



CMAST COMMUNICATOR

THE CENTER FOR MARINE SCIENCES AND TECHNOLOGY

discovering coastal solutions

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CMAST LAUNCHES NEWSLETTER



Welcome to the inaugural issue of CMAST Communicator! The Center for Marine Sciences and Technology, located in Morehead City, NC, is home to many faculty and staff representing three NCSU colleges and a variety of

departments. The CMAST facility is a resource not only for NCSU faculty and students, but other scientists with interest in conducting research and training programs within North Carolina. One mission of CMAST is to discover innovative solutions to questions and problems in marine systems and provide effective communication of these discoveries. It is our hope that this newsletter will do just that – keep you informed of the latest research, activities, and events being conducted by the many departments housed at CMAST. For more information about CMAST visit www.cmast.ncsu.edu.

We hope to hear from you. Send your comments or questions and suggestions for future articles to jill_fournier@ncsu.edu. The *CMAST Communicator* will be published quarterly and sent electronically. We ask that you forward this to colleagues that may have an interest in the CMAST programs. To subscribe, visit our website and click on “Exciting Opportunities” section.

CMAST SUMMER FELLOWS PROGRAM

NCSU's Center for Marine Sciences and Technology will offer the third annual Summer Fellows Program for 2007. The program is open to undergraduate students statewide at the university, college or community college levels, with preference being given to science majors hailing from Carteret County. With the aid of a CMAST faculty and graduate student mentor, undergraduates chosen for the program identify an independent study project which addresses a current issue affecting North Carolina's coastal ecosystems and communities; participate in the research design, implementation, and

CURRENT EVENTS

CMAST FACULTY PRESENTATIONS

May 17

10:30 am at NOAA, Pivers Island
Dr. David Eggleston
CMAST Director/MEAS
“Hurricanes and Blue Crab
Population Dynamics in NC”

May 24

10:30 am at NOAA, Pivers Island
Dr. Jeff Buckel
NCSU Department of Zoology
“Historical and Present Catch
Rates of Reef Fishes off North
Carolina”

CMAST COURSES

MEA 459 “Field Investigation of Coastal Processes” will be taught during late May to late June. MEA 459 examines coastal zone processes and dynamics with emphasis on the forcing factors that help determine coastal landforms, ecosystems, animal physiology, and seabed morphologies. Field observations and field techniques are carried out in tidal freshwater coastal wetlands, estuaries, barrier islands, tidal inlets, continental shelves, and shelf-margin habitats.

CMAST OPEN HOUSE

Please join us for informal lectures, a tour of the facility, marine research demonstrations and refreshments on Thursday, July 5, 2007 from 4:00–6:00 pm.

presentation of research results; gain a better understanding of the ethical issues surrounding environmental research, and as a result experience personal growth that may influence their future career decisions on important coastal issues.

The program begins on May 28 and runs through August 3, 2007. Students are selected based on their expressed interest, coursework and recommendation letters. Eligible students must be US citizens or permanent residents in the United States or its possessions, enrolled as full-time undergraduate students, and be able to participate fully in the ten-week summer program without other course work or employment commitments.



2006 Summer Fellows and Interns

(left to right) CMAST Fellow Kathryn Zettl, West Carteret HS 2005 graduate, attending Elon College; NC Sea Grant Intern Weston Smith, Carteret Community College 2006 graduate, attending UNC-CH; CMAST Fellow Melissa May, West Carteret HS 2005 graduate, now attending Peace College; NC Sea Grant Intern Benjamin LaRoque, 2006 West Carteret HS graduate, now attending UNC-CH; Hutton Junior Fisheries Biology Program Scholar Merrill Fox, West Carteret HS Junior; CMAST Fellow Matt Stallsworth, West Carteret HS 2006 graduate, now attending NCSU; and CMAST Fellow Philip Jarret, East Carteret HS 2002 graduate, now attending NCSU.

