Sporting a new look, the NCSU Seafood Laboratory has revived the newsletter Seafood Currents. To be published quarterly, Currents will be delivered electronically via email. Each issue will contain a feature article on a “current” seafood topic – anything from laboratory research to local industry issues to national seafood news. Regular items planned for the newsletter include a calendar of events relating to the seafood industry and the laboratory, short articles and updates, and culinary preparations developed in the Seafood Laboratory Test Kitchen. Additionally, look for seafood tips each issue to keep consumers educated and informed on seafood safety.

David Green, Director of the Seafood Laboratory, says, “Originally developed and published by NC Sea Grant, Seafood Current provided news to the NC seafood industry. By re-introducing Seafood Currents, our laboratory staff hopes to expand this newsletter to share new knowledge and research with people in and around the seafood industry. Our hope is to make the important work of the laboratory better known and offer services to other researchers, provide information to government agencies, and help address industry issues.”

We look forward to your input. Please contact Jill Fournier with any comments, suggestions for future issues, or wish to be added to the email list. jill_fournier@ncsu.edu or 252-222-6334.
ABOUT THE NCSU SEAFOOD LABORATORY

Established in the late 1960s, the Seafood Laboratory’s initial purpose was to “conduct and use applied research” and “complement the seafood research work at NCSU’s Raleigh laboratories.” Extension work was an important part of the work then, when seafood specialist Dr. Frank Thomas worked with local seafood businesses to apply the results of the research being conducted. Dr. Thomas hired three industry specialists in those formative years of the lab: Steve Stokes (Winston-Salem), Ted Miller (Ocean), and Sam D. Thomas (Marshallberg).

Over 30 years later, the Laboratory, now a part of the NCSU Department of Food, Bioprocessing and Nutrition Sciences, has an expanded mission in mind – to interpret, adapt and extend research information to the NC seafood industry and to national and international businesses. The goals supporting this mission are “improving the safety, variety and quality of seafood products supporting economic development and to maximize human health and welfare.” Extension is in the forefront, where Lab personnel provide information resources and technical assistance to regulatory agencies, trade associations and businesses.

Services available to the industry include HACCP training and technical assistance, product commercialization, and product safety and shelf life evaluations. The consumer benefits from the research conducted in product preparation, formulations and safe-handling guidelines. Public health issues are also addressed through continuing education for regulatory specialists and retail and restaurant employee training.

Lab personnel are currently working on projects that include:

* Histamine Control – complying with state and federal regulatory policies; meeting HACCP guidelines; and establishing monitoring practices
* Traceability – understanding legal requirements; establishing practical guidelines; and assisting with program implementation
* Post-Harvest Handling – minimizing animal stress during harvest; purging and rapid chilling; and establishing quantitative grading programs
* Product Commercialization – prototype development, meeting labeling requirements, pilot-processing, advice on co-packing and marketing
* CarteretCatch™ marketing and branding program for locally caught seafood

The Seafood Laboratory is located at the NCSU Center for Marine Sciences and Technology (CMAST) on the campus of Carteret Community College in Morehead City, NC. For more information on the work conducted at the Seafood Laboratory, see the following article, or visit www.seafoodlab.cmaст.ncsu.edu or www.cmaст.ncsu.edu.

STAFF CURRENTS

Dr. David Green has returned full time to his departmental duties after serving six plus years as CMAST Director. Since returning to the lab full-time, Green is focusing his attention now on extension education and applied research programs; seafood safety – histamine research in particular; quality assurance and traceability; and value-added products. Currently, he has stepped up his work with hybrid striped bass in two projects: exploring purging techniques to improve the quality of the fish by removing the muddy, earthy flavors; and implementing a Quality Index Method for farmers to grade and track their fish using cell phone technology. (See article Seafood Freshness 101.)

Green recently was named co-editor of the Journal of Aquatic Food Product Technology, an international
Greg Bolton, Research Laboratory Specialist, is supporting the research work of a Ph.D. candidate and CMAST Summer Scholar. Greg not only provides technical support at the Seafood Lab, but also carries on his own laboratory research and provides process validations in crab cookers and smoked fish operations. He recently completed a three-year US Department of Agriculture project on the effects of high hydrostatic pressure (HPP) processing of histamine fish. Greg has recently completed course work at the Carteret Community College Culinary Institute to support his work in the laboratory.

Jill Miller Fournier, Information and Communication Specialist, joined the department in January 2007. Jill comes to the lab from Raleigh where she worked for Wake County Public Schools in graphics and public information. She is currently working on a new look for the Seafood Lab with logo, brochures, web site changes and more with a goal of increasing the visibility of the laboratory and the work being done. She also works part-time for CMAST, assisting with the communications efforts of all the departments within CMAST.

