projects, including the Comprehensive Everglades Restoration Project, strengthened my research interest in hydrology.

I emphasize the importance of working as a technician because I have noticed that generally, opportunities are given to intellectually competent candidates with experience on the subject and the ones who demonstrate their “willingness” to volunteer or do unpaid internships. Though this approach might be of interest for getting the best science in short term, it keeps diverse minds from coming into the research field. First generation college students from financially unstable immigrant families, such as myself, are

preoccupied with a job for sustenance and have very little to no exposure to intellectual activities, volunteering experiences, nature outings, or even basic college application instructions. For us, becoming an ideal candidate for research jobs early in life is unlikely. Our socio-economic condition does not allow us to remain unpaid for even a short period, and that restricts us from exploring many ideas. This puts us at a disadvantage in choosing research as a career path when compared to students from financially stable and educated families.

One of the most common, but rarely discussed, challenges is the financial obligation to our households right after graduating high school. This necessity to help our families continues for the rest of our lives and forces us to find jobs as soon as possible. Many of us do not have the liberty of being unemployed at any point in time, even less to rely on our parents’ incomes for unpaid internships or volunteering positions. We are so preoccupied about basic needs and ensuring financial stability for our families and ourselves that we do not seek anything other than graduating college as soon as possible. This “unwillingness” to participate without an economic incentive almost certainly disqualifies us from getting into scientific research, or to even know it exists. I am now a PhD student in geosciences at Florida International University (FIU), but my transition from being a full-time employee to full-time student was contingent on getting a graduate assistantship and the financial support from my husband. Without this financial support, I would have not been able to make that career move. I was fortunate to get a research assistantship and most tuition costs waived due to the recent establishment of a National Science Foundation Center for Research Excellence in Science and Technology at FIU. Since FIU is a minority serving institution, this research center has involved many traditionally underrepresented students in water chemistry research.

With so many challenges keeping underrepresented groups from endeavoring in scientific research, calling attention to one—our financial limitations—may move us towards a more inclusive scientific community. My own story attests to how one person, Paul Ban, by way of the wrong number was able to start a “traditionally underrepresented person in science” down a path that allowed me to be where I am today. If principal investigators and lab managers keep these socioeconomic barriers in mind when hiring entry-level technicians/interns or new students, they might be more willing to include an unconventional candidate. Applicants who lack volunteering and internship positions may not be afforded these opportunities, but if we open the pool to those who show potential, the entire scientific community will benefit from diverse minds in the long run.

Had I not had these technical jobs in research institutions it would have been very unlikely for me to pursue a PhD.

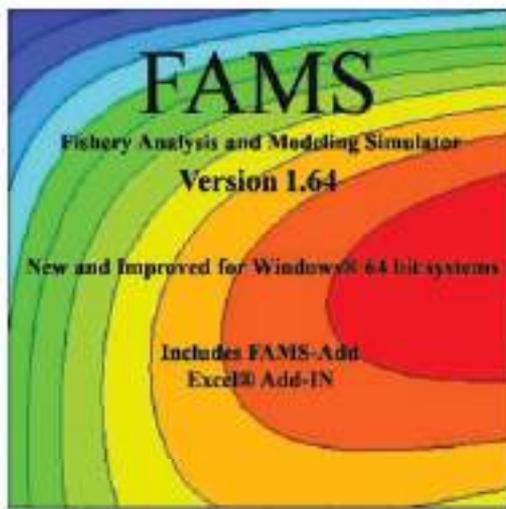
Research has made my life incredibly meaningful, and I do not believe another career path would fulfill my craving for knowledge like this one. I will always be immensely grateful to everyone who at one point or another trusted me with their projects. It might not have made much difference in

technical work, but it opened up a whole world to a curious mind. [AFS](#)

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Theme 4: What Does Diversity Require of Us?



Olivia Lee | Co-Chair, Diversity and Inclusion Collaboration Team, Interagency Arctic Research Policy Committee, University of Alaska Fairbanks, 505 South Chandalar Drive, Fairbanks, AK 99775.
E-mail: oalee@alaska.edu

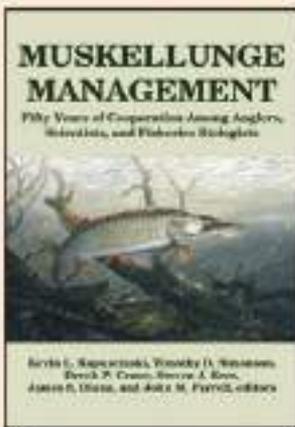
I don't value diversity—at least not when it is presented superficially. At best, diversity metrics can be a proxy for diverse experiences, backgrounds, and maybe ways of thinking. At worst, showing that there is some racial and gender diversity in an institution gives a false sense that diversity initiatives are successful. It is not enough to have diversity, or policies that aim to recruit more diversity. For diversity to serve a purpose, it has to be functional and valued.

