
HOOK, LINE AND THINKER

The Newsletter of the Fishermen and Scientists Research Society

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Winter 2011

2010 4VSW SENTINEL MONITORING PROGRAM UPDATE

By Shannon Scott-Tibbetts, Research Biologist, FSRS

On September 1, 2010 three longline fishing vessels contracted by the Fishermen and Scientists Research Society (FSRS) began the 2010 4VsW Sentinel Survey, a groundfish survey executed fully by the fishermen themselves. The fishermen surveyed 53 predetermined stratified random stations. The 4VsW monitoring program area encompasses the inshore waters from Sambro to Canso and the offshore waters including Emerald and Western Banks (Figure1). This year there were eight additional sets done in stratum 467; one of the captains had expressed interest in expanding the survey further to the east. The extra money was available in the budget for the Sentinel Program and so it was agreed to allow the expansion for this year to see the catch results.

Following the 4VsW Survey protocols, the longline fishermen set 1500 number 12 circle hooks baited with mackerel. The fishermen gathered all the scientific fisheries information themselves, as well as oceanographic information via the use of CTD's and minilog temperature recorders. The fishermen must record where they set their gear, how long the gear fished, and number of hooks that were snarled, if any. They also record all species caught on the hooks, the number and weight of each species caught, and the length, sex, and stage of sexual maturity of the fish. The fishermen also remove the fish otoliths (used to age the fish) and remove the fish stomach if there are contents inside. All this work is completed by the fishermen on relatively small fishing vessels, 35 to 50 feet in length. Over the last decade, the survey has been executed to perfection. The fishermen deserve a great deal of credit. Table 1 shows the three longliners employed to survey the chosen strata in the 2010 4VsW Sentinel Monitoring Project (Table 1).

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2010 Sentinel Surveys Station Locations

