



NEFSC Multispecies Bottom Trawl Survey





Multispecies Survey Objectives

1. Monitor trends in abundance, biomass and recruitment
2. Monitor the geographic distribution of species
3. Monitor ecosystem changes
4. Monitor trends in biological parameters (growth, mortality and maturation rates) of the stocks
5. Collect environmental data



NEFSC Bottom Trawl Surveys

Autumn Bottom Trawl Survey

- 1963 – Present (49 years)
- September – October
- Cape Lookout to Scotian Shelf
- 370 stations (60 sea days)

Spring Bottom Trawl Survey

- 1968 – present (44 years)
- February – April
- Cape Lookout to Scotian Shelf
- 370 stations (60 sea days)

Winter Bottom Trawl Survey

- 1992 – 2007 (16 years)
- February
- Cape Hatteras to Georges Bank
- 105-160 stations (24 sea days)



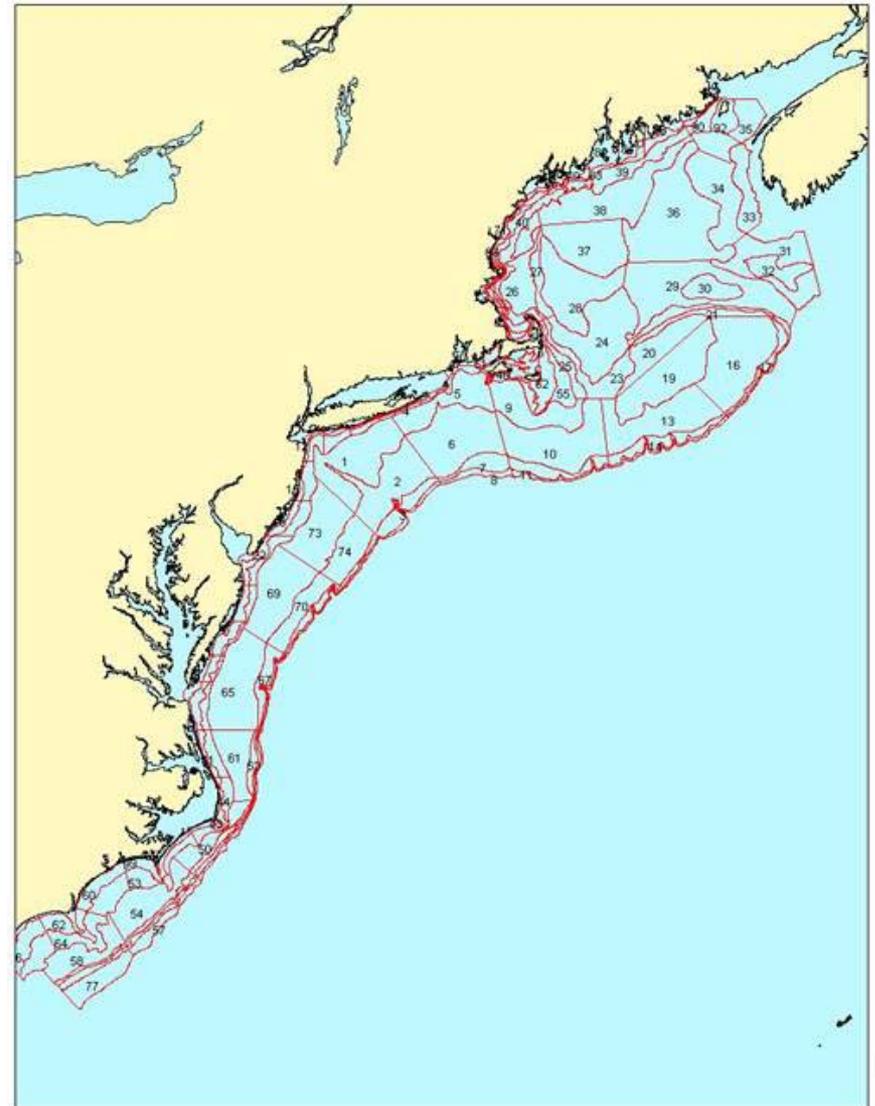
NOAA Fisheries Bottom Trawl Survey

Stratified Random Design:

- Station locations are randomly selected within geographic strata.
- Strata were determined by depth and region.

