Inshore Gulf of Maine Acoustic Survey of Atlantic Herring Sentinel Spawning Grounds: size, sex, maturity from the F/V Jennifer & Emily NEC-JA2005-1 from the Gulf of Maine, 2006 (NEC-CoopRes project)

Website: https://www.bco-dmo.org/dataset/2981
Version: 30 Jan 2009
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Project
» Northeast Consortium: Cooperative Research (NEC-CoopRes)

Program
» NorthEast Consortium (NEC)

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Dataset Description

Inshore Gulf of Maine Acoustic Survey of Atlantic Herring Sentinel Spawning Grounds

Atlantic Herring biological sample data: size, sex, maturity

Methods & Sampling

Project reports:

Herring Acoustic Survey (Year 6) Final Report - July 2007
Herring Survey Mid-Year Progress Report - December 2006

"The temporal and special characteristics of spawning herring aggregations in coastal Gulf of Maine waters have been studied during the fall since 1998. The program has attempted to estimate the biomass of herring spawning in these waters during the fall months to establish an index of spawning stock biomass. Surveys have been conducted from Cape Ann, Massachusetts to Cutler, Maine. Each year, techniques have been refined for implementing acoustic surveys and collecting representative biological samples on fishing vessels.

In March 2005, the Northeast Consortium funded and facilitated an independent peer review, which concluded that acoustic surveys are an appropriate way to survey herring in this area and recommended continuation of the project. It also recommended that future surveys focus on estimating biomass using a broad-scale systematic survey approach, as well as developing an annual "sentinel" acoustic survey of the important spawning grounds. This project continues with additional funds from the Northeast Consortium granted in 2005. The panel's recommendations are being incorporated into the work, with surveys focused on identifying and quantifying "sentinel" spawning grounds." *extracted from: Summary of Completed Cooperative Research Projects Funded by the Northeast Consortium, September 2006*

Sub Areas

Each survey leg was apportioned into geographical sub areas prior to data analysis in order to allow for more precise target strength calculations for individual aggregations of fish. For any given leg, the observed distribution of Atlantic herring as well as the locations and distribution of biological sample tows were used to define between two and four unique sub areas for the leg. Data from all biological sample tows conducted within a given sub area were combined before calculating a target strength. This process should reduce the variance within each sub area biomass estimate and accounted for multiple sampling of the same fish aggregations.

Data Processing Description

When significant aggregations of fish were detected acoustically, the midwater trawl was set to confirm species identity and to collect approximately 100 individual Atlantic herring. Tows were conducted along the transect line after passing over the fish aggregations. Tow times were generally short in duration (10 - 20 minutes); just long enough to collect the necessary samples. All herring samples were frozen at sea for further laboratory analysis.

Back in the laboratory, herring samples were thawed out for examination. Natural length measurements were taken to the nearest 5 mm, total weight to the nearest 0.1 g, gonad weight to the nearest 0.1 g, sex and International Commission for the Northwest Atlantic Fisheries (ICNAF) gonad development stage (Table 3). In order to account for freezing and thawing of herring samples, length measurements were corrected using Maine Department of Marine Resources' correction equation:

Lmm = 4.1825 + 1.0051 * [Frozen Sample Length (mm)].

Stage Description and Criteria
ICNAF Atlantic herring gonad development stages (from Burnett et al., 1989).

I
Immature: testes and ovaries very small, threadlike, 2 - 3 mm broad; testes grayish white or brownish red; ovaries pinkish or wine red.
II
Immature fish that will spawn next year: testes and ovaries small, 3 - 8 mm broad; testes reddish or grayish brown; ovaries orange-red; eggs visible only with microscope.
III
Ripening, early stage: testes and ovaries occupy about half of ventral cavity, 1 - 2 cm broad; testes grayish or brownish red; ovaries orange-red; eggs small, but visible and granular.
IV
Ripening, mid-stage: testes and ovaries almost as long as body cavity; testes reddish yellow with blood vessels clearly visible; ovaries orange-red or pale yellow-red; eggs larger, opaque with only a few clear.
V
Ripe: testes and ovaries fill body cavity; milt and eggs do not flow, but can be extruded by pressure; testes yellowish white or milk white with no reddish color and

blood vessels not visible; ovaries yellowish; eggs large and mostly clear.
VI
Spawning: testes and ovaries ripe and emptying; milt and eggs flow freely; testes white or pale yellowish white with no blood vessels visible; ovaries yellowish; eggs large and clear.
VII
Spent: testes and ovaries baggy, flabby and bloodshot; testes empty or with residual milt; ovaries empty or with few residual eggs.
VIII
Resting: testes and ovaries firm and larger than in Stage II; walls striated with blood vessels prominent; testes brownish red; ovaries wine red; eggs not visible to naked eye.

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Data Files

File
herr_spawn_size.csv (Comma Separated Values (.csv), 160.04 KB) MD5:3a67fe62bf45e5c4c63228ef4c150b20 Primary data file for dataset ID 2981

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Parameters

Parameter	Description	Units
lat	latitude; North is positive	decimal degrees
lon	longitude; East is positive	decimal degrees
sex	sex of specimen	
yrday_local	local day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon)	
time_local	local time	
year	year of sampling	
length	length of	mm
weight	weight of fish	grams
Maturity_ICNAF	see processing description under 'Stage Description and Criteria'	
weight_gonad	weight of gonads	grams
visit	datafile name, comprised of date of sample plus A, B, C if there are several subfiles.	

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Instruments

Dataset-specific Instrument Name	Midwater Trawl
Generic Instrument Name	Midwater Trawl
Dataset-specific Description	17 x 15 fm midwater trawl net with a 17/8" mesh codend. The net included a trawl monitoring system which relayed real time height of headrope from the sea bottom to aid with the collection of herring samples.
Generic Instrument Description	A mid-water or pelagic trawl is a net towed at a chosen depth in the water column to catch schooling fish such as herring and mackerel. Midwater trawl nets have very large front openings to herd schooling fish toward the back end where they become trapped in the narrow "broiler". The sides of the deployed net are spread horizontally with two large metal foils, called "doors," positioned in front of the net. As the trawler moves forward, the doors, and therefore the net, are forced outward, keeping the net open. This instrument designation is used when specific make and model are not known.

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Deployments

NEC-JA2005-1

Website	https://www.bco-dmo.org/deployment/57853
Platform	F/V Jennifer & Emily
Report	http://northeastconsortium.org/ProjectFileDownload.pm?report_id=830&table=project_report
Start Date	2006-07-21
End Date	2006-11-03
Description	F/V Jennifer & Emily

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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)	NA05NMF4721057

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