NC STATE UNIVERSITY

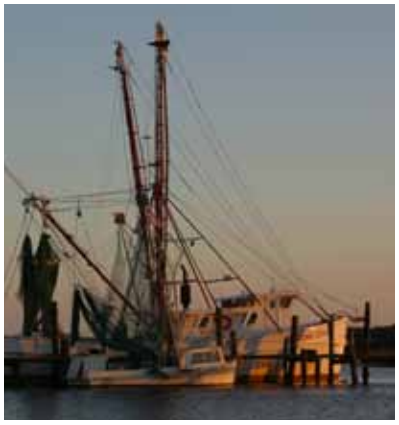
CMAST COMMUNICATOR

THE CENTER FOR MARINE SCIENCES AND TECHNOLOGY

discovering coastal solutions

VOLUME 2 NUMBER 2 SPRING 2009

CMAST: Linking Research and Extension to Economic Development



Those that make their living from the sea are continually challenged to keep their businesses afloat - pun intended - between dwindling marine populations, tougher regulations, imported products and a deflated economy.

Despite these challenges, researchers and specialists at CMAST continue to work hard on a variety of projects and programs, with outcomes that can aid coastal areas with applied direct and indirect economic development opportunities. Whether it's partnering with local fishermen on marine research projects to new methods of farming fish and shellfish to developing methods of detecting harmful bacteria in fish, these efforts have and will continue to provide a positive impact on the economic development of coastal North Carolina.

CMAST and NC Sea Grant

CMAST and NC Sea Grant partner at a variety of levels, ranging from sharing space at the CMAST building, to collaborative research and extension activities, to K-12 and undergraduate/graduate teaching and training opportunities. A couple of examples are Brian Efland, Sea Grant's Marine Conservation and Enterprise Development Specialist, and Barry Nash, Sea Grant's Seafood Technology and Marketing Specialist, who are involved in a variety of projects with CMAST faculty, students and staff, and whose research provides positive economic results for local businesses and beyond.

As a member of the board of directors of the North Carolina Shellfish Growers' Association, **Brian Efland** works to provide economic incentives for growers. Through the annual Shellfish Expo, sponsored by Sea Grant, NC Department of Agriculture and Consumer Services, and Carteret Community College, opportunities are provided for growers and buyers to come together under one roof to network about commodities and needs. The Expo has food samples and fun events including an "Iron Chef" competition between area chefs and culinary students, using locally grown seafood products. Pairing these buyers and sellers is a win-win situation. Sellers (shellfish growers) get to market their product and buyers (local restaurants and seafood markets) learn about the latest aquaculture harvests as well as support local farming by providing a fresh, NC product to their customers.

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CURRENT EVENTS

CMAST SEMINAR SERIES • ROOM 205

January 23
Dr. Douglas Nowacek
Division of Marine Science and Conservation/ Department of Electrical and Computer Engineering, Duke University Marine Lab
"Marine mammals and sound: the creative ways we both listen to as well as annoy cetaceans"

February 6
Dr. Ari Friedlaender
Division of Marine Science and Conservation, Duke University Marine Lab
"Conservation and management of ice breeding seals in the Arctic: using large-scale climate indices to measure and forecast changes in available habitat"

February 20
James Locascio
College of Marine Science, University of South Florida
"Passive acoustic studies of black drum, Pogonias cromis"

March 13
Dr. Jud Kenworthy
NOAA-NOS Beaufort Laboratory
"Think globally, act locally; the future of seagrasses in North Carolina"

March 20
Dr. Frank Hernandez
Dauphin Island Sea Lab
"Seasonal variability in ichthyoplankton predation risk due to gelatinous zooplankton feeding in the northern Gulf of Mexico"

May 11-15
Coastal Ecology Week
Part of Fisheries and Wildlife Summer Camp
Contact jeff_buckel@ncsu.edu for info

May 31- June 4
Sport Fishing School
57th Annual Sports Fishing School
Hatteras, North Carolina
Dr. Jeff Buckel, CMAST, instructor

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From the Director

Welcome to the CMAST Communicator. One of my favorite aspects of CMAST is the partnerships among CMAST residents, the local marine science community, and main campus. CMAST is very unique among NCSU's centers in that we house faculty, staff and students from three NCSU colleges, as well as staff from NC Sea Grant, NC Cooperative Extension and Carteret Community College. As the shadow of the economic recession hangs over NC and the world, it is critical that synergistic partnerships among universities help create new economic opportunities. In this issue, we highlight the collaborative research, extension and training opportunities that are creating economic opportunities in NC and beyond.