Strata ranges:

- 60' – 90' (10 – 15 Fm)
- 90' – 180' (15 – 30 Fm)
- 180' – 360' (30 – 60 Fm)
- 360' – 600' (60 – 100 Fm)
- 600'+ (100+ Fm)





Multispecies Survey Sampling System



FSV Henry B. Bigelow

- 209' LOA
- 49' Breadth
- 29.7' depth (fully loaded)
- 24 Officers and Crew
- 16 Scientific Staff

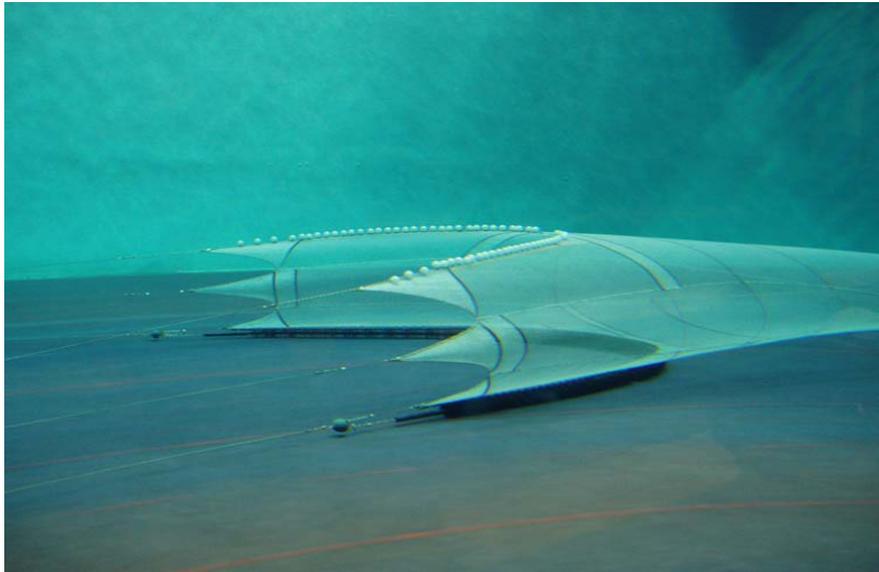


Multispecies Survey Sampling System

4 - Seam, 3-Bridle Box Net, (400 X 4.7' FC)

Designed over a 3 year period with input from:

- Industry Representatives (7)
- Academia / Gear Researchers (4)
- Center Scientists (2)



Design Features:

- 89' Rock-hopper Sweep
- 69' Headrope
- 4.7' Twine in Wings
- 2.4' Twine in Balance
- 4.7' Codend with 1' Liner

Nominal Fishing Characteristics:

- 108' Door Spread
- 46' Wing Spread
- 13' Headrope Height



Key Attributes of the Scientific Trawling System

- Representative sample of a variety of species and sizes
- Ability to sample a variety of habitats
- Maximum catchability between the wing ends and minimum sampling between the wing ends and doors
- Consistent wing spread
- Consistent headrope height
- Consistent bottom contact
- Easily maintained



The Following Slides are Intended to
Address Questions that May Arise



Survey Tow Evaluation Protocol

Select Tow Settings Map Exit

Representative Tow

T	O	G	A
1	1	1	1

Tow Type

Alternate Random, within 1nm radius Repeat

Random, Offshore Co Random, outside 1nm within 3nm

Operation Auto-Generated Impact Codes

(O1) Good Performance

Gear Impact Codes

(G1) No Damage/Malfunction

Acquisition Auto-Generated Impact Codes

(A1) No Data Acq. Errors

1
2
3
4



Performance Evaluation Screen

Select Tow
Settings
Map
Exit

Representative Tow

T
1

O
1

G
1

A
1

Tow Type

Alternate
 Random, within 1nm radius
 Repeat
 Random, Offshore Continental Shelf
 Random, outside 1nm within 3nm

Operation Auto-Generated Impact Codes

(O1) Good Performance

Gear Impact Codes

(G1) No Damage/Malfunction

Acquisition Auto-Generated Impact Codes

(A1) No Data Acq. Errors

Watch Chief comments...