Barry Nash, NC Sea Grant Seafood Technology and Marketing Specialist, is involved in many projects at the seafood lab such as product commercialization, and especially the education and marketing program CarteretCatch™, which he currently serves as president of the board of directors. CarteretCatch™ is a nonprofit organization dedicated to assisting local fishermen gain greater community visibility for their seafood to better compete with imported commodities. Visit www.carteretcatch.com for more information about this important program. Barry has also worked hard supporting several coastal businesses develop and launch new seafood products to the market including: Fresher Than Fresh, Inc. with three retail seafood dips; Pamlico Packing with a line of wholesale crab cakes; and Kay’s Tarheel Foods BBQ sauces for retail sale. He also is participating in a USDA regional project through Cornell University to create an on-line GMP course for food processors.

Joyce Taylor, NC Sea Grant Consumer and Education Specialist, coordinates the all-volunteer Nutrition Leader’s group who, through Joyce’s direction, develop and test a variety of seafood formulations to assist North Carolina seafood processors. The group had originally served as the basis for Joyce’s consumer education program. Now Joyce and Barry Nash work together in testing and developing commercial products for local businesses seeking to expand into new markets. The Nutrition Leaders have provided numerous institutional and commercial formulations for the North Carolina industry over the years, most recently in value-added products.

Kristin Bjornsottir, a Ph.D. candidate in Food Science, is developing a molecular-based assay for detection and enumeration of histamine-producing bacteria in a variety of fish. Her goal is to improve upon the current culture-based assays used to screen for the presence of histamine-producing bacteria. This new approach will drastically improve the reliability and quantification of bacteria responsible for scombrototoxic fish poisoning, which accounts for one-third of all seafood-borne related illnesses reported in the United States. Kristin’s histamine work has drawn the attention of research groups from Alabama to Hawaii and as far away as Denmark and New Zealand. She will also travel to DIFRES (Denmark) in Fall 2007 to work in the lab of Dr. Paw Dalgarrd, a world-renowned researcher in seafood microbiology and scombroid fish.

Matt Stallsworth, a CMAST Summer Fellow, is conducting a ten-week comparative study on histamine-producing bacteria from fish samples collected from yellowfin tuna and mahi-mahi. The goal of this study is to isolate and identify different histamine-producing bacteria from two geographically different regions in the United States. See the following article or more details this summer project.
SEAFOOD FRESHNESS 101?

That seafood displayed in your local supermarket may look and smell fresh, and has a current “Use By” date on the package; but do you really know how old it is or where it came from for that matter? What is the best seafood for you and your family and how can you actually determine the freshness in fish you buy? Do supermarket personnel or sellers know the answers to your questions?

The chances are they don’t. And not knowing these answers can be a problem. By not knowing how fresh it is, how it was handled before arriving at the store, or even where it came from, can be a potential health issue and eventual problem.

The NCSU Seafood Laboratory is working to solve this issue before it becomes a problem. Personnel are designing a science-based, quality assurance program to be used initially with North Carolina seafood products. With funding from the NC Fishery Resource Grant Program, Food Science Extension Specialist Dr. David Green, NC Sea Grant Seafood Specialist Barry Nash and NC Cooperative Extension Area Aquaculture Agent Mike Frinsko are continuing work on a Quality Index Method (QIM) scheme for rating the freshness and quality of farm-raised, hybrid striped bass.

The QIM scheme was originally developed by Danish visiting scientist Dr. Durita Nielsen and is being implemented first at White Rock Fish Farm in Vanceboro, which is owned and operated by Ted and Brenda Davis. The latest project will extend this original technique to wild-caught brown shrimp and summer flounder. The QIM scheme and a mobile, cell phone-based program, being developed by D.M. Health Systems in St. Louis, Missouri, will serve double duty. Fish harvesters and producers will be able to better market their fish using a standardized quality grading system with a predicted shelf life.

When coupled with a tracking identification number (a program already in use called FreshNet™), the QIM grading will also allow distributors, wholesalers and foodservice personnel to access information about the age, quality and source of their fish from an internet-based program. Sellers can then mark their product with confidence with an appropriate “Best Use by Date” and other pertinent information.

This quality assurance program is just one of several applied research and extension education efforts underway at the NC State University Seafood Laboratory. To learn more about the programs and services offered for seafood producers, processors and consumers contact Dr. David Green at the Center for Marine Sciences and Technology by phone (252) 222-6304 or email dpg@ncsu.edu.

LAB EMPLOYS CMAST SUMMER FELLOW

Spending the summer at the beach can mean fishy business - especially at the Seafood Laboratory where rising NCSU sophomore Matt Stallsworth, a participant in the annual CMAST Undergraduate Summer Fellows program, is working this summer. Matt was chosen to work in the Seafood Laboratory on a ten-week, independent research project designed to compare types of histamine-producing bacteria found on yellowfin tuna and mahi-mahi from the waters of North Carolina vs. Hawaiian fish. His work also supports the efforts of Kristin Björnsdóttir, Department of Food Science Ph.D. candidate, who is working in the Seafood Laboratory on molecular techniques to identify histamine-producing bacteria.