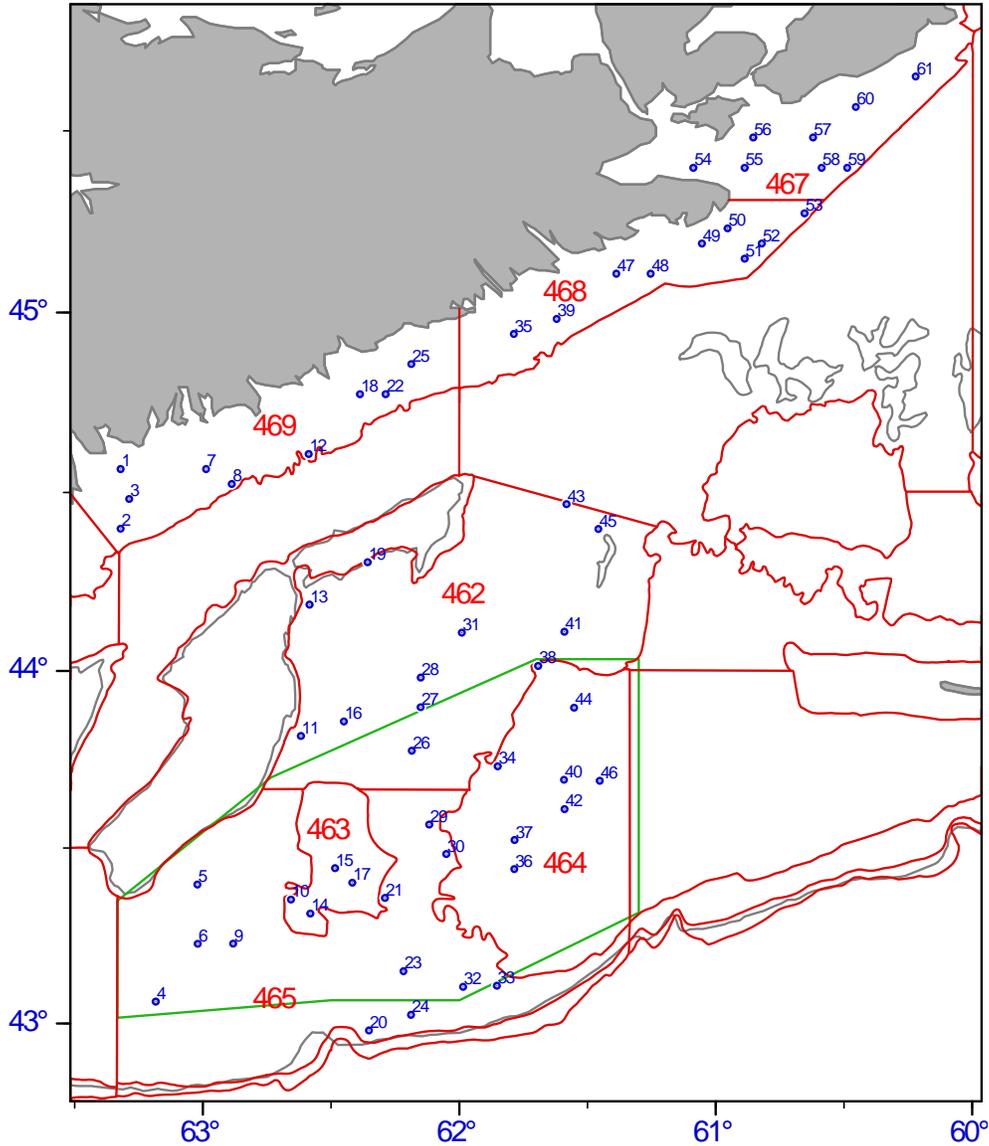


Figure 1: 2010 Map of 4VsW Sentinel Monitoring program stations

Table I: 2010 Sentinel Survey Participants.

Randy Boutilier	Jeff & Troy
Jerry Creamer	Darcy Dean
Ricky Jewers*	Scotty N Sisters

*Ricky’s crew members completed the assigned stations

Preliminary analysis of the 2010 catch results compared to last year’s indicated cod and haddock in the areas surveyed showed some changes. **There was a decrease in both the haddock and cod catches.** The catch for cod and haddock in 2009 was 4363 lbs and 3094 lbs respectively, compared to 2099 lbs for cod

and 1903 lbs for haddock in 2010. Participants caught a large number of barndoor skates, 176 in total number or 2333 pounds. This year, the fishermen kept the barndoor skates and brought them into shore, as it was requested from DFO for more detailed examination.

Table II includes the catch data from all sentinel sets completed in 2010. Kept weights and discarded weights are in round pounds. Total numbers of fish captured are the sum of the kept and discarded fish. Only dogfish, sculpins, skate, invertebrates and halibut are allowed to be discarded. Commercial groundfish (cod, haddock, White hake, pollock, cusk, and redfish) which were badly damaged by seals, dogfish or sand fleas, i.e. no tail or no head, were discarded and weights estimated by finding the average weight of that species for that set. Sentinel participants collected 533 otoliths from cod, haddock and White hake and also collected 76 stomachs from the original 53 stations for analysis in the lab. Looking at the extra sets done in stratum 467, only a few species were caught with only 76 lbs of cod retained (44 fish). From these fish, 13 otoliths and 18 stomachs were obtained.

Table II. 2010 4VsW Sentinel Monitoring Project Catch Results from all 53 Stations.

Species	Kept Weight (lbs)	Discard Weight (lbs)	Number caught
Cod	2099.5	7	763
Haddock	1903	4	1021
Cusk	55		12
Barndoor Skate	2333	56	176
Halibut		1047	56
White Hake	1257	54	459
Winter Skate		161	18
Thorny Skate		291	40
Atlantic Wolfish	2	17	8
Spiny Dogfish		7	2
Pollock	18	2	5
Silver Hake		6	6
Red Hake		373	348
Blue Shark		320	5
Mako Shark		120	1
Porbeagle Shark		455	3
Monkfish	237	3	39
Longhorn Sculpin		97	64
Spotted Wolfish		2	1
Redfish		3	3
Hagfish		1	1

Species	Kept Weight (lbs)	Discard Weight (lbs)	Number caught
Wrymouth			1
Sea Raven			3
Tile fish	10		1
Lobster		13	2
Jonah Crab		2	2
Snow Crab		11	8
Rock Crab		1	1
	28	7914.5	3057
			3048

We thank, as always, the Sentinel captains and crew for the excellent scientific work that they provide each year. They help make the 4VsW Sentinel Program a success.



ESIP FACT SHEETS RELEASED

On January 6, 2011, the Gulf of Maine Council's EcoSystem Indicator Partnership (ESIP) announced the release the first of seven indicator-specific fact sheets. The **Aquaculture Indicators Fact Sheet** was created through the combined efforts of the aquaculture subcommittee, data providers, design team and ESIP Steering Committee.

