UNH Research 2014
A digest of the year’s research news from the University of New Hampshire

- Agriculture & Biological Sciences
- Business & Technology
- Engineering & Physical Sciences
- Health, Behavioral & Social Sciences
- Humanities & the Arts
- Marine & Ocean Sciences
- Space Science
- Sustainability & the Environment

This report is produced by the Research Development and Communications unit of the UNH Research Office.
Find it on the Web at http://www.unh.edu/research/UNH-Research-Digest.
**Bluebloods: Horseshoe Crabs’ Contribution to Modern Medicine Comes at a Cost**

Collecting blood from horseshoe crabs for use in testing vaccines and medical devices for bacterial contamination might be playing a significant role in the decline of horseshoe crab populations, thus negatively affecting ecosystems from the Gulf of Mexico to the North Atlantic. A team led by Win Watson, UNH professor of zoology, and Christopher Chabot, Plymouth State University professor of biology, found that a significant percentage of the horseshoe crabs released back into the water after bleeding die, while those who survive are less active and have low levels of hemocyanin, a blood protein that carries oxygen throughout their bodies. Based on their findings, the team advocates for an improved approach to crab containment conditions and suggests that the time of harvest be changed to after the breeding season to help ensure the sustainability of this important organism.

http://www.unh.edu/news/releases/2014/02/bz24crabs.cfm
http://www.unh.edu/campusjournal/2014/02/research-biomedical-bleeding-affects-horseshoe-crab-behavior
http://www.unh.edu/unhtoday/veterans/2014/03/research-makes-difference
http://www.unh.edu/unhtoday/2014/06/bluebloods

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**Cloudy With a Chance of Copepods**

Kate Cart ’15 spent the summer of 2014 at the University of Maine’s Darling Marine Center, where she studied how water turbidity levels affect the foraging behavior of mysids, shrimp-like crustaceans that play an integral role in the estuarine food webs in the Gulf of Maine and many temperate estuarine ecosystems around the world. Cart’s work, was supported by a Summer Undergraduate Research Fellowship grant from the UNH Hamel Center for Undergraduate Research. The results of her research will contribute to a better understanding of how overall estuary and coastal health are affected as turbidity is changing in response to factors such as stronger storms, longer growing seasons, and increased coastal development.

http://www.unh.edu/unhtoday/unhtoday/2014/12/cloudy-chance-copepods

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**Exxon Valdez, Deepwater Horizon and Beyond: Experts and Witnesses Share Their Expertise**

A UNH-sponsored forum, "Oil Spill Response: 25 Years After the Exxon Valdez and in the Wake of Deepwater Horizon, What Have We Learned and What Are We Missing?" took place October 28-29, 2014. Hosted by the UNH Center for Spills in the Environment and the School of Marine Science and Ocean Engineering, the forum boasted nearly 40 experts and eyewitnesses from science, government, industry and other organizations who gathered to discuss past experiences and future outlooks regarding oil spill responses. The forum concluded with an in-depth discussion of what actions can be taken to improve communications with the public, facilitate scientific research, minimize the intrusion of politics, and consider human impacts during future spill responses.

http://www.unh.edu/news/releases/2014/10/bp09oilspill.cfm
Gift Expands Student Access to UNH’s Shoals Marine Laboratory
As part of a recent major gift to UNH, alumnus J. Morgan Rutman ‘84, and his wife Tara, allocated $375,000 to the Shoals Marine Laboratory, a cooperative research and education program of UNH and Cornell University. The funds will be used for new curriculum development and to provide support for 10-week summer research internships, awards, and scholarships to lower the cost of participating in a program at the Lab for current UNH students as well as high school students with an interest in science, technology, engineering, and math.

http://www.unh.edu/news/releases/2014/06/em30marine.cfm

Hope on the Halfshell: The Humble Mollusk: Superhero
Ray Grizzle, research professor of zoology, and Ray Konisky ’03G, marine conservation ecologist for The Nature Conservancy’s Oyster Conservationist Program, are on a mission to help the declining oyster population along the Great Bay Estuary – as are about 58 local “oyster sitters” who have volunteered to help. The citizen oyster program restores oyster beds by creating a layer of shells to act as a foundation for a living reef and then placing on it disease-resistant oysters that have been raised in Grizzle’s laboratory. With this head start, the mollusks will rebuild a reef, creating a giant natural water-filtering machine, helping to bring the Bay ecosystem back into balance.

