

# Collaborations

A report on collaborative research projects in the northwest Atlantic Ocean.



## Are we using herring bait to farm lobsters?

**T**he past decade, Maine's lobstermen and marine biologists have watched in awe as lobster landings have steadily climbed (last year's 70 million-plus pounds were valued at over \$253 million).

There are a number of theories to explain this impressive abundance. Some researchers point to the decline in groundfish stocks (cod, haddock, hake, and others happen to be predators of juvenile lobsters). Others believe that the huge landings may be attributable to overexploitation because controls are set by limiting traps not by limiting how many lobsters are taken. A few have even suggested that the increased harvesting of Sea urchins has opened up a comfortable niche for lobsters in the Gulf of Maine's kelp fields.

However, the explanation that seems to carry the most weight at present has to do with the 70 million metric tons of herring bait that is introduced to the Gulf of Maine ecosystem each year as lobster bait.

"You put that much feed into the water and lobsters are going to grow," said Matt Schwier, a lobsterman from Monhegan Island.

A recent study that documented lobsters' use of traps with underwater video seems to support the proposition that we are farming lobsters in the Gulf of Maine. (Many of the crustaceans were shown to enter traps to eat and escape before being hauled to the surface.)

But to systematically investigate the question, scientists at the Gulf of Maine Research Institute (GMRI) in collaboration with colleagues at the University of North Carolina, the University of Maine, and the Maine Department of Marine Resources began a research project in the waters off Monhegan Island and around the Georges Island in midcoast Maine in 2002.

These locations were chosen because they are closed for

## Letter From the Editor:

One of the great characteristics of our time is its reliance on the scientific method - the process by which we endeavor to construct an accurate representation of the world.

From reading a review about how a minivan performed in a crash test to (as I recently experienced) fighting a traffic ticket in court to studying the ocean, the scientific method affects many aspects of our lives.



Science, through the use of standard procedures and criteria, attempts to minimize the influence of personal and cultural factors when developing a theory. A famous scientist once said, "Smart people (like smart lawyers) can come up with very good explanations for mistaken points of view." In short, the scientific method attempts to minimize the impact of bias and prejudice when testing a hypothesis or theory.

This is all good. In order to build safe minivans, have fair representation under the law, and understand marine systems we need to work with consistent, reliable, non-arbitrary representations of reality.

But, of course, just because we strive for unbiased execution in our experiments doesn't mean subjectivity doesn't creep into the lab from time to time.

I'm not referring to a carelessly spilled beaker or falsified data. But the inevitable politics that influence much scientific research that is done today.

In short, there is such a thing as the politics of science. Let's face it: research takes money and these days money doesn't come easily (and without political savvy). To get research done, those who have been successful, also built alliances, made compromises, seized opportunities.

Collaborative research, like other areas of inquiry, is subject to the politics of science.

The other day Congress approved some \$80 billion for Hurricane Katrina Relief, there's a war on, and the economy remains somewhat sluggish. Based on this empirical observation, my theory is that, like it or not, it's time again for those in the collaborative research community to be political.

A handwritten signature in black ink, appearing to read "Michael Crocker". The signature is fluid and cursive.

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## Collaborations:

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Several hypotheses have been generated to explain recent surges in lobster landings in the Gulf of Maine. Research on lobster population dynamics has focused primarily on early postlarval life stages, so that our current understanding of the importance of herring bait on sublegal lobsters remains limited.

-Jon Grabowski (GMRI)

portions of the year, giving scientists a way to gauge the impact of bait, when it is present and when it is not.

Originally, the research was funded with a \$111,972 grant from the Northeast Consortium. Additional support has been provided by the Maine Department of Marine Resources, Maine Sea Grant, and the Davis Family Foundation.

The study used a variety of methodological approaches involving multiple scientific disciplines (ecology and biogeochemistry) to address questions of interest to the scientific and fishing communities of Maine.