There is a reason why underrepresented groups continue to be greatly underrepresented at leadership levels in the sciences. It is difficult, almost impossible, to thrive in an environment where your values do not align with the prevailing culture. In the sciences our community forces us to conform to what is considered valuable productivity—and that could essentially weed out anybody with a different value system or research style—for example, someone who values having greater flexibility to raise children than an institution might allow, or a person whose cognitive and analytical thinking style involves needing more time to develop and publish research resulting in a lower publication record. As a minority, I know it

is draining to spend so much effort proving your worth in a culture that doesn't always align with your values. It is easy for the intelligent, enlightened minority person to recognize that there are far more worthwhile pursuits in life, and hence it can be more fulfilling to take your talents elsewhere. That is a loss to the scientific community, because that diverse perspective and the investment in cultivating the technical knowledge is lost. Moreover, along with that loss, the potential for improving the culture for future generations of scientists disappears.

It is more damaging to the scientific community as a whole for an institution to hire more diversity when the existing culture in a team is not ready to nurture a diverse environment. So perhaps more importantly than recruiting diversity, we should first pay attention to improving the culture to understand why diversity is valuable, and what sort of diversity is going to bring that function. Only then can we make allowances that ensure we help to nurture the people who bring diversity into a team. Without it, we are essentially churning out the same type of person and way of thinking—just in a different exterior package. **AFS**

Muskellunge Management: Fifty Years of Cooperation Among Anglers, Scientists, and Fisheries Biologists



Kevin L. Kapuscinski, Timothy D. Simonson,
Derek P. Crane, Steven J. Kerr, James S. Diana,
and Steven J. Kerr, editors

675 pages, hardcover
List price: \$79.00
AFS Member price: \$55.30
Item Number: 540.85C
Symposium 85
Published December 2017

Proceedings of the 2016 Hugh C. Becker Memorial Muskellunge Symposium, examining Muskellunge management and research in North America.

This book represents the state of the art in our understanding of Muskellunge biology, ecology, and management and is a must-read for anyone studying or managing this iconic species. Readers will benefit from the latest information on a novel, nonlethal method for sampling contaminants in Muskellunge, how angler-scientist partnerships have enhanced management actions, how genetic tools have improved our understanding of this species, and population-level responses to management actions and outbreak of viral hemorrhagic septicemia.

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Theme 4: What Does Diversity Require of Us?

Doug Mecum | NOAA Fisheries Alaska Regional Office, 709 W. 9th St., Rm 420, Juneau, AK 99802.
E-mail: doug.mecum@noaa.gov



Doug Mecum is the Deputy Director of the NOAA Fisheries Alaska Regional Office in Juneau, AK, and one of the initiators of the first Diversity and Inclusion symposium at the AFS Annual Meeting in 2017.

First, we need to *define* what “diversity” means. For me it means providing people opportunity—particularly for those who never thought they would have a chance to pursue their dreams or were perhaps deemed by others as incapable of doing so, whether by accident of birth or their social standing. Second, diversity requires *caring*. Not everyone believes that diversity is important. For example, the Society for Human Resource Management has reported that 41% of managers say they are “too busy” to implement diversity initiatives. Moreover, in my experience, even if managers think that enhancing diversity in their organization is important, most do not see it as their responsibility. This occurs despite ample research showing that ethnically and gender diverse companies financially outperform and are generally more productive than their less diverse peers (Hun et al. 2018).

Third, diversity requires us to be *willing* to actually do something. In my experience, everyone says that diversity is important but all too often they are just paying lip service to what, for them, is a vague and ill-defined concept. All of us have observed leaders of organizations stand up and swear that enhancing diversity is the most important priority and then one year later you cannot even find it on their organizational goals’ radar screen.

Fourth, diversity requires vision and *strategic* focus. As Henry David Thoreau said in his 1857 letter to H.G.O Blake, “It’s not enough to be industrious; so are the ants. What are you industrious about?” I believe that having the right strategy is where most well intentioned diversity initiatives fail. We may care about diversity and we may be willing to do something about it, but if we do not have a sustainable and effective strategy, our vision can quickly turn into a nightmare.

Fifth, diversity requires *commitment*. As the former General Electric CEO Jack Welch said “Good business leaders create a vision, articulate the vision, passionately own the vision, and relentlessly drive it to completion” (Tichy and Charan 1989). Being resilient in the face of cognitive dissonance, administrative roadblocks, and scarcity of resources requires a “never quit” mindset that many leaders lack.

So, I know what diversity means, I care enough about it to actually do something, I think I have a great strategy, and I am committed to making it work—sounds straightforward enough, right? Not so fast. No matter how good your intentions and your efforts, there are always things that happen that are outside of your control. This requires a plan for learning and adaptation (metrics). As Sir Winston Churchill said “However beautiful the strategy, you should occasionally look at the results.” You have to ask questions,

reach out to experts and other organizations for help and advice, and last, but not least, you need to talk to the very people you are trying to help. After all, maybe you are asking the wrong questions, and we all know what the definition of insanity is.

Bottom line, this thing called “diversity” is really hard. Is it even worth the effort? I say yes. Because, if I can help even one person that never thought they could pursue their dreams and succeed in reaching their full potential, then it’s enough for me.