This fact sheet provides an introduction to the aquaculture indicators selected by ESIP – economic value of aquaculture and acres of permitted aquaculture - and a snap shot of the indicator data. The data is also available through the on-line ESIP Indicator Reporting Tool (www2.gulfofmaine.org/esip/reporting) where it can be mapped with other indicator data or graphed to show trends.

ESIP released a second fact sheet on February 28, 2011. This **Climate Change Indicators Fact Sheet** looks at climate change in the Gulf of Maine by summarizing data from around the Gulf of Maine for three key indicators - sea level, air temperature and precipitation - to show how the climate in the region has been changing over recent decades.

This fact sheet is intended to introduce the concept of indicators for tracking change and to demonstrate their value in better understanding the wide-ranging effects being seen in the region. The fact sheet also provides local examples on how this climate change data can be accessed and how it might be used for planning and decision-making purposes.

The ESIP Fact Sheets and additional information on ESIP and indicators are available at www2.gulfofmaine.org/esip.

NEW TO THE FSRS LIBRARY

Volume 27, Number 10, October 2010. Atlantic Fisherman, Off the Hook.

Volume 27, Number 11, November 2010. Atlantic Fisherman, Off the Hook.

Vol. 6, Issue 1 & 2, June/Sept. 2010. Netawek Ikjium, Voices of the Ocean.

Fall 2010. Tidings, Gulf of Maine Research Institute Newsletter.

Annual Report 2009/10. Marine Stewardship Council.

Canada's Oceans - Research, Management and the Human Dimension. OMRN 2009 National Conference, Post Conference Synthesis

Stewards of the Sea; Building Fisheries for the Future / Understanding Your Markets - The Canadian Council of Professional Fish Harvesters (DVD)

Atlantic Fisherman: Off The Hook - Volume 27, Number 12, December 2010



Publication links now on our web site:

Publications page, <http://www.fsrs.ns.ca/fsrs/publications.html>:

At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index (Canadian Technical Report 2890)

Ocean Tracking Network (OTN) as a Fisheries Research Tool – full report

Ocean Tracking Network (OTN) as a Fisheries Research Tool – summary report

Inshore Ecosystem Project page, http://fsrs.ns.ca/projects/inshore_research.html:

At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index (Canadian Technical Report 2890)

SATELLITE TAGGING UNCOVERS SURPRISING BIRTHING GROUND OF PORBEAGLE SHARKS

Feature Article by Fisheries and Oceans Canada (You can subscribe to receive regular Science Feature Stories from Fisheries and Oceans Canada by emailing your request to: sciencebulletin@dfo-mpo.gc.ca). For additional Science Feature Stories, please visit the Fisheries and Oceans Canada web site at: <http://www.dfo-mpo.gc.ca/science/publications/article/index-eng.asp>".

Over the past 15 years, researchers at DFO's Bedford Institute of Oceanography (BIO) have been unraveling the life history of porbeagle sharks, a smaller relative of the great white and mako shark and one of 19 species of sharks that roam Canada's east coast waters. Until recently, however, a critical piece of knowledge remained a mystery: where exactly do porbeagles give birth? Little is known about the birthing grounds of most of the world's large sharks, yet information about this critical life stage can aid efforts to rebuild depleted stocks. Recent research led by Dr. Steven Campana of BIO has uncovered some surprising and unique findings about porbeagles, including where they give birth.

Rebuilding depleted porbeagle stocks

The porbeagle has been fished off of Canada's east coast since the 1960s, when overfishing by foreign fishermen depleted the stock by 80 percent in a mere six years. In recent years, collaborative efforts by DFO and the Canadian shark fishing industry, including strict catch quotas and management, have enabled the stock to rebuild. Porbeagle mating grounds have also been closed to shark fishing. However, several nations fish for porbeagles outside of Canada's 200-mile exclusive economic zone (EEZ) and the species is unregulated in international waters.

"We needed to find the birthing ground of porbeagles to determine whether or not it requires protection," says Dr. Campana. "There was concern that if the birthing ground happened to be in a heavily fished area or an area outside of Canadian management control, the population could potentially be wiped out without being able to do anything about or even knowing about it."

