Numerical abundance, catch-per-unit-effort, percent composition from F/V Stormy Weather NEC-HH2006-1 in the Gulf of Maine off New Hampshire coast from June 2008 (NEC_ProjDev project)

Website: https://www.bco-dmo.org/dataset/3460
Version: 20110404
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Project
» Northeast Consortium: Project Development (NEC_ProjDev)

Program
» NorthEast Consortium (NEC)

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Dataset Description

"Development of a Multi-Beam Sonar as a Fisheries Tool for Stock Assessment and Essential Fish Habitat Identification of Groundfish in the Western Gulf of Maine"

This data set:
Mean and standard error (S.E.) for numerical abundance, catch-per-unit-effort (CPUE, fish per 30-minute tow), and percent composition (%) of fish enumerated in 10 tows of a 6.5-inch mesh otter trawl by F/V Stormy Weather in Area Closure 133 on 21, 22, and 25 June 2008.

Abstract
Stock assessments based on accurate abundance and distribution data are essential to developing effective management strategies for the Gulf of Maine stock of Atlantic cod, *Gadus morhua*. The purpose of this study was to prove the concept of using multi-beam sonar as a fisheries tool for studying the behavior and quantifying the abundance of groundfish. The focus of this research was was to develop multi-beam sonar (MBS) as a fisheries survey tool. MBS can complement traditional narrow-beam echosounder and trawl surveys because MBS has a large sampling volume, three-dimensional spatial description, and potentially fewer behavior-related sampling biases than traditional trawl surveys. Relationships between acoustic backscatter and fish biology need to be understood before reliable acoustic surveys using MBS can provide sciencebased information for stock assessments. A series of acoustic and optical measurements were made using 38- and 120-kHz EK60 split-beam echosounders and a 300 kHz EM3002 MBS. These were fixed to a surface platform over a 98 cubic meter submersible cage of 5-cm stretched mesh twine. After standard sphere calibration, the cage was stocked with 195 live Atlantic cod with a mean total length of 80.7 ± 0.8 cm (± standard error; range 51.5-105.0 cm) from nearby spawning grounds 10-15 km off the New Hampshire coast, USA. The sonars were synchronized to collect acoustic data on a captive population of mature cod of known size and number

under video surveillance by two underwater cameras. Cod were incrementally removed from the cage to provide a time-series of acoustic backscatter at four densities (n=195, 116, 66, and 23). Preliminary results demonstrate the feasibility of the EM3002 MBS to detect cod and show that quantification of the acoustic backscatter is possible.

See final report

Methods & Sampling

Study Area
Field collections were made on spawning grounds 10-15 km off the New Hampshire coast, USA and experiments were conducted at the Open Ocean Aquaculture site located approximately 1 mile south of the Isles of Shoals, off the coast of New Hampshire. Dockside preparation were made at the UNH Coastal Marine Laboratory at Fort Constitution, Portsmouth, NH and the Jackson Estuarine Laboratory at Adams Point, Durham, NH.

Fish Sampling
Live Atlantic cod were collected with a 6.5-inch mesh otter trawl over a total of thirteen 30-minute tows made by F/V Stormy Weather on 21, 22 and 25 June 2007. Live Atlantic cod and haddock were individually measured (total length) and placed into 1 m3 insulated polyethylene containers for transport to the site. A continuously running deck hose was used to circulate and exchange water in live wells during transit from the nearby fishing area to the cage. Fish were stocked in the cage and mortalities were removed each day. After experiments were completed, fish were removed from the experimental cage at the surface with large dip nets, measured, and counted. In accordance with NMFS permits and IACUC, all fish were caught using approved gear, transported live, held in captivity for a short term, and then released after experiments were completed.

Data Processing Description

Preliminary results demonstrate the feasibility of the EM3002 MBS to detect cod and show that quantification of the acoustic backscatter is possible.

The Northeast Consortium facilitated a technical mail review of this project, the results of which were submitted to the New England Fishery Management Council in July 2008. The Council is incorporating project information as appropriate.

The results and experience from this project led to a 2008-2009 New Hampshire Sea Grant award for more extensive experimentation.

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Data Files

File
howell_sonar_catch.csv (Comma Separated Values (.csv), 1.03 KB) MD5:282ef1d140bc80dba308e48a9961ae48
Primary data file for dataset ID 3460

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Parameters

Parameter	Description	Units
common_name	commonly used name of the fish species	text
species	taxonomic name	text
catch_total	total number of fish caught	integer
catch_mean	mean number of fish caught	number
catch_se	standard error of number of fish caught	number
cpue_mean	catch per unit effort	fish per 30-minute tow
cpeu_se	standard error of catch per unit effort	number
pcent_composition_mean	mean percent composition of fish caught	number
pcent_composition_se	standard error of the percent composition of fish caught	number

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Instruments

Dataset-specific Instrument Name	Otter Trawl
Generic Instrument Name	Otter Trawl
Dataset-specific Description	6.5-inch mesh otter trawl
Generic Instrument Description	Otter trawls have large rectangular otter boards which are used to keep the mouth of the trawl net open. Otter boards are made of timber or steel and are positioned in such a way that the hydrodynamic forces, acting on them when the net is towed along the seabed, pushes them outwards and prevents the mouth of the net from closing. The speed that the trawl is towed at depends on the swimming speed of the species which is being targeted and the exact gear that is being used, but for most demersal species, a speed of around 4 knots (7 km/h) is appropriate. More: http://en.wikipedia.org/wiki/Bottom_trawling

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Deployments

NEC-HH2006-1

Website	https://www.bco-dmo.org/deployment/58660
Platform	F/V Stormy Weather
Report	http://northeastconsortium.org/ProjectFileDownload.pm?report_id=865&table=project_report
Start Date	2008-06-21
End Date	2008-06-25
Description	The purpose of this project was to examine the feasibility of multi-beam sonar as a fisheries acoustic survey method for stock assessments, EFH identification, and evaluation of time/area closures for Atlantic cod. The proposed research included installing, calibrating, and testing multi- and split-beam sonar configurations in experimental cages for detection of cod. Once experimental methodologies were proven, relations between acoustic measurements and fish biology were examined through experimental manipulation of wild fish caught by fishing industry participants. Results from the proposed research would naturally lead to further experimentation and cooperative research using a multi-disciplinary approach of acoustic and trawl sampling to describe spatial distribution and relative abundance of spawning cod aggregations within EFH such as the rolling area closure 133 in the Western Gulf of Maine.

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Project Information

Northeast Consortium: Project Development (NEC_ProjDev)

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.

Priority areas for Northeast Consortium funding include selective fishing-gear research and development. The development of selective fishing gears that enhance gear selectivity, target healthy stocks, reduce bycatch and discard, reduce or eliminate technical barriers to trade, minimize harvest losses, and improve fishing practices. Studies of new and developing fishing gears and technologies aimed at reducing environmental impact is funded under Project Development.

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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
NorthEast Consortium (NEC)	unknown NEC_ProjDev NEC

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