REFERENCES

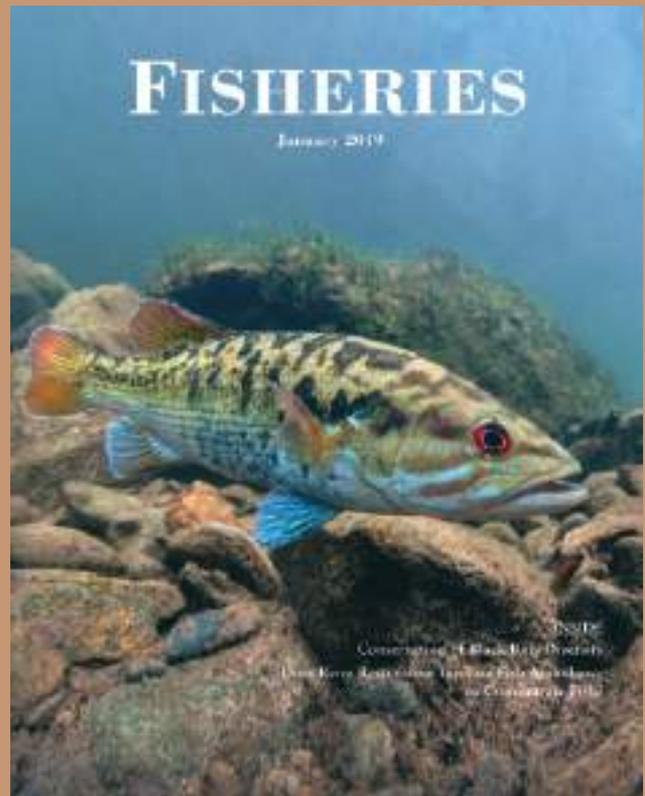
- Hun, V., S. Prince, S. Dixon-Fyle, and L. Yee. 2018. Delivering through diversity. McKinsey & Company, New York.
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AFS Seeks Co-Chief Science Editor

The American Fisheries Society (AFS) seeks a scientist with a broad perspective on fisheries to act as Co-Chief Science Editor to work as part of a leadership team to oversee the science and creative content of *Fisheries*. The Editor must be committed to fast-paced deadlines and would be appointed for a five-year renewable term.

Duties include:

- Work in a highly collaborative manner with the Editor-in-Chief (EIC) and other Co-Chief Science Editor to manage the science component of *Fisheries*.
- Work with the EIC and Managing Editor as part of the overall creative leadership of *Fisheries*.
- Assign an appropriate science editor for half of the scientific manuscripts submitted to *Fisheries*.
- Make final publication decisions based on peer reviews managed by science editors.
- Ensure the veracity of each issue's total scientific content.
- Recruit and retain science editors and provide them with mentoring and guidance.
- Solicit cutting-edge submissions as well as ensuring broad topic coverage.
- Work with Fisheries Managing Editor and AFS Publications Director on the content, themes, and direction of the scientific aspects of *Fisheries*.



Qualifications: AFS seeks an established fisheries or aquatic science professional with substantial writing and editorial experience. As part of building an editorial leadership team, we seek skills and/or experience to ensure that the editorial team has complementary areas of expertise (e.g., marine, freshwater, and human dimensions). To be considered, send a current curriculum vitae along with a letter of interest to Aaron Lerner (alerner@fisheries.org) by **October 7, 2019**. Please also feel free to contact EIC Gary Curtis (Sturgeon373@gmail.com) or **541-613-4914** (Pacific Time) for further information about the position.

Note: The Co-Chief Science Editor receives a quarterly honorarium, as well as support to attend the AFS Annual Meeting.

ESSAY

Theme 4: What Does Diversity Require of Us?

Rosalinda Gonzalez | U.S. Forest Service, 431 Patterson Bridge Rd, John Day, OR 97845. E-mail: rosalinda.gonzalez@usda.gov

Diversity and inclusion is not always intuitive but it is important and it requires us to be kind to one another. You never know what someone is going through or what they have been through. So even if you do not know how to start moving towards a more diverse and inclusive world, remember to be kind to yourself and others. This will likely lead you to step out of your comfort zone. It will require you to listen to, understand, and ask questions when you need clarification; to take tactical pauses or breaks; and will require patience. Hopefully it will lead you to greater perspective, more solutions (that work for a larger group), more friends, and hopefully bring you joy.

Diversity and being inclusive is not just something visual. Being inclusive and having diversity does not solely mean having people that look different work together. That is a part of it and a step in the right direction. However, we also have to remember that what makes us unique is not always visible. Therefore, it is important that people step out of their comfort zone and try to understand someone else's perspective. We need to be open-minded. Ignorance is not always bliss, and sometimes it can be hard to work together. Nevertheless, if we choose to respect and be kind to one another it will be easier. If we focus on working together towards the same goal and listen to each other, we can solve our problems or questions more simply. We will learn from one another and will likely come up with more solutions together.

We need to remember that we are a team. You are not alone. Even if you feel alone or have been pushed away. People are human and we make mistakes. Being inclusive requires us to think of when we may have felt like our voice was not heard or our needs were not met. It then requires us to be observant of when we may be silencing a voice that should be heard. Keep in mind that if you are in the same field as someone working towards the same goal that you are on the same team. We are a community that should help each other progress and grow.