Bridge Comments

No Bridge Comments

Chief Scientist Comments

No Chief Scientist Comments

Tow Validation for Tow 405 (Operation ID: 617, Strata-Tow: 01270-7)

Door Spread Std Dev	Door Spread Mean	Δ Winch Tension	EK60 - 18 kHz Mean	% Tow in Strata	Distance from Planned
0.55	38.27	0.07	146.93	100	1.2217 nm
Wing Spread Std Dev	Wing Spread Mean	Δ Block Tension	Ship vs Trawl Depth	Area Swept (Doors)	Rep Tows in Last Day
0.26	14.16	0	145.48	67,878 sq km	6
Headrope Std Dev	Headrope Mean	Δ Winch Wire Out	Tow Duration	Area Swept (Wings)	Non-Rep Tows in Last Day
0.07	3.38	-3.6	00:20:01	25,113 sq km	1
Scope Ratio	Ship Speed Mean	Δ Block Wire Out	Distance Towed	Volume Swept	Bridle Angle
365	2.87	-1.72	0.9576 nm	84.872 cubic km	14.3

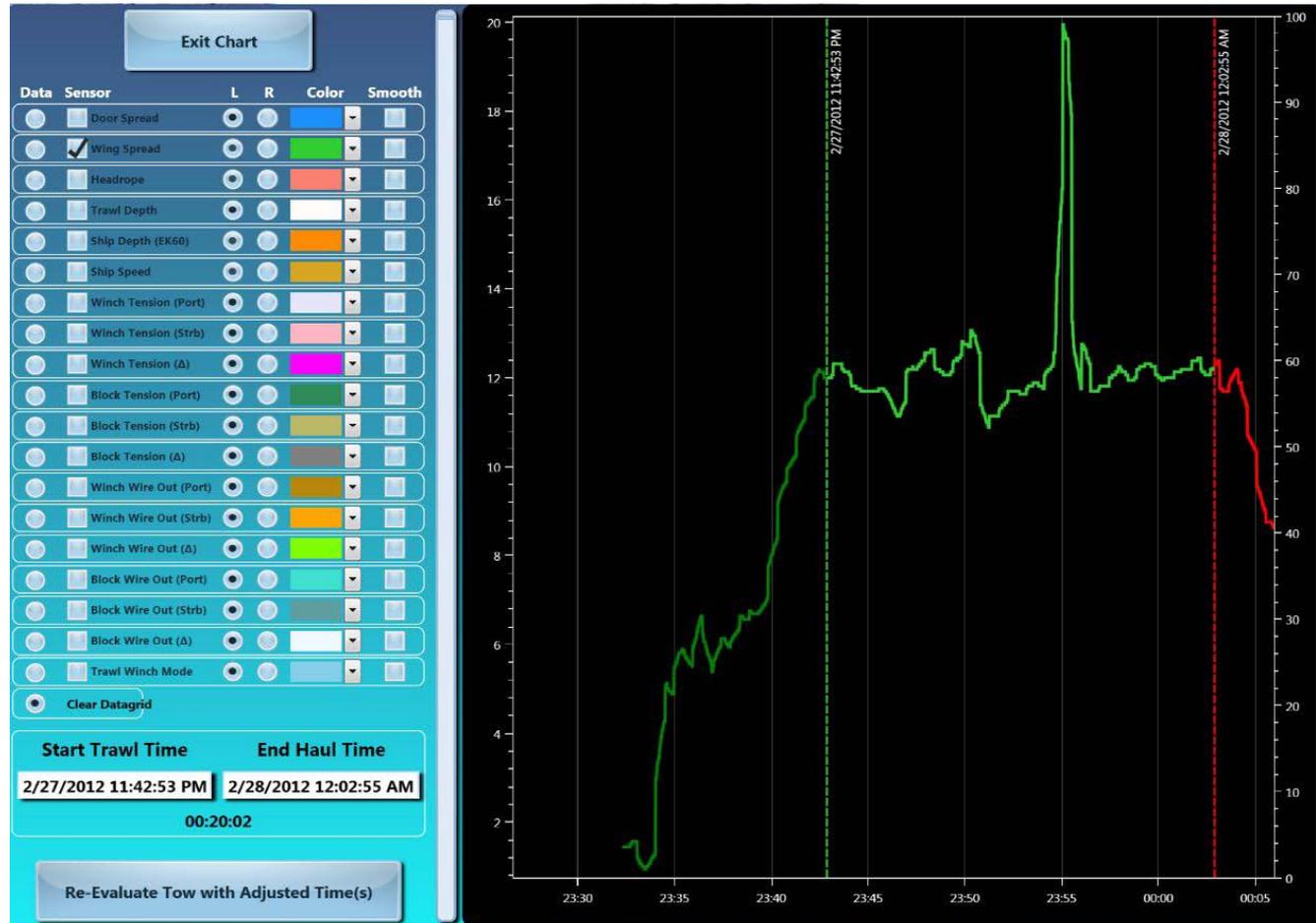
Sensor Use

Door Sensor (Master)	Door Sensor (Slave)	Trawl Sounder
A4335	MR6180	TS2288
3 - 0 3:57	3 - 0 3:57	7 - 0 17:36
Wing Sensor (Master)	Wing Sensor (Slave)	
A4373	MR3887	
11 - 1 9:52	11 - 1 9:52	
Headrope Sensor	Depth Sensor	
N/A	HCL2656	
N/A	1 - 0 0:00	

