Red Crab stock assessment project: 100-600 fathoms, from the Canadian border (Hague Line) to approximately Hudson Canyon from 2004-2005 (NEC-CoopRes project)

Website: https://www.bco-dmo.org/dataset/3434
Version: final
Version Date: 2007-04-30

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

Program
» NorthEast Consortium (NEC)

Contributors	Affiliation	Role
Wahle, Richard A.	Bigelow Laboratory for Ocean Sciences	Principal Investigator

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Dataset Description

Red Crab Tag Data

Project Leader: *Richard A. Wahle,* Bigelow Laboratory for Ocean Sciences
Additional Participants:
Jon Williams, Benthic Fishing Corp.
Yong Chen, University of Maine

Companion objects:
red crab tag data
red crab return data
redcrab temperature data
redcrab camera data
red crab trawl log data
redcrab trawl data.

"The objectives of the main project were to: (1) Employ camera-based and net-trawl sampling methodology established by an earlier NMFS red crab surveys (Wigley et al. 1975) to determine wheter abundance, size structure, and sex composition of the population has changed significantly at the same sites sampled in 1974, (2) Conduct sea sampling to better characterize the commercail catch, (3) Conduct tagging to obtain much needed information on red crab growth rates and movement, and (4) Develop three stock assessment modeling approaches of different complexities (size-structured yield-per-recruit model, production model, and size-structuredied simulation model) to evaluate the dynamics of the red crab stock, estimate current status of the fishery, and evaluate alternative management strategies. The supplemental project compared the efficacy of otter-trawl to net trawl in this application.

The benthic sled system for camera surveys combined with net trawl collection generated the first population density estimates and demographic data of red crab in 30 years. The comparison of the two net trawl methods confirmed that otter trawls were the most efficient approach in these surveys. Results of the main project indicated that the abundance of the largest crabs targeted early in the history of the fishery (males>114 mm, 4.5 inches) is down by approximately 42% since 1974. Based on sea sampling data the fishery now harvests smaller male crabs, and the standing biomass of crabs currently harvested is on a par with 1974 levels. The abundance of smaller males and females is substantially higher than in 1974. Some 9600 crabs were tagged over the course of the study, and of about 300 returns there was little evidence of growth, which is consistent with prior evidence of slow growth for this species. However, the limited growth data curtailed application of the stock assessment models. The full parameterization of these models awaits addtional growth data. Models are implemented as Excel spread sheets that and are available from the PI, and will be easy for the user to update as data become available. These results were a key component of the NMFS red crab stock assessment conducted in 2006. "*(extracted from: Final Report Submitted to the NORTHEAST CONSORTIUM, December 11, 2006)*

Questions regarding this data set should be directed to:

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Methods & Sampling

The benthic sled system for camera surveys combined with net trawl collection generated the first population density estimates and demographic data of red crab in 30 years. The comparison of the two net trawl methods confirmed that otter trawls were the most efficient approach in these surveys. Results of the main project indicated that the abundance of the largest crabs targeted early in the history of the fishery (males>114 mm, 4.5 inches) is down by approximately 42% since 1974. Based on sea sampling data the fishery now harvests smaller male crabs, and the standing biomass of crabs currently harvested is on a par with 1974 levels. The abundance of smaller males and females is substantially higher than in 1974. Some 9600 crabs were tagged over the course of the study, and of about 300 returns there was little evidence of growth, which is consistent with prior evidence of slow growth for this species. However, the limited growth data curtailed application of the stock assessment models. The full parameterization of these models awaits addtional growth data. Models are implemented as Excel spread sheets that and are available from the PI, and will be easy for the user to update as data become available. These results were a key component of the NMFS red crab stock assessment conducted in 2006. "

Data Processing Description

"The objectives of the main project were to: (1) Employ camera-based and net-trawl sampling methodology established by an earlier NMFS red crab surveys (Wigley et al. 1975) to determine wheter abundance, size structure, and sex composition of the population has changed significantly at the same sites sampled in 1974, (2) Conduct sea sampling to better characterize the commercail catch, (3) Conduct tagging to obtain much needed information on red crab growth rates and movement, and (4) Develop three stock assessment modeling approaches of different complexities (size-structured yield-per-recruit model, production model, and size-structuredied simulation model) to evaluate the dynamics of the red crab stock, estimate current status of the fishery, and evaluate alternative management strategies. The supplemental project compared the efficacy of otter-trawl to net trawl in this application.

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Data Files

File
redcrab_camera.csv (Comma Separated Values (.csv), 49.32 MB) MD5:8e5162c3d528e9e76466b2d2f422fa29 Primary data file for dataset ID 3434

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Parameters

Parameter	Description	Units
yrday_local	local day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon)	
year	year photo was taken	YYYY
date_local	local date of photo	mm/dd/yy
towid	sled tow identification number	integer
site	code for photo location	text
bottom_time	time on bottom. e.g. 1230=12 hours and 30 minutes	hhmm
depth_start_fm	depth at start of tow	fathoms
depth_end_fm	depth at end of tow	fathoms
depth_avg	average depth of tow	fathoms
photoid	photograph identification	alphanumeric
sector	sampling area; four geographic sectors originally established by Wigley et al. (1975)	A to D
camera_type	still or digital camera	text
bottom_type	desciption of sea bottom	text

turbidity	turbidity	percent
turbidity_flag	Turbidity <25% = 1; >25% = 0 (only 2005)	0 or 1
sled_movement	description of sled movement	text
quality_flag	quality flag: Good=1 or Bad = 0	0 or 1
area	area of photograph	m^2
species	scientific or common name of animal	text
count	Animal count on the photo with these exceptions: anenomes: 1=present; 0=absent shrimp: 1=present; 0=absent jellyfish/squid: 1=present; 0=absent tubeworms: 1=present; 0=absent sea pen: 1=present; 0=absent exceptions for years 2003; 2004; 2005 only other years count= # of animals	integer
density	number of red crabs per unit area	number per m^2
comments	comments on each photo	text

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Instruments

Dataset-specific Instrument Name	Camera
Generic Instrument Name	Camera
Dataset-specific Description	camera sled: Nikon Coolpix 990 digital still camera modified with a programmable intervalometer and computer interface software designed by Engage Technologies. The camera was housed in a deep-sea titanium housing and was coupled to a Benthos model 382 strobe (on loan from the National Undersea Research Center at the University of Connecticut). The camera was aimed perpendicular to the sled at a height of 1m with a downward angle of 35 degrees. In that position the camera viewed a total area of 10 m2 and an effective illuminated area determined to be 6.6 m2. This was determined using a grid subdivided into 0.01 m2 squares placed horizontally on the sea bed in front of the camera. The system was programmed to take photographs every 15 sec; at a speed of 2 knots a photograph was taken approximately every 14m, a 30 minute tow resulting in about 120 images.
Generic Instrument Description	All types of photographic equipment including stills, video, film and digital systems.

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Deployments

NEC-RW2001-1

Website	https://www.bco-dmo.org/deployment/57766
Platform	F/V Krystal James
Report	http://northeastconsortium.org/ProjectFileDownload.pm?report_id=635&table=project_report
Start Date	2002-04-24
End Date	2005-11-25
Description	Otter trawl- and camera-based sampling of red crabs, tagging study.

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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
NorthEast Consortium (NEC)	unknown NEC-CoopRes NEC

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