
HOOK, LINE AND THINKER

The Newsletter of the Fishermen and Scientists Research Society

Issue: 2008-2

Spring 2008

CROSS BORDER COLLABORATION – FSRS ATTENDS MAINE FISHERMEN’S FORUM

By Patty King, General Manager, FSRS

Two van loads of Fishermen and Scientists Research Society (FSRS) members and staff made the journey to the 33rd Annual Maine Fishermen’s Forum, held at the Samoset Resort in Rockland Maine February 28 – March 1, 2008. FSRS fishermen members Junior Risser, David Baker, John Levy, Bill Bond, John Lavers, Garnet Heisler, Randy Boutilier, Bob Henneberry, Hughie Boutilier, and Eugene O’Leary filled the vans driven by FSRS Research Biologist Carl MacDonald and FSRS General Manager Patty King. A special thanks to Darden Restaurants Foundation and the Gulf of Maine Lobster Foundation (GOMLF) for providing funding assistance which made it possible for us to attend the Maine Fishermen’s Forum. Their support was greatly appreciated.

The Maine Fishermen’s Forum is an annual three day event which focuses attention on issues affecting Maine’s commercial fishing industry. The forum is attended by thousands of people, including scientists, fishing-related business, fishermen’s organizations and individual fishermen. The Forum agenda included seminars on a wide range of topics, as well as life raft and immersion suit training, a trade show and health care screening. The Opening Reception is always a highlight of the Forum and we were all glad to arrive just in time to partake of the seafood feast at the reception. After a long day on the road it was a great way to end the day, getting to see old friends and meet new ones and eat lots of delicious seafood.

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Seminars included Oceans of Data to Harvest, Green Marketing for Maine Lobster – MSC Certification, State of the Lobster Industry, Community Access to Groundfish: How to Win the Battle, What are the Effects of Climate Change on Maine’s Coastal Fishing Communities, and Zone C Lobster Hatchery, to name just a few. The seminars provided an opportunity for us to learn about the issues being faced by the industry in Maine and how they are dealing with them, and to share our knowledge and experience on the topics. MSC Certification was a session of particular interest as this is an issue we are also dealing with here in Atlantic Canada. In the session on Community Access, our fishermen were able to contribute their experience in dealing with community based management and quotas. The session on Climate Change was also one of particular interest and it was surprising to hear a few fishermen saying afterwards that, contrary to what most think, they do not believe climate change is a problem for the fishery. The seminars are always guaranteed to generate lots of discussion and exchange of opinions. In one of the sessions, one of the FSRS fishermen was able to provide clarification to correct some misconceptions about the Canadian lobster fishery. Through such dialogue, we are able to understand and learn from each other and benefit from each others experience.

The FSRS members also attended the trade show and found some great deals. I was also able to get a few items donated for the auction at the 2009 FSRS Annual Conference, including a lobster trap and sweatshirt from Brooks Trap Mill. The vans were stuffed to capacity on the ride home.

One of the purposes of the cross border collaboration the FSRS and GOMLF has established is to advance the Lobster Recruitment Project, known as the Ventless Trap Survey in Maine. The Forum provided an opportunity for Carl MacDonald to meet with Sara Ellis, the GOMLF biologist, to discuss the results of our respective projects, data analysis and data sharing. I had the opportunity to meet with Erin Pelletier and Patrice McCarron to start planning the next joint lobster science workshop to be held in February 2009 in Truro, NS. We look forward to hosting the group from Maine next year.



Front row left to right: Junior Risser, David Baker, Patty King and John Levy.

Back row left to right: Bill Bond, John Lavers, Garnet Heisler, Randy Boutilier, Bob Henneberry, Hughie Boutilier, Carl MacDonald and Eugene O'Leary

For information on the 34th Annual Maine Fishermen’s Forum, to be held March 6 – 8, 2009, check out <http://www.mainefishermensforum.org/>. The website also has information, articles and photos from past Forums.

FISHERMEN'S PARTICIPATION ENCOURAGED IN THE REGIONAL ADVISORY PROCESS

By Blair Cabot, Fisheries Technician, FSRS

The DFO's Regional Advisory Process (RAP) was implemented in 1994 as a means to increase both the accuracy and transparency of stock assessments. Since then, it has evolved as a medium to provide advice on various topics, such as habitat, aquaculture, and ecosystem management.

The goal of the RAP is to provide science input from a wide variety of sources, including the traditional knowledge of individuals, including that of fishermen. Review of scientific data must be analyzed and discussed by the participants to allow for different interpretations to be resolved before moving on to matters of conservation and management.

Participants are not meant to attend just to be informed about conclusions on scientific questions or stock assessments. Meetings are designed to be a forum where information can be challenged and discussed to provide the highest level of quality control. Participants are not representatives of any interest group but are present as informed individuals and everyone has equal stature at the table.

To maximize the efficiency of the RAP, the number of members is workable. External participation is by invitation only. The exact mix of individuals present varies depending on the agenda of the meeting. If you would like more information on the Regional Advisory Process, please contact Valerie Myra at the Bedford Institute of Oceanography at (902) 426-7070 or visit the web site www.dfo-mpo.gc.ca/80/csas/csas/Process-Processus/ExtPart-PartExt/Ext-Part-RAP_e.htm.

FSRS WELCOMES SUMMER STUDENT

By Miriam Morgan, Assistant Data Analyst, FSRS

Hello everyone, my name is Miriam Morgan and I'm working this summer as an Assistant Data Analyst for the FSRS. I have just finished my 2nd year at Dalhousie University and am pursuing a Bachelor of Science Co-op degree in Marine Biology. Marine biology and marine conservation has always been a strong interest and passion of mine, instilled mostly through growing up in beautiful Lunenburg County, as well as through scuba diving, for which I obtained certification at the age of 12. I am excited for the many experiences that lie ahead this summer of 2008 and am looking forward to working with the FSRS.

Do we have your current address?

If your mailing or e-mail address has changed recently please send us your current address so that you are ensured uninterrupted delivery of the
Hook, Line and Thinker.

We can be reached through our website at www.fsrs.ns.ca or
email: chrispm@eastlink.ca, fax: 902-876-1320 or
telephone: 902-876-1160.

