



### President's Message

Dear Members,

We are quickly approaching our annual Board of Control meeting on September 28-29, which will coincide with this year's joint American Fisheries Society (AFS) and The Wildlife Society (TWS) [conference in Reno, NV](#). We look forward to seeing you there and invite you to our business meeting for either or both days. Member contributions are critical to the advancement of the Institute and your ideas are valuable to us. AIFRB has a long-time tradition of holding open business meetings, where all members are encouraged to participate at any time. You are welcome to stay in the meetings for any amount of time you would like.

The Board would also like to inform you of upcoming AIFRB events in Reno, including the [Trade Show & Poster Networking Event](#), where we will sign up new members and offer current members to renew their memberships for 2020. We also hope to see you either present a paper or participate in the [Marking, Tagging, and Tracking of Fish and Wildlife Symposium](#) jointly organized by AFS, TWS and AIFRB. Be sure to join us for our AIFRB Social, to be held at the Renaissance Hotel on October 1<sup>st</sup>—be on the lookout for details that will be coming soon in your email and AIFRB website.

The Board is seeking to fill several vacancies and we welcome your participation and your nominations of peers and colleagues who are members, or those who are interested in becoming members. Check out the announcement in this newsletter for the following available positions: AIFRB President-Elect, AFS-AIFRB Liaison, Social Media Director and District Director. Please [contact me](#) if any of the positions are of interest to you and I'd be happy to answer any questions you might have.

Finally, although tardy in my acknowledgment, I'd be remiss if I did not use this opportunity to thank Dr. Barbara Warkentine, past Secretary of AIFRB, for her dedicated service, unabated support and realistic and honest approach to this institute's governance. Please be sure to learn more about Barbara in this issue of Briefs.

As always, thank you for what you do in both fishery science and for AIFRB. Feel free to contact me at any time with any questions, concerns or ideas.



Sincerely,

Kim Anthony

President

[kim.anthony@aifrb.org](mailto:kim.anthony@aifrb.org)

## Special Thanks



AIFRB would like to recognize Dr. Barbara Warkentine for her long-time service on the Board of Control. Barbara joined the Institute in 1986. She served two terms as the district director of the New York/New Jersey district (now the Keystone District) before serving as Secretary for 10 years and on the Membership Committee for 20 years. Barbara graciously served as Secretary for an additional four years, officially closing out her duties in August 2018. Barbara remains an AIFRB member and still serves on the Institute's Membership Committee, supporting the admission of new members,

outstanding professionals and up and coming fishery scientists from across the country. We are also privileged to benefit from Barbara's institutional knowledge and meticulous work ethic as she leads the effort to revise and update the AIFRB Procedures Manual.

*"I have truly valued my affiliation with AIFRB and meeting many new colleagues from across the country as I served as a member of its Board. I strongly support AIFRB's mission and hope that it continues to grow and attract talented fishery research biologists and members and leaders."* – Barbara Warkentine

We thank Barbara for her long-time service to AIFRB on the Board of Control and appreciate her continued support of the Institute.

### **If you haven't already done so...**

#### **Renew Your Membership!**

**\$25** - Student Associates

**\$45** - Professional Associates, Members, and Fellows

**\$600** - Lifetime Member

#### **Become a Member!**

**\$35** - Student Associates

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**\$600** - Lifetime Member

Online payments available at [www.aifrb.org](http://www.aifrb.org)

#### **Checks payable to "AIFRB" can be sent to:**

AIFRB c/o Cate O'Keefe  
P.O. Box 251  
Fairhaven, MA 02719

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## Current Member Spotlight

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The New York Sea Grant (NYSG) Board of Governors and Stony Brook University (SBU) Provost Michael Bernstein are pleased to announce the appointment of **Rebecca L. Shuford**, Ph.D., as Director of the NYSG Institute. Becky will begin to serve as the new director on June 17, 2019.

Becky is a New York (NY) native, originally from Brooklyn, and has a life-long history with and love for NY's coastal ecosystems and communities. She is thrilled to be joining NYSG and to be returning "home" to work with partners across the State and within each of NY's coastal ecosystems, including the Great Lakes, Hudson River Estuary, Long Island Sound, and Atlantic Ocean.



"The opportunity to serve as Director of NYSG is truly a homecoming for me," says Shuford. "I am eager to meet, learn from and work with all of our coastal partners, constituencies and communities on topics of mutual interest and importance and to collectively bring 'Science to the Shore.'"

Prior to appointment as Director of NYSG, Becky worked for the National Oceanic and Atmospheric Administration (NOAA) in Silver Spring, MD, where she managed a portfolio of challenging, high-profile programs focused on the science, management, conservation and sustainable use of trust coastal and marine resources using an ecosystem-based approach to management. This included developing and directing NOAA's Integrated Ecosystem Assessment (IEA) program and leading NOAA's Large Marine Ecosystem (LME) program, among other responsibilities.

Becky holds a Bachelor of Science Degree in Environmental Biology from Cornell University as well as



a Masters and a Ph.D. in Marine Science from the University of South Carolina. Her graduate degrees focused on the biology and life-history of yellowfin tuna in the Atlantic, and her doctoral work was conducted at a French research lab in Brest, France.

Becky's interest in fisheries oceanography was sparked while, between her undergraduate and graduate education, working for the National Audubon Society.

During that time, she had the opportunity to go fishing off the coast of Montauk with the director of the oceans program. Becky also interned at the Jamaica Bay Wildlife Refuge, where she worked on coastal conservation and restoration efforts, further informing her interests.

Following her graduate studies, Becky earned the John A. Knauss Marine Policy Fellowship and served as a Foreign Affairs Fellow in the Office of International Affairs for NOAA Fisheries. She then served as a Research Assistant Professor and fisheries oceanographer as a member of the Southeast Coastal Ocean Observing System based at the University of South Carolina, before joining NOAA's Integrated Ocean Observing System Program as an Oceanographer.

Becky is preceded by **Katherine Bunting-Howarth**, Ph.D., J.D., who has served as Interim Director of NYSG from June 2018 to June 2019, following the retirement of **William Wise**, Director of NYSG from 2013 to 2018.

"The NYSG Team is thrilled to have Dr. Shuford at the helm," says Bunting-Howarth. "Her background and expertise will enhance our diversity and strengthen our ability to provide our stakeholders with relevant and timely programming and research."