The main cause of seafood-associated illnesses reported from 1990 to 2003 in the United States was histamine (scombrotoxin) poisoning. Histamine is formed when specific strains of bacteria are allowed to grow on certain species of fish long enough to produce large amounts of the enzyme histidine decarboxylase. This enzyme converts amino acids in the fish tissue into histamine and other compounds that cause allergic-like reactions when consumed.

The Seafood Lab has been conducting research on the formation and prevention of histamine for the past five years. Until now all of the work was focused on fish harvested in NC waters. Matt received samples from
Hawaii, where other histamine research is being conducted, in order to compare the types of bacteria to those isolated from North Carolina fish. He is isolating bacteria, testing their ability to produce histamine in culture and then performing several tests necessary to identify the specific strains. Matt will present his findings at the end of the summer during the CMAST Summer Fellows Seminar and again at the 17th Annual NC State Undergraduate Research Symposium in Raleigh. For a copy of the final project, contact the Seafood Laboratory at 252-222-6334.

NC SEA GRANT/SEAFOOD LABORATORY PUBLICATION WINS NATIONAL AWARD

Published in collaboration with NC Sea Grant, *Seafood Traceability: A Practical Guide for the U.S. Industry*, written by Arni Petersen and David Green, has won a 2007 Award of Excellence from the APEX Awards (Awards for Publication Excellence), a national competition for communication professionals. NC Sea Grant submitted the guide for review. Anne Green, Communications Specialist with Sea Grant and editor of the winning publication, was also named as an award winner. Visit [http://www.ncseagrant.org/index.cfm](http://www.ncseagrant.org/index.cfm), follow the Products tab to Free Products for a downloadable copy of the guide.

 Congratulations also go to Sea Grant’s Communications Team who received a second Award of Excellence for the magazine *CoastWatch*.

TIPS AND TASTES FROM THE LAB

**Seafood Tips**

**About Crab Meat**
When planning to pick your own crab meat, cook live crabs the day you buy them. Discard any that have died. If using fresh cooked, picked crab meat, it should be used within 7-10 days. Pasteurized crab meat (in cans) must be refrigerated and can be stored, unopened, for 6 months. Once opened, it should be used within 3 days.

**What’s does backfin mean?**
Backfin is a grade of crab meat. There are four grades available commercially to choose from: Lump, Backfin, Special, and Claw Meat.

**Lump (colossal or jumbo)** refers to the large pieces of meat from the two back swimming legs of the crab and is the most expensive grade. Lumps should not be broken up to maintain the delicate flavor. Use in recipes where the lumps can stay intact such as sautés or cocktail presentations.

**Backfin** is a blend of broken pieces of lump and special grades and is ideal for using in crab cakes, sautés, stuffing or cold salads.

**Special** is the most versatile grade for widest recipe use. It contains smaller flakes of white meat from the body of the crab. Perfect for crab cakes, salads, wraps, etc. with a similar flavor to lump but with a less expensive price tag.

**Claw Meat** is picked from the two front legs, or pinchers, of the crab. It is darker meat with a stronger flavor, excellent for use in recipes with heavy sauces, dips or soups, as the crab flavor can still come through. Claw meat is also the least expensive of the crab meat grades.
Seafood Tastes

A delicious, home-style crab cake similar to the famous crab cakes of the Maryland Chesapeake Bay region. This recipe was developed by Joyce Taylor of the Seafood Laboratory Test Kitchen.

Maryland-Style Crab Cake

1 pound backfin crab meat
1/4 cup mayonnaise
1 egg
1 teaspoon dry mustard
1/4 cup finely chopped onion
2 tablespoons finely chopped, sweet red pepper
1/2 teaspoon Tabasco sauce
1 teaspoon Worcestershire sauce
1 tablespoon Old Bay seasoning
1 tablespoon dried parsley flakes
3/4 cup medium saltine cracker crumbs
1 cup medium saltine cracker crumbs for rolling cakes

Remove any shell or cartilage from crab meat.

In medium bowl, combine mayonnaise, egg, mustard, onion, red pepper, Tabasco, Worcestershire, Old Bay and parsley. Blend in 3/4 cup cracker crumbs.

Gently mix in crab meat, being careful not to break pieces apart.

Shape into 6 or 8 crab cakes. Lightly coat cakes with cracker crumbs. Fry in 3 tablespoons oil until brown on one side, about 4 to 5 minutes. Turn and repeat on other side. Drain on paper towels.