VENTLESS TRAP SURVEY

2007 REPORT TO MAINE DEPARTMENT OF MARINE RESOURCES

By Sara Ellis and Erin Pelletier, GOMLF

Overview

The Gulf of Maine Lobster Foundation (GOMLF) continued The Ventless Trap Survey for its eighth successful year in 2007, with funding from Maine's Lobster Advisory Council (LAC). The Ventless Trap Survey (VenTS) is a trap-based, fishery-independent sampling program conducted by lobstermen to monitor the abundance and size structure of juvenile lobsters year-round in the Gulf of Maine. Continued participation by lobstermen is important in order to determine if the abundance of sub-legal lobsters in various locations are increasing or decreasing over time.

Data collected through a Canadian counterpart of VenTS has been used to derive fishing exploitation rates in Canada and in Canadian lobster stock assessments. We believe VenTS could be used to assist in developing indices of recruitment for use in predicting fishery landings, and as a data input into US lobster assessment models to improve stock assessment.

2007 Update

In 2007, there were 23 fishermen participating in the project, of whom 21 are from Maine. These fishermen are spread throughout Maine in all seven lobster management zones, with 1 in Zone A, 3 in Zone B, 2 in Zone C, 3 in Zone D, 1 in Zone E, 6 in Zone F, and 5 in Zone G. This was the first time since 2004 that we had participants in Zone E. We will continue to try to reach our goal of having several lobstermen participating in each zone.

We have 2 active participants in Massachusetts. Each participant fishes in a different part of the Cape Cod area. Massachusetts participants use the same survey protocol as in Maine, so that all data will be comparable. The GOMLF is committed to working with industry to increase participation in the project.

We have entered all the data into the database from logbooks collected so far, and conducted preliminary analyses on more than 8,300 lobsters caught in 2007. Only a few 2007 logbooks are outstanding. We will continue to analyze the data and send out reports to each participant before summer 2008.

US/Canada Collaboration

The GOMLF and Fishermen and Scientists Research Society (FSRS) continue to collaborate on this bi-national US-Canada project. The GOMLF and FSRS communicate through conference calls to analyze the protocol for data collection, trap design and data management. The GOMLF remains on the FSRS' data management committee to assist with this endeavor.

In March 2008 FSRS brought 10 ventless trap participants and two scientists from Canada to the Maine Fishermen's Forum, with help from GOMLF via a grant from Darden Restaurants Foundation. This was an opportunity for lobstermen from both sides of the border to compare notes and to build camaraderie among the VenTS participants.

Results

To date, more than 69 US lobstermen have participated in VenTS contributing more than 7,700 trap hauls comprised of 2,711 ventless, 1,280 standardized ventless and 2,714 control traps. More than 69,100 lobsters have been sexed and measured, of which more than 62,000 were sub-legal lobsters.

Over the study period, most lobsters (43,443) have been caught in the lobstermen's ventless traps, compared with 17,905 caught in the standardized ventless traps, as these were not introduced until 2004. Only 7,774 lobsters were caught in the control traps.

Table 1. Level of participation, effort and catch in VenTS, 2000-2007.

Year	# Participants	# Trap Hauls	# Lobsters
2000	34	1,766	19,398
2001	11	747	6,062
2002	7	196	1,845
2003	7	283	2,635
2004	25	1,361	11,534
2005	18	1,113	8,624
2006	20	1,239	10,634
2007	23	1,021*	8,372*
Total	69 individuals	7,712	69,104

* more data to come

Both the standardized ventless and individual's ventless traps are effective at capturing and retaining juvenile lobsters. The mean sub-legal component of the catch in control traps was 1.5 lobsters/trap compared with 10.1 in standardized ventless traps and 13.3 in ventless traps. Catch per trap haul (CPTH) of legal size lobsters shows the inverse relationship, with control traps catching on average 0.97 lobsters/trap and standardized traps only 0.56 legal lobsters/trap.

Data from both types of ventless traps from 2000-2007 were used to look at the relative number of sub-legal lobsters by trap haul. The overall trend in sub-legal lobsters decreased from 2000 to 2005, with a slight upward trend in 2006. This trend did not however continue upward in 2007. The ventless catch per trap haul in 2000 was 16.8 sublegal lobsters compared to 10.8 in 2005 and 12.5 in 2006, and 9.6 in 2007.

This was the second year in which we had sufficient data to compare inter-annual trends in ventless and standardized ventless traps. The 4-year time series from 2004-2007 shows that the two types of traps track the same trends very well. The one noticeable difference is that the average CPTH in ventless traps are usually higher than in the standardized ventless traps. This is likely due to the slightly smaller size of the standardized traps.

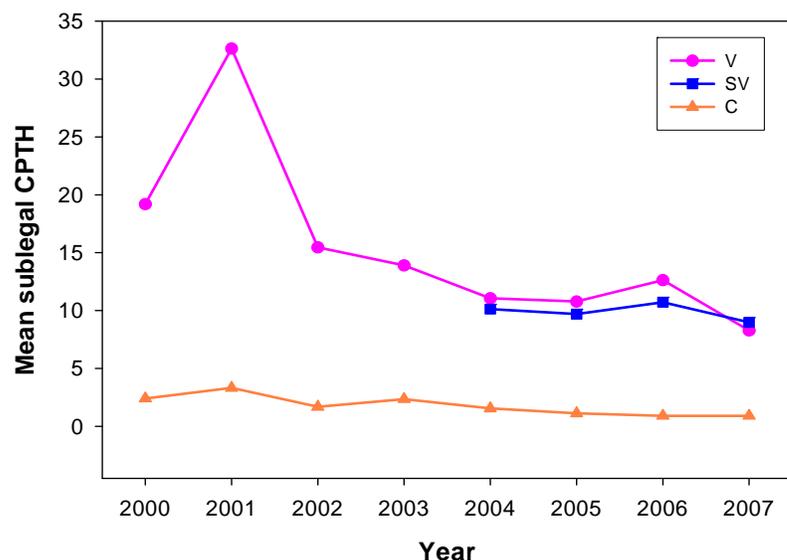


Figure 1. Inter-annual trend in catch per trap haul of sublegal lobsters in Standardized Ventless, Ventless, and Control traps, 2000-2007. All data from ME, NH and MA are combined (n = 69,104 lobsters and 7,712 trap hauls).

