POTYEAR: Determining the Seasonality of Cod Pots: fish catch,size from fishing vessels NEC-MP2007-2 in Massachusetts Bay from 2008-2009 (NEC-CoopRes project)

Website: https://www.bco-dmo.org/dataset/3570
Version: final
Version Date: 2011-11-08

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

Program
» NorthEast Consortium (NEC)

Contributors	Affiliation	Role
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Dataset Description

Newfoundland-style, large, large-mesh static pots were compared to Norwegian-style, smaller, small-mesh, off-bottom, dynamic pots in a controlled study from a commercial fishing vessel from November 2008-November 2009. Results from analysis indicate that cod were most vulnerable to pots during a limited season, and that the smaller mesh pot caught more small cod. Otherwise, the pots performed similarly. We conclude that either pot style may be effective for further development, that seasonality plays an important role and should be exploited for further testing, and observation of near-field behavior in cod near pots is still vital and problematic.

Objectives for continued development of cod pots:

1. To compare catch rates and sizes of Atlantic cod captured in Norwegian and Newfoundland cod pots;
2. To compare catch rates and sizes of Atlantic cod over eight months;
3. To observe Atlantic cod behavior in reaction to bait and to cod pots.

Methods & Sampling

Tests were conducted onboard three similar vessels, primarily used for lobster pot fishing, each approx. 13 m, 260kW, equipped with a pot hauler and a boom.

Ten pots each of the Newfoundland (NF) and Norwegian (NO) design were set singly in pairs approx. 0.25 nm apart for periods within each of eight months

There were 383 pot-hauls on 24 trips; 377 pot-hauls were considered valid for analyses. Pairs where no cod were caught in either pot were removed for cod catch analyses, resulting in 114 pairs where at least one cod was present. Overall, pots were set in an area of approx. 16 sq. km, inside of Massachusetts state waters.

Additionally, we attempted to conduct at least one filming session each month to observe fish behavior in the vicinity of a pot. An underwater camera was attached to an NF pot using an aluminum outrigger and video was live-fed to the vessel and recorded. A series of observations were planned to assess the effect of different aspects of the pot design on fish behavior. We planned to begin by filming a baited NF pot with side panels removed and top netting opened and rolled down, progressing stepwise to a fully enclosed, normal configuration.

Data Processing Description

Catch was identified, weighed, and measured. Operational and biological data were collected by DMF biologists, including: catch composition and weights for all species, midline lengths for Atlantic cod (and other species as practical) to the nearest cm, set and haul times, locations, weather conditions, depth, and bottom seawater temperature. Data were entered into a customized Access database and analyzed using the open-source statistical program R (R Development Core Team, 2009; Sarkar 2009).

Holst and Revill (2009) described an implementation of Generalised Linear Mixed Models (GLMM) to paired catch experiments. This implementation allows fitting of curves of limited complexity to expected proportions-at-length (in our case, count of cod in NO pots/total count in both pots for each pair). GLMMs in the Holst and Revill (2009) method incorporate between-pair variance (Fryer, 1991). Four fixed-effect models (constant, linear, 2nd order, and 3rd order polynomial relationships of length) were tested, each using pair as a random effect. We used the penalised quasi likelihood function (glmm-PQL function in MASS package of the R statistical software (R Development Core Team, 2009)), where insignificant terms are removed based on the Wald's test (Holst and Revill, 2009).

Collected video was reviewed at least twice, by two separate reviewers. Observations of fish were noted, and identified to likely species where possible. Actions of fish relative to entry to the camera frame, direction, level of activity, and activity were noted. Pot motion, direction of current, and visibility of the pot were also recorded.

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Data Files

File
potyear_catch.csv (Comma Separated Values (.csv), 121.03 KB) MD5:ce4e9f1dc817ff1341cf002b24e7d0c7 Primary data file for dataset ID 3570