http://www.unh.edu/unhtoday/2014/06/hope-halfshell
http://www.fosters.com/apps/pbcs.dll/article?AID=/20140629/GJNEWS_01/140629366/-1/FOSNEWS0413

How I Spent My Summer Vacation: Studying Crustaceans in Great Bay
Erika Moretti ’15, a zoology major, spent the summer of 2014 researching how an increase in blue or green crabs might impact the Great Bay’s lobster populations, and thus the industry. With financial assistance from a 10-week Summer Undergraduate Research Fellowship (SURF) from UNH’s Hamel Center for Undergraduate Research, Moretti studied the crustaceans’ behavior in close proximity by placing the three species in shared living spaces, using an above-the-tank camera to snap pictures every two seconds to record their activity. Moretti conducted her research with the guidance of Win Watson, associate director of education in the School of Marine Science and Ocean Engineering and professor of zoology.


Intensive Testing Coming to York Beaches
Environmental microbiologist Stephen Jones will conduct intensive testing of the levels of bacteria in the water at York, Maine’s four beaches during the summer of 2014. Jones expects to run 1,500 tests on water samples collected from Cape Neddick Beach, Long and Short Sands beaches, and Harbor Beach as part of a beach water quality testing plan that will alert swimmers when it is unsafe to go into the water.

http://nhepscor.org/news/intensive-testing-coming-york-beaches

Over Their Heads In Algae at Shoals Marine Lab
Amber Litterer ’16, a zoology and ecogastronomy major, and Kristen Mello ’14, a recent graduate of UNH’s zoology program, spent the summer of 2014 as Near Shore Ecology interns at the Shoals Marine Laboratory on Appledore Island. The new program, funded by the Rutman family, provides novel research opportunities for UNH undergraduates, such as investigating the relationship between the degree of surface area complexity in species of algae found in bays across the various Isles of Shoals and the abundance of invertebrates. “The more surface area...an alga has
is directly related to its value as a food source and habitat in which larger predators hide,” says Litterer. “We’re now seeing that half of all the species living here are non-native, and we’d like to know what types of invertebrates currently inhabit each alga,” Mello explained. The student researchers were advised by Jennifer Dijkstra, affiliate assistant professor of biological sciences.

http://www.unh.edu/unhtoday/veterans/2014/08/over-their-heads-algae-shoals-marine-lab

Regional Fisheries Catch Topic for Podcasts
A series of online podcasts will highlight the current struggles of commercial fishermen in New England. Hosted by Erik Chapman, UNH Cooperative Extension and New Hampshire Sea Grant fisheries specialist, the podcasts will explore the shifting professional options within the local fishing industry. The series will feature interviews with fishermen, researchers, managers, and others dedicated to the preservation and resilience of New England’s marine heritage and economy.

http://extension.unh.edu/articles/Regional-Fisheries-Catch-Topic-Podcasts

Research Profile: Colin Ware: Visualizing Patterns in the Data
Whatever the topic, one of Colin Ware’s primary goals is to represent data visually, allowing people to discern patterns and thus understand the meaning of the data. As director of the Data Visualization Lab at UNH’s Center for Coastal and Ocean Mapping at UNH, Ware’s current research covers a range of subjects, from tracking sea lions and humpback whales to creating more effective methods of mapping ocean and wind currents.

http://www.unh.edu/campusjournal/2014/02/research-profile-colin-ware-visualizing-patterns-data

Seeking Surface Data: Marine Bio Class Builds, Launches Drifting Datacenters to Measure Ocean Currents
Erik Chapman, assistant professor of natural resources, and students from his introduction to marine biology laboratory course are working to build vessels or “drifters” to help ocean scientists understand more about surface currents in the Gulf of Maine. These drifters will bob along the current, relaying their position periodically via satellite to scientists at the National Oceanic and Atmospheric Administration and the Northeast Regional Association of Coastal and Ocean Observing Systems. After launching their drifters, the students will study a biological process of their choosing using data from the drifters and other ocean-observation instruments such as buoys and floats.