Despite the gloomy economy, global demand for fish continues to climb, especially in affluent, developed nations, which in 2004 imported 33 million tons of fish worth about $61 billion. The Food and Agriculture Organization (FAO) estimates that an additional 40 million tons of fish will be required by 2030 just to maintain current levels of consumption. Research by CMAST and its partners of seafood experts are helping provide a sustainable source of safe seafood through projects ranging from the biochemistry of spoilage to marketing value-added products. Research by NCSU and its partners of aquaculture experts are providing training programs for this rapidly growing industry, developing new species for culture, and refining technology to reduce environmental impacts. A new NCSU Marine Aquaculture Research Center in Carteret County will serve as a pilot demonstration facility for the transfer of mariculture technology to private industry as a means to diversify jobs and income in eastern NC, while simultaneously meeting growing demands for seafood.

Lastly, we update you on many of the diverse research and community activities by CMAST faculty, students and staff, including research on invasive lionfish, a right whale stranding, new internet and phone infrastructure at CMAST, and numerous awards recognizing excellence in our staff, students and faculty. I invite you to visit our web-site, our beautiful facility located on Bogue Sound in Morehead City, or contact any of our faculty, staff or students with questions.

Best wishes,
Dave Eggleston

RESEARCH AND ECONOMIC DEVELOPMENT (con't.)

Leone (l) Efland (r) show proper handling of tuna.

Efland also organizes a yearly Bluefin Tuna Workshop, developed to provide information to those in the industry selling giant bluefin tuna commercially. Fishermen and processors come to the workshop to learn about the complex regulations in the tuna fishery as well as safe handling techniques. By learning how to avoid improper cutting, puncture wounds, bruising and temperature abuse, tuna handlers can improve the value of their fish for the market. And the market is respectable. According to NC Division of Marine Fisheries, in 2008 the value of bluefin tuna caught in North Carolina was almost $1.5 million. These workshops were developed through cooperative research funded through Sea Grant's Fishery Resource Grant program, which pairs a local business with researchers. Local fish seller George Leone is the lead partner with NCSUs Seafood Laboratory in "Assessment and Validation of NC Bluefin Tuna Industry Practices," and takes part in presenting the tuna workshop.

Another project Efland takes part in is the NC Clean Marina Program. This project is done in collaboration with the NC Division of Water Quality and NC Division of Coastal Management. The Clean Marina program is designed to show marina operators how to help safeguard the environment by using best management practices that go above and beyond regulatory requirements.

Through the program, marine operators are given economically feasible solutions and alternatives to the common practice of pressure washing watercrafts, necessary in the maintenance of boats and protecting the owner's investment by removing salts and marine fouling that destroy coatings and metals. A key problem with marinas lies in the runoff created by washing a boat. Special coatings on the hull can leach off and, if not captured, drain into surrounding waters. These coatings can have minerals toxic to the environment that can eventually impact marine life. By using alternative methods, such as containment wash pads for collection of runoff, impact to the surrounding waters can be minimized. In the long term, marina best management practices can reduce impact on the environment, and keep the marine life abundant.

Barry Nash, Sea Grant's Seafood Technology and Marketing Specialist, manages an economic development program for the NC seafood industry that addresses, in part, the development of value-added products for retail and wholesale markets. His work is influenced by national research that indicates consumers are "time-starved" and have little time or interest in preparing home meals on a regular basis. Research indicates that heat-and-serve frozen and fresh, pre-prepared seafood offers a convenience consumers desire at an affordable price. Since 2001, Nash has assisted ten North Carolina businesses commercialize 43 new products, including a line of retail seafood salads and spreads for Pamlico Packing Co., of Grantsboro and Bright Water Seafood of Charlotte.

Another of Nash's projects that has generated strong visibility for coastal seafood is CarteretCatch™, a nonprofit organization Nash helped establish in 2006 to create more public awareness of commercial species that are harvested by Carteret County fishermen. CarteretCatch™ partners with fishermen, dealers, restaurants and community organizations to educate county residents and visitors, in part, about the seasonal availability of seafood, fisheries management programs that protect stocks, and the heritage of the fishing families.

Since Fall 2005, CarteretCatch™ has been

profiled in over 40 articles across the nation and served as a model for "Queensland Catch," a local-seafood program launched in Australia last year. Nash is now working with fishermen south of Wilmington on a new branding program called "Brunswick Catch" as well as the Ocracoke Working Waterman's Association on a brand identity for their seafood.

CMAST and the Seafood Laboratory

NORTH CAROLINA STATE UNIVERSITY
SEAFOOD LABORATORY

NCSUs Department of Food, Bioprocessing and Nutrition Sciences Seafood Laboratory at CMAST works with North Carolina's fishing, processing, and distribution industries, public health officials and consumers on important seafood processing and food safety issues. The mission of the lab is to "maximize human health and nutrition and improve the safety, variety and quality of seafood products in support of economic development." Projects focus on seafood safety, processing technologies and value-added products through applied research and education programs.

