

NEWS in Science and Technology



from the

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The following is an Executive Summary of the Academy's quarterly Bulletin (Vol. 21,4) that includes topics and issues in science and technology deemed by the Academy to be both timely and relevant to Connecticut's interests. Each item is briefly summarized from press releases and reports of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Hyperlinks are included to the original online source, where more detailed information is available.

NOTE: Online versions of this newsletter and the Bulletin are available on the Academy website at www.ctcase.org.

UCONN PLAYS KEY ROLE IN OCEAN CENSUS

➤ UConn Scientist Plays Key Role in International Marine Census

Dr. Ann Bucklin, Director of Marine Sciences at the University of Connecticut (UConn) since the fall of 2005, heads the Census of Marine Zooplankton—an ocean realm field project that is part of the Census of Marine Life (CoML)—which will complete a global survey of zooplankton biodiversity by 2010. Her research is part of an international census that began in 2000 and has as its purpose to develop a comprehensive understanding of marine life in terms of what species exist, where they reside and what their populations are. CASE spoke with Dr. Bucklin about her research interests, the international marine census, and her view of the role of UConn's marine sciences department.

- Zooplankton very important to ecology of marine ecosystem:
 - Serve as Intermediaries between commercially-harvested fish and phytoplankton that provide ocean's productivity—declines in species and number of individuals of those species can be early warning of problems that will reach throughout the ecosystem, including commercial fisheries.
 - Understanding dynamics of zooplankton can help predict fisheries production.
 - Collected in nets with "lots of bells and whistles"—modern sampling systems are electronically controlled and calibrated to regulate volume of water and measure concentration of animals. These systems collect information about the physical and chemical parameters of the ocean.
 - Census of marine zooplankton involves 20 scientists from 16 countries with goal of global coverage by 2010.
- Understanding how environment changes the genetic makeup of organisms and populations is "Holy Grail" of marine genetics:
 - Gene sequencing can detect short-term changes in marine animal populations, which respond dramatically to environmental change.
 - Gene expression can show if organism is hungry, experiencing stress, heat or cold.
 - Current research is looking for indicators of environmental impacts from chemical pollution, hypoxia and nutrient enrichment—will aid in understanding health of Long Island Sound (LIS) ecosystem.
- Impact of zooplankton and other UConn marine sciences research initiatives at federal, state and local levels includes:
 - Contributing to understanding of ocean ecosystems, already a foundation of national oceanographic policy.
 - New version of federal legislation (Magnuson-Stevens Fishery Conservation and Management Act) now up

for reauthorization calls for ecosystem-based fisheries management.

- Contributing to improved awareness of how LIS's ecosystem works and how it can accommodate activities of man.
 - Goals for Department of Marine Sciences include:
 - developing a sense of common purpose among faculty.
 - maintaining and growing "their share" of coastal observation and biodiversity initiatives.
 - remaining competitive in "big oceanographic programs" and playing significant role in big questions of the day.
- [See http://www.ctcase.org/bulletin/21_4/21_4.pdf]

NEWS FROM THE NATIONAL ACADEMIES

➤ Public Needs Better Guidance for Seafood Choices

A new report by the National Academies' Institute of Medicine reviews the scientific evidence on the benefits and risks of consuming seafood and finds that due to the "fragmented" and confusing nature of the

(continued on back page)

Banucci Awarded CT Medal of Technology

The 2006 Connecticut Medal of Technology was awarded to Gene Banucci, founder and Chairman of the Board of Danbury-based ATMI, Inc., at the Alliance for Connecticut Technology Award Dinner at the Connecticut Convention Center in Hartford on October 19, 2006. The award, modeled after the national Medal of Technology, was established by the General Assembly and is administered by the Board of Governors for Higher Education. It is the state's highest award for technological achievement in fields crucial to economic competitiveness.