CMAST REVAMPS WEB SITE

CMAST is proud to offer a new look on the World Wide Web. The redesigned and expanded web site, launched in March 2007, will provide you up-to-date information



on research, seminars, outreach activities, faculty and more associated with the center. There's also a "CMAST Images" section to view and download a multitude of marine-related photographs.

We invite you to visit www.cmast.ncsu.edu and tour just one of CMASTs latest projects.

NOTES FROM THE CMAST DIRECTOR



Welcome to the CMAST Communicator. I'm excited to share with you the discoveries and activities taking place at CMAST. This wonderful facility hosts a diverse and dynamic group of research, education and extension specialists that are making exciting discoveries in marine and coastal systems. Just a few of the projects that are developing include: a Marine Magnetic Resonance Imaging and Spectroscopy Facility, led by Dr. Michael Stoskopf of the College of Veterinary Medicine, that will provide an incredibly flexible and powerful tool to look at questions related to marine animals and marine products; the Seafood Laboratory, led by Dr. David Green, Department of Food Science, which is researching improved methods of tracing the source of seafood products required through federal regulations, and also assisting coastal processors with value-added commercialization; or the studies of the Atlantic Bluefin Tuna ecology and potential ecosystem effects, led by Dr. Jeff Buckel of the Department of Zoology. In this issue, we emphasize educational outreach using two examples: our summer undergraduate fellowship program, and our newly launched

web-site. In the following articles we highlight the work of two faculty members from the College of Veterinary Medicine – Dr. Michael Stoskopf, Marine Mammal Medicine, and Dr. Craig Harms, Marine Mammal Strandings.

We hope to provide you with research information from CMAST and its educational partners here in Carteret County, in North Carolina and beyond. I invite you to visit 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

WHOM TO CONTACT AT CMAST

CMAST is fortunate to have an excellent staff on board. They include Marlu Bolton, Administrative Assistant; Linda Dunn, Operations and Systems Analyst and Webmaster; Ernie Yeager, Facilities Management; and Jill Fournier, Communications.

SPOTLIGHT ON CMAST FACULTY AND DEPARTMENTS

WHEN A MARINE MAMMAL BECOMES STRANDED



In March 2007 a Pygmy Sperm Whale was found stranded in the surf at Emerald Isle. When this type of

event takes place along North Carolina's coast, a team of local scientists are available to respond. Through coordinated efforts, university researchers, veterinarians and others, representing a variety of federal, state and local agencies, participate in a Marine Mammal Stranding Program. This group is called upon to come to the aid of live, stranded marine mammals or conduct a study and dispose of any marine mammal carcasses found on the beaches of North Carolina. Dr. Craig Harms, veterinarian from NCSU's College of Veterinary Medicine at CMAST, is a principal member of the team.

In this most recent stranding, the whale was found still alive, struggling in the surf, obviously injured and suffering. Pygmy sperm

whales are common to North Carolina waters and generally travel alone, not in large groups as some other marine mammals do. Within an hour or two of the report of it being discovered, Dr. Harms and other members of the team were on their way to examine the whale. The team brings with them a variety of laboratory and recovery equipment, and in this case, the addition of a portable EKG machine. These particular whales are known to have heart conditions such as cardiomyopathy – a degeneration of the heart muscle. One goal of marine mammal research is to collect as much information from living animals, such as EKGs, in order to have resources for future use by veterinarians and researchers. Dr. Harms hoped this opportunity would allow him to get a reading on the whale's heart beat and rhythms – a procedure which is not often done.

With the help of the team and some local residents, the whale was brought further onto the shore. Dr. Harms was able to record an EKG for his records. The team then decided it was in the best interest of the animal for euthanasia, after which a local beach worker brought in a backhoe and helped lift the whale into a truck for transport back to CMAST in Morehead City for further study.

Once at CMAST, statistics were taken. This whale was a mature male, weighing over 700 pounds and measuring over 12 feet long. After an external

inspection offered no immediate clues as to the cause of stranding, a necropsy was begun which lasted over six hours. Over 10 people assisted with hundreds of tissue samples being

recovered and sent for analysis. No determination has yet been made on what caused this animal to strand.