Green works with local seafood retailer.

Dr. David Green, Seafood Laboratory Director and Extension Specialist for over 20 years, has worked on applied research studies including post-harvest handling, grading and marketing of farm-raised hybrid striped bass; rapid chilling techniques for blue fin tuna; and detection of histamine-forming bacteria in the control of histamine fish poisoning. Sponsors of these studies are the North Carolina Sea Grant Fisheries Research Grant Program and National Fisheries Institute's Fishery Scholarship Program. Industry partners include Ted Davis of White Rock Fish Farm in Grantsboro and George Leone of Morgan Harvest Inc. of Newport. Impacts from these studies are improved quality, safety and economic importance of fresh, wild and farmed-raised fish, increased awareness on the quality and source of North Carolina fish species, and improved safety of scombroid (histamine) fish. Extension education programs are offered throughout the year by the Seafood Laboratory, working with NC Sea Grant, state and federal public health officials, and industry members. One important training program is the Hazard Analysis and Critical Control Points (HACCP) workshops for seafood dealers, processors, and public officials. This training complies with state and federal requirements to increase knowledge of groups in identifying potential hazards and critical points in the handling, production and distribution operations of safe fish and fishery products. Since 1997, laboratory staff trained nearly 800 individuals who have received AFDO (Association of Food and Drug Officials) certification of course completion. In addition, staff helps to organize an annual seafood quality and safety school for environmental health inspectors, teach in local restaurant managers' food safety workshops (ServSafe™) and participate in several state and federal public health training programs.

Laboratory staff also provides informational and technical assistance for seafood businesses and consumers such as development of the FDA-required HACCP plans and annual verifications. Technical services include process validations, value-added product development, packaging, labeling, and shelf-life evaluation. These technical services provide businesses with access to the latest food technology developments and processing techniques to extend the shelf life of ready-to-eat seafood salads and value-added products – resulting in less potential of loss for the business.

Adding value, safety and quality for domestic seafood businesses has become increasingly important to remain competitive in today's world economy.

CMAST and Aquaculture

Aquaculture is becoming a large business in North Carolina and throughout the world. As demand outstrips supply of wild seafood, aquaculture will make-up the difference. CMAST has several aquaculture activities underway and planned in the near future in collaboration with NCSUs main campus, NC Cooperative Extension, Carteret Community College and other universities. Aquaculture research highlights the collaborative nature of CMAST programs.

The CMAST-building Is located on the western part of the campus of Carteret Community College (CCC). **Mr. Skip Kemp** directs CCC's Aquaculture Technology program, which provides hands-on experience and course work in hatchery management, fish and shellfish propagation, design and construction of aquaculture facilities, and summer internships.

The projects undertaken at the aquaculture facility at CCC are in direct support of the seafood industry in the coastal area as well as the state. A recent independent study project by a student included the spawning and raising of ornamental fish such as koi, seahorses, dotty back and more to be used in aquariums and outdoor ponds. That student has since launched a business in ornamental fish. Research is also being conducted on the potential of extracting oils from farm grown algae to be used as diesel fuel or omega-3 oils that can be added back to fish feeds. Pond grown tilapia was a recent student success with over 4,000 pounds harvested and sold. The funds raised are used to supplement the Aquaculture program itself. Kemp would like to see more people learning to grow oysters - which could turn out to be quite a cash crop for North Carolina as the demand for the shellfish continues to grow worldwide.

Student at CCC Aquaculture Lab

CCC's summer interns often work in the research laboratories of CMAST faculty, and a recently approved 2+2 articulation agreement will facilitate the transfer of CCC Aquaculture Technology students to undergraduate curricula in marine sciences at NC State if they so desire. Moreover, CMAST faculty and graduate students often seek the advice of Kemp in their laboratory experiments and work in CCC's seawater systems, Some of the courses in this program are transferable to four-year colleges and universities. Graduates of the diploma program may continue their education in the associate in applied science de-

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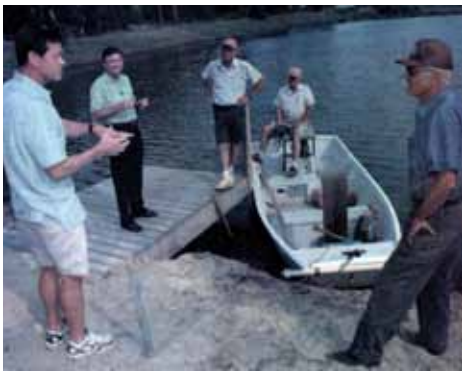
RESEARCH AND ECONOMIC DEVELOPMENT (con't.)

gree program, start their own fish or shellfish farm, or go to work as a technician at any of the many established Aquaculture operations in North Carolina or throughout the nation.