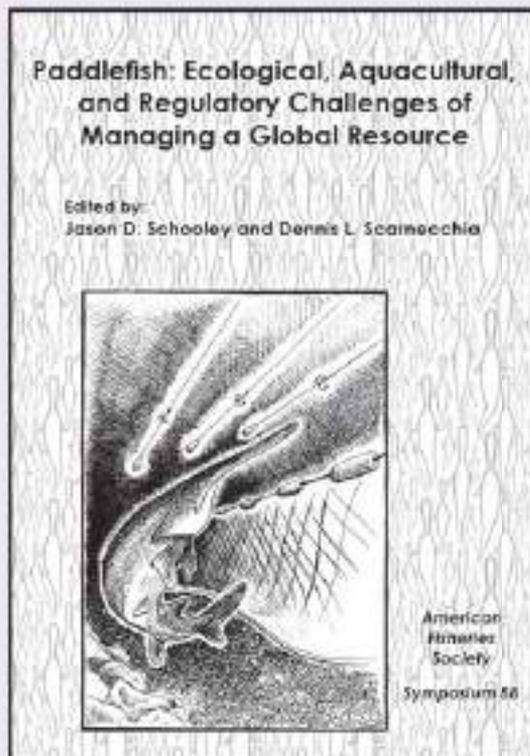
Diversity and inclusion also requires that we learn to forgive one another, and sometimes ourselves. At the end of the day, we are all just human. Every one of us needs something



different to make us happy. So sometimes we may forget that the way that we think is not the way others think. Try to put yourself in someone else's shoes. Be patient and if you need a break, take one. Sometimes you have to agree to disagree. If you need help, ask for it.

I have been told the best things in life, most worth doing, are not always going to be easy. I have found that to be true but have also found that community and supporting one another is key to success for all. [AFS](#)

Paddlefish: Ecological, Aquacultural, and Regulatory Challenges of Managing a Global Resource



Edited by
Jason D. Schooley and
Dennis L. Scarnecchia

297 pages, hardcover
List price: \$79.00
AFS Member price: \$55.30
Item Number: 540.88C
Published July 2019

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This multi-authored book with chapters by state, federal, and international agency scientists and academic experts provides an up-to-date review of the biology, life history, ecology, genetics, habitat use, and sustainable fisheries management of the North American Paddlefish.

Recent advances in knowledge of life history, migrations and movements, and recruitment are included and technological advances in genetics, telemetry, sonar, eDNA, and microchemistry are addressed. The book includes chapters discussing Paddlefish aquaculture for restoration, supplementation, and commercial production. The scope extends beyond the domestic range of Paddlefish by adding perspectives on global status, including introduction and aquaculture in Europe and Asia. The book also has relevance to people interested in caviar, as well as to those studying and managing sturgeon and other long-lived fish species worldwide.

Theme 4: What Does Diversity Require of Us?

Bill Karp | NOAA Fisheries Northeast, Fisheries Science Center (retired), Woods Hole, MA | NOAA Fisheries, Alaska Fisheries Science Center (retired), Seattle, WA.
E-mail: BILLKARP1950@gmail.com



Our field is remarkably diverse and the work that our scientists, managers, and policymakers carry out touches the lives of people across a broad spectrum of our society. So why is this diversity of stakeholders not reflected within our communities of scientists, managers, and policymakers?

Demographic statistics can be helpful in understanding the magnitude of the problem and guide us in the direction of positive change. However, I believe we can learn the most from the stories of individuals, their struggles, and their successes. For me, the most compelling message was from the individual stories presented during the symposium on Diversity and Inclusion at the 2018 American Fisheries Society (AFS) Annual Meeting.

I worked for NOAA for 30 years and as a senior administrator during the last decade of my career. I have seen small improvements related to the diversity of candidates applying for positions (at all levels) and in the makeup of the workforce. However, progress has been slow and it is time to bring forward some new ideas that support our goals for meaningful diversity and inclusion.

Inclusion is certainly a workforce issue; it concerns the importance of bringing the right people together, from within our profession, to provide a full range of perspectives, expertise, and experience when planning and carrying out scientific research, organizational change, and public engagement. Inclusion also involves bringing the right people together from the communities we serve to advise on the development and/or evaluation of policies and regulations that impact different sectors of the public. Again, statistics can be helpful in characterizing demographic status and trends, but they distract us from asking important questions. Why do we have so much difficulty finding qualified candidates from public sectors such as African Americans, Latinos, Native Americans, and other underrepresented communities? Are the advisory bodies that support NOAA Fisheries policymaking (e.g., Fishery Management Councils, Marine Fisheries Advisory Council) sufficiently diverse and inclusive? Broad policies within our state and federal agencies recognize these issues to some degree, but strategies for improvement are limited.

