



Commercial Fisheries News

**Closed Areas I, II
access outrage • 5**

**Late season bluefin
bite off NJ • 8**

Lobster prices • 18
Howling winds , year-end holidays

Shrimp Moratorium • 24
No fishing in 2014

Herring/haddock • 20
Face-off at NE council meeting

**Dogfish quota up,
but no market fix • 10**

**CFRF whelk, lobster,
scallop project results • 15**

Bearin's • 42
Church is where you find it

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CFRF whelk, scallop, lobster projects reveal surprises, climate change effects

SOUTH KINGSTON, RI – Fishermen got some surprising news about channeled whelk and engaged in a lively Q&A over Southern New England lobster nursery survey results during a shellfish research session hosted by the Commercial Fisheries Research Foundation (CFRF) on Nov. 7. Biologists from the Massachusetts Division of Marine Fisheries (DMF) also presented findings from an expanded coastwide ventless lobster trap survey, and food science researchers from the University of Rhode Island explained how scallop viscera has the potential to be an additional income source for fishermen.

Over the last two years or so, CFRF has provided nearly \$450,000 in grants for the four research projects through its federally funded Southern New England Collaborative Research Initiative.

Steve Wilcox of DMF presented the results of the channeled whelk project conducted with Kenneth Oliveira of the University of Massachusetts Dartmouth School for Marine Science and Technology. The study focused on determining the size and age at maturity, as well as monitoring seasonal gonadal changes for whelk in Buzzards Bay, Vineyard Sound, and Nantucket Sound.

Whelk is a \$7 million fishery annually in Massachusetts, yet this was the first-ever study to pin down these basic biological characteristics of the mollusk.

Wilcox reported that harvest sizes for channeled whelk bear no correlation to biological reference points but are instead determined by market demand.

The legal minimum size is 2-3/4" in Massachusetts, a size, Wilcox said, at which no female whelk is capable of reproducing. Female whelk don't mature until they reach 3" to 3-3/4", he explained. However, most whelk are caught prior to reaching maturity.

Fearing a stock collapse, Massachusetts fisheries managers are gradually raising the minimum legal size by 1/8" per year beginning in 2014 to protect the spawning stock.

Wilcox said that growth rings on the whelk's operculum – the hard structure at the foot of the whelk that covers the shell opening – were counted to determine age, much like growth lines on fish ear bones or growth rings on trees are counted.

Because whelk take years to mature and have limited movement, they are at a higher risk of area depletion. Since whelk hatch fully formed, there is no larval dispersal, making repopulation of depleted areas unlikely.

Wilcox gave much credit for the success of the CFRF channeled whelk project to fisherman Jarrett Drake, owner of the F/V Cynthia Lee, who showed the team how to fish for conch.

The legal minimum size is 2-3/4" in Massachusetts, a size at which no female whelk is capable of reproducing.

—Steve Wilcox

SNE lobster nurseries

University of Maine researcher Rick Wahle, Rhode Island Lobstermen's Association President Lanny Dellinger, and Rhode Island Division of Fish and Wildlife biologist Scott Olszewski combined their knowledge of Narragansett Bay's historical and current lobster nursery sites to try to figure out where juvenile and young-of-year (YOY) lobsters have gone (see CFN March 2013).

Through their CFRF project titled "A Fisherman-Scientist Collaboration to Reassess Lobster Nurseries in Narragansett Bay After Two Decades of Environmental Change," the researchers repeated a comprehensive diver-based visual and suction sampling survey of nursery areas in the bay and the state's outer coast, which was last conducted in 1990 when lobster abundance was high.

The project also included the deployment of passive cobble-filled post-larval collectors at the same sites and expanded the survey using these methods to new locations selected by fishermen.

See *LOBSTER PROJECT*, next page



Northeast Regional Ocean Planning Public Meeting

We want to hear from you! Please share your thoughts on recently developed information and draft goals for regional ocean planning in New England.

The draft goals were developed by the Northeast Regional Planning Body, a group of state, tribal and federal representatives from New England who are working to implement the National Ocean Policy and advance regional ocean planning over the next few years. Proceedings from previous meetings are available at: <http://northeastoceancouncil.org/regional-planning-body/meetings/>

SAVE THE DATE

Next meeting set for

January 22-23

This meeting will primarily focus on discussing and approving revised regional ocean planning objectives and an accompanying draft work plan.

Meeting will be held in the Boston area.
Location and additional details to be announced.

For updates visit

<<http://northeastoceancouncil.org/regional-planning-body/meetings/>>



CFRF lobster project

Continued from previous page

Wahle directs the American Lobster Settlement Index (ALSI) project, which has been using these techniques to document the abundance of tiny lobsters at sites from Nova Scotia to Rhode Island for nearly 25 years (see CFN June 2013).

He reported that, between 2011 and 2012, the CFRF project found significant declines in juveniles and shallow-water nurseries that had been full in the early 1990s.