Blue crab fisheries are just one example of the aquaculture work being done by CMAST researchers with funding from NC Sea Grant and in collaboration with NC Cooperative Extension and University of Maryland.



Eggleston (l) and Harris (on pier) meet with local farmers about blue crab research project.

Dr. David Eggleston, CMAST Director, Marine Sciences Professor and Researcher, has been working on blue crab studies since coming to NCSU in 1993. The blue crab is North Carolina's leading commercial fishery product in weight and dollar value, accounting for 32.9 million pounds of hard crabs with a dock-side value of $25 million in 2008. Although 2008 was a relatively good year for blue crabs since 2000, blue crab harvests are well below the annual average of ~50 million pounds prior to 2000.

The spawning stock of North Carolina's native blue crab population has been at historic lows since 2000, and Dr. Eggleston has been looking at various methods for helping the population recover. Recently, he has been working on a possible solution that not only reduces pressure on wild crab populations, but also benefits farmers looking to diversify crops by using freshwater ponds on farms to grow blue crabs.

After a collaborative test project with the University of Maryland's Center of Marine Biotechnology, Eggleston and Ray Harris, NC State Director of Cooperative Extension for Carteret County, had the opportunity for a large-scale test by stocking a 10-acre lake with 40,000 hatchery-raised crabs, and a smaller pond with 4,000 crabs. With the rapid rate of growth seen in earlier tests, Eggleston expects that in a given year, a farm could produce two to three harvests in a summer, as crabs don't do well in freshwater during the winter months.

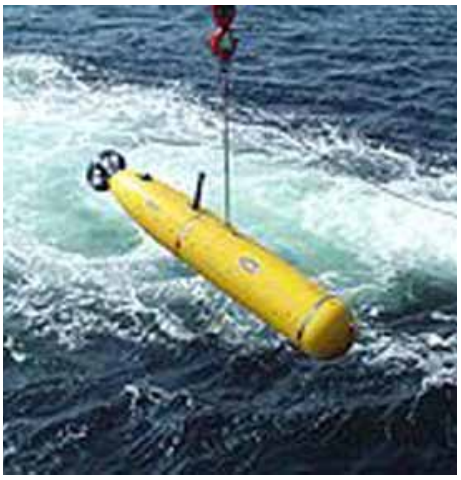
Public interest in this project skyrocketed after being reported in a local newspaper during summer 2008. Word spread and eventually was reported by National Public Radio (NPR) nationwide. Inquiries about establishing fresh water crab ponds have come not only from North Carolina but Maryland, Missouri, Louisiana and states in between.

Early results suggest that there is high economic potential for this emerging aquaculture product IF two major roadblocks can be eliminated through research: (1) transfer of larval rearing technology from University of Maryland to NC State University, and (2) an efficient means of capturing peelers from ponds prior to their molt. Peelers are crabs whose molt to a soft-state for the soft-crab market is 1-3 days away. The larval rearing technology is critical to providing a reliable source of seed crabs for ponds. Eggleston, Harris and their colleagues will continue to pursue funding to address these remaining roadblocks to this emerging aquaculture technology.

CMAST RESEARCH

CMAST Faculty to Take Part in Harbor Branch Consortium, NOAA's Newest Cooperative Institute

NOAA announced the award of a new cooperative institute to focus on ocean exploration, research, and technology development for the U.S. East Coast. The institute, one of the now 22 institutes nationwide, is a consortium to be led by and headquartered at the Harbor Branch Oceanographic Institute at Florida Atlantic University in Fort Pierce, Fla. The University of North Carolina Wilmington will be the co-managing partner and limited partners are SRI International, St. Petersburg, Fla., and the University of Miami.



Picture of an autonomous underwater vehicle (AUV) taken by an employee of Bluefin Robotics Corporation during a US Navy exercise. An AUV will employed by the NCSU research team to help survey deep habitats for reef fish and crustaceans.

The new institute will conduct research under three main themes: development of advanced underwater technologies, exploration and research of frontier regions of the eastern continental shelf and beyond, and improved understanding of deep and shallow coral ecosystems.

NCSU submitted a project proposal as part of the overall institute proposal entitled: "Supporting Ecosystem-Based Management (EBM) of Shelf Frontiers." NCSU's Dr. David Eggleston, Professor of Marine Science and CMAST Director is the lead PI on the shelf frontiers project. Additional NCSU personnel include Dr. Ruoying He, Associate Professor in MEAS and Dr. Jeff Buckel, Associate Professor in Department of Biology.

