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Pamela Rogers, Editor

What's Behind All that Black Plastic? Can I Peek?

If you have ever been tempted to peek behind the fireproof black plastic walls of the big NAL 144 wet lab or poke your head into one of the many experimental rooms in RSF, you run the risk of destroying hours of carefully crafted work to create controlled environments. In a recent tour behind the closed doors of the tank rooms used by the Fisheries Behavioral Ecology Program of the Alaska Fisheries Science Center, National Marine Fisheries Service, Rich Titgen explained some of the work underway and why it is crucial for you to respect this restricted space by not disturbing the tank rooms.

The AFSC Fisheries Behavioral Ecology Program under the direction of Bori Olla has completed building a large number of new experimental tank areas and they are now fully operational. The group is focusing on the topic of capture-induced stress in a number of commercially important marine species such as sablefish, halibut and walleye pollock. This research coordinated by Michael Davis requires a large number of tanks with controlled light intensities and supplied with temperature-controlled seawater to simulate conditions near the bottom of the ocean. The tanks are used for holding different species and ages of fish, as well as for recovery of fish from the effects of experimental treatments designed to simulate capture and release from commercial trawling and hook and line gear. Non-targeted fish captured in this manner and then released back into the ocean are termed bycatch and are a high priority for NMFS research and fisheries management. The impact of bycatch on survival of fish stocks is a worldwide problem. Technical assistance for this project is provided by NMFS personnel Rich Titgen and Mara Spencer as well as contract technicians, Michele Ottmar and Erick Sturm.

Motorized arm pulls cod end through tank

In the photo above, one can see an arm that is rotated by a 5 hp electric motor. A net which simulates the cod end of a fishing trawl is attached to the arm. Fish are loaded into the net and towed for fixed periods of time under controlled conditions of temperature and light to simulate capture by commercial trawling. Following towing, fish are exposed to elevated seawater temperatures and air to simulate time in the upper water column during retrieval of a trawl and time on deck of a fishing vessel. NMFS is studying how the fish captured and released as bycatch are able to survive the stress induced by commercial fishing. Results indicate that stress in fish can be a function of light intensity, speed and duration of towing and exposure to elevated temperatures similar to those present in thermoclines of the upper layers of the ocean during summer and autumn. There are also marked differences among species of fish in resistance to stressors. Stress in fish is measured by decrements in feeding behavior, predator avoidance, delayed mortality and by

correlated physiological measures such as elevation in plasma cortisol, glucose, lactate and electrolytes. This information will be used to assess the impacts of bycatch on the health of fish stocks and to suggest alternative management strategies and fishing practices to reduce the impact of bycatch on the health of fish stocks and to suggest alternative management strategies and fishing practices to reduce the impact of bycatch processes.

Additional research programs in the AFSC Fisheries Behavioral Ecology Program include studies by Cliff Ryer on foraging and predator avoidance behavior in walleye pollock and sablefish under light intensities ranging from daylight through twilight to total darkness. Infrared illuminators, not visible to fish, are used to provide light for video cameras so that fish behavior may be observed under conditions of low light intensities without disturbing the fish.

Automatic fish feeder placed over tank

In the photo above, an automatic feeder provides food for experiments, removing any risk of human contact frightening fish into abnormal behavior. The feeders also provide a means for delivering food in discrete packets or continuously in experiments that determine the role of temporal and spatial factors of food distribution in schooling and territorial behavior of fish and their subsequent predator avoidance behavior.

Sue Sogard is working with the effects of warm and cold temperatures on the behavior and growth of walleye pollock and sablefish. In large tanks (2.5 x 2.5 x 2.5 meters), she is able to create thermoclines to simulate ocean conditions. Experimental fish are videotaped to determine what risks the fish are willing to take in low-food regimes; whether they will go into colder water to slow their metabolism at the risk of getting too cold for survival. She is conducting other experiments to define the optimum temperature conditions for growth of fish and the role of growth compensation in development after periods of low food availability.

The next time you walk through the black fireproof plastic hallway of NAL 144 or past doors marked "Do Not Enter-Experiment in Progress," you will know that there are definite reasons why the signs are to be obeyed. Video cameras are rolling in many of those rooms and an unauthorized curious visitor can upset the whole carefully orchestrated environment. You may also be filmed for posterity and identification. Thank you for your consideration. Personnel in the Fisheries Behavioral Ecology Program welcome any further questions that you may have about their research.