Encouraging change by example is, I think, essential. The stories shared during the 2018 AFS Diversity and Inclusion Symposium were unique and compelling. They reminded me of the many impediments to success that individuals encounter. They also reminded me of the incredible inner resources that these individuals have drawn from, and of the importance of family support, effective mentorship and education, and opportunities for internships and future employment. So let's share and publish these stories, but let's also work together to write new stories that document the challenges and

accomplishments of individuals from diverse backgrounds who seek careers in fisheries or aquatic science, or for those who wish to play a role in shaping policies that address the needs of a diverse human population while ensuring conservation of our living marine resources and ecosystems. Let's also build a new storyline that documents the achievements of leaders, administrators, and employees who have made a difference to the lives and careers of individuals who seek a future in the fields of fisheries and aquatic science, but are faced with challenges that could impede their professional success. We must set and achieve lofty goals for diversity and inclusion if we aim to provide opportunities for everyone to contribute fully and build a stronger and fully inclusive society.

To draft new stories, we need to encourage more individuals to come forward and share their experiences. Here is where AFS can play a key role by providing a forum and resources to encourage and support sharing of stories and also, perhaps, a publication (printed and/or online) that will grow over time. This will provide a powerful resource and another opportunity for documenting change.

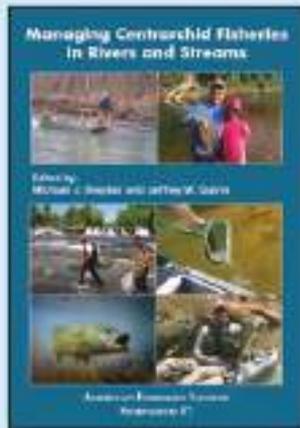
We should also be asking our senior administrators and leaders to set examples and hold themselves accountable for working directly with individuals from underrepresented sectors who are interested in careers in our fields or taking on greater responsibilities as stakeholders and advisors. Leadership recruitment criteria should avoid boilerplate language about commitment to diversity and inclusion principles. Instead, it should ask prospective candidates specifically what work they have done with individuals, as well as institutions, to help change lives and bring about change. In addition, candidates should be asked to describe precisely what they intend to do, at the individual and institutional level, to lead and encourage the change that is necessary if we are going to be successful in building a workforce that is diverse, as well as a pool of stakeholders that is active and informed. This aspect of a candidate's application should be weighted heavily and must be seen as an ongoing commitment if the individual is hired. Achievements and expectations should be evaluated regularly. In addition to compiling stories from individuals who are willing to share their personal struggles and achievements, we should also catalog stories from leaders and administrators so that we can borrow from and build on the experiences and good ideas of our colleagues.

As a retired federal employee I have seen that well-intentioned efforts to address our diversity and inclusion deficiencies have not brought about the desired systemic change. I can claim credit only for my own lack of commitment to

finding and implementing meaningful solutions. So I am, to some degree, accountable and most definitely ready to play a supporting role as we pass the torch on to a new generation of professionals and leaders who, hopefully, will have a better

understanding of the individual, the institutional, and the societal costs of failing to meet these challenges and will bring new energy and creativity to bear. I encourage my fellow colleagues to do the same. [AFS](#)

Managing Centrarchid Fisheries in Rivers and Streams



Edited by
Michael J. Siepker and
Jeffrey W. Quinn

270 pages, paper
List price: \$79.00
AFS Member price: \$55.30
Item Number: 54087P
Published March 2019

This book synthesizes current scientific and management studies for centrarchids in rivers and streams, and is a must-read for natural resource professionals as well as stream fishing enthusiasts. Readers will benefit from the diverse array of topics addressed by studies of six species in 11 states. The latest information provided on native species conservation and restoration, unique lineages, species interactions and distribution, life history, habitat use, and population demographics will be useful to a variety of resource professionals. Stream fisheries managers will especially benefit from chapters that evaluate angler exploitation, stocking, fish removals, dam removal, forage addition, and harvest regulations.

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Theme 4: What Does Diversity Require of Us?

“Where are You Really From?” and Other Invasions of Narrative Space



Shany Fiske | Rutgers University–Camden, 303 Cooper St, Camden, NJ 08102, USA. E-mail: shanyfiske@yahoo.com

Shany Fiske is an associate professor of English at Rutgers University (Camden) and directs the MA Program in English. She teaches and writes about Victorian literature and culture, classical reception studies, and issues of social justice.

I came to the United States from Beijing in 1981. I was 7 years old and did not speak a word of English. I lived in the dorms at Wellesley College with my mother, who was a full-time adult student on an international scholarship, holding down a waitressing job at a Chinese restaurant in Central Square to make ends meet. Despite spending the first few years of my American life in linguistic and social limbo, I did not encounter the concept of diversity until I entered seventh grade. By then, I had transferred from public school—where I was getting into weekly fist fights—to the genteel (though, one could argue, more vicious) world of the New England private school system. The school I attended had a stone castle that housed the cafeteria and boarding students. Manicured athletic fields stretched for miles below the central campus. At Christmas, we all gathered in the tiered auditorium to hear a staged reading of Paul Gallico’s *The Snow Goose*, a story whose darker tones of loneliness and loss could be savored as we sat nestled among friends and faculty whom the school urged us to consider a second family.