### **More Info: New York Sea Grant**

New York Sea Grant (NYSG), a cooperative program of Cornell University and the State University of New York (SUNY), is one of 33 university-based programs under the National Oceanic and Atmospheric Administration's National Sea Grant College Program.

Since 1971, NYSG has represented a statewide network of integrated research, education and extension services promoting coastal community economic vitality, environmental sustainability and citizen awareness and understanding about the State's marine and Great Lakes resources.



Through NYSG's efforts, the combined talents of university scientists and extension specialists help develop and transfer science-based information to many coastal user groups—businesses and industries, federal, state and local government decision-makers and agency managers, educators, the media and the interested public.

The program maintains Great Lakes offices at Cornell University, SUNY Buffalo, SUNY Oswego and the Wayne County Cooperative Extension office in Newark. In the State's marine waters, NYSG has offices at Stony Brook University in Long Island, Brooklyn College and Cornell Cooperative Extension in NYC and Kingston in the Hudson Valley.

For updates on Sea Grant activities: [www.nyseagrant.org](http://www.nyseagrant.org) has RSS, [Facebook](#), [Twitter](#), and [YouTube](#) links. NYSG offers a free e-list sign up via [www.nyseagrant.org/nycoastlines](http://www.nyseagrant.org/nycoastlines) for its flagship publication, *NY Coastlines/Currents*, which is published quarterly. Our program also produces an occasional e-newsletter, "[NOAA Sea Grant's Social Media Review](#)," via its blog, [www.nyseagrant.org/blog](http://www.nyseagrant.org/blog).



# Young Professional Spotlight

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*Elise Koob – New England District*



***What is your current position, with what company/organization, and what is the focus of your research/work?***

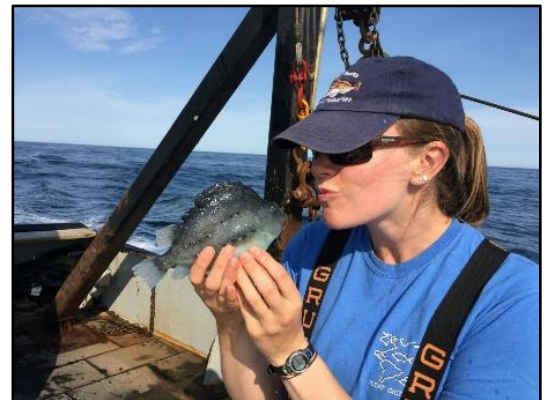
I work as a Research Technician in the Age & Growth Laboratory of the Massachusetts Division of Marine Fisheries (MA-DMF). This lab provides age data to stock assessments for commercially and recreationally important species in Massachusetts waters, including striped bass, winter flounder, summer flounder, black sea bass, tautog, river herring, cod, bluefish, scup and American shad. We use a variety of structures to determine the age of these species, including otoliths, scales, opercula and fin spines.

***Where did you receive your education, and what helped pave your way to your current position?***

I completed a B.S. in Marine Biology from the University of New Hampshire and I am currently working towards a M.S. in Marine Science and Technology from the University of Massachusetts Boston. I was introduced to the age and growth world during a summer internship during my undergraduate career with the Commonwealth Scientific and Industrial Research Organization in Cleveland, Australia. There, I learned how to make age determinations using the otoliths of golden trevally (*Gnathanodon speciosus*) and how these data are used to estimate a variety of parameters used in stock assessments. The skillset I acquired from this project led to an age-related research position at the Gulf of Maine Research Institute in Portland, ME working with bluefin tuna and swordfish and from there I applied to my current position at MA-DMF.

***How does your work apply to, or influence, fishery management (e.g., stock assessments, sportfishing, commercial regulations, habitat protection, etc.)?***

The data collected by the MA-DMF Age & Growth lab informs fisheries managers about status of many important species in Massachusetts waters. Age data are imperative for estimating a variety of parameters that are used in stock assessments, including age at maturity, size at age, mortality, growth rates and productivity parameters. These data increase the accuracy of models used to manage fisheries, ensuring that the decisions made from this information best reflect current stock status.



***What is your professional outlook for fisheries management? In other words, what will the future of fisheries management look like 10-20 years from now. What are we doing correctly, what needs to be improved (e.g., in research, policy, education)?***



I hope that future fisheries management is even more collaborative than it is currently and that there is better understanding between all fisheries stakeholders. Though many great collaborations exist already, I think that there is a wealth of knowledge and opportunities yet to be fully tapped. Further linking of experts from a wide-variety of backgrounds to achieve a better understanding of the problems we face in fisheries

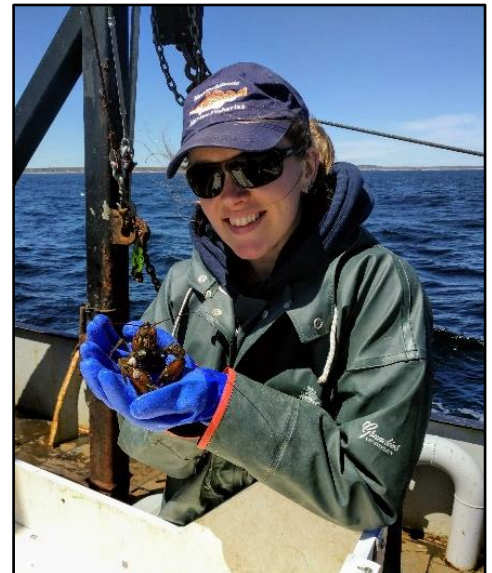
research can only result in improved management opportunities. Additionally, there is (and will continue to be) conflict between interest groups and protecting fish stocks for the future. Though wishing for universal agreement and cooperation is a bit farfetched, my hope is for increased willingness between researchers, fishermen and managers to work together towards a common goal.

***What is the importance of young fishery professionals today and for the future of fishery management?***

Young fishery professionals today have the opportunity to introduce new ideas as well as a vivacity to the field of fishery science. Young professionals are often full of grand ideas that, with the guidance of experienced mentors, spark an eagerness and determination into projects. The hard-work and energy that young professionals bring to a project are qualities that will help progress the field into the future.

***What drew you to AIFRB, and what does AIFRB do for you and what can it do for other young professionals in this field?***

I was introduced to AIFRB at the 148<sup>th</sup> annual AFS meeting in Atlantic City in 2018 by co-workers who were already members. I was immediately invited to join the AIFRB social that evening and connected with other members as well as fisheries stakeholders from the area. I thought this was a unique and great opportunity for people from a variety of fisheries-related interest groups to meet and talk about their respective backgrounds and goals for the future. AIFRB also provides the opportunity for regional networking events between the larger conference meetings that allow for new ideas and collaborations to begin. I think this is extremely important for young professionals looking to expand skillsets, explore new opportunities and foster ideas for future projects.



