

2019 Student Projects

One major goal of the striped bass initiative is to provide a forum for students to ask questions, to develop hypotheses and to devise ways to test the hypotheses.

Student Projects

Jolie Ganzell, Great Mills High School, Great Hills, MD

Students from prior years have speculated that stripe aberrations of striped bass allow identification of individual fish (much like the unique patterns of whale flukes). To test this hypothesis, controls are needed to ensure that the patterns do not change over time. Jolie studied whether the stripe aberrations of captive striped bass changed over a 9-month period. Her conclusion that they do not change is exciting and will now allow further identification of individual fish by stripe patterns. Jolie writes, *“Working in a lab setting at MBL made a difference in my life and education because I got to experience something similar to what it would be like to study marine biology in and after college. Overall, this experience has increased my interest in marine biology.”*



Jolie Ganzell catches a “schoolie” striped bass in Maryland.

Emyrs Martens, high school student at Sint-Paulus Gent, Gent, Belgium, studied the daily movements of striped bass. A group of fish in Eel Pond gather daily but then leave in the evening about 7:30pm. Emyrs hypothesized that any action that fish associated with feeding might delay or prevent the departure. He first observed the fish from afar to get the “normal” departure time. Then he ran three tests, 1) whether his presence with no movement, 2) whether his presence with movement and 3) whether his presence with feeding the fish every 15 min or so would delay the departure of the fish. Although there were not enough replicates, the preliminary information indicates that he could delay departure most dramatically with feeding. However, none of the trials prevented departure. Emyrs comments, *“The internship itself was innovative and creative for the freedom we had, sadly I only really realized this the last week.”*

Laurel Barnett, Westwood High School, Westwood, MA,
Jonathan Marvel-Zuccola, Beaver Country Day School, Chestnut Hill, MA and
Mikaere Todd, Tamalpais High School, CA
Emyrs Martens, Sint-Paulus Gent, Gent, Belgium

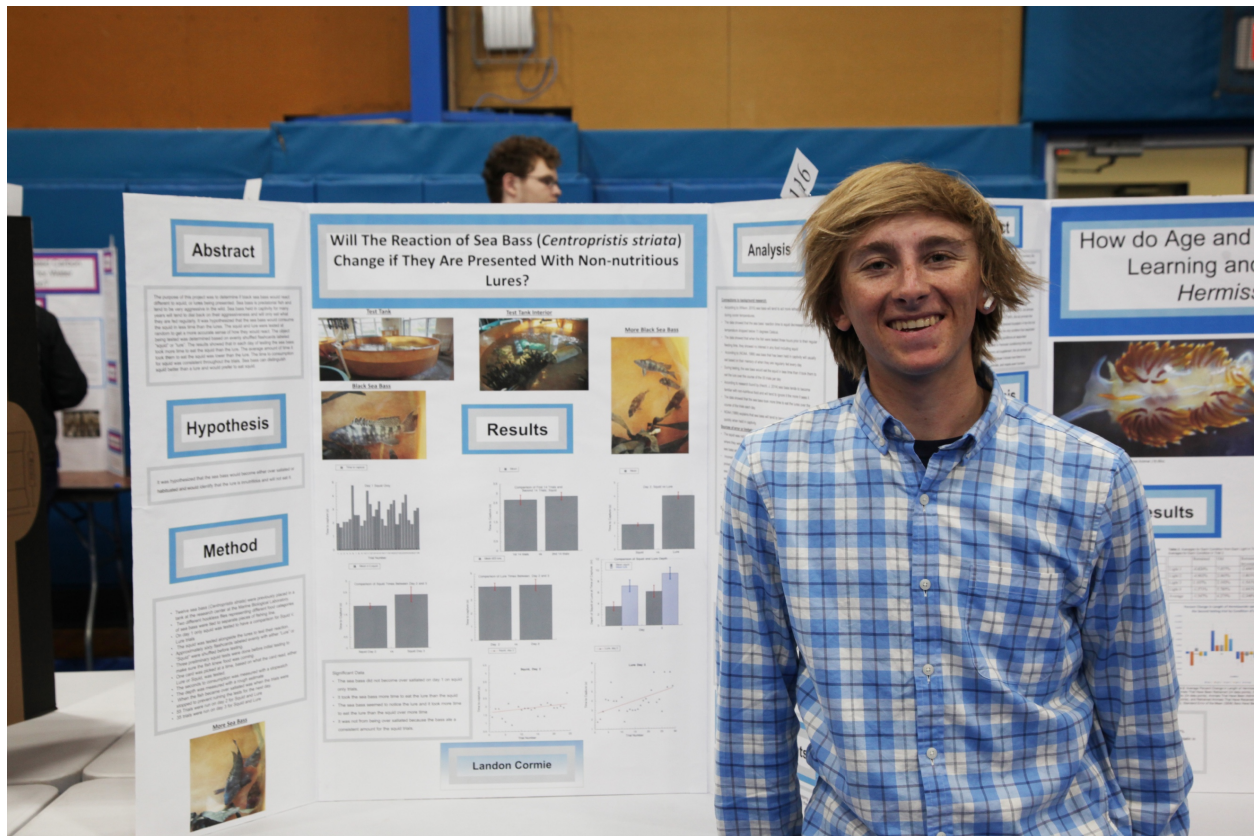
This team conducted a number of tests utilizing acoustic transmitters and receivers. Using a receiver in Eel Pond, they tested whether multiple acoustic tag transmissions or boat motor noise interfered with reception. They deployed thermometers to determine the temperature profile near one of the sites that are used by the striped bass. The group also tested the distance over which a transmitter can be detected by a receiver. Laurel writes, *“Being challenged to write a lesson plans to meet exacting standards, to think on my feet while presenting to groups of both students and adults, and to work both independently and in a collaborative setting helped me gain confidence as both a learner and a leader. I have no doubt that these experiences will help me succeed in future academic and work endeavors, and I am grateful to have been a part of the Striped Bass Project.”* Mikaere notes, *“The atmosphere was warm and welcoming, and the group of interns became a close-knit collective. I appreciated the creative freedom we got when it came to designing our own lesson plans for the website. It made the work constantly individualized and interesting.”* Jonathan comments, *“In evaluation the preponderance of this experience can be subjectively deemed to be positive, and I will contemplate returning in future summers.”*