Researchers say that understanding the contribution of herring bait to lobster population growth will better inform lobster management decisions that are currently based on lobster mortality without consideration of increased food supply.

In October, Jon Grabowski of the GMRI and a lead scientist on this study, presented a report at a Northeast Consortium conference.

“Several hypotheses have been generated to explain recent surges in lobster landings in the Gulf of Maine. Research on lobster population dynamics has focused primarily on early postlarval life stages, so that our current understanding of the importance of herring bait on sublegal lobsters remains limited.”

In order to assess the affects of herring bait on lobster population dynamics, researchers sampled diet composition (stomach content analyses), tissue production (nitrogen stable isotope ratio analyses), and growth (mark-recapture experiments) of large (66-83 millimeter carapace length) and small (45-65 millimeter carapace length) sublegal lobsters in seasonally closed sites around Monhegan Island and compared the findings to fished sites around the Georges Islands in mid-coast Maine during the summer and fall of 2002 and 2003.

According to the report, herring bones were more prevalent in the diet of lobsters at open sites, and were more prevalent in the summer. Smaller lobsters from open sites contained more natural prey (i.e., crabs, mussels, clams, polychaetes, urchins, etc.) than those from closed sites.

Stable nitrogen isotope ratio analyses indicated that lobsters derive 33.7-68.6 percent (large) and 10.9-35.6 percent (small) of their tissue from herring bait. Recaptured lobsters from the Georges Islands that molted outgrew those from Monhegan by 16.2 percent. Quadrat and trap sampling suggested that lobster densities are similar between sites, but lobsters are larger at closed (Monhegan) sites.

“Collectively, these results support the notion that herring



Herring school in the Gulf of Maine. The study suggests that fisheries managers consider the impact of lobster bait in the system when drafting management protocols.

bait may be very important for lobster population dynamics in the Gulf of Maine, and therefore, the contribution of herring bait should be considered when developing management policies that affect fishing effort,” the report concluded.

The study’s findings thus far are available at:  
<http://northeastconsortium.org/projects.shtml#recset>

# A Fishing Gear Workshop by Fishermen for Non-fishermen

Dr. Pingguo He, a fisheries scientist at the University of New Hampshire figured it was about time, non-fishermen became familiar with fishing gear.

In the past few years, many fishermen involved with collaborative research have become familiar with all sorts of non-fishing gear, like CTD probes, fish-tagging devices, and mapping software.

So Dr. Pingguo He, a fisheries scientist at the University of New Hampshire, figured it was about time that non-fishermen became familiar with fishing gear.

To facilitate the process, Dr. He submitted a project development proposal to the Northeast Consortium in 2002 to support the training of marine scientists by commercial fishermen in the ways of trawl nets and doors, roller frames and codends, among other gears.

Since, four such workshops have been held at a flume tank in St. John's Newfoundland, where participants can watch scale model gear perform under simulated conditions.

Fishermen, like Vincent Balzano and Proctor Wells (both of Maine) have been on hand to explain how and why even minor adjustments to fishing gear can have a significant impact on net performance.

"It is so important for scientists involved in research to get firsthand experience in the use of gear—the workshops I've been involved in have gone a long ways toward expediting the gear designs we're working on," said Wells.

Last year, the program took a new turn when Dr. He collaborated with the captains of four fishing vessels in training a number of government and university scientists on dragger and gill-net vessels from New Hampshire.

"From the scientists' point-of-view this project was one of the most rewarding they had done, because what happens is that researchers really start to see commercial fishing through the eyes of real fishermen," said Dr. He.

Dr. He said that as university and government scientists, fisheries organizations staff, and others involved in fisheries policy issues, workshops such as this are especially important.

"We have come to a point where non-fishermen increasingly have influence on gear design and policy decisions that affect fishermen. The main goal of this project is to put these people in the shoes of the fishing industry for at least a few days, so that they have can better understand the world that they are impacting," said He.