The juvenile lobsters the team did find were mostly restricted to outer coastal sites and deeper water. One of the few places juveniles were found was a relatively deep site off Fort Wetherill at 45' to 50', a sampling site identified by industry members.

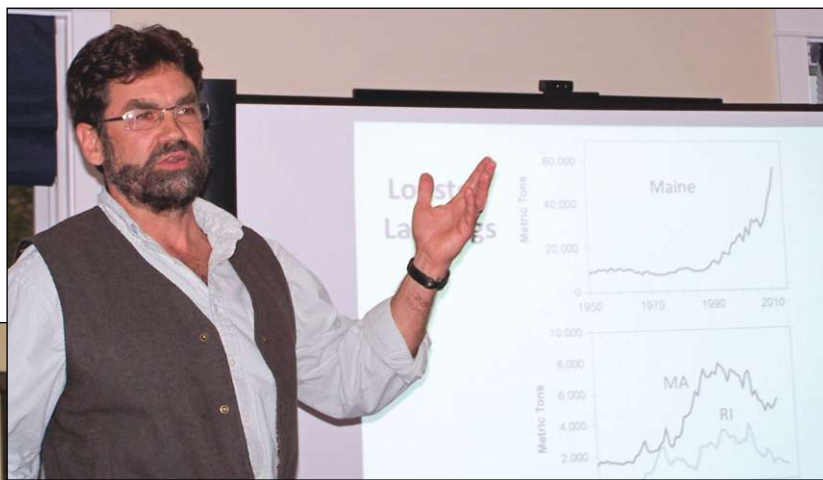
Referring to another CFRF study recently led by Bob Glenn of DMF, Wahle noted that egg-bearing females also seem to be retreating to deeper water off the Southern New England coast, in effect distancing the source of larvae from historical nearshore nurseries.

"It appears that the hatching grounds are moving out," said Wahle. "That could change the whole pattern of settlement."

In 2012, the North Atlantic Ocean experienced an oceanic heat wave, said Wahle, and surface and bottom temperatures hit all-time peaks in Southern New England. As part of the CFRF lobster nurseries reassessment project, Wahle's team measured bottom temperatures at or above 68°F throughout Narragansett Bay. The exception was the deepwater site off Fort Wetherill.

Increases in water temperatures are likely to continue into the future, he said. The National Oceanic and Atmospheric Administration has predicted 2°F to 3°F higher surface water temperatures and increasing acidity levels to pH 7.8

Rich Wahle of UMaine's School of Marine Sciences/Darling Marine Center discusses results of a lobster settlement project conducted in Narragansett Bay in 2011-2012.



Joyce Rowley photos
From left, Rhode Island lobsterman Bill McElroy, Tracy Pugh of MA DMF, and Andy Lipsky of SeaPlan.

by the second half of this century.

During the discussion, Dellinger reminded Wahle of the lobster die-off after Hurricane Irene in 2011, particularly around "the House on a Rock" at the upper end of the bay. Prior to the storm, Dellinger said, lobsters were found in abundance during the visual survey at that site, but Wahle found dead lobsters when he sampled several days after the storm.

"That was when there was flooding in Vermont," said Dellinger, who added that all of that water emptied into Narragansett Bay, carrying contaminants with it.

Other lobstermen questioned whether the predators found in the collectors altered the juvenile count.

Wahle said that the Asian shore crab is found throughout the bay now, whereas in 1990 it was nonexistent. The invasive crab is a warm-water species and was not found at the deep site at Fort Wetherill.

"We can't rule out the possibility that the Asian shore crab may have played a part in the demise of lobsters in the shallows of the bay," he said.

Most of the other bays and estuaries sampled as part of the ALSI are much like Narragansett Bay, Wahle said. He pointed to work performed by DMF's Bob Glenn in Martha's Vineyard Sound and Buzzards Bay, which also showed higher bottom temperatures and few, if any, juveniles for the same time period.

Dellinger said that settlement had increased and water temperatures had dropped considerably in 2013, with bottom temperatures peaking at 60°F.

Long-time lobstermen Norbert Stamps Jr. and Bill McElroy, who is also an Atlantic States Marine Fisheries Commission (ASMFC) member, pointed out that lobstering in Narragansett Bay hit bottom before in 1950 and then took years to rebound.

McElroy suggested that the temperature cycle might be occurring over a longer timeframe.

Andy Lipsky of SeaPlan, a Boston-based nonprofit ocean science and policy group, asked how the Rhode Island results compared to other areas in Wahle's ALSI study.

In response, Wahle said it may be that Maine is now in decline and Southern New England is on the uptick, possibly due to a reversal in the North Atlantic oscillation, which is a phenomenon involving the large-scale seesawing of atmospheric conditions between subtropical highs and polar lows.

But since adult lobsters tend to decline five years after a decline in settlers, Wahle said the outlook is still bleak and that there likely will not be a significant rebound in the

Southern New England stock any time soon.

I find it disturbing that there is no funding in Southern New England for lobster studies.