Despite a stranding usually being the loss of one

of the ocean's most beloved and celebrated mammals, it is a tremendous opportunity for researchers to understand what may have happened, why it happened and if anything can be done to prevent future strandings. In many cases, the cause of a stranding is undetermined. However some identified and suspected causes of strandings include disease (e.g. pneumonia), parasite infestation, harmful algal blooms, injuries due to boat strikes or net entanglements, pollution exposure, trauma, and starvation. Marine mammals' health can also signal a change in the ocean's health. By understanding these events better, scientists can possibly help improve the health of the world's oceans.



Dr. Craig Harms, DVM, PhD, Dipl, ACZM has been part of the NCSU College of Veterinary Medicine since 1992 – as a resident, a doctoral candidate studying fish immunology and joining the faculty in 2000 at CMAST in Morehead City. He specializes in the study of sea turtles and other aquatic animals and also provides veterinary services for the NC Aquariums and the Topsail Island Sea Turtle Hospital.

Photos courtesy of Gretchen Lovewell, National Marine Fisheries Service, Beaufort NC.

MARINE MAMMAL MEDICINE

When porpoises or other marine mammals become sick, whether in captivity or in the wild, who comes to their aid to help them recover? With luck these animals will be in the care of graduates who studied with Dr.

Michael Stoskopf in the Marine Mammal Medicine course offered at the NCSU College of Veterinary Medicine (CVM).

Marine Mammal Medicine is a relatively new and growing field of veterinary medicine which covers a wide swath of opportunities – not just for veterinarians. Specialists are needed who can effectively and directly treat captive marine mammals in aquariums and sea parks throughout the world. Scientists are needed to understand and help determine causes of unusual mortality events and mass strandings of marine mammals in the wild. Researchers are needed to assess the world's ocean health using the marine mammals who act as sentinels and barometers of oceanic conditions.

Marine Mammal Medicine is offered through the Aquatic Medicine Program, regarded as one of the most highly recognized programs in the nation and world, at NC State University's College of Veterinary Medicine in Raleigh. The course, offered biannually, is intended for graduate students and researchers in Bio-Medical or Fisheries and Wildlife courses of study, but is also recommended for CVM students who seek internships and residencies in seaquariums. This training will make students more competitive in the residency market.

During the semester-long course, a wide scope of diseases affecting free ranging and captive mammals are

examined, with special emphasis on species found in North American waters, particularly pinnipeds (seals, sea lions and walrus), sireneids (manatees), marine mustelids (sea and river otters) and cetaceans (porpoises and whales). Additionally, anatomy, physiology, behavior, population management, and assessment of diagnostic and therapeutic



approaches to diseases in these species are also explored.

Hands-on opportunities are provided to students to perform necropsies of stranded or injured mammals. Carcasses are turned in from the beaches and are sent to the veterinary school for examination. Students examine the animal and take samples to try to determine causes of death in these mammals if unable to determine visibly. The CVM has a state-of-the-art facility in the Veterinary Teaching Hospital and pathology laboratories in which these procedures and tests are performed.

While the main focus being the students' ability to diagnose diseases in marine mammals, the Marine Mammal Medicine course has clear objectives for students – they will have an understanding of current major health management issues of captive and free ranging mammals, they will understand and be able to communicate the appropriate approaches to management of marine mammal strandings and environmental disasters, and will be able to outline an appropriate diagnostic and therapeutic course for a variety of marine mammal diseases. At the conclusion of the course, students develop and present an original, informative paper on a relevant marine mammal medicine topic.

Dr. Stoskopf developed the Marine Mammal Medicine course over 10 years ago to help fill a need for graduate students in marine-related disciplines. Over 100 students have participated in the course since its initial offering. The next course will be available in Spring 2008.