Next Spring, Ken LaValley of New Hampshire Sea Grant will be taking the lead on a workshop that will train Congressional staff members onboard commercial fishing vessels.

For more information about the workshops contact Pingguo He by email at [pingguo.he@unh.edu](mailto:pingguo.he@unh.edu).



Trawl workshop participants pose for a photo in front of the flume tank at Memorial University in St John's Newfoundland last year.

## Scientific Consensus Statement on Marine Ecosystem-Based Management

*Prepared by scientists and policy experts to provide information about coasts and oceans  
to U.S. policy-makers*

**Executive Summary:** The current state of the oceans requires immediate action and attention. Solutions based on an integrated ecosystem approach hold the greatest promise for delivering desired results. From a scientific perspective, we now know enough to improve dramatically the conservation and management of marine systems through the implementation of ecosystem-based approaches.

**Coastal and ocean ecosystems are vitally important to U.S. interests and they are at risk.** Over half of the U.S. population lives along the coast, and more than \$200 billion in economic activity was associated with the ocean in 2000.<sup>1</sup> Despite their economic significance, U.S. oceans, like those around the world, are changing in unprecedented ways. Recently, the Pew Oceans Commission and the U.S. Commission on Ocean Policy concluded that a combination of human activities on land, along the coasts, and in the ocean are unintentionally but seriously affecting marine ecosystems by altering marine food webs, changing the climate, damaging habitat, eroding coastlines, introducing invasive species, and polluting coastal waters. These changes threaten the ability of ocean ecosystems to provide the benefits Americans expect from marine ecosystems. Currently, each activity or threat is typically considered in isolation; coordinated management of cumulative impacts is rare. **Both commissions call for a more comprehensive, integrated, ecosystem-based approach to address the current and future management challenges of our oceans.** Both commissions describe ecosystem-based management as the cornerstone of a new vision for healthy, productive, resilient marine ecosystems that provide stable fisheries, abundant wildlife, clean beaches, vibrant coastal communities and healthy seafood for all Americans.

### WHAT IS ECOSYSTEM-BASED MANAGEMENT FOR THE OCEANS?

**Ecosystem-based management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors.** Specifically, ecosystem-based management:

- emphasizes the protection of ecosystem structure, functioning, and key processes;
- is place-based in focusing on a specific ecosystem and the range of activities affecting it;
- explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;
- acknowledges interconnectedness among systems, such as between air, land and sea; and
- integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependences.

<sup>1</sup> U.S. Commission on Ocean Policy (2004) Appendix C: Living Near and Making a Living from the Nation's Coasts and Oceans

UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE

NORTHEAST REGION  
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December 19, 2005

**Small Entity Compliance Guide**

Dear Limited Access Northeast (NE) Multispecies Permit Holder:

This letter is to inform you that the National Marine Fisheries Service (NOAA Fisheries Service) is reducing the Georges Bank (GB) yellowtail flounder trip limit from an unlimited amount to 15,000 lb per trip for limited access Northeast (NE) multispecies days-at-sea (DAS) vessels fishing in the U.S./Canada Management Area, as of 0001 hours, **December 21, 2005**.

Recent data indicate that over 59% of the TAC has been harvested to date. NOAA Fisheries Service is taking this action to slow the rate of harvest of GB yellowtail flounder to increase the likelihood that the GB yellowtail total allowable catch (TAC) will be available through the end of the 2005 fishing year on April 30, 2006, and to prevent the TAC from being exceeded. NE multispecies DAS vessels that have not departed on a trip and crossed the Vessel Monitoring System (VMS) demarcation line prior to 12:00 AM on December 21, 2005, are restricted to a 15,000-lb trip limit of GB yellowtail flounder.