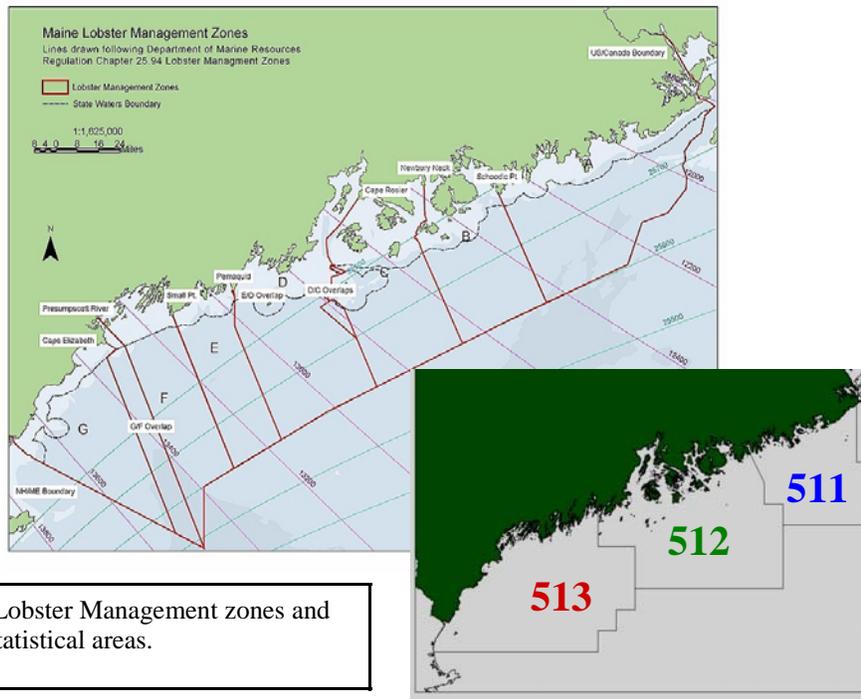


Figure 2. Maine Lobster Management zones and federal fisheries statistical areas.

Trends within Maine

Although we recognize that participation was not consistent between Maine lobster management zones over the study period, it is still possible to look for trends in juvenile abundance within and between zones (Figure 3). However, by grouping Maine data together according to statistical fisheries management areas (where statistical area 511 includes Zone A, 512 includes zones B, C, & D, and 513 includes zones E, F, and G), we were able to look for regional trends on a larger scale that is less affected by uneven participation. Most notable is the increase over time of sub-legal lobsters Down East from 2002 onward, with a concurrent decrease in sub-legal lobsters in mid-coast and southern Maine. It is important to note that these regional trends are similar to those that have been observed in other monitoring projects, such as DMR’s trawl survey and the New England Lobster Settlement Index (Wahle et al. 2006) (See Figure 4).

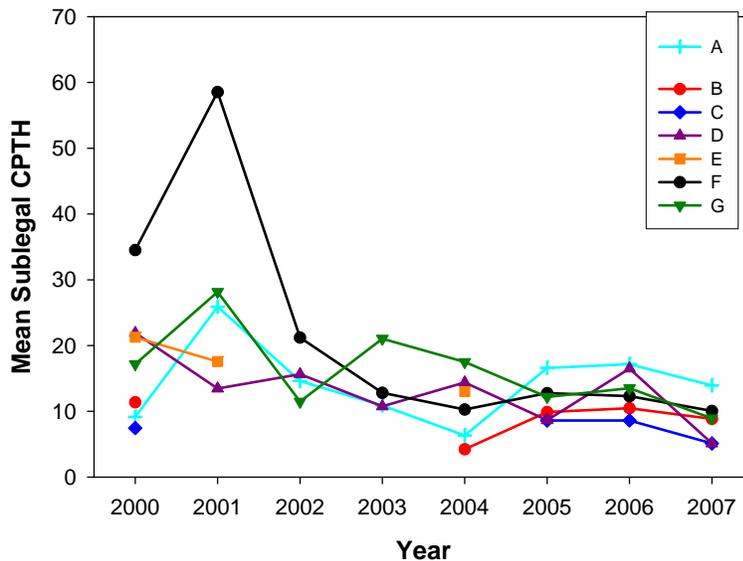


Figure 3. Inter-annual trend in catch of sublegal lobsters in Ventless traps, in Maine, by lobster management zone (n = 58,398 lobsters).

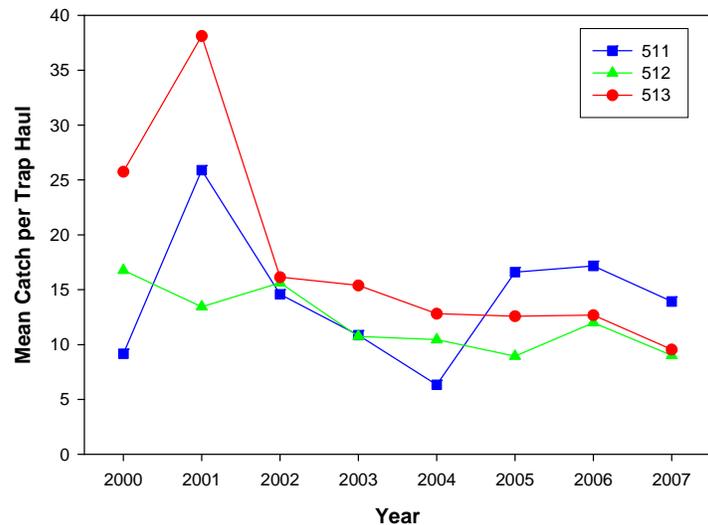


Figure 4. Inter-annual trend in catch of sublegal lobsters in Ventless traps, in Maine, by federal fisheries statistical area (n = 40,461 lobsters). Area 511 is Down East (Zone A), 512 Midcoast (zones B-D), and 513 is southern Maine (zones E-G).

