

Fall 2015

HUMBOLDT STATE UNIVERSITY



HSU TELONICHER Marine Laboratory

Dear Brian,

Fall is a busy time as students return to campus and re-engage in classes and research projects. This semester the lab is supporting a variety of new and important projects in addition to upgrading aging lab infrastructure. Read on to learn about some of these projects.



The Lab Is Getting New Water Tanks!

Through a \$346,000 grant from the National Science Foundation our aging water tanks, built in 1965, will be replaced with two smaller underground tanks in 2016. The smaller footprint of the new tanks will open up new space for potential lab expansion in the future.

New Climate Change Research Underway

HSU Leading Study on Ocean Acidification

Faculty and student researchers will be looking at how low pH (ocean acidification) and low dissolved oxygen (hypoxia) will impact the behavior, physiology and genetics of juvenile rockfish. Their research is conducted in collaboration with Cal State Monterey Bay, NOAA Fisheries and Moss Landing Marine Labs.



[Link to Full Article](#)

Marine Lab Studying Mercury in Fog



HSU Joins Network of Fog Monitors along the Coast

Fog is as much a part of Humboldt County as the redwoods. Now, as part of the FogNet project, researchers from Humboldt State are joining those at other universities and organizations along the coast to look at fog's potential as an indicator of environmental health. Faculty and students from Humboldt State's Marine Laboratory are among contributors to the project, which is funded by the National Science Foundation.

[Link to News Release](#)

Featured Student Story: Cori Flannery

Studying the Effects of Ocean Acidification and Hypoxia on Juvenile Rockfish

By Cori Flannery

Corianna Flannery is a Fisheries Biology Graduate Student at Humboldt State University working under Dr. Eric Bjorkstedt. She received her B.S. in Marine Biology at UC Santa Cruz in 2013, and began her studies at HSU in January 2015. She is interested in studying how commercially important fish stocks are affected by oceanographic and anthropogenic forces in order to improve sustainable fisheries management.



Since the Industrial Revolution, CO₂ levels in the atmosphere and ocean have increased substantially. Only recently has the impact of these rising CO₂ levels become recognized as a global problem. As the ocean absorbs a greater amount of CO₂, it becomes more acidic, resulting in a phenomenon known as ocean acidification (OA). The ocean pH has already dropped by 0.1 units since the Industrial Revolution, and is predicted to decrease

by another 0.4 units by the end of the century, making the ocean more acidic than it has ever been in the past 400,000 years. Additionally, it is predicted that climate change will increase the frequency of hypoxic (low oxygen) events in the ocean, especially in upwelling areas such as California. What will happen to the organisms living in the ocean as their environment becomes more acidic and hypoxic?

Most research has focused on the effects of OA in tropical systems, suggesting several potential negative effects of OA on organisms such as corals and shellfish. Studies on tropical reef fish have found that lower pH impairs olfactory senses and reduces survival. However, the effects of OA on temperate fishes, such as those found along the coast of California, remains unclear.

My research will focus on the effects of OA and hypoxia on juvenile rockfish behavior and physiology. Rockfish are one of the most commonly found fish off the coast of California, comprising a significant chunk of our local fishery catch. These fish spend the first couple of months of their lives in the open ocean environment before recruiting to nearshore habitats such as kelp forests. This settlement period for juvenile rockfish is a critical stage in their life, as they are more exposed to changes in nearshore ocean chemistry and are at increased risk of predation.

Since June, our team has been collecting juvenile rockfish as they recruit to nearshore habitats in Trinidad Bay, and we will begin rearing them in tanks with low pH and decreased dissolved oxygen concentrations. After the fish have been exposed to either the acidic or low oxygen conditions for several weeks, a series of trials will be conducted to test for the independent effects of OA and hypoxia on their behavior and physiology.

Behavioral studies will include examining fish boldness and problem solving abilities using an escape chamber, detection and avoidance of predator odors, and examining bias in left vs. right turning decisions. To study the effects of OA and hypoxia on rockfish physiology, we will measure swimming speed, growth rates, and overall aerobic performance.

Through this project, we hope to anticipate how the reproductive success of rockfish will be affected by future changes in ocean chemistry. This study will continue for the next two summers, where we plan to also examine the combined affects of OA and hypoxia on rockfish. Stay tuned for results from our first year, and if you wish to learn more about this research project, please contact me at ch138@humboldt.edu.



HSU Marine Scientists Attend WSN!

From Nov. 5-8, 2015 twenty-eight individuals will be attending the [Western Society of Naturalists Annual Meeting](#) in Sacramento to present the results of scientific studies. Overall, seven faculty, seven graduate students and 14 undergraduate students will be presenting a total of 11 talks and 14 posters. Stay tuned for future descriptions of some of these projects!

Give Now!

Help Support the Lab!

If you are interested in supporting the lab your donations can help fund a number of activities; even a small donation is important to us:

- Increasing the hours we are open to the public;
- Support student research projects;
- Help us build a new, interactive touch tank.

If you have any questions please don't hesitate to give me a call or send an e-mail.

Sincerely,

Brian Tissot, PhD
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FOR MORE VISIT OUR WEBSITE



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<http://www2.humboldt.edu/marinelab/>



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