Door Spread Chart

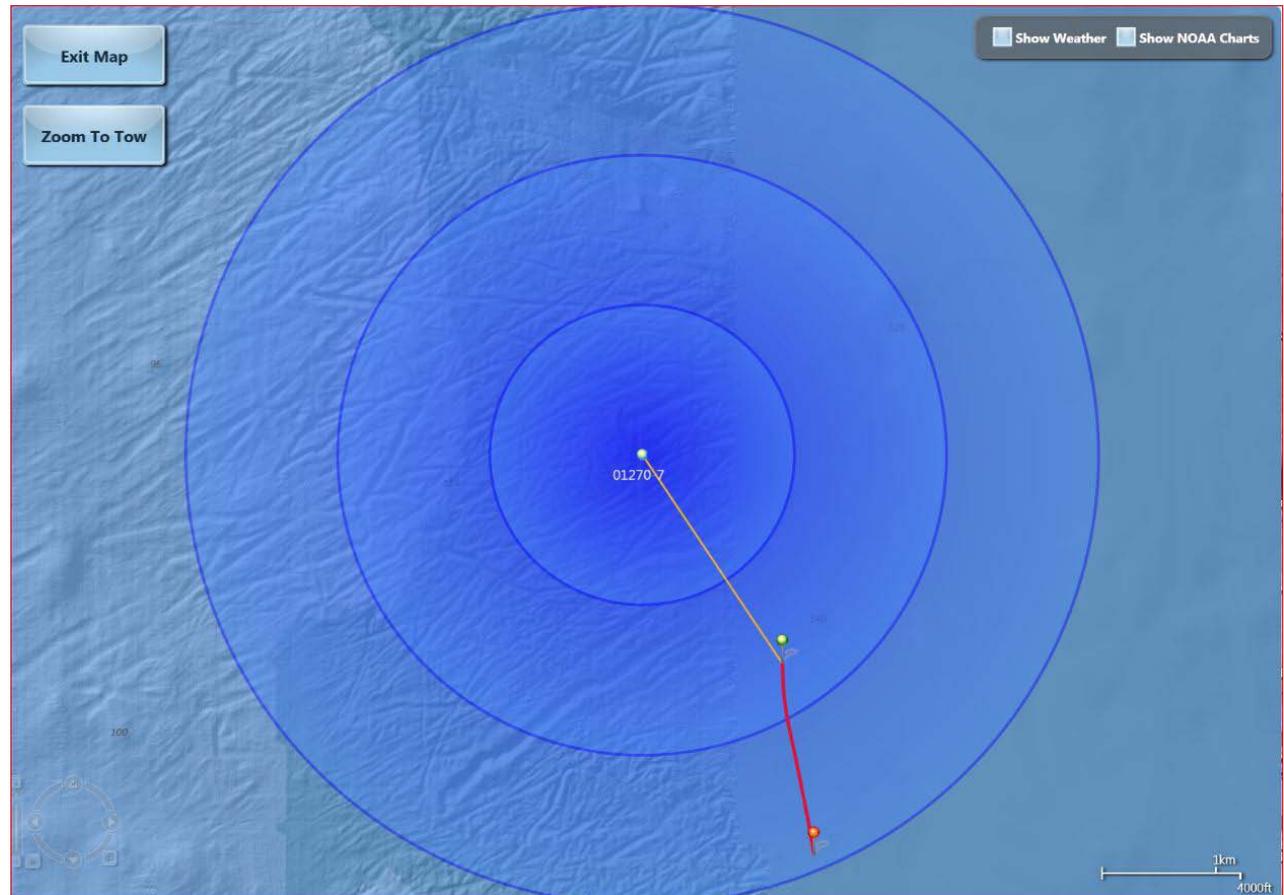


Performance Charting Screen





Tow Proximity Chart Example



