the Lobster Bulletin

Summer 2006

"News, research updates, and information on lobsters and the lobster industry."

Published by the Lobster Institute

"Protecting and conserving the lobster resource, and enhancing lobstering as an industry…and a way of life."

Lobster Institute Christens Its "New" Research Vessel

The Lobster Institute would like to thank Bill and Georgia Fike of Greenwich, Connecticut for the donation of their 22' Boston Whaler, the *Shadow* to the Lobster Institute for use as a research vessel. The *Shadow* has been refitted for trap hauling and will be used in various Lobster Institute projects such as alternative bait testing and juvenile sampling studies. The boat replaces the *RV Black Fly*, an antiquated workboat obtained as Coast Guard salvage, that has seen years of use, and that the Institute has struggled to keep operational for the past several years. Like the *Black Fly* before it, the *RV Shadow* will be cared for by long-time Lobster Institute volunteer Herb Hodgkins, and moored at the Frenchman Bay Conservancy's Tidal Falls property in Hancock, Maine. The boat was re-christened on August 21 during a special event at Tidal Falls. According to Lobster Institute Executive Director Dr. Bob Bayer, "It is said that a proper christening ensures good fortune to the boat and her crew throughout the life of the vessel. It has also been said that re-naming a boat is bad luck – so to be on the safe side – and to honor the Fike's – we decided to keep her original name. However, we thought a re-christening for the *Shadow's* new purpose as a research vessel would be in order."

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Georgia Fike (r) prepares to christen the R.V. Shadow with champagne on the shore at Tidal Falls, with the assistance of Herbert Hodgkins.(l)

A continuing "did you know" series featuring historical highlights of Lobster Institute research and accomplishments.

LOBSTER INSTITUTE
SPOTLIGHT

CSI: Lobster Institute

Did you know that the Lobster Institute has developed a type of forensic science that can be use to determine if a lobster has had its eggs illegally removed? Almost all lobstermen are extremely conservation conscious and v-notch and release all egg bearing lobsters they catch back into the water. However, on a rare occasion there will be someone who tries to increase their catch by illegally keeping egg bearing females and using chemicals (typically bleach) to scrub the eggs off their tails in an attempt to destroy the evidence. Initially, short of catching someone in the act of illegally scrubbing eggs off of lobsters, it had been difficult for marine patrol officers to prove this had been done. A scientific method to determine if scrubbing had taken place was needed. Lobster Institute researchers at the

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Spotlight on the Institute
CSI: Lobster institute

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University of Maine, in conjunction with researchers from California Polytechnic University and the National Marine Fisheries Service developed a technique using a microscope to detect chemically scrubbed lobsters. An egg bearing lobster carries her eggs on her tail, where they are basically "cemented" to tiny hairs on the pleopods or "swimmerets". Under microscopic examination, these researchers found there are distinct differences in the structure of setal hairs on the pleopods of lobsters that have been chemically treated compared to those on lobsters that are untreated. The setal hairs of untreated lobsters have a feather-like pattern with pairs of fine, uniformly arranged hairs extending from opposite sides of a central shaft. Pleopod setae from lobsters dipped in bleach appear highly disorganized, with many bent or even missing.

In related work, scientists from the University of Pennsylvania and the Marine Biological Laboratory in Woods Hole, Massachusetts developed a field-based technique capable of revealing residual chlorine on chemically dipped lobsters.

Both these methods of detecting illegally scrubbed lobsters are described in a manual for law enforcement personnel put together by the Lobster Institute and the then Maine/New Hampshire Sea Grant College Program. The manual, "Techniques to Detect Chemically Scrubbed, Egg-Bearing Lobsters" is available by contacting the Lobster Institute at 207-581-1443. The Institute will also provide hands-on training in these techniques to marine law enforcement officers. ⌘

Lobster Institute Executive Director Dr. Bob Bayer (l) instructs Special Agent Ross Lane (r) of the NOAA Fisheries Office for Law Enforcement in the proper techniques to detect egg-bearing lobsters that have been chemically scrubbed.