Banucci co-founded ATMI in 1986 and has led the company ever since. Today, the company employs more than 750 people worldwide. ATMI went public in 1993, and has grown to over \$300 million in annualized revenues with a market capitalization exceeding \$1 billion. The key technological advance made by ATMI is a revolutionary method of safely storing hazardous gases as solids so they can be safely transported and efficiently used in semiconductor manufacturing. The resulting product, called SDS[®] (Safe Delivery System), is now used in nearly every semiconductor plant in the world. Semiconductor associations have called it "one of the greatest safety, environmental and productivity innovations in the history of the industry."

[See http://www.ctcase.org/bulletin//21_4/21_4.pdf]

EXCAVATION TO EXPLORATION: SCIENCE CENTER MAKES PROGRESS ON GALLERIES AND CONSTRUCTION

The Connecticut Science Center and Pitney Bowes are working together to create an exciting children's gallery that will be a playground of interactive science exhibits for the Center's youngest visitors. The Pitney Bowes Literacy and Education Fund Children's Gallery will feature an interactive display designed in collaboration with Hartford-based photographer and artist Walter Wick, who's famous "I Spy" and "Can you see?" books are treasured by children around the world. The gallery will also include a water play area, a soundscape and a children's reading nook, co-programmed by the Hartford Public Library. With this generous gift, the Center will develop a broad array of educational offerings, including classroom-based and kit-based programs, after-school programs, professional development and specialized programs for teachers and students in Charter schools. These programs will serve to enhance and reinforce the science education that will be offered at the Science Center. Where possible, funding will be made available to underwrite the cost of class trips to the Center for schools in low-income communities. With the announcement of the \$1 million donation from Pitney Bowes, the Center has reached 95% of its campaign goal, with under \$10 million still to raise.

This winter, the Connecticut Science Center plans to finalize construction of its three-level parking garage, which will also serve as the base of the building. In August, the Center began pouring concrete for the first floor of the parking garage and is now in the process of completing the ramp to the third level. You can view real-time video of the construction of the project and see plans for the Pitney Bowes Literacy and Education Fund Children's Gallery, as well as other information about the Center, online at www.CTScienceCenter.org.

information made available to them, consumers often have misperceptions about both the nutritional value and the health risks associated with fish and shellfish. The report recommends

- that federal agencies partner with state, local and private groups to develop new, more coherent information tools.
- finds much evidence on seafood's health benefits and risks preliminary or insufficient, but supports current dietary guidelines and seafood advisories.

[<http://www.nap.edu/catalog/11762.html>]

➤ Possible Links Between Military Service and ALS

A limited body of evidence suggests an association between military service and later development of amyotrophic lateral sclerosis (ALS), commonly known as Lou Gehrig's disease, a rare but fatal neurodegenerative disorder, according to a new report from the Institute of Medicine. The report recommends

- more high-quality studies to confirm relationship between military service and ALS, noting that only five have been conducted.
- research to explore what might be causing ALS among veterans.

[<http://newton.nap.edu/catalog/11757.html>]

➤ Some North American Pollinators Declining

Long-term population trends for some North American pollinators—bees, birds, bats, and other animals and insects that spread pollen so plant fertilization can occur—are "demonstrably downward," says a new report from the National Research Council. It recommends

- increased efforts to monitor these creatures, noting there is sufficient evidence to conclude some, including honeybee, declining.

- Collaboration by US with Canada and Mexico to form network of long-term monitoring projects. Rapid, one-time survey should be conducted as soon as possible.
- US Department of Agriculture support research to improve quick identification of pollinators.

[<http://www.nap.edu/catalog/11761.html>]

➤ Foreign Technologies Could Help US Army

To facilitate destruction of buried chemical warfare materiel, the US Army should consider adopting a faster and more efficient technology—such as one of those currently used in Europe or Japan—to complement the ones it currently uses, says a new report from the National Research Council. The report

- Notes new technique would be used primarily to destroy whole chemical munitions from large burial sites
- Looks at technologies that can destroy entire munitions such as rockets, land mines, mortars, and projectiles as well as those that can handle only chemical agents, such as nerve and blister agents.

[<http://www.nap.edu/catalog/11777.html>]

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