This project will utilize the science and technological capabilities of the Cooperative Institute partners in the exploration of and research on living marine resources of the eastern U.S. continental shelf. The specific objectives are to apply and refine non-destructive technology to survey fish and marine benthic organisms at select habitats that will be mapped (as part of the overall Consortium effort); link specific species, functional groups, and trophic guilds to specific habitats and ecosystem processes at varying spatial/temporal scales; and, compare and contrast marine ecosystem organization and functions across habitats and space/time scales.

Each of the 22 cooperative institutes are NOAA-supported, non-federal organizations that have established an exceptional research program in one or more areas

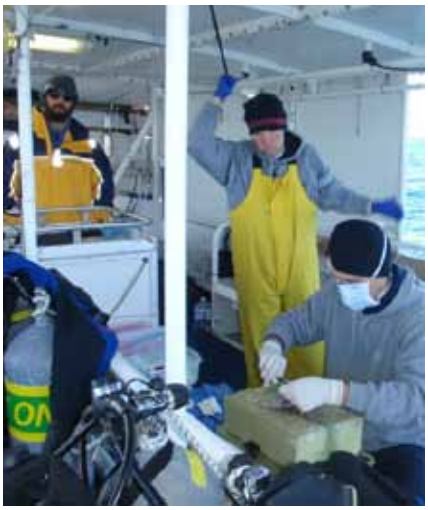
relevant to the agency's mission. The institutes collaborate with NOAA scientists on long-term research topics, provide significant coordination of resources among all nongovernment partners, and promote the involvement of students and postdoctoral scientists in NOAA-funded research. Institutes also benefit from funding stability, allowing them to support and expand their research and educational missions.

**portions of this article are excerpted from the NOAA Web site (http://www.noaanews.noaa.gov/stories2009/20090506_institute.html).*

Monitoring the Movements of Invasive Lionfish

Dr. Craig Harms of NCSUs CMAST and College of Veterinary Medicine, as well as Zoological Medicine Residents Eric Anderson and Betsy Stringer, and technician Chris Butler, have been collaborating with NOAA researchers Paula Whitfield and Brett Harrison of Beaufort, NC to surgically implant sonic tags into free-ranging, invasive lionfish off the coast of North Carolina. Scientists are very concerned about the establishment of invasive lionfish because of their lack of natural predators, and their predatory impact on food resources for and juvenile stages of recreationally and commercially important reef fish.

Twenty-five transmitters have been implanted so far in lionfish during two offshore trips aboard the local Olympus dive boat in December 08 and February 09. The lionfish proved to be good surgery patients as they tolerated the procedure well with no mortalities. One of the major challenges of the project was finding windows in the winter weather at the coast that would allow a reasonably stable surgery platform. A receiver array located underwater is currently logging data on the whereabouts of the lionfish. The primary goal of the project is to monitor the seasonal movements of the lionfish, supplementing current photo-ID work by NOAA divers.



Dr. Eric Anderson surgically implants a sonic transmitter into an anesthetized lionfish while CMAST technician Chris Butler and NOAA scientist Brett Harrison assist and look on.

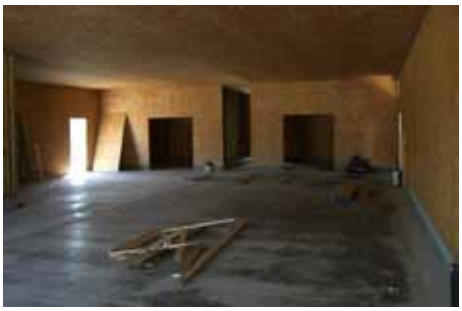
Native to the sub–tropical and tropical Indo–Pacific region, lionfish (*Pterois volitans* and *Pterois miles*) are often kept in both public and private aquariums. Since 2000, however, lionfish have been observed, primarily by SCUBA divers in coral, rocky and artificial reefs along the southeast coast of the U.S., from Florida to North Carolina and also throughout the Bahamas, Bermuda and Cuba. Juvenile lionfish are also routinely observed in the northeast region near Long Island NY, but do not appear to survive the cold winter temperatures. In more recent years bottom fishing anglers have also caught lionfish. Scientists expect lionfish to continue to disperse throughout the Caribbean Sea, Gulf of Mexico and the Florida Keys. There is also increasing concern among fishery scientists that lionfish, having no natural enemies, may adversely impact native fish populations. In addition, this fish has venomous spines and may pose a hazard to divers and anglers alike. Scientists at NOAA have been conducting research on the invasive lionfish to better understand lionfish distribution, density, life history, temperature tolerances and genetics. This information will now be used to determine and mitigate potential ecosystem and fisheries impacts due to the presence of lionfish.*

**Paragraph excerpted from Center for Coastal Fisheries and Habitat Research, NOAA Website*

Aquaculture Center Nears Completion

A new NCSU Marine Aquaculture Research center (MARC) near Marshallburg in Carteret County is well on its way to completion of Phase 1. The purpose of the Center, made possible by private donations, the NCSU Agriculture Foundation, and the College of Agriculture and Life Sciences, is to conduct research that will support the development of state-of-the-art waste-water treatment systems, as well as marine fish and shellfish culture.