**Please contact Elise ([elise.koob@mass.gov](mailto:elise.koob@mass.gov)) to continue the conversation!**

# Young Professional Spotlight

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Beth Bowers – Florida District



**What is your current position, with what company/organization, and what is the focus of your research/work?**

I am a doctoral candidate at Florida Atlantic University in the Integrative Biology program. I also serve as the Lab Supervisor of the FAU Elasmobranch Research Laboratory. My doctoral dissertation focuses on the migratory patterns of the blacktip shark, *Carcharhinus limbatus*, in the western Atlantic Ocean. By instrumenting individuals with acoustic transmitters and in conjunction with collaborative acoustic telemetry networks, I am able to track their movements along the entire Atlantic Seaboard as they perform their annual migrations.

**Where did you receive your education, and what helped pave your way to your current position?**

I earned my Bachelor's degree in Biology, a Master's in Biology with a Neuroscience certificate, and a Master's degree in Geosciences with an emphasis in Geographic Information Systems, all from Florida Atlantic University. During my undergraduate degree, I suffered the loss of three family members in succession. As my family home went into foreclosure, I struggled to justify entering the field of marine biology where my pay may be too low to financially support my remaining family. As I battled with the idea of becoming a dentist, a kind professor steered me back toward my passion, while he explained to me that no amount of money was worth having a career that wouldn't make you happy. As I re-entered the world of marine science, my current major advisor, Dr. Stephen Kajiura, took me under his wing as a volunteer. As I proved my work ethic and dedication to Dr. Kajiura, he provided me with training and emotional and financial support and that would groom me to be the scientist that I am today. Although a straight and narrow path into marine biology would have saved time, I don't believe I would have the same amount of persistence and drive that I do now after having had that meandering experience.



**How does your work apply to, or influence, fishery management (e.g., stock assessments, sportfishing, commercial regulations, habitat protection, etc.)?**

The blacktip shark is a highly migratory species that is popular in recreational fisheries. My work outlines the seasonal areas where it may be important to manage this population now and in the future. I track the movements of these individuals along their migratory route, investigate the differences in migratory patterns between sexes, and use environmental indicators to predict their future movements. As global climate change continues to impact the movements of marine animals, it will become increasingly more important to have the means to rapidly shift marine policy and protected habitat.



**What is your professional outlook for fisheries management? In other words, what will the future of fisheries management look like 10-20 years from now. What are we doing correctly, what needs to be improved (e.g., in research, policy, education)?**



As we become more technologically advanced in terms of monitoring, we as fisheries biologists will need to develop analysis methods that are appropriate for those high-resolution data. Additionally, as information becomes more available to the masses, we too will need to make our information public and justify our share of taxpayer dollars. Social media makes it possible for us to educate many viewers and reach out to stakeholders who may influence the security of our jobs in the future. We have a duty to share what we have learned with the general public and to advocate for the need for fisheries management.

**What is the importance of young fishery professionals today and for the future of fishery management?**

Young fishery professionals have the ability to influence how future fisheries management is decided. By learning integrative analysis methods now and gaining an understanding of the limitations of current sampling and analysis techniques, young professionals can minimize the error in fisheries estimates and create more accurate estimates for stock assessment and better inform fisheries policy.

**What drew you to AIFRB, and what does AIFRB do for you and what can it do for other young professionals in this field?**

I initially joined AIFRB outside of the Monsters of Climate Change workshop that was sponsored by the Institute at the 148th American Fisheries Society annual meeting. Every speaker at the workshop danced down the aisle to their favorite rock song while laser lights flashed around the room. The all-inclusive, fun, yet informative atmosphere at this workshop made me want to be a part of this group. The AIFRB puts me in contact with and gives me reasons to speak to professionals in this field that I otherwise would be too intimidated to converse with. I have learned so much already from the many friendly faces that represent the AIFRB. Other young professionals can have the same experience by joining the Institute.



**Please contact Beth ([mebower5@gmail.com](mailto:mebower5@gmail.com)) to continue the conversation!**

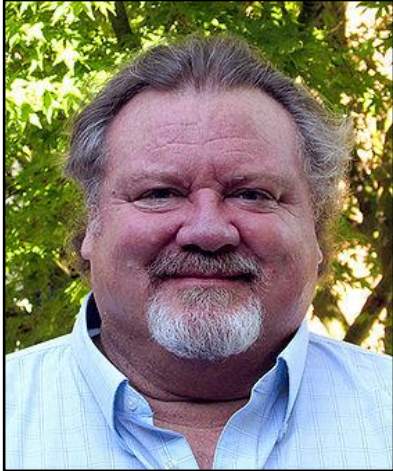


# AIFRB Position Opening

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## AIFRB President

*A message from Tom Keegan, Past President*



We are currently soliciting nominations for our next AIFRB President as our current President, Kim Anthony, is in her second year of her three-year term. If you or someone you know is interested in guiding our Institute into the next decade, please send Tom Keegan an email with your nomination (or suggested nomination!) at [tomk@helixepi.com](mailto:tomk@helixepi.com). Please give some thought to this extremely rewarding experience, working closely with the other Officers of the Institute and District Directors to advance the Mission of our Institute. Our Bylaws state that the next President must be at least Member status and cannot be from the same District as the current President, so that would disqualify Southern California District members from being nominated at this time.

## AIFRB Social Media Director

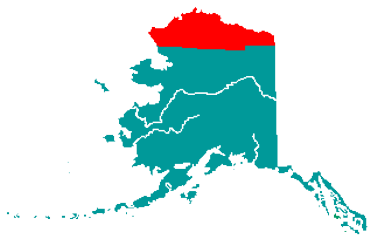
Do you love the AIFRB? Do you love social media? Why not combine the two? The Institute is looking for a tech savvy, energetic member to serve as Social Media Director. As the Social Media Director, you would also serve as an ex-officio member of the Board of Control. Your duties would include production and maintenance of AIFRB's web presence, assisting the Newsletter Editor, serving as liaison between other Board members to ensure timely updates and posts of AIFRB events and news, and updating, maintaining, and printing the AIFRB display. Interested? Contact President [Kim Anthony](#) for more details.