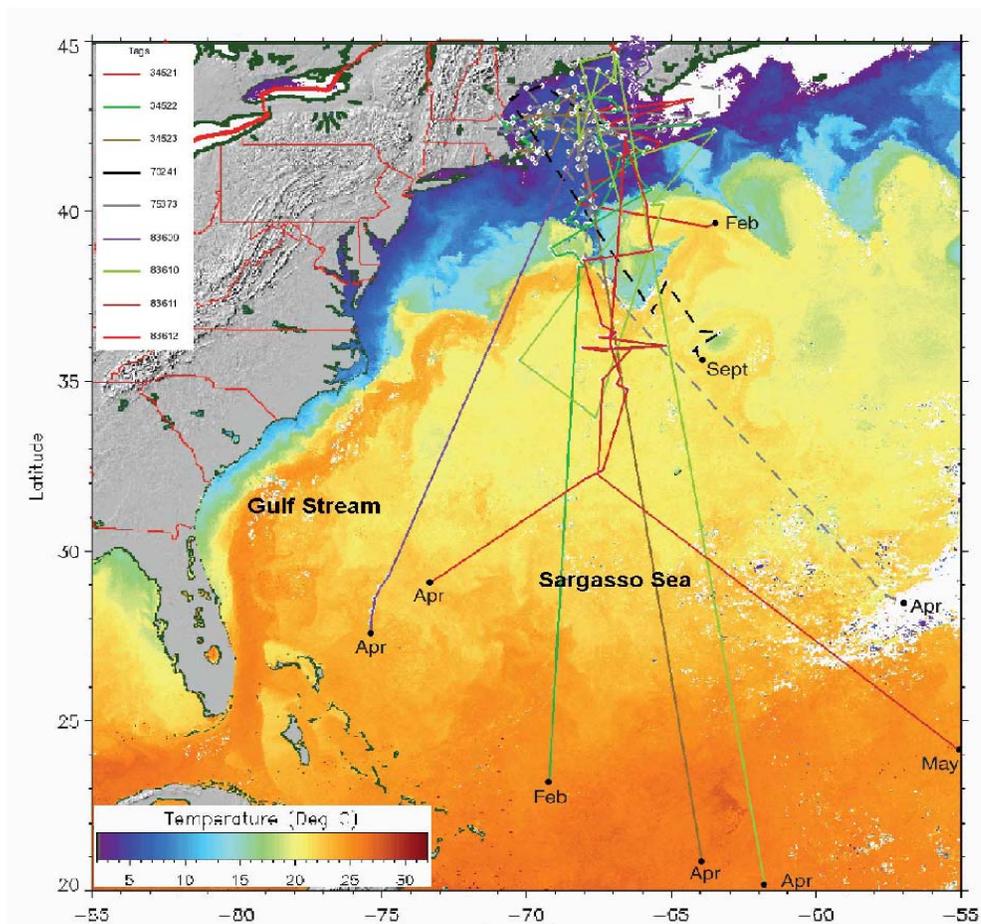


Plan Ahead!

**FSRS 19th Annual Conference
February 24th and 25th 2012**

Porbeagle mating ground discovered

Acting on reports from commercial groundfish fishers that large female sharks were being caught near the Canada-U.S. border, Dr. Campana led an exploratory shark survey of Georges Bank in July 2008. The survey led to the discovery of a new porbeagle shark mating ground, only the second known to science. In collaboration with the Atlantic Shark Association, 21 porbeagles were also captured, measured and fitted with pop-up satellite archival tags (PSATs) to record their swimming depth and approximate location based on light level, as well as water temperature. The startling findings of this research were published, in the June 2010 issue of the Canadian Journal of Fisheries Aquatic Science.