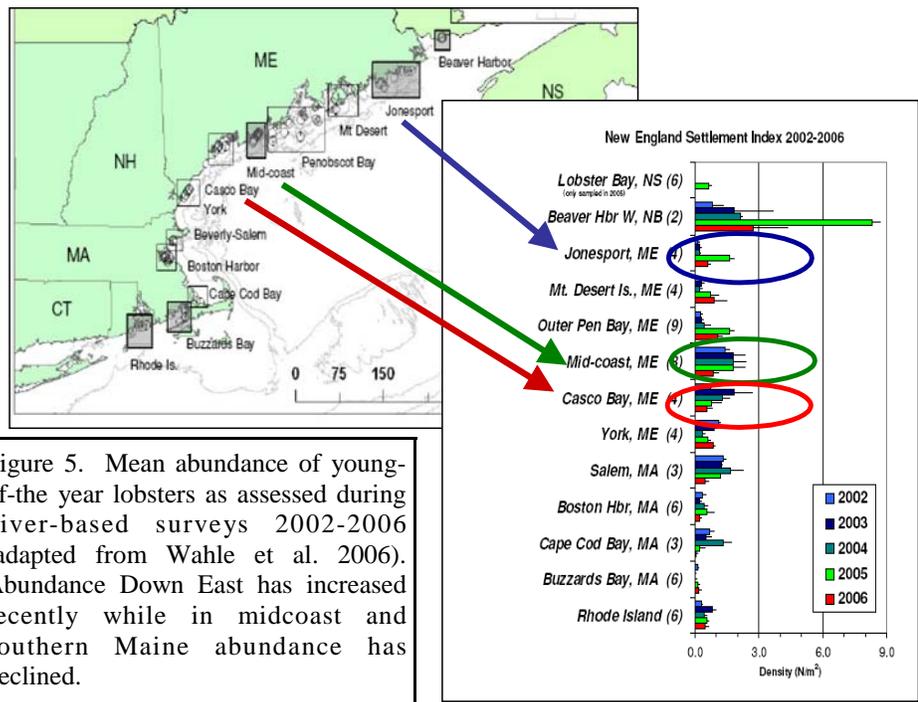


Figure 5. Mean abundance of young-of-the-year lobsters as assessed during diver-based surveys 2002-2006 (adapted from Wahle et al. 2006). Abundance Down East has increased recently while in midcoast and southern Maine abundance has declined.

Conclusions

Our 8-year time series supports patterns observed in other long-term monitoring projects. This indicates that VeNTS is serving well as one of several indicators that can be used to track trends in populations of pre-recruit lobster. The use of multiple indicators has been recommended by the Atlantic States Marine Fisheries Commission for improving lobster stock assessments.

In order to monitor trends in abundance, VeNTS is designed as a long-term program. We are grateful to the Maine’s Lobster Advisory Council for their ongoing support.

References

Wahle, R., C. Wilson, R. Glenn, P. Lawton, D. Robichaud, J. Tremblay. 2006. New England Lobster Settlement Index, Update 2006 - Testing New Tools.

NEW ENGLAND LOBSTER SETTLEMENT INDEX UPDATE 2007 - WIDENING COLLABORATIONS

Compiled by Richard Wahle (Bigelow Laboratory for Ocean Sciences)

Participants: MEDMR (C. Wilson), MADMF (R. Glenn), RIDFW (M. Gibson), DFO Canada (P. Lawton, D. Robichaud, Glyn Sharp, J. Tremblay), UNB (R. Rochette), Memorial Univ. (V. Burdett-Coutts, K. Jones), U. Mass. (P. Milligan), Guysborough Co. Inshore Fishermen's Assoc., NS (E. O'Leary), Fishermen and Scientists Research Society (P. King), IMR Norway (J. Knutsen)

As the New England Lobster Settlement Index nears its 20th year, it finds itself amidst a widening collaboration, raising the prospect of a larger geographic scope and leading us to wonder if the name "New England" still applies. With the long-standing diver-based suction sampling going strong, passive postlarval collectors are adding to the effort. With support from NOAA's Northeast Consortium to deploy collectors in New England, other US and Canadian collaborators have found the means to come on board and expand the coverage to span the lion's share of the American lobster's geographic range from Rhode Island to Newfoundland, if only for a few years. Collectors have also added a new dimension – depth – to the settlement picture, something not possible with the diver-based survey. This update reports the 2007 settlement patterns from

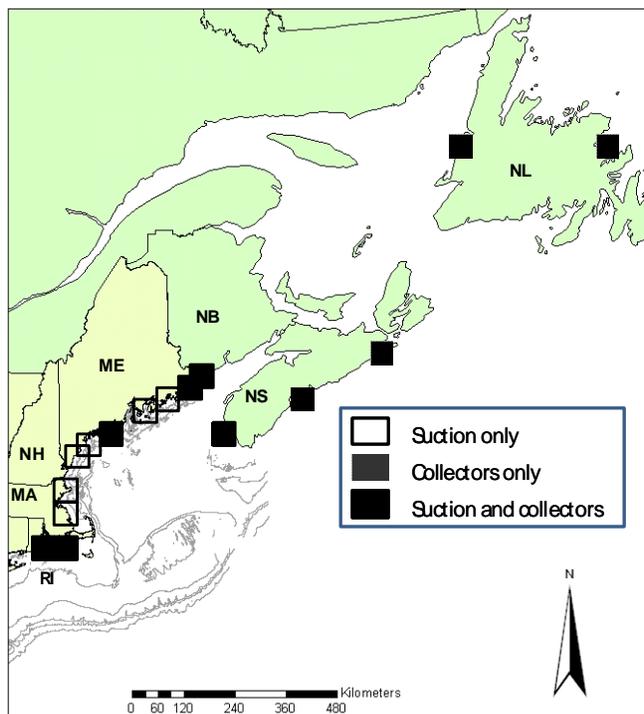


Figure 1. Sampling regions where lobster settlement data were collected in 2007 either by suction sampling, passive collector, or both. Initiated in Maine and Rhode Island in 1989-90, annual suction sampling spans some 65 sites from RI to New Brunswick. The addition of passive collectors to some of these, as well as new regions has considerably added spatial coverage. Boxes surround sites used for regional averages presented in Figs. 2, 3 and 4.