It is anticipated that the facility will be functioning as a mariculture facility during summer 2009 with a ribbon-cutting ceremony in September 2009. This effort has been led by Dr. Tom Losordo, Professor and Extension Leader in the Department of Biological and Agricultural Engineering at NC State University, and a world-renown Aquaculture Specialist.



Top: Aquaculture Center nearly complete. Bottom: Interior awaits installation of saltwater equipment for aquaculture research.

CMAST OUTREACH

Communication Lines are Now Open

As a satellite campus, CMAST is not in the midst of campus life at NC State University, which can present frequent communication challenges. Being on-campus allows

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Distance learning classroom at CMAST.

access to other departments, colleges, university administrators and students, training opportunities, campus facilities and much more.
However, being located at the coast does have its advantages. CMASTs proximity to North Carolina's Crystal Coast, which has a vast diversity of marine and coastal habitats, is essential to the work of researchers, faculty and staff housed here. It is centrally located along the shores of Bogue Sound in Carteret County, allowing easy access to the many miles of coastline both north and south, to marine-related businesses, and other marine research facilities.

Working at a remote location does pose challenges to those who need to meet with on-campus peers, or professors who need to teach students in their departments and colleges. Staff or faculty may need to attend meetings or trainings. Many hours of travel can be necessary to meet these work obligations – which is costly not only in time but in money – time away from the desk and money for travel. And in this time when dollars are extremely tight, solutions are sought to help cut costs wherever possible. CMAST has solutions in place to help solve many of these challenges.

Digital and electronic communications allow CMAST staff members to stretch their electronic wings more and more. Within the building are conference rooms equipped with video conferencing capability, classrooms with distance learning connections and computers with software, cameras and audio used for live web casts to students across the state, nation and world. Graduate students located at CMAST take part in weekly graduate-level classes generating from the Raleigh campus. Members of the NCSU College of Veterinary Medicine (CVM) hold weekly staff meetings from the Raleigh teaching hospital with CVM professors and interns at CMAST. And just a year ago, the CVM group was able to video connect with veterinarians simultaneously in Raleigh and Iraq, as they aided in retraining Iraqi veterinarians in the process of rebuilding a local zoo affected by the war.

But of most recent significance is a class taught by **Professor Patricia McClellan-Green** from her office at CMAST. She was assigned to teach Toxicology 201 – People, Places and Poisons for the spring semester - online. Being an undergraduate course, TOX 201 fulfills a general college requirement so it would be expected to have a large number enroll – sometimes up to 200 in a class on campus. But when registration was complete there were 100 students enrolled – most on-campus – and several were distance education students including a few from out-of-state. This class is one of the largest online classes held by Distance Education.

McClellan-Green

McClellan-Green prepared lectures for students to download – incorporating state of the art web casting on a few occasions to work with students live – which allowed them to type in questions and she could respond. She held virtual office hours, where she would be available, via email, to converse with students. Tests and grades were available online to students through Moodle - provided by NC State.

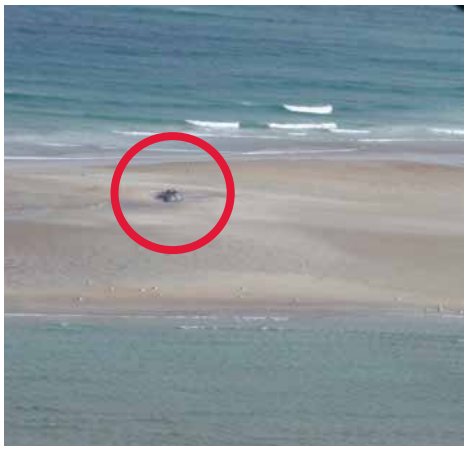
Being the first time McClellan-Green has taught this course required much preparation – recording lectures, learning new computer software, troubleshooting web casting and such. But the time it allowed her to remain at the CMAST facility without having to travel to Raleigh several days a week was cost-effective for she, CMAST and the university. She is also scheduled to teach again in the fall semester.

Upgrades to CMAST Infrastructure

This past year, CMAST upgraded its computer system switches and other network hardware in a joint venture between CMAST (Linda Dunn), NCSU's Communications Technology (Kristina Gasca) and Carteret Community College (Ken Martin). This major overhaul and upgrade in December 2008, made a new enterprise-level Voice over IP (VoIP) phone system possible. Additionally, maintenance and configuration duties for the entire building passed from main campus to CMAST, further strengthening local network autonomy while still remaining a part of the larger NCSU I.T. infrastructure. The new arrangement will allow more immediate and fine-grain control for the network, giving CMAST the ability to configure the switches and firewalls to best serve student and faculty I.T. needs.