# AIFRB Position Opening

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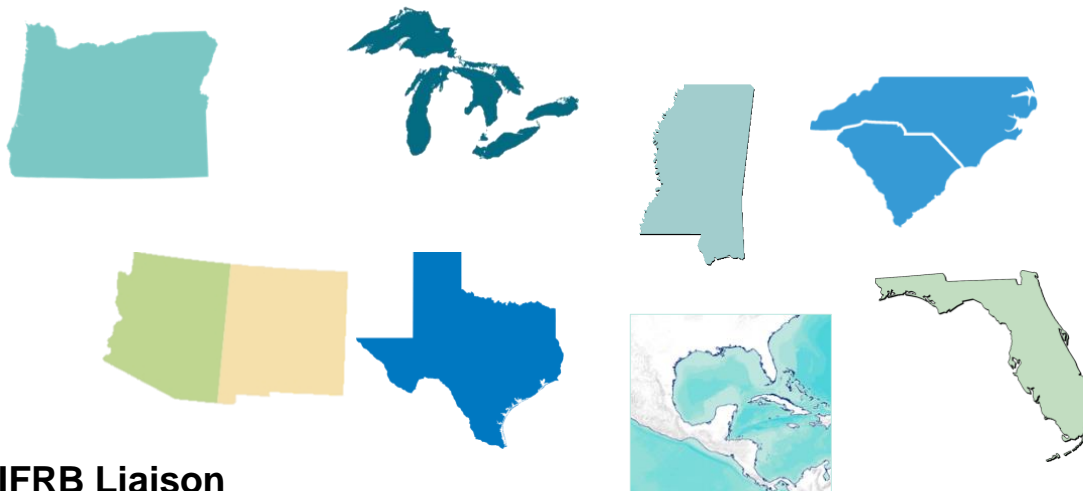
## District Director Vacancies – Now Seeking Nominations!



The Institute has vacancies for District Directors in the following Districts: Northern Alaska, Southeast Alaska, Oregon, the Great Lakes, Mississippi, the Carolinas, Arizona/New Mexico, the Gulf of Mexico, Texas, and Florida. These present excellent opportunities for members to get more involved with the Institute in a leadership role in order to help advance our mission, including the professional development of members and the advancement of the field of fisheries science. District Directors are elected by the membership of each District to serve two-year terms

and they are responsible for promoting the Institute activities at the regional level, including the recruitment and advancement of members, as well as organization of regional meetings and activities. District Directors also serve on the AIFRB Board of Control to be involved with leadership of the Institute on a national level. Therefore, serving as a District Director presents individuals with many opportunities for professional and personal development while serving in these rewarding roles and making meaningful contributions to our field.

If you are interested in nominating someone (including self-nominations) for one of these vacancies, then please contact [Kim Anthony](#) by September 1, 2019.



## AFS – AIFRB Liaison



Are you looking to get more involved with AIFRB? Are you also active in AFS? We are looking for a new AIFRB-AFS liaison for the upcoming year. Duties include organizing an AIFRB sponsored symposium at the annual AFS meeting and updating both organizations on what the other is doing. This is an excellent position to network with scientists across multiple disciplines of fisheries science. If you are interested please feel free to reach out to our current AIFRB-AFS liaison, Sean Lucey, at [Sean.Lucey@NOAA.gov](mailto:Sean.Lucey@NOAA.gov).

### The effect of ocean warming on black sea bass (*Centropristis striata*) aerobic scope and hypoxia tolerance

Emily Slesinger<sup>1,3</sup>, Alyssa Andres<sup>1</sup>, Rachael Young<sup>1</sup>, Brad Seibel<sup>2</sup>, Vince Saba<sup>2</sup>, Beth Phelan<sup>4</sup>, Dan Wieczorek<sup>4</sup>, John Rosendale<sup>4</sup>, Grace Saba<sup>2</sup>

<sup>1</sup>Conducted physiology experiments <sup>2</sup>Co-Principal Investigators <sup>3</sup>AIFRB Members <sup>4</sup>Additional Participants

**Funding provided by NOAA Oceanic and Atmospheric Research, Coastal and Ocean Climate Applications Program**

Ocean warming is a consequence of climate change and is of significant concern for fish that inhabit marine environments. The U.S. Northeast Shelf (U.S. NES) is experiencing rapid ocean warming [1]. In addition, over the next 80 years, ocean temperature is projected to continue to increase by up to 4.1°C and 5.0°C in the surface and bottom waters, respectively [2]. In this study, we investigated the effects of warming temperatures on black sea bass (*Centropristis striata*), a commercially and recreationally important species found throughout the U.S. NES. Temperature plays an important role in black sea bass annual migrations; they will migrate inshore during the warm summer months and offshore during the cold winter months [3]. Black sea bass spawn during the late spring-summer months, which can coincide with the warmest portion of the year. Because of this, we investigated the physiological effects of temperatures that are representative of current and future bottom temperatures during the warm summer months. In order to



do this, we assessed two different metrics, absolute aerobic scope (AAS) and Metabolic Index (MI), at a range of temperatures to determine a potential thermal optima or range of optimal temperatures. Absolute aerobic scope is the difference between the maximum (MMR) and standard metabolic rate (SMR) and represents the available scope beyond what is needed for maintenance metabolism [4]. The temperature that is correlated with the highest AAS is thought to be the thermal optimum [5]. The measurement of hypoxia tolerance,  $S_{crit}$ , at a range of temperatures is used to calibrate the Metabolic Index (MI), which is the ratio





of environmental oxygen supply to fish oxygen demand. The MI is also synonymous to factorial aerobic scope (FAS), MMR divided by SMR. An MI of 1 is equal to the  $S_{crit}$  at a given temperature. Environments where the MI is 2-5 are thought to be sustainable for populations of fish [6]. Both AAS and MI can be used in habitat distribution modelling using optimal temperature that are determined through physiology laboratory experiments.

We measured AAS, MMR, SMR, and  $S_{crit}$  at a range of temperatures that are representative of current and future bottom temperatures (12-30°C). In addition, we examined black sea bass acclimation potential at 30°C, a temperature that may become common in the southern portion of their range under future climate change projections. To do this, we held a subset of black sea bass at 30°C for an entire month (fish were held at target temperatures for a week for all other temperature treatments). We compared two different methods, swim-flume and chase, to examine if the results from the methods that measure MMR varied, and if so, the impact on AAS.