Osis Receives \$283,000 Hughes Grant

Vicki Osis, Marine Education Specialist, just received word that the Extension Sea Grant Marine Education program has been awarded a four-year grant of \$283,000 from the Howard Hughes Medical Institute. The grant will support work with middle school teachers and their students to investigate coastal streams and watersheds. The grant is part of a \$1.8 million grant that has been awarded to Oregon State University. Other components of the grant include OSU's Science and Math Investigative Learning Experiences (SMILE) program and the Department of Biochemistry

and Biophysics. The grant begins September 1. More information will follow as it becomes available.

Cory Grage and Gideon Alegado pose for the camera.

Public Wing Interns Add Zest to Interpretation

The Public Wing has three summer interns this year, only one of whom is a repeat from last summer. Tyler McAdam has actually been working weekends through the year since his stint last summer and brings experience to the new recruits. Gideon Alegado is a senior OSU student in the field of natural resources education and public information. He wanted to work at the Center this summer to practice what he has been taught in the classroom. Gideon's parents are from the Philippines and he can speak a little on one of the numerous languages there. He likes to write, draw, and can play the guitar and piano. Gideon will be here through Labor Day.

Cory Grage comes to us from Northland College in northern Wisconsin, where he is a junior in Environmental Education. His minor is in coaching, specifically coaching soccer. He also enjoys camping and hiking and is a native Oregonian. He also enjoys drawing and, of course, playing soccer. He will only be able to stay until mid-August, as the coaching season begins back in Wisconsin.

Bobko Studies Black Rockfish for Wick Award

Stephen Bobko, working with Steve Berkeley, has been awarded the Bill Wick Memorial Award for 1998. The \$3,000 award will be used to study black rockfish reproductive potential and recruitment.

Understanding variability in the recruitment of fishes is among the most important objectives in fishery science. Numerous factors, such as egg and larval size, starvation, and predation have been assessed in attempts to explain this variability, with each factor contributing in some respect. One of the more interesting and well-received theories on recruitment variability is that prolonged duration of early life history stages greatly influences recruitment through increased exposure to high levels of mortality over time, with even subtle changes in stage duration being consequential.

Demersal juvenile black rockfish, *Sebastes melanops*, are unique among North Pacific rockfish in their choice of habitat, which is primarily nearshore/estuarine, including eelgrass beds, tide pools and floating docks. These habitats are particularly vulnerable to alteration caused by coastal development and human activity, and currently we have no information regarding the quality of these different habitats for juvenile fish.

Results of Steve's preliminary research indicate that older fish spawn earlier in the spawning season than younger fish, and that few of the larvae spawned late in the season (by young fish) survived to the benthic juvenile stage. This finding strongly suggests that current management practices that do not take the age structure of the adult population into account may not provide adequate protection for the stock. During the first sampling year, they found that juvenile mortality appeared to be much higher than anticipated. Further, they found that eel grass beds that once supported large populations of juvenile black rockfish, as judged by collections made in the 1970s and 1980s, now appear to have much smaller populations. These findings considerably elevated the importance of quantifying mortality during this life stage.

The objective of Steve's research is to determine the mortality rate of black rockfish during the benthic juvenile stage and to determine the relative value of different habitat types to the growth and survival of juvenile black rockfish. A sample of at least 100 juvenile black rockfish from each of two replicates of two habitat types (seagrass beds and floating docks) will be collected, measured and marked with Elastomer tags. Sequential samples will be taken, marked fish measured and released, and unmarked fish uniquely tagged, measured and released. This will be repeated biweekly for two months to obtain sequential population estimates, which will yield information on individual growth rates, residence time, habitat-specific mortality rates, and immigration and emigration rates.

Bobko will be moving back to Norfolk, Virginia, after the field season ends in July, to take a position as lab manager in an age and growth lab at Old Dominion University. He will be working for Dr. Cynthia Jones on all Atlantic Coast recreational and commercial species and overseeing nine students and one full-time worker.