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Parameters

Parameter	Description	Units
year	year of sampling	
cruise_id	cruise identifier	
month_local	month; local time	
day_local	day; local time	
haul_id_trip	haul identification number	
gear_desc	gear description: Norwegian; collapsible; wiremesh; rigid; fishing rods (see Instruments section)	
gear_nation	origin for the gear: Norwegian or Newfoundland	
time_set	local time when setting the pot was begun	HHmm
lat_set	latitude where the pot was set; North is positive	decimal degrees
lon_set	longitude where the pot was set; West is negative	decimal degrees
time_haul	local time when hauling the pot was begun	HHmm
lat_haul	latitude where the pot was hauled; North is positive	decimal degrees
lon_haul	longitude where the pot was hauled; West is negative	decimal degrees
duration	duration of pot deployment	hours
temp_ss_F	sea surface temperature	degrees Fahrenheit
depth_haul_begin	water depth at start of haul, from echosounder	meters
comments_haul	comments pertaining to the pots	
species	binomial that consists of a genus name followed by the species name of an organism	
common_name	commonly used name for a species	
weight_catch_lb	total weight of a pot catch	pounds
count	number of fish in a pot	
weight_lb	wieght of individual fish	pounds
length_cm	length along midline of fish	centimeters
comments_fish	comments pertaining to the fish	
yrday_local	local day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon)	

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Instruments

Dataset-specific Instrument Name	cod pot
Generic Instrument Name	Cod Pot
Dataset-specific Description	The Newfoundland design cod pots are all pyramid-shaped when fishing and are constructed in three different ways: two are approx. 2 m x 2 m x 1 m (6.5 ft x 6.5 ft x 41 in) and consist of a steel frame with netting panels; one of these designs is collapsible, saving deck space. The third construction type is 1.8 m x 1.8 m x 1 m (71 in x 71 in x 3.3 ft) and made from polyvinyl-coated wire 50 mm square mesh. All three have netting attached at the top: 30 meshes of 50 mm diamond mesh with a float whose buoyancy creates the pyramid of netting on top. Each pot has two entrances on opposite sides with 40 cm diameter circular rings. Attached to the rings are 'triggers': stainless steel 5 mm diam. rods about 50 mm apart that swing in to allow entrance, but do not swing out. The pots are designed to be static on the sea floor. Previous research (Pol and Walsh 2005) showed these three designs did not fish differently from one another, and for the purposes of this study were treated as identical. The Norwegian design pots are collapsible two-chamber rectangular pots made of netting, with a single bridle with anchor along the short end of the pot, allowing it to float and to turn with the current, adapted from Furevik et al. (2008). They have one entrance at the opposite end as the bridle, and are made of 50 mm black poly mesh for the trap body and 50 mm white poly for the entrances (into the pot and between chambers). Three frames per pot were constructed of 2 cm diam. PVC electrical conduit, with 13 cm radius corners, glued with cement. The frame sizes were approx. 1.5 m x 1 m (4.79 ft x 3.28 ft), hung 0.7 m (2.3 ft) apart forming two chambers with a widemouth entrance in between. The bridles were anchored with >5 kg links of chain. After several months, observations of cracking in the PVC and catches of lobsters suggested that pots were not floating as expected. A pot was set in a large-scale, laboratory sea water tank, and did not float off bottom. The PVC pipes were then perforated and 11 deep-water gillnet floats were added along the upper frame to achieve proper orientation. All NO pots were subsequently modified in this manner. During the tank investigation, the top of the NO pot was measured to be 3 m off bottom; the bottom of the pot was 1.5 m off-bottom. Locally caught clams, shelled and frozen, were used for bait during the field research. Pots were set and hauled on three or four consecutive days in each month.
Generic Instrument Description	Crab pots modified to catch cod. Variously designed: floating v. static; large v. small; two or more large entrances v. one small entrance, rigid v. collapsible.

Dataset-specific Instrument Name	Fishing Rod
Generic Instrument Name	Fishing Rod
Generic Instrument Description	Used to catch fish.

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Deployments

NEC-MP2007-2

Website	https://www.bco-dmo.org/deployment/58733
Platform	Fishing Vessels
Report	http://www.northeastconsortium.org/ProjectFileDownload.pm?report_id=1352&table=project_report
Start Date	2008-12-15
End Date	2009-11-12
Description	Multi-vessel project to compare catch rates and sizes of Atlantic cod captured in Norwegian and Newfoundland cod pots. Tests were conducted onboard three similar vessels, primarily used for lobster pot fishing, each approx. 13 m, 260kW, equipped with a pot hauler and a boom. Open transoms simplified setting of pots. Vessels: F/V Jeanne C, Captain Kelo Pinkham; F/V Ann Marie, Captain Robert Marcella

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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/

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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)	09-048A

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