Tracking porbeagles with satellite tags

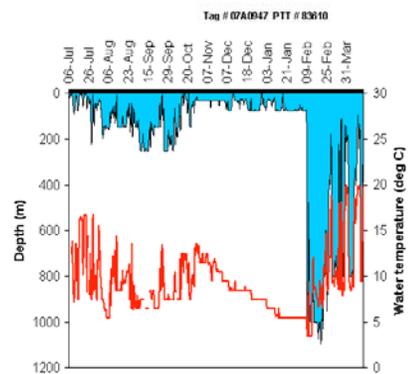
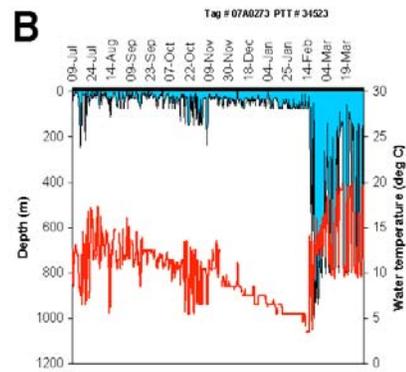
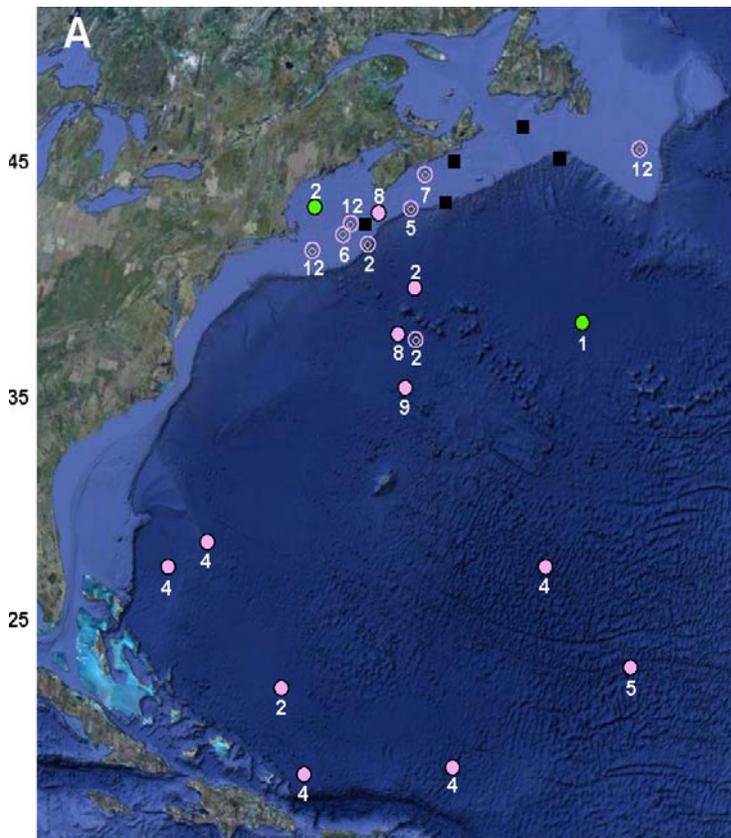
“We began satellite tagging porbeagles in 2001,” says Dr. Campana. “Once we learned more about their movements in general, then we started to target sexually mature females and programmed the tags to pop up during the period the sharks give birth, which we determined from other studies is during April and May.”

Each satellite tag was programmed to record information on the shark for six months to one year before physically releasing from the shark. The tag then floats to the surface of the ocean and transmits its accumulated data to an orbiting Argos satellite and back down to the researchers. This means the sharks don't have to be recaptured to gather the data.

Data reveals surprising birthing ground

Young porbeagles and adult males remained in cool waters off the coast of Nova Scotia for periods of up to 348 days, usually staying within 200 km of the coastline. However the satellite data collected reveals a different story for adult females.

“All of the adult females left the continental shelf by December, swimming distances of up to 2,356 kilometres to the Sargasso Sea — a vast area in the middle of the North Atlantic Ocean — before the satellite tag released. They remained there during that critical birthing period between March and April and, on average, stayed 500 metres below the surface. Even though we couldn’t see they were giving birth, we knew by their location at that time that they had to be giving birth in the Sargasso Sea,” says Dr. Campana. “This was a huge surprise because the porbeagle is a cold-water species associated with cool or cold temperate water and the Sargasso Sea is subtropical.” Porbeagle sharks prefer waters between 5 and 15°C, which probably explains why the sharks stayed so deep. The surface waters of the Sargasso Sea and Gulf Stream often exceed 30°C, far too warm for porbeagles.



Findings reveals record southward migration

Porbeagles have never been observed so far south before — 1,000 kilometres south of the previous known southward distribution of any porbeagle shark and more than 2,000 kilometres from the East Coast of Canada where they spend most of their lives. This led researchers to ask how the entire population of mature females managed to give birth in the Sargasso Sea each year and remain undetected. The answer appears to be due to the great depths to which porbeagles dive and swim.

Of the sharks tagged, each one swam about half a kilometre beneath the surface during its travels, swimming underneath the warm Gulf Stream to get to the Sargasso Sea. One shark dove 1.36 kilometres below the surface, which is the deepest ever recorded for a large shark. “For them to dive that deep to avoid the Gulf Stream is staggering because they are totally blind at that depth,” says Dr. Campana.