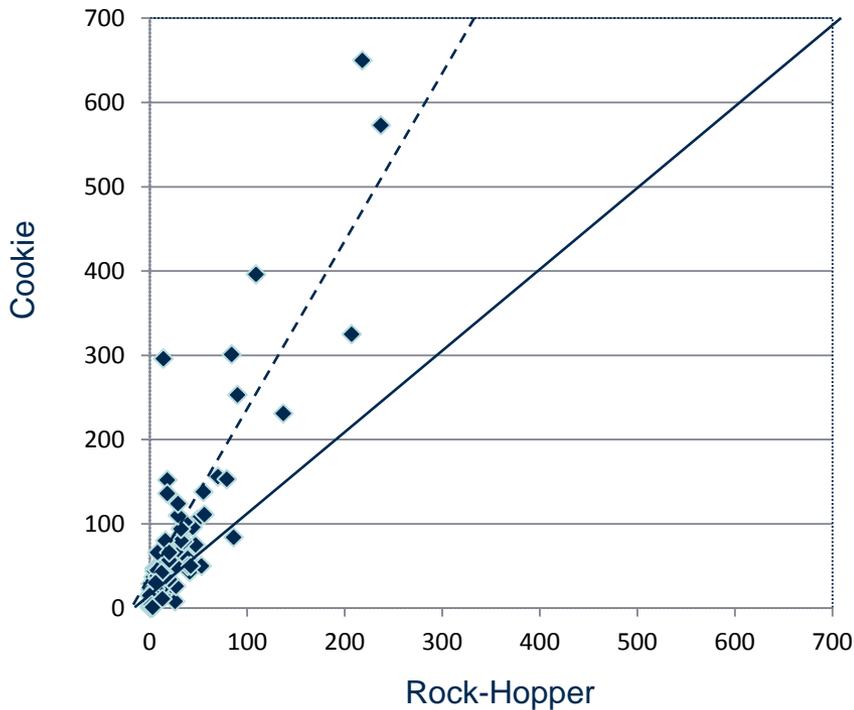


Sweep Study Results for Georges Bank Yellowtail Flounder

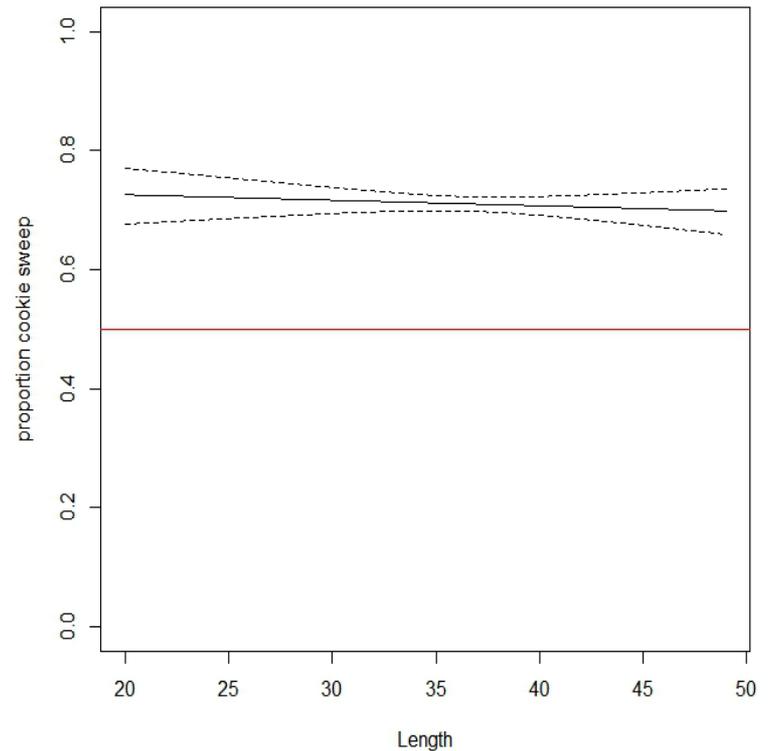
