Sea scallop abundance and size in closed bottom habitats from F/V Irene Renee II NEC-BB2006-1 in the Great Wass Island, Maine from 2007-2009 (NEC-CoopRes project)

Website: https://www.bco-dmo.org/dataset/3349
Version: 20100608
Version Date: 2010-06-08

Project
» Northeast Consortium: Cooperative Research (NEC-CoopRes)

Program
» NorthEast Consortium (NEC)

Contributors	Affiliation	Role
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Dataset Description

A Collaborative Effort to Examine New Strategies for Managing Closed Bottom Habitats for Sea Scallops

Fishermen in eastern Maine wished to evaluate the efficacy of closed areas with respect to enhancement of wild sea scallops. Beginning in spring 2007, two 1 km2 zones that were once, but were no longer, productive scallop grounds were created in the Beals-Jonesport area. To determine the best methods to collect, handle, transport, and deploy wild sea scallops (5-70 mm SL), we initiated and completed experimental bottom trials in each zone over a period of 30 days beginning in late April or early May, 2008. In addition, we collected wild scallop spat (5-10 mm SL) using collection methods transferred from successful field trials in the Canadian Maritimes.

Three independent field trials were conducted in the Jonesport-Beals region from May 2007 to May 2009 that focused on providing information for fishermen and fisheries managers about the efficacy of using closed bottom areas to enhance commercial populations of these bivalves.

final report

presentation: *A Collaborative Effort to Examine New Strategies for Managing Closed Bottom Habitats for Sea Scallops* (pdf)

Associated data sets:
Abundance of scallops after wet or dry storage methods, 2007 data
Size of scallops after wet or dry storage methods, 2007 data

Station Location Code Names

Sites on West Side of Great Wass Island	Sites on East Side of Great Wass Island
CI = Crumple Island	BH = Bunker's Hole
CL = Corn Ledge	BI = Ballast Island
D1-D12 = "Deep 1 through Deep 12"	BL = Breaking Ledge
D1 = Palmer's Island	BSI = Big Spruce Island
D5 = Outer Ram Island	D1 = "Deep Site #1"
D9 = Eastern Side Ram Island	D2-D10 = "Deep Sites #2 through #10"
DL = Drowned Ledges	D11 = JL = Jumper Ledge
HI = Hardwood Island	LH = Lakeman's Harbor
IS = Inner Sand Island	LP = Loon Point (Jonesport)
LR = Little Ram Island	MI = Mark Island
OR = Outer Ram Island	PL = Point of Lakeman's Harbor
OS = Outer Sand Island	S = Seguin Island
SD = Sea Duck Island	SI = Sheep Island
SS = Steven's Island South	SR = Shag Rocks
ST = Steven's Island North	WC = Wallace Cove (Head Harbor Island)

Methods & Sampling

The first trial was short-term, and conducted from May to June 2007. Two approximately 1 km2 bottom areas were closed to all dragging and diving activities. Bottom plots (15 m x 15 m; n = 8) within each area were seeded at a density of 2.5 individuals/m2 using legal and sub-legal size scallops dragged from an area in Englishman Bay, in Jonesport. One-half of the plots in each area received scallops that had been stored for ca. 7 hours in commercial fish totes (black, plastic units measuring 70 cm x 40 cm x 28 cm deep with holes in the bottom) on board two commercial draggers, while the other half of the plots received scallops that had been held in flow-through containers (modified Xactic box) for the same period of time. The fate of these scallops was followed for thirty days by SCUBA divers. Scallop recovery and survival in all plots in both areas was excellent and independent of handling treatment. In one of the two areas, mean number of scallops recovered on Day 30 from both handling treatments was not significantly different from the initial seeding density. Final recovery was lower at the other area where faster tidal currents occurred that tended to push scallops out of the marked bottom plots.