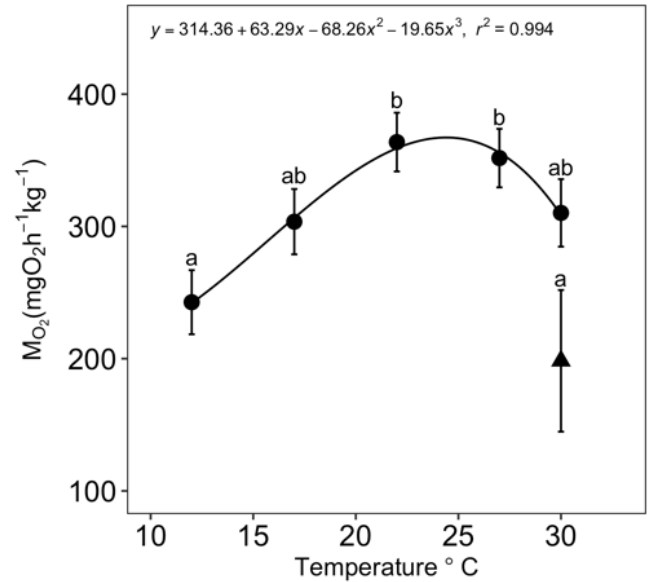


Figure 1. AAS (mean ± S.E.) for each temperature treatment. Letters indicate Tukey post hoc HSD significance where different letters indicate significance.

The flume MMR method performed better than the chase MMR method, as was evident from consistently higher metabolic rates at each temperature treatment. Therefore, the flume MMR was used in the calculation of AAS. Absolute aerobic scope reached a maximum of 367.21 mgO<sub>2</sub> kg<sup>-1</sup> hr<sup>-1</sup> at 24.4°C (Figure 1). Black sea bass that were held at 30°C for one month did not seem to acclimate, observable by a decrease in their AAS which was driven by a significant decrease in their MMR. Hypoxia tolerance decreased with increasing temperature and there was no significant change in hypoxia tolerance in the 30°C chronic treatment when compared to the fish held at 30°C for one week.

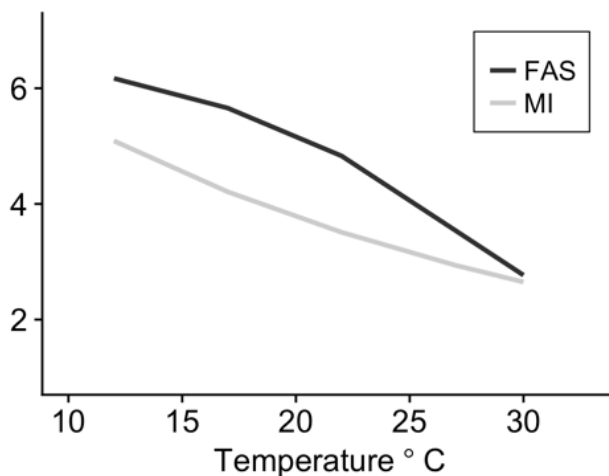


Figure 2. FAS and MI for each temperature treatment. Both measures are unitless.

The MI calculated from  $S_{crit}$  declined with increasing temperature and closely matched FAS (Figure 2). While there was an optimal temperature at 24.4°C suggested from the AAS data, the results from MI suggested that 24.4°C may be better defined as a tolerable temperature threshold. Here, black sea bass MI was 3.8 and suggests limited scope for sustained activity at 24°C. In addition, the fact that the 30°C chronic treatment saw a decrease in MMR but not in SMR nor  $S_{crit}$  suggests that oxygen supply was not limited, but that maximum performance was limited by some process on the oxygen demand side (e.g. muscle function, ATP production). Therefore, we suggest that the use of AAS as a predictor of thermal optima may not be sufficient for black sea bass and

that their thermal optimum may be lower than 24.4°C. This would corroborate well with the recent northward expansion of black sea bass in the U.S. NES.

The results from this study are currently being used to inform black sea bass distribution models based on thermal habitat. Many distribution maps for fish along the U.S. NES are constructed using presence/absence data from the NOAA Northeast Fisheries Science Center bottom trawl survey [7]. While these distribution maps are informative of fish distributions, it can be biased depending on where the survey is conducted, the time of year, and the thermal habitat sampled based on those conditions. In contrast, we are using the results from this study to compare black sea bass distribution with respect to temperature based on physiological measurements that are determined in the laboratory.



Want to read the entire publication?

**Slesinger, E.,** Andres, A., Young, R., Seibel, B., Saba, V., Phelan, B., Rosendale, J., Wieczorek, D., Saba, G. 2019. The effect of ocean warming on black sea bass (*Centropristis striata*) aerobic scope and hypoxia tolerance. PLoS ONE 14(6): e0218390. <https://doi.org/10.1371/journal.pone.0218390>

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# Goodbye to a Dear Friend

## Remembering Terry Quinn

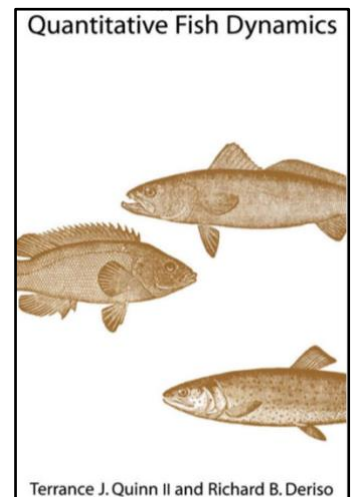


AIFRB and the fisheries science community lost a prominent scientist and good friend this May when Terrance J. Quinn II passed away in Palm Springs with friends and family. Last year, Terry retired from the Juneau Center, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, where he had been a Professor since 1985. Coincident with his retirement, the AIFRB Board decided to award Terry with the 2019 AIFRB Outstanding Achievement Award to recognize his many contributions to the advancement of fishery science, significant publications, outstanding teaching and mentoring, and exceptional service to the fishery profession.

After receiving a Bachelors degree in Mathematics from the University of Colorado, Terry received a Masters degree in Fisheries and a Doctoral degree in Biomathematics from the University of Washington. Terry immediately engaged in applied fisheries science, becoming a member of the North Pacific Fishery Management Council's Statistical and Scientific Committee (SSC) in 1986, and he remained on the Committee, serving as chair for a long period, until his retirement. The North Pacific SSC has been a model for the nation, and Terry provided leadership in the national implementation of regional SSCs.