http://www.unh.edu/unhtoday/2014/10/seeking-surface-data

The Coral Microbiome: Understanding a Piece of the Paradox
Michael Lesser, research professor of molecular, cellular and biomedical sciences in UNH’s College of Life Sciences and Agriculture, has received a grant from the National Science Foundation to study the role of coral in nutrient cycling in coral reef ecosystems. Lesser and his team will collect samples from coral reefs throughout Australia, Hawaii, and Curacao for genomic analysis and classification. The research will help scientists to better understand the crucial ecosystem services that coral reefs provide that are becoming increasingly threatened by climate change.

http://colsa.unh.edu/article/coral-microbiome
The Oyster Is Their World: How Four UNH Researchers Are Working to Keep Illness Off the Raw Bar

A multidisciplinary team of UNH researchers is investigating the presence of Vibriosis-causing bacteria among oysters in the Great Bay. Steve Jones, associate director of NH Sea Grant and research associate professor of natural resources and the environment; Vaughn Cooper and Cheryl Whistler, associate professors of microbiology; and Tom Safford, associate professor of sociology, are collaborating on a three-year study of water quality, bacterial strains, and public trust of health warnings from the scientific community. The UNH researchers are part of a larger team that includes oyster farmers and university scientists from New Hampshire and Maine.

http://www.unh.edu/unhtoday/veterans/2014/08/oyster-their-world

The Tales a Lobster Trap Tells

The lobster research lab team supervised by professor of zoology Win Watson has produced a video detailing their work studying the effectiveness of lobster traps. The video, titled “What do lobster traps tell us about the lobsters on the bottom?”, features underwater footage of the lobsters interacting with the traps. Results of the study could inform New England fishing practices and future marine research approaches. The video was selected as a finalist for the Ocean 180 Video Challenge which aims to engage non-scientists and students in timely and relevant ocean science research. It will be viewed and judged by over 30,000 middle school students internationally.

http://www.unh.edu/unhtoday/2014/01/tales-lobster-trap-tells

UNH Ocean Mappers Discover Seamount in Pacific Ocean

A team of UNH scientists headed by UNH Center for Coastal and Ocean Mapping/Joint Hydrographic Center research professor James Gardner has discovered a new seamount near the Johnson Atoll in the Pacific Ocean. Working aboard the R/V Kilo Moana, an oceanographic research ship owned by the U.S. Navy and operated by the University of Hawaii, Gardner and his team were using multibeam echosounder technology to create detailed images of the seafloor when, late at night, the feature appeared “out of the blue.” The team was in the area on a mapping mission in support of the U.S. Extended Continental Shelf Task Force, a multi-agency project to demarcate the outer edges of the U.S. continental shelf.

http://www.unh.edu/news/releases/2014/09/bp02seamount.cfm
UNH Scientist’s Image Appearing in New Godzilla Movie

An image of the Mariana Trench, which was mapped and developed by UNH scientist James Gardner, has been licensed by Warner Bros. and is being used within a quick-cut-montage sequence in the new Godzilla movie. The licensed image was taken during an underwater survey of the area by a team of researchers from the UNH Center for Coastal and Ocean Mapping/Joint Hydrographic Center that took place from August through October of 2010.

http://www.unh.edu/news/releases/2014/06/cd02godzilla.cfm
http://www.unh.edu/unhtoday/unhtoday/2014/06/unh-scientist%E2%80%99s-image-appearing-new-godzilla-movie
http://www.unh.edu/unhtoday/unhtoday/2014/12/research-professor-paleoceanographerhollywood-collaborator

UNH-led Fisheries Research Collaborative Calls for New Regional Projects

The UNH-led Northeast Consortium (NEC) will lead a new collaborative research initiative supported by the New England Fishery Management Council. The NEC will distribute research funds to projects researching groundfish stocks and the groundfish fishery in the Gulf of Maine and Georges Bank. Project proposals from local commercial fishers and scientists are due November 5, 2014.