The second (2007-2008) and third (2008-2009) field trials involved collecting wild scallop spat (juveniles < 20 mm in shell height) using fine-mesh bags similar to those used successfully to collect small scallops of the same species in nearby Passamaquoddy Bay during the 1990's, and in the Northumberland Strait and surrounding areas of the Canadian Maritimes in the past decade. In addition, materials and methods of deploying spat bags were similar to those used successfully in Japan, Chile, and Northern Europe. The reason for attempting to collect wild spat was for the purposes of enhancing the bottom plots in both closed areas. A total of 1200 bags were deployed in late summer 2007 and 2008, and these were retrieved in the spring of 2008 and 2009, respectively. Each year, one half of the bags were placed on the eastern and western side of Great Wass Island, in the town of Beals. On each side of the island, one-half of the bags were deployed in shallow (< 20 m) and deep (> 30 m) water. Less than 40% of the gear was retrieved in both years. In May 2008, number of spat per bag averaged 2.8 ± 0.43 individuals (n = 460 bags). Recruitment was approximately 6.5x higher in May 2009 (18.6 ± 2.04 individuals per bag; n = 383 bags). In May 2008, scallop density per bag was significantly higher and scallop size was significantly greater on the western vs. eastern side of Great Wass Island. In May 2009, no significant difference in scallop density was observed between sides of the island, but scallop size remained higher on the western vs. eastern side. In both years, more scallops settled into bags deployed in deep vs. shallow water. These results are in stark comparison to the work of others in the Canadian Maritimes where > 3,000 spat have been collected in similar size bags.

On 8-9 September 2007, we deployed 240 lines -- 120 on the east and west side of Great Wass Island (Beals, Maine; Lat. 44o 28.83'N; Long. 67o 35.90'W). Each line was anchored to the bottom using a typical cement block filled with cement. Five spat bags (0.75 m long x 0.45 m wide with 3 mm aperture and stuffed with a single piece of Netron® ca. 0.70 m long x 0.5 m wide) were arrayed on each line approximately 1.5 m apart. The bottommost spat bag was placed 3 m from the anchor, and the remaining four bags were each space 1.5 m apart from each other. That is, the uppermost bag was approximately 9 m from the cement anchor. A buoy was placed 1 m above the uppermost bag to ensure that the line remained upright during the time when bags were in the water. A surface buoy marked each line. Bags were deployed in early September, because we have

found that this is approximately one month after gonad indices fall significantly (Beal 2004), which signals reproduction. One half of the lines and bags on each side of Great Wass Island were deployed in both shallow (< 20 m) and deep (>30) locations. These locations were chosen by collaborating fishermen, and in the analysis, location is considered a "fixed factor," whereas "lines within each location" were considered a "random" factor. Specific locations of each line were recorded using GIS.

Data Processing Description

Sept. 2007 - May 2008
Bags were collected 16-17 May 2008. Of the 600 bags deployed on each side of Great Wass Island, 224 and 237 (37.3% and 39.5%) were recovered from the east and west side, respectively. The contents of each bag and piece of Netron® were processed at the time of collection. All scallops from each bag were placed into uniquely labeled plastic bags and returned to the laboratory where the content of each was counted and all individuals measured (longest shell dimension: shell height - from the ventral margin to the hinge).

August 2008 - May 2009
To determine whether sea scallop spat collection patterns observed in 2007-2008 are generalizable, we deployed spat bags at the same locations on both sides of Great Wass Island on 30-31 August 2008, and retrieved the bags on 30-31 May 2009. These trials enabled us to determine if temporal variation (i.e., year-to-year) is greater than spatial variation. Our methods during the August 2008 deployment of gear were identical to those described above for the 8-9 September 2008 deployment. When bags were collected on 30-31 May 2009, each was inspected separately by emptying the contents of a single bag and the piece of Netron® into a plastic fish tote. Scallop spat were picked from the tote and placed into a labeled bag. Bags were taken to the University of Maine at Machias and stored in a walk-in cooler (5oC) until the scallops within each could be counted and measured. Because the number of scallops in the bags was significantly higher than the previous year, as many as fifteen randomly sampled scallops were measured (to the nearest 0.1 mm using Vernier calipers). To randomize the scallops from a particular sample (=bag), all scallops were arrayed in a matrix within a white enamel pan. Then, a random number table was used to choose fifteen scallops from the array. If a sample had fifteen or fewer scallop juveniles, then all individuals were measured.

DMO Note: for purposes of the MapServer, 'Shallow' was defined as 20 meters and 'Deep' was defined as 30 meters.