Lobster Institute Christens the R.V. Shadow

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The Fikes were on-hand for the occasion, with Bill offering traditional toasts and Georgia participating in the sprinkling of the champagne over the bow. Bill intoned the following toasts as part of the ceremony:

- "For thousands of years, we have gone to sea. We have crafted vessels to carry us and we have called them by name. These ships will nurture and care for us through perilous seas, and so we affectionately call them "she." To them we toast, and ask to celebrate the R.V. Shadow". To which the guests responded, "To the sailors of old…to the *R.V. Shadow*."

- "The moods of the sea are many, from tranquil to violent. We ask that this ship be given the strength to carry on. The keel is strong and she keeps out the pressures of the sea." To which the guests responded: "To the sea...to the sailors of old...to the sea!"

- "Today we come to re-christen this lady the *R.V. Shadow*, and send her to sea to be cared for, and to care for all who work with the Lobster Institute. We ask the sailors of old and the mood of God that is the sea to accept the *R.V. Shadow* for her new purpose, to help her through her passages, and allow her to return with her crew safely." To which the guests responded, "To the sea...to the sailors before us...to the *R.V. Shadow.*" ⌘

Because you asked:

Maine has the greatest number of licensed commercial lobstermen in the U.S. – with Massachusetts coming in second.

- In 2005, Maine issued 7,261 commercial lobster licenses (including student and apprentice licenses). An additional 1,970 non-commercial licenses were issued – for a total of 9,231.
- Massachusetts has just over 1,900 licensed commercial fishermen.

Check out the Lobster Institute website at www.lobsterinstitute.org, providing the definitive site for lobster information …… with nearly 200 links.

the Lobster Bulletin

Research Report

Readers may contact the Lobster Institute for more detailed information on any of these projects.

❖ **Using Sensor Technology to Gauge Lobster Quality –** The Lobster Institute is partnering with Mainely Sensors, LLC to explore the potential for using sensor technology, in the form of optical absorption measurements, as a means to measure serum protein levels in lobster hemolymph (blood) to aid in assessing the vigor and quality of live lobsters. Should this sensor technique prove feasible, it would provide valuable data to assist lobster dealers, buyers, processors and wholesalers in making marketing decisions regarding the ability of lobsters to survive the necessary storage and/or shipping processes.

Current invasive techniques to measure serum protein involve the extraction of a blood sample from a live lobster using a hypodermic needle, and then measuring serum protein levels using a refractometer. This technique, however, has several drawbacks, which include increasing the stress level of the lobster and the risk of faulty readings due to contamination during sample extraction. Therefore a compelling need exists to develop a sensor that is non-invasive and provides reliable readings of serum protein.

The ultimate objective of this project is to produce a marketable hand-held device that can be used dockside to measure serum protein levels in lobsters, in a non-invasive manner. Knowing the serum protein levels before purchase, storage, and/or shipping will help determine which lobsters are suitable for shipping as a live product, how long live lobsters might withstand storage or if they should be sent directly to be processed.

Mainely Sensors recently received a Seed Grant from the Maine Technology Institute to begin work on this project. Initial objectives include:

- Performing optical absorption spectroscopy on lobster blood samples using laboratory-based spectrometers, to demonstrate and verify the reported UV-VIS absorption behavior of hemocyanin. The infrared (IR) absorption spectrum (unreported) will also be examined for any useful characteristic peaks associated with serum protein.
- Perform optical transmission spectroscopy on lobster tissue samples, to determine penetration depth of the serum protein absorption wavelengths, in order to assess the feasibility of a non-invasive, optical measurement.
- Performing *in vivo* absorption /transmission spectroscopy on live lobsters, using a commercial, portable spectrometer from Ocean Optics, and compare results with *in vitro* data collected from the same lobsters. If comparable measurements are obtained, the portable spectrometer will be used to measure spectra on lobsters at different lengths of time post capture and the results will be compared with those obtained with a refractometer.
- If the *in vivo* optical absorption approach proves to be feasible, the design for a prototype instrument will be developed.

Mainely Sensors, LLC, under the guidance of its president John Vetelino, Ph.D., specializes in adapting sensor technologies for applications in various business sectors. The company is based in Orono, Maine.

