

# Tidings

Gulf of Maine Research Institute Newsletter

SPRING  
2008

## Hewlett Grant Positions Maine to Emerge as "Education Innovation State"

GMRI has received a landmark grant from the William and Flora Hewlett Foundation one of the nation's leading contributors to innovative education programs. This grant will enable GMRI to roll out its *Vital Signs* program on the 32,000+ laptop computers provided to every 7th and 8th grader through the Maine Learning Technology Initiative.

Maine is the only state to have successfully implemented one-to-one computing across an entire age cohort. As a result, Hewlett is just one of a growing number of national foundations who see Maine as an ideal market to test the transformative power of technology-enhanced education initiatives, such as *Vital Signs*.



### Local Visionary Support Helps GMRI Earn Hewlett Grant –

An extraordinary demonstration of local support positioned GMRI to earn this Hewlett Foundation grant. The Lunder Foundation, Sam L. Cohen Foundation, and Bernard Osher Foundation were among the first to realize *Vital Signs*' potential to profoundly impact science education in Maine and beyond. In late 2007, they approved a visionary three-way challenge grant totaling \$450,000. The Morton-Kelly Foundation committed an additional \$50,000. Their support sent a powerful message about Maine's commitment to becoming a leader in education innovation.

The Hewlett Foundation grant enables GMRI to leverage Maine's unique cyber-infrastructure, along with the state's rich natural resources, to redefine how science is taught and learned in the 21st century. *Vital Signs* will transform the traditional classroom learning environment into a collaborative research setting. Students will be challenged and equipped to monitor their local aquatic ecosystems for invasive species and to share their observations as part of an online community. In their roles as scientists, they will operate in an inquiry environment, making observations, asking questions, forming hypotheses, collecting and analyzing rigorous data, and sharing conclusions with a critical audience. Connecting classrooms to a virtual community of professional and citizen scientists is a critical component of *Vital Signs*, facilitating a fluid exchange of information from novice to expert to explore the threat of invasive species to aquatic resources and the economies that depend on them.

Educational programs such as *Vital Signs* will become critical as Maine's economic base continues to grow and change. The career opportunities open to Maine's next generation will necessitate a different mix of knowledge and skills than what was required to succeed in traditional forestry, fishing, agriculture, tourism and manufacturing industries. *Vital Signs* fosters curiosity, creativity, communication and collaboration, problem-solving, and critical thinking skills to prepare students for the transition to college, careers, and citizenship in an increasingly connected, digital, and scientific world. By reshaping students' and teachers' relationships with the sciences from distant spectators to active participants, *Vital Signs* will take a critical step to realizing Maine's potential to emerge as the "Education Innovation State."



**GMRI Scientists Complete 3 Year Study on Scallops** – The scallop industry is a profitable fishery for New England, however some are concerned about the impacts harvesting may have on other fisheries. GMRI scientists teamed up with commercial scallop fishermen over the last three years to examine the significance of these impacts to the health of other fish species.

Sea scallops are harvested primarily by towing a large metal frame with an attached chain bag (the dredge) across the sea floor. Sometimes unwanted species (bycatch) are caught with the scallops. The predominant bycatch species are monkfish, flounders, and skates. Yellowtail flounders are of particular concern in the northeast region because recent federal stock assessments have indicated this species is overfished.

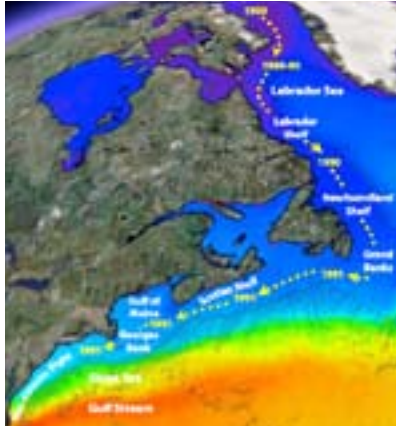
GMRI's scientists designed an intensive study to look at the percentage of bycatch species caught in relation to the total catch of sea scallops in the Great South Channel, a significant area for sea scallops southeast of Cape Cod. At the completion of the study, bycatch data indicated there was no more than 4% of total catch of any individual species. This data suggests that bycatch in the Great South Channel is

low, causing minimal disruption to these finfish species. As a followup, GMRI scientists will be investigating fish behavior in response to scallop gear and altering the gear to further reduce bycatch rates in the scallop fishery.

# Research

**Predicting Climate Change Impact on the Gulf of Maine** – There is strong scientific consensus that the Earth is warming and that this warming is due to increased concentrations of greenhouse gases like carbon dioxide from the burning of fossil fuels. Although predictions of the change in the Earth’s average temperature have become more accurate, predicting how small areas of the globe, such as the Gulf of Maine, will change in the coming century remains a significant challenge.

A joint appointment between GMRI and UMaine is enabling scientists to look for clues as to how the Gulf of Maine ecosystem might respond in a warmer, and possibly fresher, future. An analysis of over 40 years of data has revealed that in the 1990s water flowing into the Gulf of Maine from Nova Scotia became fresher. This seems to have caused a dramatic increase in phytoplankton (single cell plants) and the copepods that feed on them. Herring, which feed on copepods, also increased during this time period, suggesting the freshening had a dramatic impact at the base of the food web.



Colors correspond to mean sea surface temperatures for the 1990s. From Greene et al. (2008)

Scientists have been able to trace the pathway of the freshwater upstream through the Labrador Sea and ultimately, to the Canadian Arctic. One of the predicted consequences of global warming is that the North Atlantic will become fresher, through increased precipitation and melting of the northern glaciers. By studying the cause and effects of the 1990s freshening of the Gulf of Maine, GMRI and UMaine scientists will provide a deeper understanding about how global warming will ultimately affect the species in the Gulf of Maine ecosystem.

## GMRI Extends a Warm Welcome to:

### New Board Members

Holly Taylor Sargent, Harvard University  
Joan M. Smith, Baker Newman Noyes, LLC

### New Navigators

Chris Emmons, Gorham Savings Bank  
Heidi Fitz, Civic Leader  
Jerry Knecht, North Atlantic Seafoods  
Don LEEBER, Civic Leader  
Roger Martin, Unum  
P. Andrews Nixon, Civic Leader  
Gloria Pinza, Pierce Atwood LLP  
Peter F. Richardson, R.M. Davis  
Mike Stillings, Baker Newman Noyes, LLC  
Carol Wishcamper, Civic Leader

GMRI has launched a new website.

Please check it out at [www.GMRI.org](http://www.GMRI.org).

Since 2006, GMRI has welcomed over 23,000 5th or 6th graders from Maine to our interactive marine science program, *LabVenture!* Each dot represents a town which has participated in this program since its creation. This year, GMRI will serve 90% of 5th or 6th graders from all 16 Maine counties, totaling over 13,200 students.



Science. Education. Community.  
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**Gulf of Maine Research Institute**



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