—David Spencer

Ventless trap survey

DMF biologist Tracy Pugh said that Buzzards Bay, once home to a huge lobster fishery, no longer supports harvesting at a commercial level. Like Wahle, she suggested that a big part of the reason is surface and bottom temperatures above what lobsters can tolerate throughout the bay.

So, as part of its CFRF-funded study to broaden its well-established coastwide ventless lobster trap survey in Southern New England, DMF followed the commercial fleet and, in 2011 and 2012, sampled additional locations in statistical area 538 and the federal portion of statistical area 537 in Lobster Conservation Management Area 2. The expanded areas included mid-depth (66'-131') sites and also deepwater (greater than 131') sites that were added for the first time.

The team, assisted by lobstermen Jarrett Drake, Arthur DeCosta of the F/V Sheri & Deke, and Aaron Cebula of the F/V Andrea Lee, found relatively plentiful sublegal and legal-sized lobsters offshore.

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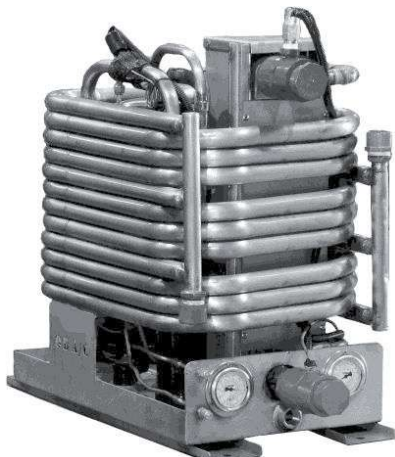
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Inshore in Area 538, the bay yielded far fewer lobsters than had been seen in the mid- to late-1990s.

Similar to the Narragansett Bay findings, the expanded ventless trap survey found that there were fewer spawning adult lobsters in Buzzards Bay, and most were found in the waters outside of the bay. The study concluded that this redistribution likely was due to environmental factors such as water temperature rather than fishing effort.

The researchers recommended continuing the expanded area survey in order to better understand and monitor changes in the reproductive cycles of lobsters.

Massachusetts and Connecticut did not fund lobster surveys in 2013, but Pugh said researchers were hoping funding would be restored in 2014. Rhode Island was not funded for 2014, according to Scott Olszewski.

"I find it disturbing that there is no funding in Southern New England for lobster studies," said David Spencer, CFRF board chairman and Atlantic Offshore Lobstermen's Association president.

He said that surveys were particularly needed because ASMFC has declared the Southern New England lobster stock depleted and has taken steps to reduce fishing effort in the region.

Scallop viscera

Part of the focus of CFRF's Southern New England Collaborative Research Initiative is exploring new economic opportunities in the fishing industry. CFRF Executive Director Peg Parker reiterated this point

About 164 million pounds of potentially valuable sea scallop viscera are tossed overboard each year.



VIMS photo

Scallop viscera and the edible meat.

during her introduction of the researchers involved in the project investigating the potential value of sea scallop viscera – the guts.

The project was proposed by Mike Marchetti, president of the Eastern New England Scallop Association, and performed by researcher Chong Lee of the University of Rhode Island Food Science and Nutrition Research Center and Geoff Day of Seafood Research Associates. Other groups involved in the research included Rhode Island Sea Grant, Sea Fresh USA, and Great Bay Aquaculture.

When you break it down, a sea scallop is about 70% shell, 23% viscera, and 7% edible meat. So, with sea scallop harvests coming in at more than 50 million pounds annually in recent years, about 164 million pounds of viscera are tossed overboard each year.

The project team looked at ways to turn that scallop viscera into valuable products, including human food supplements and high-value aquaculture feed, through a grinding and liquefying process called hydrolyzation.

Although the scallops were harvested from areas known to be free of paralytic shellfish poisoning (PSP) and other toxins, the hydrolysate was screened for biotoxins. All samples tested well below federal standards.

Nutraceuticals, a term coined from the words "nutrition" and "pharmaceuticals," are foodstuffs that provide a health benefit beyond simple nutrition. For example, the testing showed that scallop viscera has high levels of omega-3 fatty acids, which many people now take in the form of fish oil gel capsules as a nutritional supplement.

Scallop viscera offer other unique human health properties, according to the researchers. It can act as an antioxidant to prevent cell damage, as an anti-hypertension agent to lower blood pressure, and as a lipase-enhancing agent to aid lipid digestion. Likewise, it ranked high as a feeding attractant and growth enhancer for summer flounder and European sea bass.

But there are a few roadblocks to direct harvesting of viscera. Currently, scallopers are not allowed to land viscera because of PSP risks. To overcome that, Lee said a simple testing tool for screening, similar to current on-deck PSP testing for surf clams and ocean quahogs, would be needed before the next phase of product development could occur. Also, regulations would need to be modified and scallopers might have to reengineer their vessels to cheaply and effectively freeze and land large quantities of scallop viscera.

For more information on all of these CFRF projects and others, visit the foundation's website at <<http://cfrfoundation.org>>.

Joyce Rowley

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