While in the Sargasso Sea, every porbeagle spent the daylight hours at depths of around 600 metres, moving shallower to 250 metres during the night. Researchers suspect that the sharks were probably adjusting their depth to prey on vertically-migrating fish and squid.

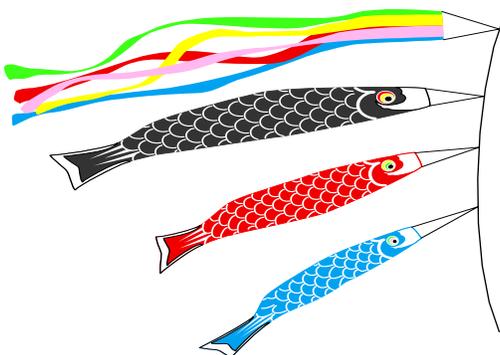
Young porbeagle hitch a ride

“Porbeagle young of the year begin appearing off of the East Coast of Canada in June or July,” says Dr. Campana. “We think the young are hitching a ride north to Canadian waters on the deep parts of the Gulf Stream, which is known to contain huge quantities of squid that are part of the porbeagle diet.”

So what does this new knowledge about the location of the porbeagle birthing ground mean? “Given that the birthing ground is half a kilometer down in the Sargasso Sea in an area that is lightly fished and too deep for conventional long-line fishing, it doesn’t look like any action is required at this time,” says Dr. Campana. “However, if something happened to change the status quo, the population could potentially be endangered so it’s important to keep a close eye on what goes on there in terms of fishing.”

For more information about Canadian sharks and the shark satellite tagging, please see the web site of the Canadian Shark Research Laboratory: www.marinebiodiversity.ca/shark.

THE FSRs WELCOMES NEW MEMBERS



The Fishermen and Scientists Research Society would like to welcome the following members, whose applications were approved at the February 10th Executive Committee meeting. We trust that the addition of these new members to the FSRs will prove to be beneficial to all involved.

Victor Aramavo N.
Adam Fancy
Geoff Irvine
Michael Park
Christine Tilburg

Elliot Boudreau
M. Vincent Guptill
Olusola Omirin
Rabiu Razaq
Marc Allain

BEACHCOMBING - What's New in The News

Managing Adaption to Environmental Change in Coastal Communities:

Canada & the Caribbean, or C-Change for

short, is a
five year
International
Community-
University
Research
Alliance
project being
carried out



through the University of Ottawa, in partnership
with the University of the West Indies, Trinidad.

C-Change attempts to link communities and university researchers from Canada and the Caribbean in support of research on coastal adaption to climate change at the community level. Since 2008, this project has examined four coastal communities in the Caribbean (Trinidad, Belize, Bequia, and Guyana) and four coastal communities in Canada (Charlottetown, PE, Isle Madame, NS, Iqaluit, NT and Gibsons, BC) whose livelihoods will be affected by rising sea levels. This project will result in community awareness, proposals for new infrastructure, and decision support tools for developing adaption and mitigation strategies for the impacts of sea-level rise and storm surges on the selected coastal communities.

For more information please visit our website:

www.coastalchange.ca

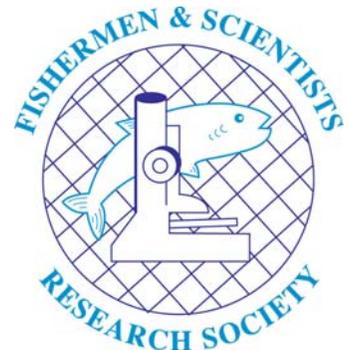
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Patty King

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UPCOMING EVENTS

ICMSS 2011 - 8th International Conference on Molluscan Shellfish Safety University of Prince Edward Island, Charlottetown , Prince Edward Island, Canada June 12-17, 2011

Hosted by the Canadian Food Inspection Agency (CFIA) and the Prince Edward Island Department of Fisheries, Aquaculture and Rural Development (PEI-DFARD). Experts from around the world will discuss the latest scientific advances and their impact on molluscan shellfish safety. Topics will include: risk management and human health, pathogenic bacteria and enteric viruses, known and emerging phycotoxins and more. For more information visit the website: www.gov.pe.ca/icmss2011/.