Terry was a member of the National Research Council's Ocean Studies Board and served on multiple committees, including the Committee on Fisheries, Committee on Fish Stock Assessment Methods (co-chair), Committee on Defining Best Available Science for Fisheries Management, and Committee to Review Atlantic Bluefin Tuna. Terry became a National Associate of the National Academies of Science in 2001. Terry served as Associate Editor of the Canadian Journal of Fisheries and Aquatic Sciences. He was an active member of AIFRB since 1982.

Among Terry's many accomplishments is his book, written with co-author Rick Deriso on "Quantitative Fish Dynamics" (1999, Oxford University Press), which is one of the primary references for fishery stock assessment methods. Terry made a positive and lasting impact on many students. Terry's teaching and mentoring have helped to train a generation of quantitative fisheries ecologists and stock assessment scientists who are capable of developing state-of-the-art stock assessment model applications. Terry's students are contributing to fisheries science throughout North America, and several of them are emerging leaders in our field.



Terry had planned to join us in Reno this fall to receive his award at the AIFRB Symposium on "Spatial Ecology and Telemetry." The award ceremony will be a bittersweet recognition of his many contributions to the advancement of fishery science, outstanding teaching and mentoring, significant publications, and exceptional service to the fishery profession. Many of us will also be missing a dear friend.



## Past Events

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### The Structured Decision Making Workshop



Hosted by the School for Marine Science and Technology and AIFRB, this event was attended by an engaged group of 20+ participants including graduate students, state and federal fisheries biologists, and managers from across southern New England. Participants learned about the structured decision making process, namely the ProACT cycle of identifying the problem, eliciting objectives, brainstorming alternatives, predicting consequences, and evaluating trade-offs to select the optimal action.

Exercises included quizzing to help identify the limitations of instinctual decision making, role-playing group objective selection, applying multiple criteria decision analysis approaches, calculating the expected value of research, and more. Following the workshop, participants had a chance to network with colleagues at the AIFRB sponsored social at the Moby Dick Brewing Co. in New Bedford, MA.

Some of the projects that participants plan on using structured decision making for include prioritizing of watersheds across the region for aquatic connectivity work, development of domestic and international policy on fish passage, and decisions made by RI Marine Fisheries regarding state fisheries management and federal offshore wind permitting. Moreover, if you are part of a stakeholder group working in Integrated Ecosystem Assessment or are a policy maker or manager helped by a facilitator aiding your ability to make informed decisions when there is considerable uncertainty, you may have the pleasure of meeting one of our workshop participants as they apply their new skills.

### Keystone District Social, Highland Park, NJ

The Keystone District Director, Dr. Douglas Zemeckis (Rutgers University) hosted a networking social at Pino's Lounge in Highland Park, NJ on April 25, 2019. This event followed a seminar presentation earlier in the day by Dr. Nick Dulvy (Simon Fraser University) on shark management and conservation that was held at Rutgers University. Dr. Dulvy was the 2019 Distinguished Speaker as a part of the Center for Fisheries and Ocean Sustainability at Rutgers University, which is led by Dr. Olaf Jensen (also an AIFRB member!). Over 25 people attended the social, including existing and new AIFRB members, and other researchers working in fisheries and other disciplines. Funding from AIFRB supported the purchase of food and drinks for attendees.



## Upcoming Events

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### 11<sup>th</sup> International Flatfish Symposium - Interdisciplinary Fisheries Science & Solutions

AIFRB is sponsoring the 11<sup>th</sup> International Flatfish Symposium, which will take place on November 15-20, 2020 at Wentworth by the Sea in New Castle, New Hampshire. Since 1989, the International Flatfish Symposium has offered a platform for the exchange of high quality, scientific ideas and results, and for strengthening international cooperation and collaborations ([www.flatfishsymposium.com](http://www.flatfishsymposium.com)). The 11<sup>th</sup> International Flatfish Symposium will be focused on interdisciplinary research to solve persistent challenges of flatfish ecology, conservation and sustainable utilization, including climate change, essential habitat, bycatch and population structure. The program is being developed as a single session with keynote speakers for each theme. If you are interested in getting involved, please contact AIFRB members Elizabeth Fairchild (University of New Hampshire, [elizabeth.fairchild@unh.edu](mailto:elizabeth.fairchild@unh.edu)) or Steve Cadrin (University of Massachusetts, School for Marine Science & Technology, [scadrin@umassd.edu](mailto:scadrin@umassd.edu)) for more information.



### Ensemble Modeling in Fisheries and Wildlife: Providing Scientific Advice to Natural Resource Managers Can Be a Risky Business!



Providing scientific advice to natural resource managers can be a risky business! In many resource systems, identifying a single best ecological model will fail to capture scientific uncertainty about the true state of nature. In such cases, using a single analytical model will likely result in underestimation or mischaracterization of the actual uncertainty around the scientific advice, which may compromise risk-based decision tools used in natural resource management. However, the understanding and prediction of system dynamics, and therefore resulting scientific advice, can often be improved by analyzing the range of plausible working hypotheses where the scientific advice represents a synthesis across these hypotheses. Ensemble modeling accounts for multiple working hypotheses by employing multiple candidate models to explain and predict outcomes of the target system. Each candidate in the model ensemble makes a distinct claim about system dynamics and process outcomes and represents a unique hypothesis about how the system works. Synthesizing the results of the model ensemble can provide a more accurate characterization of the target system, especially when individual model predictions are unbiased and the covariance between model predictions is low. This symposium includes presentations and discussion of scientific advancements in ensemble modeling approaches, as well as perspectives and case studies where ensemble modeling has been applied in fisheries and wildlife ecology. This includes model selection, model weighting, multi-model inference (including averaging and other techniques), machine learning for ecological predictions, and communicating results of ensemble modeling for robust resource management.

## Upcoming Events

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### Advancements and Best Practices in Quantitative Population Modeling Symposium

Science informs management of living biological resources through population modeling. In both fisheries and wildlife management, a broad array of techniques are used to assess the condition of living resources and advise on sustainable management decisions. These quantitative techniques range in complexity, and the approach used in a given scenario is typically dictated by the available data. As new modeling techniques, data sources, and advanced computing resources become available, the range of available analytical techniques continues to expand. However, with increasing capability comes increasing responsibility to understand what is available, what is appropriate for a given situation, and how the approach should be applied given the available information and scientific understanding.