The hallways of this school were lined with bulletin boards, decorated with pictures of school life and glossy, colorful brochures advertising the various academic and athletic programs. I’m not sure when I started noticing that my face showed up with disconcerting frequency in these pictures and brochures—particularly those near the admissions office—but I do know I started developing a sixth sense for when the school photographer had his camera trained on me. At this point I had forgotten all of my Chinese and considered myself fully assimilated, so I was taken aback when an upper-classman informed me that this was happening not because I was particularly photogenic but because I was one of only two Asian students in the school, which ran from 7th to 12th grade, and one of only four minority (that is, non-Caucasian) students. I was a quarter of the school’s diversity. My photograph in the hallways contributed to a larger image of itself that the school wished to project. It didn’t matter who I was. It mattered only that I looked different.

Since that first encounter with myself as a token minority, I’ve noticed both from my own experience and from those of others who are racially or ethnically marked in some outward way that there is a discrepancy between who we understand

ourselves to be and who the world wants or needs us to be at any given moment. That demand for otherness can be strange and alienating. It can also limit the potential for growth and dialogue.

Take, for example, the seemingly innocuous question, “Where are you from?” People who are visually or verbally marked will immediately understand where this is going. If I respond to this question with, “Boston” or “Massachusetts,” the inevitable next question is, “No, where are you *really* from?” Why is this line of dialogue so irritating for some of us? After all, it could be—and frequently is—an innocent way for someone to establish a connection (e.g., “Oh, I have a cousin who taught in Beijing for a year”). Without denying such innocence of intention, I posit that the question “where are you *really* from” is a move toward narrative control. Its gesture toward intimacy is underwritten by an assumption of otherness that establishes non-negotiable boundaries of interaction. It is a way for one person to say to another, “I already know you,” and disallows the person whose origins it is trying to ascertain the freedom to tell their own story.

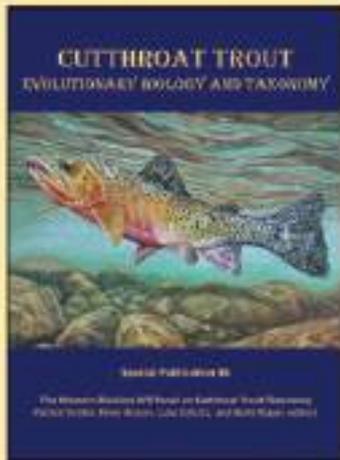
I do believe that people want to share their stories. Indeed, wanting to be known seems an essential part of our human nature, as has been demonstrated to me on a weekly basis in the classrooms and communities where I teach. As a literature professor, my job is to elicit diverse interpretations of texts from my students. Ideally, as we share our views, we become aware that any story bears within it a multiplicity of meanings; that narratives exist as fragments that can be arranged and rearranged; that meaning is not given but endlessly negotiable. If I am doing my job well, we arrive at the realization that this is as true of the stories we read as of the stories we inhabit. I have seen my students open up about their own lives as they unpack the texts before them, eager to let their stories be known and curious to discover new contexts for their lived experiences. In a class discussion this past semester of Sandra Cisneros’s 1991 short story “Woman Hollering Creek,” one student told about her illegal crossing of the United States–Mexico border as a child, using her story to help the rest of us grasp not only the struggles of the text’s Mexican–American characters but their relevance to the current border conflicts. Student veterans have shared the challenges of coming home

from combat in Iraq and Afghanistan and have helped the rest of the class understand Odysseus's lengthy and conflict-ridden assimilation to life back in Ithaca. In communities where I teach outside my university, Vietnam veterans have explained their sympathy with Achilles's rage and sense of betrayal in the *Iliad*. Factory workers have expressed their anger at social and corporate hierarchies during a discussion of William Carlos Williams's 1938 short story "The Use of Force." In each of these cases, personal experience shaped and was reshaped by both textual interpretation and the discussion in the room. The conversations, arguments, and deep disclosures that have emerged from these spaces have taught me that diversity simply cannot be categorized, and it is only when we understand the complexities of individual experience that we can begin to grasp the geographies of difference.

In my research on trauma and Post Traumatic Stress Disorder, I've been struck by the fact that one symptom of post-traumatic stress is the inability to experience oneself as evolving. Like the texts in my classrooms, we are all fragmentary beings bearing potential for reinterpretation and, it turns out, the ability to maintain the fluidity of our personal narratives—to allow for the rupture and reconstitution of our

experiences—is essential to our health. In contrast, categories of race, class, and gender that often define our concept of diversity serve their social function by remaining rigid and unchanging, presenting categories that obligate an uncomfortable conformity—categories that gloss over much more interesting and intricate fracture lines between the ragged, conflicting, and constantly shifting pieces that make up ourselves. Questions like "where are you really from?" reinforce this categorical thinking and paralyze the faculties of imagination and empathy that are crucial to the goals of inclusiveness and dialogue that diversity clauses are meant to foster. Ironically, then, what diversity requires of us is that we resist allowing the overly politicized and corporatized concept of the term to interfere in our encounters with one another as individuals. What diversity requires is that we allow ourselves to know and be known for the fragmented and multiple selves housed within our bodies of experience. True diversity opposes binary thinking in every way; it continually resists closure; it posits the "what if" to the "in conclusion;" it relentlessly proposes acts of radical imagination that can reshape not only organizations and institutions, but the very concept of what it means to be human. **AFS**