Dr. Michael Stoskopf, DVM, PhD, Dipl, ACZM is Professor of Aquatics, Wildlife, and Zoologic Medicine and of Molecular and Environmental Toxicology. He was formerly of Johns Hopkins University and the Chief Veterinarian for the National Aquarium of Washington, DC. He has been on the faculty of the NCSU College of Veterinary Medicine for over eighteen years.

WHERE ARE THEY NOW?

(Here's what just a few of our recent graduates are up to)

Dr. Eric Johnson graduated with a Ph.D. from NCSU (MEAS) in 2004 under the direction of Dr. David Eggleston and conducted research on blue crab ecology and population stock status while based at CMAST. Eric is currently a Research Scientist working on blue crab and estuarine ecology at the Smithsonian Environmental Research Center in Edgewater, Maryland.

Dr. Nathalie Reyns graduated with a Ph.D. from NCSU (MEAS) in 2004 under the direction of Dr. David Eggleston and examined bio-physical mechanisms associated with blue crab recruitment to Pamlico Sound. Nathalie is currently a post-doctoral research associate at Woods Hole Oceanographic Institution, has recently had her second child with husband Steve Search (Ph.D. '05), and will be starting a new faculty position at the University of San Diego in Fall 2007.

Dr. Steve Searcy graduated with a Ph.D. from NCSU (MEAS) in 2005 under the direction of Dr. David Eggleston and examined pre- versus post-settlement processes in the population dynamics of croaker in the Newport and White Oak Rivers while based at CMAST. Steve is currently a post-doctoral research associate at the University of Massachusetts.

Dana M. Bethea graduated with ???, working with Jeff Buckle, Zoology and studied. Dana is now working at NOAA Fisheries Service Panama City Laboratory, Fishery Biologist, Shark Population Assessment Group, Panama City, FL.

Jack E. Tuomikoski: Fisheries Biologist, Western Fisheries Research Center, Klamath Falls Field Station, US Geological Survey, Klamath Falls, OR

Kara L. Schwenke: Maryland Department of the Environment, Baltimore, MD

COLLEGE AND DEPARTMENT NEWS

College of Agriculture and Life Sciences

harvest.cals.ncsu.edu/indexmain.cfm

Environmental and Molecular Toxicology - www.tox.ncsu.edu

Food Science - 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

Summer Fellowships

Yiyi Wong and **Cathy Thompson** have been awarded NSF East Asia and Pacific Summer Institutes Fellowships. Wong (working with Dr. Paul Liu) will go to the Tongji University, Shanghai, China to continue studies of the Yangtze River and Taiwanese small mountainous rivers derived sediments in the Okinawa Trough. Thompson (working with Dr. Neal Blair) will go to the Institute of Natural Resources, Massey University, New Zealand to survey the Saiapu River watershed to understand the impacts of soil and geomorphological changes on carbon cycles.

College of Veterinary Medicine

www.cvm.ncsu.edu

Clinical Sciences - www.cvm.ncsu.edu/docs/index.html

Population Health and Pathobiology - www.cvm.ncsu.edu/dphp

Fisheries Scholar Program Approved

An innovative program for attracting top students with interest in aquaculture and fisheries health into the veterinary profession received final approval by the Admissions Committee for the **College of Veterinary Medicine** at NCSU last week. The first program of its kind, **The Aquaculture and Fisheries Scholars Program** will offer early acceptance to veterinary college to top NCSU undergraduate fisheries majors interested in fish health careers. The students who participate in the innovative program will benefit from special mentoring and summer experiences. They will be selected for early acceptance based on their academic performance, and their demonstrated focus on fisheries science issues. Fisheries Scholars are guaranteed acceptance into veterinary school upon successful completion of the Pre-Vet prerequisites and by maintaining their grades through their undergraduate fisheries careers. Once in the DVM program they will continue to be mentored by both CVM and FWS mentors and will have opportunities to pursue fisheries related experiences in their summers. The program is supported by the American Fisheries Society through their Fish Health Section.