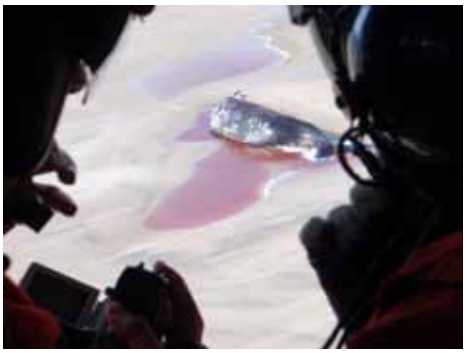
CMAST Veterinarian Collaborates on Cape Lookout Right Whale Stranding

Dr. Craig Harms of CMAST had an exceptionally busy start to 2009 with regard to Right Whale sightings and challenges across the southeastern U.S. coastline. In North Carolina, a 30' calf was reported stranded on January 26 off of Cape Lookout, NC. The remoteness of the location and inclement weather delayed efforts to verify the stranding.



Aerial view near Cape Lookout where whale was stranded.

Early on January 28, the U.S. Coast Guard (USCG) dispatched a helicopter to confirm the reports and photograph the whale. The partially submerged animal was moving slightly in a shoal area about one-half mile offshore from the Cape. SEFSC Beaufort Lab staff viewed the photographs and identified the animal as a young Right Whale. That afternoon, two members of the marine mammal stranding team,



Top: Gretchen Lovewell (NOAA) at right with Coast Guard dive safety officer on left view whale from the air. Bottom: US Coast Guard helicopter returns to retrieve stranding team members following initial assessment.

Gretchen Lovewell (NOAA) and Dr. Harms were deployed in a USCG helicopter to the shoals to further assess the whale.

Due to its poor condition and difficult location, it was decided that the most humane course of action was to euthanize the whale, which proved very challenging under the conditions of the day. A necropsy and case workup of the unfortunate whale was facilitated and conducted by a consortium of stranding response partners including the USCG, NC State University College of Veterinary Medicine and Center for Marine Sciences and Technology, Virginia Aquarium and Marine Science Center, UNC Wilmington, Duke University and the North Carolina Maritime Museum, Woods Hole Oceanographic Institution, the New England Aquarium. Analysis of the findings is still ongoing.

CMAST STAFF NEWS

Professor John Miller presented a paper and chaired a session at the 7th International Flatfish Symposium in Sesimbra, Portugal, 1-7 November 2008. The paper, "Winter winds and river discharge determine juvenile southern flounder recruitment in North Carolina estuaries" is co-authored by Miller, Chris Taylor, Len Pietrafesa, Dave Dickey and Steve Ross. Seafood Laboratory doctoral candidate **Kristín Björnsdóttir** was invited to speak at a seminar at the FDA Dauphine Island Seafood Laboratory in Alabama on February 17, 2009. She presented recent research findings titled "Detection and control of histamine-producing bacteria in fish."

Two oral presentations were made by **Paul Rudershausen** at the South Atlantic Fishery Management Council meeting in Jekyll Island, GA in March 2-6 2009. Rudershausen presented "Refining the rate of discard mortality for Black Sea Bass in the US South Atlantic," and "A two-step fishery independent design to estimate relative abundance of deep water fish." The presentation on Black Sea Bass was a result of research funded from a Sea Grant Fisheries Research Grant in collaboration with Tom Burgess, P.I., of Sneads Ferry, NC.

Zoology Research Fellow **Warren Mitchell** presented a paper on "Feasibility of using hydroacoustic survey for estimating spawning stock size of Blueback Herring in western Albemarle Sound" at the NC Chapter of American Fisheries Society in February 2009 held in Burlington, NC. Mitchell's paper also presented at the Tidewater Chapter of the American Fisheries Society meeting March 12-14 in Wilmington, NC. In addition, Mitchell was published in the January 2009 edition of Marine and Coastal Fisheries – a journal published by the American Fisheries Society. His paper is titled "Relationship between larval and juvenile abundance of winter-spawned fishes in NC, USA." This paper was a result of the work he completed as the 2006 Marine Fisheries Fellow in Associate Professor Jeff Buckel's laboratory at CMAST.

Kyle Adamski, Zoology graduate student, presented a paper "Developing an index of abundance for Gag Grouper in North Carolina: an analysis of larval and juvenile catch" at the Tidewater Chapter of the American Fisheries Society meeting March 12-14 in Wilmington, NC.