The goal of this symposium is to explore emerging techniques and best practices in population modeling from marine, terrestrial, and freshwater backgrounds to share successes in resource management and create opportunities for discussion among experts and students from all three fields. We encourage participation in this symposium from government scientists and management agencies, industries, non-governmental organizations, technology-partners, research institutions, citizen-scientists, academics (including students), and other stakeholders with a diversity of experiences.

### Marking, Tagging, and Tracking of Fish and Wildlife



Fish and wildlife tracking data inform how individual organisms and populations distribute locally, utilize habitat, migrate over larger scales, and evolve over time. Technological advances in tracking systems ignite the development of new questions about the ecology of species where previous tools did not exist to address them. Analyzed carefully, tracking data may indicate changes in climate and land use, biodiversity, invasive species, predict spread of diseases or parasites, and correspond to effectiveness of stocking efforts.

Tracking measures include utilization of physical marking tags, light-level geolocators, acoustic, radio, satellite, and GPS that enable investigation of spatial ecology and behavior of a variety of terrestrial, aerial and aquatic species. Tagging methods vary by size, price, memory and power capacity, scale, and ease of use.

Successful marking and tracking approaches not only involve proper tagging and placement of monitors to detect movements, but also require robust analyses and effective communication of large datasets. This symposium will share technologies, methodologies, findings, analytical approaches, and troubleshooting tips across a broad array of species and objectives to highlight more recent developments and encourage collaboration.



## Upcoming Events

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### Workshop to develop guidelines for addressing catch forecasts from biased Assessments (WKFORBIAS) in Woods Hole, MA (USA)



Participate in a workshop to develop guidelines for addressing **Catch forecasts from biased assessments** (WKFORBIAS), to be held at the Northeast Fisheries Science Center in Woods Hole, MA, USA, **11 November – 15 November 2019**. The workshop will be chaired by Larry Alade (USA) and Chris Legault (USA), and the Terms of Reference can be found below. In your role as chair of an ICES

working group, we would appreciate if you could circulate this note to extend the invitation to members of your expert group.

The goal of the workshop is to bring together researchers and stock assessment experts to discuss and present a framework for addressing retrospective bias in ICES stock assessments. A central task of the workshop will be to document the extent of the retrospective bias in category 1 and 2 assessments based on data produced by assessment working groups during 2019. Additional objectives are to identify and compile possible causes for retrospective bias and to develop approaches for retrospective bias correction and guidelines for acceptability of a stock assessment with retrospective bias. The outcome of the workshop is expected to be delivered to ACOM and considered for implementation in 2020.

Please let us know if you plan to attend the workshop and can present/propose candidate products for the workshop. As such please send your expression of interest to Colin Millar (colin.millar@ices.dk) stating the following:

- a. Name
- b. Affiliation
- c. Your role as an interested party to the workshop
- d. Title of a contributing Working paper addressing any number of the TOR's below (if applicable)

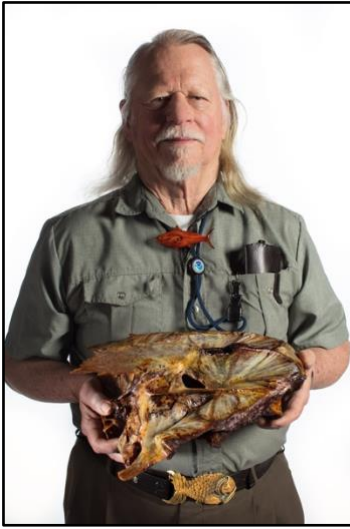
We wish to accommodate as many participants as possible so if you are interested please send your expression of interest by **15 April 2019**. A selection of the participants may be required to ensure that all of the TOR's are addressed. ICES will consider the list of potential participants and inform selected participants by **30 April 2019**.

Feel free to circulate this announcement to your networks. Should you have any questions, do not hesitate to contact the Co-Chairs (Larry Alade: [larry.alade@noaa.gov](mailto:larry.alade@noaa.gov) or Chris Legault: [Chris.legault@noaa.gov](mailto:Chris.legault@noaa.gov)).

# Postdoctoral Fellowship

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## *Sara E. and Bruce B. Collette Postdoctoral Fellowship in Systematic Ichthyology*



### **Background**

In 2017 an endowed postdoctoral fellowship was established through the generous donation of Bruce B. Collette to support postdoctoral research focused on collections-based systematic ichthyology at the National Museum of Natural History (NMNH).

With a career starting in 1960, Dr. Bruce Collette's passion has been collections-based systematic studies of marine fishes. There are three things he loves most about NMNH: the collections, the library, and the people. *"It's a very special place,"* says Collette, who spent nearly 60 years in the NMNH community as an employee of the National Marine Fisheries Service (NMFS – NOAA), a resident affiliated agency partner.

Dr. Collette and his wife Sara established this fellowship endowment at NMNH to help train the next generation of collections-based ichthyology researchers and provide an opportunity to share the NMNH with them. *"What I love most about the Smithsonian is its magnificent collection, which has enabled me to spend the majority of my career looking at specimens. I want the next generation of researchers to experience the collections, library and people of the NMNH. I want to pass on the privilege of doing research here,"* said Collette.

### **Purpose**

The purpose of the Collette Postdoctoral Fellowship is to support full-time, resident, independent research focused on the study of systematics, including comparative morphology, of fishes using the NMNH collections. This is a two-year award.

Awardees are expected to be actively involved in the scholarly activities of the Division of Fishes in particular as well as collections-based systematic ichthyology both national and internationally.



<https://www.smithsonianofi.com/sara-e-and-bruce-b-collette-postdoctoral-fellowship-in-systematic-ichthyology/>

# Postdoctoral Fellowship

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## NRC Postdoctoral Associate in Quantitative Fisheries

NOAA Fisheries conducts stock assessments of economically important marine resources to provide scientific information for the regional fishery management councils and other management partners.

The statistical models and diagnostic tools used in these stock assessments can differ by region, laboratory, and application; although, many stock assessment approaches have similar mathematical and statistical attributes. The postdoctoral associate will compare and evaluate a minimum of four age-structured assessment packages commonly used by NOAA Fisheries: the Age Structured Assessment Program (ASAP), the Assessment Model for Alaska (AMAK), the Beaufort Assessment Model (BAM), and Stock Synthesis (SS). Comparisons will rely on simulated data typical of fish stocks in various regions of the United States.