Science Fair Project, fall 2019

During the 2019-2020 academic year, Landon Cormie a resident of Martha’s Vineyard and an 8th grader at Falmouth Academy, Falmouth, MA, conducted a project to compare the response of the black sea bass (*Centropristis striata*) to presentation of pieces of squid or a lure designed to mimic the squid. He used a resident population of bass in the Marine Resources Center at the MBL and randomly presented squid pieces and the lure. He found that the bass took a significantly longer period of time to approach the lure as compared the squid. He speculates that the bass can distinguish between the lure and squid bait.

Landon comments, *“My experience at MBL was very welcoming, Dr. Steven Zottoli was extremely helpful in helping me think of new ways to approach my project. He was extremely knowledgeable in his field of work and helped me decide what would work best for the project.”*

Whenever something went wrong, everyone at MBL was there to work with me on fixing the problem. Their input was invaluable in helping me create a project that went beyond what I had in mind in the beginning of it all. The rest of the staff members that worked with me in handling the bass were extremely open to assisting me with my project. It is a dream of mine to work in marine biology when I grow up, and having Steven work with me was an experience that I will not forget. I look forward to working at MBL in the future and I know that I will have an equally fantastic time.”



Landon Cormie at his poster as part of the 2020 Falmouth Academy Science and Engineering Fair.

New team member: Brian Prendergast, Professor of Psychology, University of Chicago

Brian Prendergast, Professor of Psychology at the University of Chicago (<https://psychology.uchicago.edu/directory/brian-j-prendergast>), worked with the Research Assistants on a number of projects.

Brian is a behavioral neuroendocrinologist and an expert on diurnal rhythms of hamsters. He became interested in striped bass on a visit to MBL. This past summer he spent 6 weeks conducting experiments and helping to mentor the students. He wishes to continue the collaboration with our summer team. Such a collaboration is beneficial to the project and

provides students with an introduction to the design and implementation of experiments. Brian and the students deployed receivers inside and outside of Eel Pond to determine whether the five fish tagged in 2018 and ten fish tagged in 2019 stay in the pond 24/7 or whether they might leave the pond to return later. Preliminary results indicate that the fish spend most of the time in the pond, but occasionally leave for varying periods of time. Brian and the students ran a number of control experiments and deployed HoBo thermometers at different depths near one of the striped bass sites in Eel Pond to obtain a temperature profile of the water column. Brian comments, *“My research interests lie in understanding how daily and seasonal biological clocks allow animals to survive and adapt to a changing world. A pattern that has emerged in this field of chronobiology ('the biology of time') is that daily (circadian) and seasonal (circannual) clocks influence each other: the best time of day to forage, explore, or even just sleep changes across the seasons. Almost everything we know about how biological clocks interact with one another comes from studies of birds and terrestrial mammals; we know very little about how biological clocks function and interact to create an internal representation of environmental time in marine vertebrates. I am interested in joining stripedbassmagic to study how striped bass use circadian and seasonal environmental cues to initiate and terminate seasonal migratory behavior, and to behaviorally thermoregulate.”*



Brian Prendergast with Research Assistants (left to right: Jolie Ganzell, Laurel Barnett, Mikaere Todd and Jonathan Marvel-Zuccola)

Development of Technology used in Research

Tae Rugh, Mill Valley High School, CA senior built a robust underwater ROV utilizing bilge pump motors during the summer of 2018. However, he was unable to finish electronic control elements of the ROV but was able to do so during a short visit this summer. He and the other Research Assistants tested the ROV and it passed with flying colors. Future students can work with this ROV for various projects that involve photographing tagged striped bass. Tae is currently attending the University of California, Irvine and writes, *"I truly had a good time working on the ROV. It actually turned out to be a very helpful project for me, as I have been using a lot of the same knowledge gained this summer on a quadcopter that I'm making for my Intro to Engineering course."*



Testing the underwater ROV (left to right: Jonathan Marvel-Zuccola, Emyrs Martens, Tae Rugh and Laurel Barnett).