❖ **Maine's Zone C Lobster Hatchery Ready for Production** – The Zone C Lobster Hatchery, located in Stonington, Maine was completed this spring and began it first production runs in June. Plans called for rearing three batches of 50,000 juvenile lobsters each season, starting in June and ending in early September, with lobsters to be released in Zone C once they reach settlement age (stage IV) and have a solid chance of survival. While in the hatchery, the lobsters are fed brine shrimp (also raised at the hatchery) and kept in vigorously aerated tanks designed to prevent the lobsters from eating each other. In July, a setback was experienced with the first run, after aeration problems led to the loss of an undetermined number of the first 40,000 juvenile lobsters raised. Production was scheduled to resume and continue through September. Studies are currently underway to determine a workable method of tracking the survival of the lobsters once released. The hatchery is managed by the Penobscot East Resource Center in Stonington. More information can be obtained by contacting hatchery manager, Ted Ames, at 207-367-2708 or by emailing info@penobscoteast.org. ⌘

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LOBSTER INSTITUTE

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Select Lobster Institute Oral History Interviews Now Available On-line

Over the past several years, as time and funding has allowed, the Lobster Institute has been conducting video-taped oral history interviews with senior lobstermen and others connected to the lobster industry. This is an ongoing project aimed at recording the wisdom, experiences and stories of lobstering veterans. "Our goal is to capture and retain the spirit of the people and families who have made lobstering a way of life through the generations," said Dr. Bob Bayer, executive director of the Lobster Institute and project coordinator.

Now, thanks to the University of Maine Fogler Library and student editor Alexandre Berthier, several of these interviews are available for viewing on-line as part of the library's "Windows on Maine" project. Interviews with lobstermen Alison Bishop, Richard Black, Harvey Crowley, Robert Joyce and son Matt, Jim Knott and wife Betty, and Al McNeilly can be viewed at http://windowsonmaine.library.umaine.edu. Just enter "lobstering" into the Quick Search on the "Windows on Maine" home page.

"Windows on Maine" offers a collection of media resources that document Maine's history and the Gulf of Maine ecology: featuring the themes of forestry and lumbering; fishing and fishermen; hunting, trading, fur trading; shipping and ship building. ⌘

Renew your membership as a Friend of the Lobster Institute

You can contribute on-line through the University of Maine Annual Fund. Be sure to designate the Lobster Institute. Go to www.lobsterinstitute.org and click "Donate" at the bottom of our home page.

Maine Begins Groundline Exchange Pilot Program

The Gulf of Maine Lobster Foundation (GOMLF) began facilitating a Groundline Exchange Pilot Program this summer, designed to defray costs for lobstermen to replace existing groundlines on their traps (floating rope) with "whale safe" rope (sinking rope) as an incentive to comply with requirements of the Atlantic Large Whale Take Reduction Plan (ALWTRP). The ultimate goal is to reduce the risk of large whale entanglement, specifically the endangered North Atlantic right whales and Gulf of Maine humpback whales. This program follows in the footsteps of a similar project in Massachusetts in 2004-2005 that offered a buy-back to lobstermen to aid in replacing floating groundline with sinking line. About 300 Massachusetts lobstermen participated in that project, with about 300,000 pounds of floating rope collected, much of which was recycled.

Federal funding for the GOMLF pilot project was secured by Maine's U.S. Senators Olympia Snowe and Susan Collins. According to Snowe and Collins, "These [ALWTRP] rules could potentially be a reasonable approach to allow Maine's essential lobster industry and whales to coexist, but we must ensure that our lobstermen have the assistance they need to comply with these new regulations." The Maine Lobstermen's Association estimates that a typical lobsterman spends, on average, $500 to $1000 annually on rope – and that the new requirements could mean a 10 to 20-fold dollar increase, with a cost to individual businesses of approximately $10,000. Further, the cost of maintaining "whale safe" rope will significantly increase ongoing expenses.

Those seeking more information on the Maine project can contact Laura Ludwig at the Gulf of Maine Lobster Foundation by emailing laura@gomlf.org. ⌘