Yellowtail flounder landings will continue to be closely monitored. When 70 percent of the TAC allocation for GB yellowtail flounder is projected to be harvested, the GB yellowtail flounder limit for NE multispecies DAS vessels in the U.S./Canada Management Area will be reduced to 1,500 lb per day, up to a maximum of 15,000 lb per trip. The rate of harvest of the GB yellowtail flounder TAC in the Western and Eastern U.S./Canada Areas is updated weekly on the internet at <http://www.nero.noaa.gov>.

This small entity compliance guide complies with section 212 of the Small Business Regulatory Enforcement and Fairness Act of 1996.

Sincerely,

Patricia A. Kurkul  
Regional Administrator

## **Data Fisheries and Ocean Data Management System**

The Northeast Consortium has created the Fisheries and Ocean Data Management System to serve as a means for the public to access data from cooperative research projects. It is designed and intended to facilitate collaboration among scientists, fishermen, and fisheries managers; allow combination of multiple data sets for interdisciplinary and comparative studies; and encourage the development and testing of new theories. The Northeast Consortium requires that all data resulting from cooperative research projects be made publicly available in order to ensure that:

- data can be evaluated and considered for use in fisheries and ocean management;
- data can be rapidly compared, integrated, and synthesized from many different projects;
- cooperative research participants can learn the results of similar projects, and avoid repeating experiments or observations that have already been done; and
- federal guidelines are met for public access to data resulting from federally funded programs and activities.

The Fisheries and Ocean Data Management System uses the JGOFS (U.S. Joint Global Ocean Flux Study) data management software to serve data to any computer that has a standard Web browser, such as Internet Explorer or Netscape. The software, which is also used by the U.S. GLOBEC (GLOBAL Ocean ECosystem dynamics) Program, is designed so the public can look at, manipulate, and retrieve data.

Data can be added to the system in a variety of forms including tables, spreadsheets, and Matlab files. Data can also be served directly from other data management systems, such as Oracle, and other systems that support Internet access and the SQL interface. Images and movies can also be served.

The data system displays the data on the Web page in a number of ways; typically data are organized hierarchically and actual data values are displayed. In addition, data can be graphed in an X-Y plot format or downloaded in several formats including ASCII tables, and Matlab, zip, and tar files.

### **Data Ownership**

Data are the intellectual property of the collecting investigator(s). The intellectual investment and time committed to the collection of a data set entitles the investigator to the fundamental benefits of the data set. Publications of descriptive or interpretive results derived immediately and directly from the data are the privilege and responsibility of the investigators who collect the data. We respect the desires of researchers who would like to publish prior to submitting data from a Northeast Consortium-funded project. A three year grace period, beginning from the collection date, is granted for this purpose. If other data are gathered which are not critical for publication purposes, we strongly encourage researchers to make them available at their earliest convenience.

### **Use of the Data**

The data available are intended for scholarly use by the industry, management, academic and scientific communities, with the express understanding that any such use will properly acknowledge the originating investigator. Use or reproduction of any data or images for any commercial purpose is prohibited without prior written permission from the Northeast Consortium Data Management Office. Any person making substantial use of a data set must communicate with the investigators who acquired the data prior to publication and anticipate that the data collectors may expect to be co-authors of published results. This extends to model results and to data organized for retrospective studies.

### **How to Submit Data**

The submission of data is a simple process. The data can be in spreadsheet formats, as well as in tabular format from a word processing program. Any computer readable file, in either ASCII or binary format, is acceptable as long as supporting documentation about the file contents is provided. Images can be in several formats, including GIF, TIFF, JPEG, and PNG. The data management office will accept data via e-mail, floppy disk, CD-ROM, DVD, and ftp file transfers.

For all matters relating to data submission and accessibility, please contact Dicky Allison at the Northeast Consortium Data Management Office:  
Dicky Allison/Northeast Consortium Data Management Office/Swift House, MS #38/Woods Hole Oceanographic Institution/Woods Hole, MA  
02543/Email Dicky Allison/(508) 289-2298



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