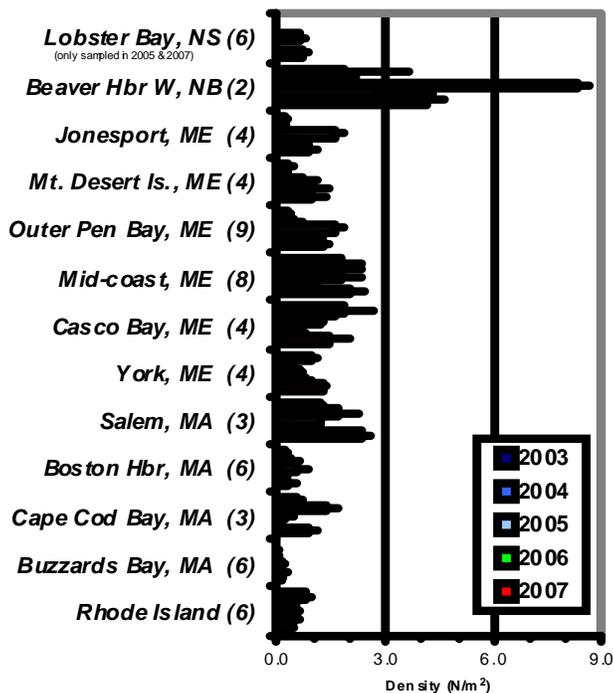


Figure 2. Suction sampling. Regional 5-year time series of average lobster settlement in New England, and southern New Brunswick and Nova Scotia from 2003 to 2007. Number of sites sampled per region in parentheses.

the long term suction sampling survey, as well as new results of the first widespread deployment of collectors.

2007 Suction Sampling: In the Gulf of Maine, this year was strong across the board with all regions from Cape Cod to the Bay of Fundy generally showing better settlement than in 2006. South of the Cape, however, settlement was slightly below the previous year. This continues the string of robust years we've seen since 2001 throughout the Gulf of Maine, and a trend of increasing settlement in recent years from Penobscot Bay eastward. These trends may come as encouraging news to harvesters in Maine who saw a considerable drop in landings in 2007.

Postlarval Collectors Open New Windows: In last year's update we described the successful test of a passive postlarval collector that could be used as an alternative to suction sampling to assess postlarval settlement where diving is not an option. Renewed support from NEC made possible an expanded two-

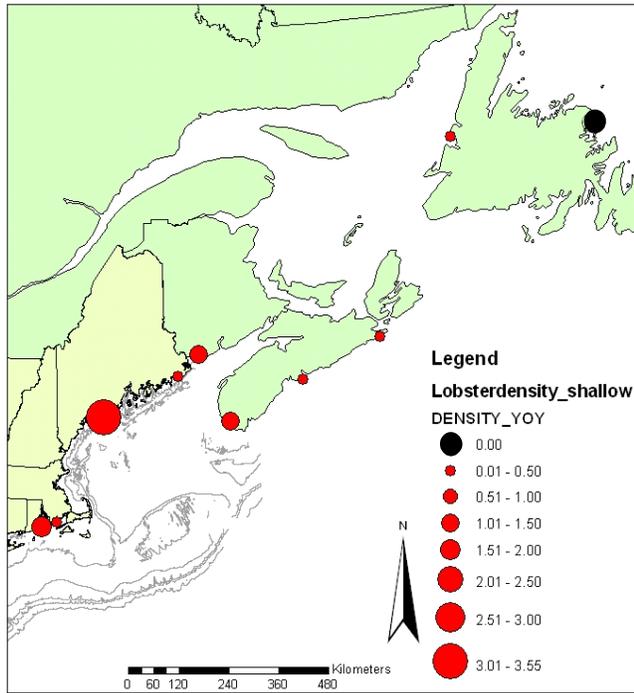


Figure 3. Collector data. Average densities of young-of-year lobsters found in collectors deployed only in the shallow depth stratum (7-18 m) in 2007. Circles represents a regional average of 1-3 sites with >10 collectors per site.

year project in Maine and Rhode Island. The surge of interest from other groups brought participation from Massachusetts, three Canadian Provinces (Fig.1), and even Norway (not shown), more than doubling the effort of the core project. The combined effort represents the largest scale synoptic view of American lobster settlement in a single season ever completed. Settlement was detected as far north as Bonne Bay, Newfoundland (Fig. 3).

The central objective of the New England-based NEC project was to evaluate depth-wise patterns of settlement in three regions of contrasting oceanography: the southern New England shelf, western-central Gulf of Maine, and eastern Gulf of Maine-Fundy regions (Fig. 4a).

Collaborating fishermen from Rhode Island (Skip O'Leary), mid-coast Maine (Matt Parkhurst), and eastern Maine (Norbert Lemieux) each deployed 100 collectors divided among three depths. This deployment revealed a depthwise pattern of settlement and older juvenile lobsters that mirrored the degree of water column thermal stratification. In summer-stratified southern New England and mid-coast Maine most settlement occurred in the shallowest strata, whereas in eastern Maine settlement spread more evenly over all depths (Fig. 4). We were surprised to find newly settled lobsters at depths as great as 80 meters in the Gulf of Maine, despite bone-chilling temperatures of 6-7°C where there would be little prospect for growth. The fate of those lobsters is uncertain.