Cutthroat Trout: Evolutionary Biology and Taxonomy



Patrick Trotter, Peter Bisson, Luke Schultz, and Brett Roper, editors

362 pages, paper, index
List price: \$79.00
AFS Member price: \$55.30
Item Number: 510.36P
Symposium 85
Published September 2018



The Cutthroat Trout is an important western North American fish species whose numbers are seriously depressed. Recently, data from new molecular taxonomy methods have revealed greater differentiation and diversity in Cutthroat Trout than previously detected. In 2015, the Western Division of the American Fisheries Society convened a special workshop to consider the different viewpoints, reconcile differing interpretations of the evidence, and, if deemed necessary, offer a revised classification of Cutthroat Trout.

The book brings together the latest available evidence for Cutthroat Trout evolutionary history and current levels of genetic diversity. It confirms the need for a revised classification of Cutthroat Trout and proposes a revised phylogeny with four deep evolutionary divergences. It presents arguments (pro and con) for classifying the four major lineages themselves as full species and for delineating each of the 25 modern subunits.

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September 8–11, 2019

EIFAAC European Inland Fisheries and Aquaculture Advisory Commission International Conference | Dresden, Germany | https://www.bmel.de/SharedDocs/Downloads/Veranstaltungen/2019-eifaac-en.pdf?__blob=publicationFile

September 8–13, 2019

International Society for River Science Biennial Symposium | Vienna, Austria | <http://isrs2019.info/cms/index.php/home-235.html>

September 9–13, 2019

 AFS Course-Planning & Executing Successful Rotenone & Antimycin Projects | Rome State Fish Hatchery, Rome, NY | <https://fisheries.org/membership/continuing-education/planning-executing-successful-rotenone-antimycin-projects/>

September 9–12, 2019

ICES Annual Science Conference | Gothenburg, Sweden | <http://www.ices.dk/news-and-events/asc/asc2018/Pages/ASC-2019.aspx>

September 16–17, 2019

 Coastal Zone 2019 International Conference on Coastal Ecosystem and Management | Amsterdam, the Netherlands | <https://www.meetingsint.com/conferences/coastalzone>

September 22–24, 2019

AFS Atlantic International Chapter Meeting | Prince Edward Island, Canada | <https://aic.fisheries.org/>

September 24–27, 2019

Water Future Conference | Benaluru, India | <https://www.waterfutureconference.org/>

September 27–28, 2019

10th International Conference on Fisheries & Aquaculture | Toronto, Ontario, Canada | <https://fisheries.conferenceseries.com/>

September 29–October 3, 2019

 American Fisheries Society and The Wildlife Society Joint Annual Meeting | Reno, NV | <http://afstws2019.org/>

Oct 2 – 4, 2019

 Student Conference on Conservation Science | American Museum of Natural History, New York, NY | <https://www.amnh.org/our-research/center-for-biodiversity-conservation/convening-and-connecting/student-conference-on-conservation-science-new-york-sccs-ny>

October 6–10, 2019

Organization of Fish & Wildlife Information Managers Annual Meeting | National Conservation Training Center | Shepherdstown, WV | <http://www.ofwim.org/>

October 27–30, 2019

Southeastern Association of Fish and Wildlife Agencies 73rd Annual Meeting | Hilton Head, SC | <http://www.seafwa.org/conference/overview/>

November 3–7, 2019

25th Biennial Coastal and Estuarine Research Federation Conference | Mobile, AL | <https://www.cerf.science/CERF-2019>

November 11–15, 2019

North American Lake Management Society 39th International Symposium | Burlington, VT | <https://mid-atlantic.fisheries.org/>

November 14–15, 2019

 AFS Mid-Atlantic Chapter Meeting | Lewes, DE | <https://www.nalms.org/nalms2019/>

November 20–24, 2019

51st Annual Desert Fishes Council Meeting | Alpine, TX | www.desertfishes.org 

Predicting Persistence of Rio Grande Cutthroat Trout Populations in an Uncertain Future

Matthew P. Zeigler, Kevin B. Rogers, James J. Roberts, Andrew S. Todd, and Kurt D. Fausch
North American Journal of Fisheries Management

Like many fish species, Rio Grande Cutthroat Trout *Oncorhynchus clarkii virginalis* will face additional challenges in a warming future. We explored the consequences of the wide variety of factors thought to influence persistence of the 121 remaining populations to 2080. Although streams are predicted to warm, less than 10% of populations will be affected. In contrast, nearly 65% are predicted to be extirpated (or nearly so) by nonnative trout that have already invaded or are expected to soon. Many populations will require the help of managers if they are to persist well into the 21st century.