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Data Files

File
scallop_spat.csv (Comma Separated Values (.csv), 243.66 KB) MD5:0f130c4a10783fedf5c2dd6fdabb49ae Primary data file for dataset ID 3349

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Parameters

Parameter	Description	Units
year	year of sampling	YYYY
region	eastern or western side of Great Wass I.	text
station	station code. See table in description section.	text
depth_relative	relative depth of spat bag: shallow (<20m), deep (>30m)	
lat	latitude; North is positive	decimal degrees
lon	longitude; West is negative	decimal degrees
line_num	line number for spat bag hanging	integer
bag_num	bag number: bag 1 was closest to bottom (~3m); bag 5 nearest top (~9m above bottom)	integer
count	number of scallop spat per bag	integer
height_shell	height of scallop shell	mm
comments	free text comments	

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Instruments

Dataset-specific Instrument Name	fine-mesh spat bags
Generic Instrument Name	Spat Bag
Dataset-specific Description	fine-mesh spat bags
Generic Instrument Description	Mesh-netted bag used for collection of spat (juvenile scallops, oysters, etc.). Access to the bag is by a top opening held shut with a drawstring. Strips or panels of black plastic or cloth material, designed to attract spat, are placed into the fine-meshed bag. Bags are closed and hung underwater for a period of time to allow the spat to settle in the collection material. Further description provided here (PDF).

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Deployments

NEC-BB2006-1

Website	https://www.bco-dmo.org/deployment/58058
Platform	F/V Irene Renee II
Report	http://cis.whoi.edu/science/bcodmo-admin/datasetDeployment.cfm?ddid=4302&did=746&flag=view
Start Date	2007-05-04
End Date	2009-09-09
Description	Deployment and retrieval of sea scallop spat bags in areas closed to bottom fishing both east and west of Great Wass Island, Maine. **Methods & Sampling** Deployment and retrieval of sea scallop spat bags in areas closed to bottom fishing, both east and west of Great Wass Island, Maine.

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Project Information

Northeast Consortium: Cooperative Research (NEC-CoopRes)

Website: http://northeastconsortium.org/

Coverage: Georges Bank, Gulf of Maine

The Northeast Consortium encourages and funds cooperative research and monitoring projects in the Gulf of Maine and Georges Bank that have effective, equal partnerships among fishermen, scientists, educators, and marine resource managers.

The Northeast Consortium seeks to fund projects that will be conducted in a responsible manner. Cooperative research projects are designed to minimize any negative impacts to ecosystems or marine organisms, and be consistent with accepted ethical research practices, including the use of animals and human subjects in research, scrutiny of research protocols by an institutional board of review, etc.

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Program Information

NorthEast Consortium (NEC)

Website: http://northeastconsortium.org/

Coverage: Georges Bank, Gulf of Maine

The Northeast Consortium encourages and funds
cooperative research and monitoring projects in the Gulf of Maine and Georges Bank that have effective, **equal partnerships** among fishermen, scientists, educators, and marine resource managers.

At the 2008 Maine Fisheremen's Forum, the Northeast Consortium organized a session on data collection and availability. Participants included several key organizations in the Gulf of Maine area, sharing what data are out there and how you can find them.

The Northeast Consortium has joined the Gulf of Maine Ocean Data Partnership. The purpose of the GoMODP is to promote and coordinate the sharing, linking, electronic dissemination, and use of data on the Gulf of Maine region.

The Northeast Consortium was created in 1999 to encourage and fund effective, equal partnerships among commercial fishermen, scientists, and other stakeholders to engage in cooperative research and monitoring projects in the Gulf of Maine and Georges Bank. The Northeast Consortium consists of four research institutions (University of New Hampshire, University of Maine, Massachusetts Institute of Technology, and Woods Hole Oceanographic Institution), which are working together to foster this initiative.

The Northeast Consortium administers nearly $5M annually from the National Oceanic and Atmospheric Administration for cooperative research on a broad range of topics including gear selectivity, fish habitat, stock assessments, and socioeconomics. The funding is appropriated to the National Marine Fisheries Service and administered by the University of New Hampshire on behalf of the Northeast Consortium. Funds are distributed through an annual open competition, which is announced via a Request for Proposals (RFP). All projects must involve partnership between commercial fishermen and scientists.

The Northeast Consortium seeks to fund projects that will be conducted in a responsible manner. Cooperative research projects should be designed to minimize any negative impacts to ecosystems or marine organisms, and be consistent with accepted ethical research practices, including the use of animals and human subjects in research, scrutiny of research protocols by an institutional board of review, etc.

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Funding

Funding Source	Award
National Oceanic and Atmospheric Administration (NOAA)	07-072

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