Graduate students **Brandon Puckett**, **Erika Millstein**, and **Ray Mroch** presented at the National Shellfisheries Association meeting in Savannah, GA, March 22-26. Doctoral researcher Puckett, who is also a National Marine Fisheries Service-Sea Grant Populations Dynamics Fellow, presented his paper on "Metapopulation dynamics of oyster reserves in Pamlico Sound." Millstein presented a poster "Oyster Reef Restoration as a Fisheries Management Tool." Mroch's poster was titled "Spatiotemporal variation in oyster fecundity among NC's oyster broodstock reserves." Brandon Puckett's presentation won an Honorable Mention in the Thurlow C. Nelson award competition. As a recipient of this award, he will receive a year of free membership to the National Shellfisheries Association, which includes a subscription to the Journal of Shellfish Research.

Dr. Patricia McClellan-Green spoke on March 25 at the Chesapeake Research Consortium Regional Conference on "Ecosystem Based Management (EBM): the Chesapeake Basin & Other Systems." McClellan-Green presented her findings on Endocrine Disrupters in Oysters titled: "EDC effects in bivalves: Are our oysters at risk?"

A CMAST researcher and graduate student have received Coastal Recreational Fishing License Grants, part of the first set of 11 grants awarded from CRFL revenues since the new fishing license went into effect. Doctoral candidate **Tim Ellis** received a grant award that will support his Ph.D. research on the study of movement and mortality of Spotted Sea Trout. **Dr. Patricia McClellan-Green** was also awarded funding which will support her research study of the spawning characteristics of blueback herring and population recovery efforts.

Sarah Friedl, Zoology graduate student at CMAST, has received a NC Association of Environmental Professionals scholarship for the 2009-2010 academic year.

WHERE ARE THEY NOW?

Dr. Geoff Bell. After graduating with his doctoral degree at NC State University in December 2008, Geoff is currently a visiting Assistant Professor at NC State University, Department of Marine, Earth & Atmospheric Sciences, Raleigh, NC.

Mr. Ray Mroch. After defending his thesis in May 2009, Ray is working as a NC Sea Grant Fisheries Fellow at CMAST under the direction of Dr. Jeff Buckel.

AWARDS

CMAST is proud to announce four winners of NCSUs Awards of Excellence. Congratulations!

Paul Rudershausen (right) with Zoology Assistant Professor Dr. Jeff Buckel.

Paul Rudershausen, Research Assistant in the laboratory of Jeff Buckel at CMAST in Morehead City, was recently named as one of six recipients of the College of Agriculture and Life Sciences (CALS)Award of Excellence. This award recognizes excellence in the areas of outstanding service, innovations, safety and heroism, and human relations. Rudershausen, was honored for his incredible work ethic and remarkable productivity. In addition to an impressive publication record, he was praised for outreach efforts to commercial and recreational fishers and to his local community, through volunteer work with his local ambulance unit and with a wildlife shelter.

Ernie Yeager (right), with CMAST Director David Eggleston.

CMASTs Facilities Coordinator, **Ernie Yeager,** was honored by the College of Physical and Mathematical Sciences (PAMS) with an SPA Award of Excellence.

Vanda Lewis (left), with NC Sea Grant Executive Director Michael Voiland.

Vanda Lewis, North Carolina Sea Grant's administrative support associate based at CMAST in Morehead City, received an Award of Excellence from the Division of Research and Graduate Studies at North Carolina State University. She is one of two winners from the unit that will go forward to the university level awards program. Cited as an "ambassador" for the university, Lewis has been part of the Sea Grant team since 1987. She is known not only for friendly welcomes and smooth operations of various workshops and other extension efforts, but also for her work with the fishing community through the N.C. Fishery Resource Grant Program (FRG) and the federal Trade Adjustment Assistance efforts.

Dr. David Eggleston (center) with Dean Daniel Solomon (left) and Vice Chancellor James Zuiches.

Dr. David Eggleston was named an Outstanding Extension Service Award recipient for the College of Physical and Mathematical Sciences. This award is given in recognition of his dedication and demonstrated achievements in serving the people of North Carolina.

CMAST University Connections

College of Agriculture and Life Sciences
harvest.cals.ncsu.edu/indexmain.cfm

Environmental and Molecular Toxicology
www.tox.ncsu.edu

Food, Bioprocessing and Nutrition Sciences
www.ncsu.edu/foodscience/

Zoology
www.cals.ncsu.edu/zoology

College of Physical and Mathematical Sciences
www.pams.ncsu.edu

Marine, Earth and Atmospheric Sciences
www.meas.ncsu.edu

College of Veterinary Medicine
www.cvm.ncsu.edu

Clinical Sciences
www.cvm.ncsu.edu/docs