<https://doi.org/10.1002/nafm.10320>



On-Site Capabilities of a Mobile Laboratory for Aquatic Germplasm Cryopreservation

William M. Childress, Brian Bosworth, Edward Chesney, Ronald B. Walter, and Terrence R. Tiersch

North American Journal of Aquaculture

- The cryopreservation of genetic material can be an important tool for researchers and managers involved with imperiled fishes, wild fisheries, aquaculture, and biomedical research.
- The standardization and reliable collection of diverse, high-quality samples are persistent challenges to the successful cryopreservation of aquatic species.
- This study worked with different user groups, cryopreserving sperm onsite at their facilities to evaluate the uses and challenges of a mobile laboratory with high-throughput and quality control capabilities comparable to those of a specialized central facility.
- If mobile laboratories prove to be effective, user groups will no longer be limited to germplasm resources that can be shipped as samples or transported as live animals to a central cryopreservation facility.

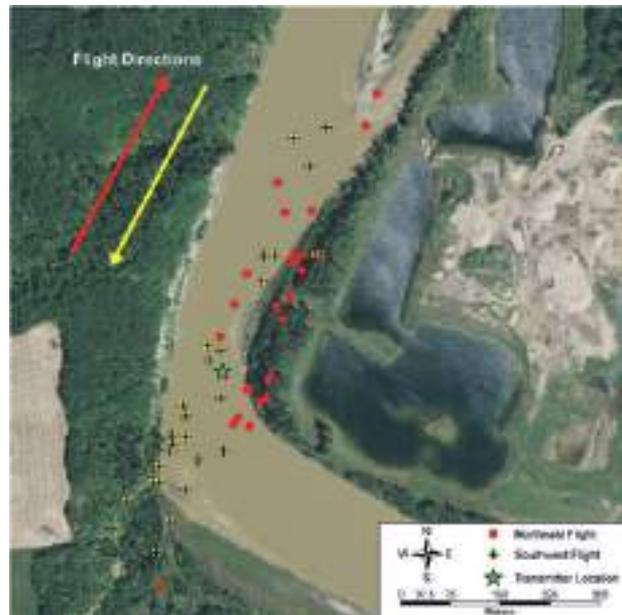
<https://doi.org/10.1002/naaq.10099>

Dude, Where's my Transmitter? Probability of Radio Transmitter Detections and Locational Errors for Tracking River Fish

Owen B. Watkins, Andrew J. Paul, Stephen C. Spencer, Michael G. Sullivan, and Lee Foote
North American Journal of Fisheries Management

- Our study quantifies probabilities of accuracy and detectability in radiotelemetry as affected by transmitter type, depth, number, and receiver altitude.
- Detection distances declined rapidly with increasing transmitter depth for both transmitter types. Detection probabilities declined with increasing transmitter depth and decreased with increasing number of scanned frequencies.
- We have provided a means to estimate locational error, and demonstrate that locational error can be large relative to a research question, and probabilities of detection low under certain circumstances.

<https://doi.org/10.1002/nafm.10307>



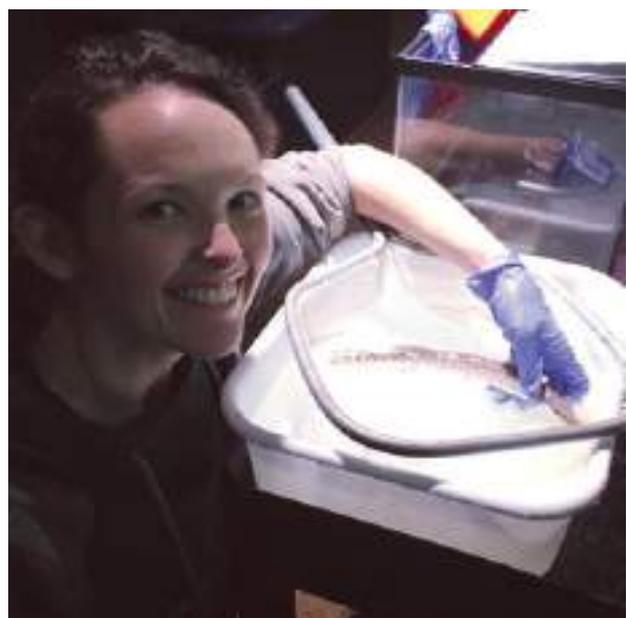
Evaluation of Tag Retention, Healing, Growth, and Behavior in Age-0 Muskellunge Following Acoustic Transmitter Implantation

Sarah E. Walton-Rabideau, Mark Newell, Amanda L. Jeanson, Elodie J. I. Lédée, John M. Farrell, and Steven J. Cooke

North American Journal of Fisheries Management

- Tag retention, healing, survival, relative growth rates, and behavior were evaluated for 96 age-0 Muskellunge *Esox masquinongy* over 120 days between three treatment groups.
- Fish were implanted with JSATs, one of the smallest commercially available acoustic transmitters.
- No fish loss tags or died due to surgery, wounds healed within 30 d, and all fish survived implantation, and tag insertion did not influence growth of tagged, sham, or control Muskellunge after four months.

<https://doi.org/10.1002/nafm.10298> 



Star Hands



Credit: Shany Fiske



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