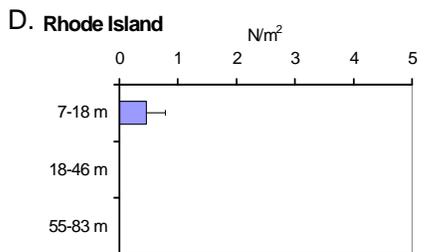
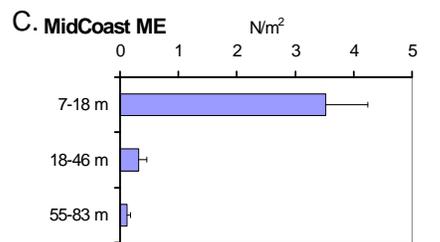
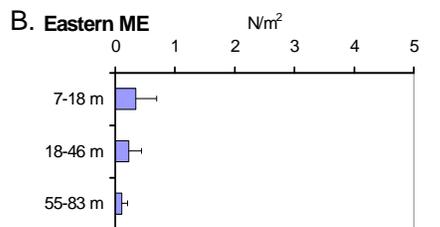
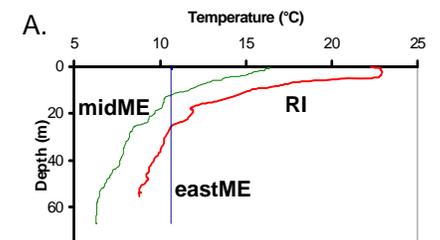


Figure 4. Depth-wise settlement. Temperature profiles in 3 thermally contrasting regions (a), and corresponding densities of young-of-year lobsters found in collectors in those regions by depth (b-c)..

All told, 2007 not only represents the largest survey yet, it also broke both depth and northern-extent records for reported American lobster settlement. As we enter the 2008 season new collaborators from Atlantic Canada aim to broaden the survey into the southern Gulf of St. Lawrence. And the Scandinavian participation (Norway and Sweden) may even give a first-ever glimpse of newly settled *Homarus gammarus*, the American lobster's European counterpart. That would be an historic event indeed!

DESCRIPTION OF THE IMR STANDARD LIGHT TRAP AND THE VERTICAL DISTRIBUTION OF SOME DECAPOD LARVAE (*HOMARUS* AND *NEPHROPS*)

By Vidar Øresland, Institute of Marine Research, Swedish Board of Fisheries

The following is the abstract for an article by Øresland, V. (in press, Dec. 2007). Description of the IMR standard light trap and the vertical distribution of some decapod larvae (*Homarus* and *Nephrops*). Western Indian Ocean Journal of Marine Science. ISSN: 0856-860X, Editor in Chief - Professor Alan Whittick, Memorial University, St. John's Nfld, Canada. Subscription info: secretary@wiomsa.org.

The traps (n=16) have been used also during 2007 and the sampling will hopefully continue during 2008. The 2007 results confirmed the 2006 results. In addition, crab larvae are investigated from 2007.

Key words: light trap, methods, *Homarus gammarus*, *Nephrops norvegicus*, larvae, vertical distribution

Abstract: The construction of different versions of a cheap, robust, and easy to operate light trap for catching various aquatic organisms is shown. The trap can be used to > 300 m depth and meets a number of criteria. Small-scale vertical distribution of decapod larvae was investigated during trap trials. The traps (6-10) were set for 24 h at different depths, once a week, between 25 July and 28 September 2006, within the Kåvra lobster reserve at the Swedish west coast. This is an area with low salinity in the surface water during summer due to outflow of water from the Baltic Sea. The larvae of the European lobster *Homarus gammarus* (stage I) and Norway lobster *Nephrops norvegicus* (stages I-III) were found within and below the thermo- and haloclines. No larvae were found within the upper 2 m. This finding may have important bearings on the larval transport by currents and increase the possibility for retention of larvae, but was not tested in this study. The highest catches of both *H. gammarus* and *N. norvegicus* were obtained during August. The trap appears to be well suited for investigating small-scale vertical distribution during the dark period, and for collecting animals in good condition. However, the trap did not catch all larval stages, and the relation between light intensity (both natural and trap light) and catch ability is unknown.

Copies of the complete article are available from Vidar Øresland, Institute of Marine Research, Swedish Board of Fisheries, Box 4, SE-453 21 Lysekil, Sweden, E-mail: vidar.oresland@fiskeriverket.se or by contacting secretary@wiomsa.org.

NEW FSRS FISHERIES TECHNICIAN FOR THE YARMOUTH AREA

By Eric Branton, Fisheries Technician, FSRS

My name is Eric Branton and I would like to introduce myself as a new member of the FSRS team. I grew up in Dartmouth, Nova Scotia. After high school I went to Dalhousie University in Halifax, Nova Scotia, and I finished with a honours degree in biology. Following university I worked for a professor at Dalhousie on different field projects in Kejimikujik National Park, and then I worked for the Department of Fisheries and Oceans as a lab technician on off-shore clams. I have recently returned to Nova Scotia after living for nine months in Gaspé, Quebec studying French.

I will be working as the FSRS Fisheries Technician for the Yarmouth area. I have only visited Yarmouth a few times in the past and I am excited to be living there and working for the FSRS, in partnership with the AVC Lobster Science Centre on the LFAs 33/34 Lobster Moulting and Quality Project, and on other lobster research initiatives.

MFU LAUNCHES CLEAN OCEANS PROJECT

The Maritime Fishermen's Union (MFU), as part of their efforts to promote conservation and enhancement of fish stocks and the marine environment, have launched a Clean Oceans initiative. The project includes a research component on environmental stewardship, currently being developed, and a public awareness campaign. The public awareness campaign includes distribution of posters, an example of which is shown below, and brochures. To obtain more information on the MFU's Clean Oceans Initiative or to obtain copies of the posters and brochures go to <http://www.mfu-upm.com/english/index.cfm?id=193> or contact the MFU at 506-532-2485 or Ruth Innes at 902-961-3038.



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63 STUDENTS RECEIVE FSRS OCEANS 11 PROGRAM AWARD FOR OUTSTANDING ACHIEVEMENT

Sixty-three students from Oceans 11 classes throughout Nova Scotia received the eighth annual Fishermen and Scientists Research Society Award for Outstanding Achievement in the Oceans 11 Program. Twenty of these students received their awards at a ceremony held at the Bedford Institute of Oceanography, as part of the Oceans Day celebrations. Each student was presented with their award and given a tour of the facilities by friendly and well trained tour guides. This annual award recognizes students, nominated by their teachers, who have demonstrated outstanding accomplishments in their Oceans 11 class, including level of interest, participation and contribution to the class, along with scholastic achievement. The Oceans 11 Program is a science program for grade 11 students, offering them the opportunity to learn about a wide range of marine science topics, including biology, oceanography, fisheries science and fisheries management.