Paul Kwon

EPA Hires Summer Workers

The new crop of summer workers has arrived at EPA and they come from varied backgrounds. Paul Kwon is working on his M.S. in Environmental Engineering at OSU. This summer he is working with Faith Cole, collecting samples for estuary studies, staking out growth areas for seagrass beds and studying the impact of waste water on the Yaquina estuary. Paul is quite interested in waste management, as his Master's thesis work is on using indigenous bacteria and pumping in extra oxygen for remediation and co-metabolism of gasoline wastes in the soil. A Renaissance man, Paul enjoys folk music, the outdoors, team sports, biking, dramatics, poetry, sketching and swing dance.

Julie Nielsen

Julie Nielsen has completed her B.A. in Russian at the University of Alaska, Juneau, and is exploring the world of aquatic and ecotoxicology. This summer she is working with Steve Ferraro doing field work on distribution of ground cover and habitat biota studies, both here and at Willapa

Bay. She hopes to be getting into the OSU Toxicology Program and is looking at the different angles that she might approach the subject. Julie wants to learn how to boogie board, enjoys skiing, making pottery, baking bread and would like to learn the tango.

Leela Rao

Leela Rao comes to us from out of state. Going into her second year of a Masters in Environmental Management at Duke, she completed her B.A. in environmental studies at Scripps College in Claremont, California. She is working with Dave Young to survey the Yaquina estuary and correlate ground findings with the aerial and infrared photographs of Yaquina Bay. She will also be working in Willapa Bay with Anne Sigleo on upwelling studies. Leela's father is from southern India and her mother is Czech. The family goes back to India for family reunions. Leela enjoys concerts of any kind of music, read lots and enjoys watercolor painting.

Kelly Chapin

Kelly Chapin is a National Network Environmental Management Studies EPA Fellow who is studying habitat relationships in Yaquina Bay, particularly crabs. She is an Marine Resource Management Masters student working with Dawn Wright. Originally from Maryland, Kelly has worked in wildlife management across the country before coming to OSU. She enjoys swimming, hiking, knitting, cooking and is a beginning woodworker.

Amy Chiuchiolo

Bostonian Studies Fish Behavior

Amy Chiuchiolo (pronounced Q-Q-Low) is one of two NMFS Fisheries Behavioral Ecology summer interns. Amy saw the position on the Internet and applied as part of her career exploration process. She has completed her B.A. in Environmental Science at Boston University and hopes to be working this fall in Bermuda as an intern. She is studying compensatory growth in fish, trying to determine if fish who have not had enough food react differently to a predator guarding the food supply than well-fed fish. Do they eventually catch up to the growth of the well-fed fish or do they always lag behind? The fish are also put in the equivalent of a treadmill to test their stamina. The "treadmill" is a tube with a strong current flowing through. The fish must keep swimming just to stay in place. Once they get tired, the current pushes them back against the end plate. Amy enjoys crew, ice hockey, and biking. She hopes to try her hand at windsurfing before she goes back East at the end of August.

Important Library Announcements

Annual Renewal of Library Books

Many of you should have received a letter from the Libraries with a list of items you have checked out. If "LOCKERS" is listed, that means you have a library key. If you cannot find your list, you can go into the catalogue and view your circulation record.

Please bring the list in, email or phone us, so we can renew your books. You have until September 29th to do so. But, your name will be mud if you wait until then!

Annual Binding Project Begins

The library has started its annual summer binding project. If you have any unbound issues of journals in your office, we'd like to remind you of a change in our policy: we are no longer allowing unbound issues to leave the library except with staff permission for very short-term photocopying. We had to make this change because some patrons were failing to check out material. In some cases, unbound journals were lost for years.

A disturbing example of the decline in patron behavior may be found in our aquarium journals. Freshwater and marine aquarium is missing the July, 1996 issue, the March, 1997 issue and pages out of the January, 1998 issue were razorbladed out. The March, 1997 issue of Tropical fish hobbyist is also missing. All of these issues were received in the library and disappeared later.

So, if you find any unbound issues of journals on your desk, please bring them back. We will be very grateful.

New Landscaping at the Guin Library

Little did Janet know what was in store when Natalie Krabbe, our superb volunteer in the library, observed that the area outside the Fisher Room looked pretty bare. Three truckloads of dirt, two loads of plants and two weekends later, we have a new planted area outside the library. Many thanks to Natalie for volunteering her eye and her back to the project. And thanks to Dr. Weber for his rototilling expertise.