**NOAA**  
**FISHERIES**

Minimum qualifications include a PhD in quantitative fisheries, statistics, applied mathematics, population dynamics, marine ecology, theoretical ecology, or a related field. Strong quantitative skills are required, as are strong programming skills (e.g., in R, AD Model Builder). The successful candidate should be motivated and capable of working independently as well as collaboratively within a team.

The associate may choose their host laboratory from locations in Beaufort NC, Miami FL, Newport OR, Seattle WA, Silver Spring MD, or Woods Hole MA. The associate will have opportunities to travel to the other locations to collaborate with members of the research team.

Annual salary is \$56,000 plus benefits, administered through the National Research Council (NRC) postdoctoral program (<http://sites.nationalacademies.org/pqa/rap/>). Postdoctoral support is available for one year.

To apply, e-mail a **cover letter** describing your interest in the position, a copy of your **CV**, and the names and contact information of **two professional references** to Kyle Shertzer ([Kyle.Shertzer@noaa.gov](mailto:Kyle.Shertzer@noaa.gov)). Review of candidates will continue until the position is filled. Short-listed candidates will be invited to submit a full application through the NRC system (NRC deadline is May 1, and **if position remains open, the next deadline is Aug 1**). Start date is flexible, but ideally work would begin in the summer of 2019.

Informal inquiries regarding the position are welcome. Regional lab contacts are:

Aaron Berger ([aaron.berger@noaa.gov](mailto:aaron.berger@noaa.gov)) – *Newport, OR*

Liz Brooks ([liz.brooks@noaa.gov](mailto:liz.brooks@noaa.gov)) – *Woods Hole, MA*

Jim Ianelli ([jim.ianelli@noaa.gov](mailto:jim.ianelli@noaa.gov)) – *Seattle, WA*

Patrick Lynch ([patrick.lynch@noaa.gov](mailto:patrick.lynch@noaa.gov)) – *Silver Spring, MD*

Rick Methot ([richard.methot@noaa.gov](mailto:richard.methot@noaa.gov)) – *Seattle, WA*

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Kyle Shertzer ([kyle.shertzer@noaa.gov](mailto:kyle.shertzer@noaa.gov)) – *Beaufort, NC*



## Job Posting

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### Experienced Marine Biologists

Positions: General Series (GS) 12 level

Salary: \$74,896 - \$97,370 per year\*



The Navy team offers innovative, exciting and meaningful work linking military and civilian talents to achieve our mission and protect our freedoms. Our work is exciting and dynamic in support of various types of projects. The Department of the Navy provides competitive salaries, comprehensive benefits, and professional development and training. These positions are located in Silverdale, Washington, one hour west of Seattle, and are part of Naval Facilities Engineering Command Northwest (NAVFAC Northwest). NAVFAC Northwest is a complex, multi-mission team where Civil Engineer Corps officers, civilians and contractors work together as engineers, architects, contract specialists, environmental planners, scientists, biologists and professionals to plan, construct, sustain, and repair the Navy's infrastructure at shore facilities and provide support to the fleet for Navy operations. Our geographic area of responsibility covers eleven states; Washington, Oregon, Montana, Idaho, Wyoming, Alaska, North Dakota, South Dakota, Nebraska, Iowa and Minnesota.

NAVFAC Northwest has openings for experienced Marine Fisheries Biologists to work on the Natural Resources team. These positions require preparation of supporting documentation under various federal laws, such as, Section 7 of the Endangered Species Act and Essential Fish Habitat, as well as reviewing and providing input on NEPA documents. Biologists prepare biological assessments, Incidental Harassment Authorization applications, Integrated Natural Resource Management Plans and other federally required documents to support the Navy's environmental stewardship mission. These positions also lead, conduct, or participate in natural resources surveys and studies in the Navy Region Northwest area. There is a wide variety of project work available and many professional opportunities to explore. Need someone with habitat management experience and strategic decision analysis skills.

To apply for these positions or for more information, please contact Ms. Mary Anderson at [mary.c.anderson@navy.mil](mailto:mary.c.anderson@navy.mil). Please include "Marine Biologist" in the subject line of your email.

\*Recruitment or relocation incentives may be offered depending on funding availability

# Job Postings

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## NOAA's Honors Program (NHP)



The NHP will help NOAA build a diverse, high-performing workforce by bringing us a multitude of talented recent graduates with different perspectives and viewpoints, and academic excellence. Recruitment for this prestigious program will occur annually.

This first year, NHP focuses on recruiting 19 Biologists, Budget Analysts, and Management and Program Analysts – multiple positions in multiple locations are located in NESDIS, NMFS, NOS, OAR, NWS, AGO, CAO, OCIO, and OHCS.

Each cohort will complete a 1-year developmental program that includes leadership training, rotations, Line Office mission site visits, mentors, and other requirements. Selectees are slated to begin September 16, 2019, first attending a 2-week orientation session in Silver Spring, MD, and then join their respective Line or Staff Office.

The Job Opportunity Announcements are open until July 26, or until the application quota is met. Please see the following links:

*Biologist, ZP-0401*

(<https://www.usajobs.gov/GetJob/ViewDetails/536128900>)

*Budget Analyst, GS-0560*

(<https://www.usajobs.gov/GetJob/ViewDetails/536862200>)

*Management and Program Analyst, ZA-0343*

(<https://www.usajobs.gov/GetJob/ViewDetails/536134100>)

*Management and Program Analyst, GS-0343*

(<https://www.usajobs.gov/GetJob/ViewDetails/536861300>)

NHP utilizes the Recent Graduates Program, which requires candidates to have graduated from college within the past 2 years (June 2017 or later); Veterans may apply up to 6 years after graduating, if military obligations intervened. Candidates will compete for a limited number of positions and will be selected based on their academic performance, experience, and selected [MOSAIC Competencies](#). A rigorous candidate evaluation process will ensure we select the best and brightest.

## The AFSC National Management Strategy Evaluation

Position: Research Biologist ZP-0482-3/4 (Direct Hire)

Agency: Department of Commerce, National Oceanic and Atmospheric Administration

Location: Auke Bay Laboratories in Juneau, AK

Salary: \$69,349 to \$151,845 per year

Agency Contact: Rahma Hussein, [rahma.hussein@noaa.gov](mailto:rahma.hussein@noaa.gov)

Application and More Information: <https://www.usajobs.gov/GetJob/ViewDetails/537644300>

Deadline: TBD

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*BRIEFS*, the newsletter of the American Institute of Fishery Research Biologists, is intended to communicate the professional activities and accomplishments of the Institute and its Members.  
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