Established in January 1994, the Fishermen and Scientists Research Society (FSRS) is a non-profit organization which is an active partnership between fishermen and scientists. The FSRS was developed with the overall objectives to establish and maintain a network of fishermen and scientists capable of conducting collaborative research and collecting information relevant and necessary to the long-term sustainability of marine fisheries, and to promote effective communication between fishermen, scientists and the general public. The current membership consists of 398 members. As the name suggests, the FSRS members are predominantly either fishermen or scientists who study the fisheries resources and the marine systems on which they depend. Other members include social scientists, educators and interested citizens. The prime requirements for becoming a member are an interest in the goals of the FSRS and a willingness to contribute towards them.

The FSRS works towards achieving the first objective in two related ways. First, members conduct science projects. These involve field collections of data, samples and specimens, and laboratory processing and analysis by FSRS technicians, interns and members. The data produced by FSRS projects have been used in stock assessments and marine mapping of fisheries resources, and published results have appeared in the primary scientific literature. The second way the FSRS seeks to improve the long-term prospects for our fisheries is through education, or more properly, co-education. Both the fishermen and scientist members have a wealth of knowledge about fisheries resources and the ocean. They certainly do not express it the same way but, more importantly it is not the same knowledge. When these two groups have put their heads together, learned each other's way of describing what they know, and pooled their knowledge, strong new insights have emerged.

As previously mentioned, one of the FSRS's primary objectives is also to facilitate and promote effective communication between fishermen, scientists, and the general public. With a view to advancing communication between these stakeholders and increasing fishermen's participation in fisheries science, the FSRS has undertaken a number of initiatives since its inception, including a quarterly newsletter, an annual conference and workshops, and a web site. Promoting communication and education also includes supporting initiatives such as the Oceans 11 Program, which is educating the future stakeholders of this industry, the future scientists and fishermen.

The FSRS implemented the Oceans 11 Achievement Award to recognize the efforts of others that work towards the goals they share with the FSRS. The development of the Oceans 11 program in our schools is clearly such an effort, and the achievements of students in the program are worthy of recognition.

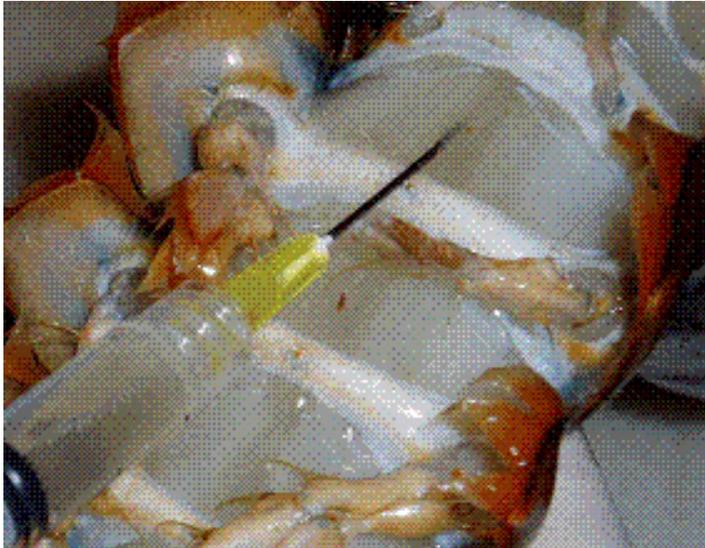
The FSRS congratulates the following students who received the award:

School	Student	Student
Advocate District School	Cindy Fletcher	
Auburn Drive High School	Tasha MacDonald	James White
Avon View High School	Adam S. Noade	
Bridgewater Junior Senior High School	Stephanie Bateman	
Cabot Jr./Sr. High School	Ricky Buchanan	
Canso Academy	Candace Haines	
Chignecto-Central Adult High School	Richard Martin	
Citadel High School	Christine Campbell	Peter Dietrich
Citadel High School	Maria Saikali	Laura Wright
Cobequid Education Center	Joshua Adams	Caitlin Congdon
	Travis Flewelling	Tessa McLaughlin
	Nadine Samson	Matthew Toole
	Joseph Trevors	
Cole Harbour District High School	Brandon Austin	Nick Barkhouse
	Kelsey Cuvelier	Chantall Langhorn
	Nick Leadbetter	Emily MacPhail
	Emily Robinson	Mitchell Robinson
Dartmouth High School	Shayne Anthony Jewers	Emily Young-Cantwell
Digby Regional High School	Jenna Cromwell	Samantha Lewis
	Jonnie White	
East Antigonish Academy	Katrina Nevin	
Forest Heights Community School	Jessica Jones	
Glace Bay High	Johnathan Dedrick	Adam Jamieson
	Steven MacIntosh	Conor MacLeod
	Chelsea Moore	Daniel Oldford
Halifax West High School	Brittany	Findlay
Highbury Education Centre	Nicole	Hawley
Memorial High School	Nolan Capstick	Meggan Howatson
	Stephen Leblanc	Santanya MacKinnon
	Randy White	
Middleton Regional High School	Myles Cloutier	Evanya Coleman
	Paul Khemapukpong	Amy Spurr
North Nova Education Centre	Kirsten Campbell	James Dean
	Brandon MacDonald	Matt Saunders
	Sara Swallow	
Riverview Rural High	Athea Costello	Tyson Hill
	Jessica MacDonald	Stephen Nash
Sackville High School	Alysha Wellon	
South Colchester Academy	Lindsay Flynn	
Strait Area Education Recreation Center (SAERC)	Johnathan Norman Stockley	

MOULT & QUALITY: 2ND PHASE BEGUN

By Brad Bernard, Field Technician, AVCLSC

The second phase of the Moulting & Quality project has begun with successful sampling trips to Howard's Cove, PE and Port Latour, NS. On these trips data such as Carapace length, sex, shell hardness, pleopod staging, Brix indices, collection of hemolymph, and plasma samples were completed. The results of these trips, along with others, will help set a baseline of lobster health in the region going forward. It will also be used in genetic and biochemical research projects throughout the region and abroad. I would like to extend thanks to Mr. Shawn Cook and crew of the Sea Prowler in Howard's Cove and as well the crew of the Little Lady in Port Latour.



