

Institute of Marine Sciences

When the Coast Has a Problem, IMS Scientists Have a Plan

MOREHEAD CITY - If a coastal concern is in the headlines or the topic of morning coffee conversations, chances are it is under study at the University of North Carolina at Chapel Hill Institute of Marine Sciences (UNC-CH IMS).

"I often package our mission in the following simple words - to provide public service through research," says John Wells, who led IMS

as director for the past 11 years. "And that research has a fundamental, immediate relevance to the citizens of North Carolina, who pay our salaries and provide support for this facility, and have for over 50 years."

Now ranked among the best of its size in the nation, the university marine laboratory was established in 1947 as the Institute of

Fisheries Research. It was renamed in 1967 to reflect its broad scope of interests, and faculty specialties remain diverse. What much of the research has in common, however, is pertinence to coastal policy.

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John Wells

"Our mission is a science mission," Wells says. "We provide the science, but we can step forward and talk about the reality of how that science ought to be used." Applying research findings in a societal

framework is no simple task.

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Beach nourishment is a prime example. Periodically pumping dredged sand onto shrinking beaches is now a common community response to oceanfront erosion in North Carolina and most



East Coast states.

The dynamics, economics, effectiveness and wisdom of such methods to protect structures are under debate in political and environmental arenas. Crucial questions IMS is attempting to answer, Wells says, involve the long-term performance of the projects, and their impacts on biological resources.

"If you let the time line go out over a few years or perhaps a decade, some of that sand is going to disappear," he says. "Where is it going? Why is it disappearing? How can we better design nourishment projects to increase their longevity or reduce their costs?"

Other questions concern the immediate effects of nourishment on crabs and other organisms that live on the bare sand beach, the cumulative impact of repeated projects on those creatures and the differences in sand on a natural beach and that taken from the sea bottom.

"People here are looking at the biology as well as the sedimentology of beaches," Wells says. "This issue is going to be with us for a long time."

IMS researchers are regarded for their commitment to long-term research on complex issues. Wells

himself is noted for his work in coastal marine geology. Water quality and shellfish revitalization are just two of the other areas where IMS researchers have made a difference, he says.

"Hans Paerl is an international expert in nitrogen loading, the nutrient problems in rivers and estuaries, the impact on fish because of the deprivation of oxygen," Wells says. Reducing the sources of nitrogen can help prevent fish kills that occur periodically, and the algal blooms that cause other problems.

Other IMS researchers have focused on methods to restore shellfishing stocks, and to harvest seafood with less impact on the surrounding ecosystem.

"Pete Peterson has spent his entire professional career at IMS working on a wide range of fishing - particularly shellfishing - studies that give us insight into how to better design oyster reefs; how to trawl and dredge; how not to trawl and not to dredge; how to do things in stressed fisheries to bring those back to where they are viable," Wells says.

Among other things, IMS scientists are also looking at the movement of water - and the fish larvae it carries - through inlets, the

role of viruses and bacteria in marine environments and possibilities for using marine plant and animal products in sunscreens and medicines.

Because many pressing issues reach well beyond North Carolina shores, IMS funds a number of investigations important to the state through federal grants and programs.



A New Direction

As a UNC-CH research unit, IMS hosts up to 25 graduate students a year. In the fall of 2003, IMS became a field site for UNC-CH's Carolina Environmental Program (CEP), and for the first time ever, offered a



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Institute of Marine Sciences

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Established: 1947

Faculty and Staff: 62

Mission: The Institute's mission is to serve the state and nation through the conduct of high-quality basic and applied marine sciences research.

full semester of undergraduate coursework.

From the IMS standpoint, Wells says, the arrangement strengthens the connection with its home campus, and enhances the institute's place in the UNC-CH organization. Undergraduate education presents a big change for a research organization, but CEP enjoyed full support in its first session.

"Almost every faculty member at the institute participated in some fashion," says Wells.

Five students from the CEP, a multidisciplinary environmental undergraduate degree program at UNC-CH, were enrolled for the semester last year, and seven are signed up for 2004. The IMS component is offered in the fall.

Maximum exposure to the coastal environment is built into the program, says site director Rachel Noble, a marine microbial ecologist, and an assistant professor for both IMS and CEP.

"Getting them out on the water is a huge part of what we do here," she says. "We want them to know what real research in the marine and aquatic sciences is all about." Last fall's students spent at least one day a week in the field, sometimes two or three, often working on active research projects.

"We want them to understand the relationship between science itself and public policy and conservation," Noble says. "We want them to know how those manage-

ment people out there actually get the data that they use to make their decisions." CEP students also interact with a number of

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Richard Luettich

scientists besides those at IMS through guest lectures and an invited speaker seminar series.

Students choose their own subject for an independent research project or an internship. They also work together on a "Capstone"

research project on a topic of mutual interest. The first class selected beach nourishment. Each student chose a facet of interest to them, such as the economics or the biological effects. The five compiled their findings in a report

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made available to future students, should a future class choose to expand on it in another Capstone effort.

The first CEP participants gave the semester high marks. UNC-CH biology major Juliana Miller from Blounts Creek says the experience and the IMS faculty reinforced her career choice.

"I realized marine ecology was definitely what I wanted to specialize in," she says, "And that

the people you work with are key."

Leadership Change

A major change for IMS is the departure of John Wells. He left this summer to become dean of the School of Marine Sciences at the College of William & Mary in Williamsburg, Va., and director of its Virginia Institute of Marine Sciences.

"I've truly enjoyed the 20 years I've spent here," he says. But someone else can bring new ideas and new vision to IMS, he says, just as he hopes to do for William & Mary. He wants his mark as IMS director to be the institute's tangible link to coastal communities and what they care about.

"I want the public to think of



IMS as a resource," he says, "a resource for the community, and the state."

Professor Richard Luettich, who has been at IMS for 17 years, has assumed the directorship. He expects to continue the close



relationship between IMS and coastal citizens. An example: IMS is participating in the development of a national network of ocean observation systems. A research buoy deployed off Cape Lookout as part of that network will provide real-time wave, wind and current conditions.

"I think that will be very helpful to the recreational and commercial fishing industries, and to the community," he says.

Wells "cast a long shadow" in many ways, Luettich says. One of Wells's most visible and significant accomplishments at IMS, he says, has been the transformation of the institute's aging facilities. Renovation and construction under Wells's direction over the last 10 years have greatly expanded, updated and improved offices, fieldwork support facilities and laboratories for students and faculty members from campus, as

well as from IMS itself.

"We're in terrific shape, finally, from a facilities perspective," Luettich says. "Now we're looking forward to expanding the research and the services that we provide." Three additional faculty members are expected to join IMS in the next 12 to 18 months, specializing in wetlands ecology, coastal geology and sediment transport.

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Luettich says he is excited about the challenge of leading the UNC institute at this critical time for the coast.

"I think the North Carolina coastal zone is only going to increase in

its importance to the state," he says. "And at the same time, the pressures to sustain it as a high-quality resource are only going to increase, too."