A syringe and needle are used to collect lobster blood which can then be examined with a refractometer to measure the protein levels. *Photo courtesy of AVCLSC.*



Moult staging is assessed by clipping the tip of a swimmeret and examining it under a microscope. This procedure does not hurt the lobster. *Photo courtesy of AVCLSC.*

SAMPLE COLLECTION: BIOCHEMISTRY PANELS

By Andrea Battison, Research Scientist, AVCLSC

Biochemistry Panels Sample collection for the Biochemistry Panel component of the Atlantic Lobster Moulting and Quality (ALMQ) project has begun. The Biochemistry component will document the changes in a variety of parameters in lobster hemolymph (blood) that occur over the course of the year. Determining what is 'normal' will help us with our studies of different lobster diseases. AVCLSC technicians, Brad Bernard and Adam Acorn, went out with samplers collecting data for the SW Nova Scotia Moulting & Quality program in LFA 33 in October 2007 and resumed sample collection when the fishing season opened in November/December. With assistance from a local fisherman, we were also able to collect our first set of data from lobsters in the Northumberland Strait (LFA 25). The hemolymph samples are analyzed in the Diagnostic Services laboratory at the Atlantic Veterinary College in a manner similar to blood samples from dogs, cats, rabbits, and other animals. A small subgroup of the hemolymph samples were also sent to our collaborator Dr. Ernie Chang at the University of California Davis, at the Bodega Marine Laboratory, for measurement of crustacean hyperglycemic hormone (CHH) levels. CHH is involved in regulation of hemolymph glucose ('blood sugar') levels and is being investigated for its role as a 'stress hormone' in crustaceans such as the American lobster.



LFA'S 33/34 LOBSTER MOULT TIMING & QUALITY MONITORING PROJECT

AVCLSC

Background and Rational

Southwest Nova Scotia generally produces high quality lobster. During the 2003/2004 season, variations in lobster quality (soft-shell and low meat yield) created an economic challenge. Understanding the factors that control the variation of lobster quality is vital to the sustainability and health of the lobster industry. To better understand the variation in lobster quality, continuous & annual sampling is required. Lobster quality is directly related to moult timing; a certain period is needed after the moult to allow lobster to harden and reach top market quality. Since the summer of 2004, lobster harvesters, buyers, dealers, processors and scientists have all been working together in developing this collaborative research program designed to document and understand the annual changes in moult timing and lobster quality in LFA's 33/34.

Project Goals

Lobster moult timing is related to temperature, diet and other ecosystem factors. Collecting biological information will allow for the investigation of the reasons why lobster quality has been reduced. The Lobster Moult Timing & Quality Monitoring project provides a new focus and resource to the lobster fishery by building on knowledge and capacity developed during previous years of research at the AVC Lobster Science Centre. The ultimate goal of the project is to expand ongoing sampling infrastructure for LFA's 33 and 34. The accumulated information from this ongoing monitoring program will be used to build predictive models for landed lobster quality based on environmental data along with historical data.

What Are We Doing?

Monitoring of lobster blood protein levels, shell hardness and moult stage has now been ongoing since the summer 2004 with pre-season, during and post-season sampling. The monitoring currently includes 18 areas in LFA's 33/34 with close to 56,000 lobsters sampled as of April 2008. The information collected for this project is available on the Internet and allows people to look at lobster sex, size, blood protein, moult stage and shell hardness by location or dates (www.lobsterscience.ca/moult). For each sample, approximately 200 lobsters are selected, when available. Each lobster is sexed, measured, assessed for shell hardness and moult cycle, while blood is examined for total protein levels. Additionally, lobsters are assessed for shell disease lesions and available environmental data (bottom water temperatures, depth and sea surface water temperatures, etc.) are being investigated for potential correlations with other parameters collected.

What Have We Found So Far?

- Lobsters in deeper waters have a delayed moult cycle relative to shallow water lobsters with water temperature having a significant influence on this relationship.
- The sexes differ in their moulting pattern throughout the year, but this is less pronounced than differences observed between deep and shallow areas.
- Moult-timing is also influenced by lobster size with small (<82.5mm) lobsters moulting later and less inclined to moult in unison than large lobsters.
- Water temperatures in the spring of 2005 and 2006 warmed more quickly than in 2004 resulting in a relatively early moult that year.

For more information contact:

AVC Lobster Science Centre, UPEI, Charlottetown, PEI

Email: lobster@upe.ca www.lobsterscience.ca/moult



BEACHCOMBING - What's New in The News

EFFECTS OF POST-TROPICAL STORM NOEL ON THE ATLANTIC COASTLINE OF NOVA SCOTIA

A summary of the shore surveys and analysis of the impacts of post-tropical storm Noel (November 2007) on the Atlantic coastline of Nova Scotia is available on the Coast web site of the Geological Survey of Canada, Natural Resources Canada - http://gsc.nrcan.gc.ca/coast/storms/noel/index_e.php.

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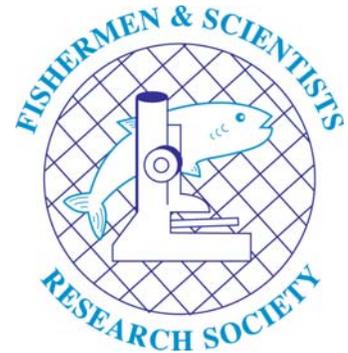
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FISHERMEN AND SCIENTISTS RESEARCH SOCIETY

P.O. Box 25125
Halifax, NS B3M 4H4

Phone: (902) 876-1160 Fax: (902) 876-1320
E-Mail: pmdservices@eastlink.ca
Web Site: www.fsrs.ns.ca

Editor: PMD Services - Christine MacKenzie and
Patty King

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UPCOMING EVENTS

**Fishermen and Scientists Research
Society
16th Annual Conference**

February 20-21, 2009

**International Council for the
Exploration of the Sea (ICES)
2008 Annual Science Conference**

**22-26 September 2008
Halifax, Nova Scotia, Canada**

**For more information:
<http://www.ices.dk/iceswork/asc/2008/index.asp>**