107 pairs

Cn = 7383 (72%)

Rn = 2934 (28%)

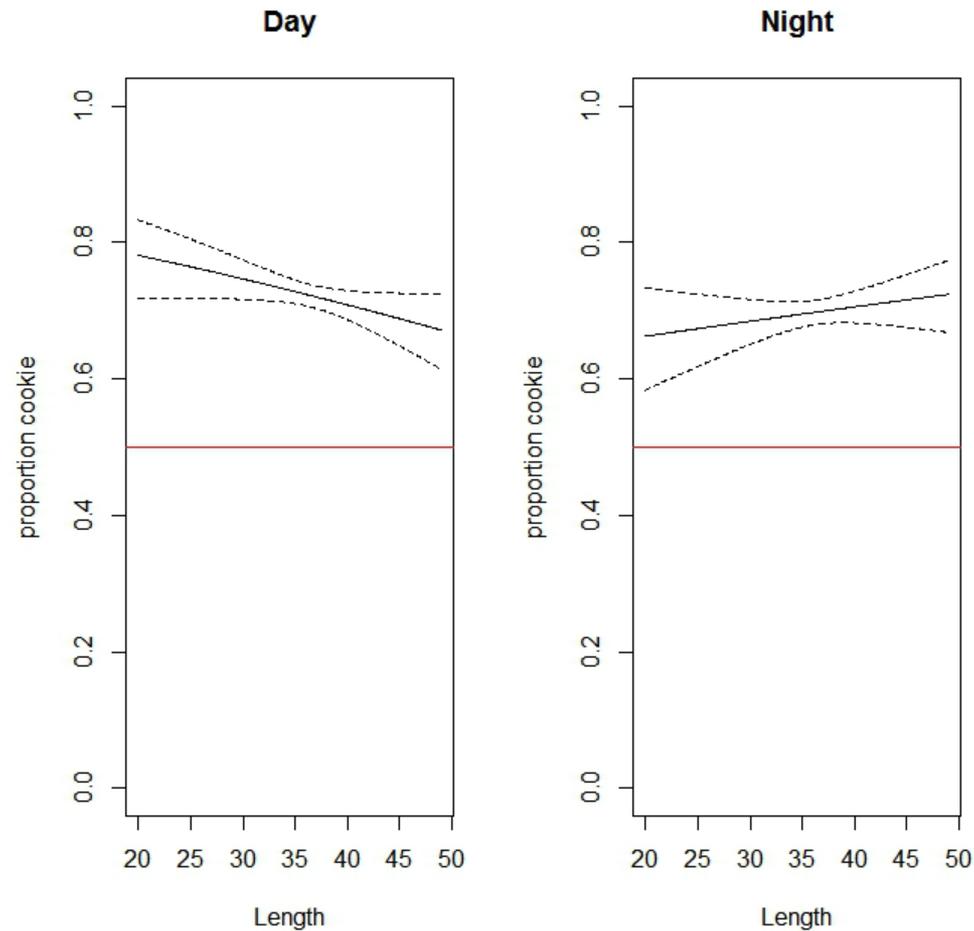


All Yellowtail Flounder





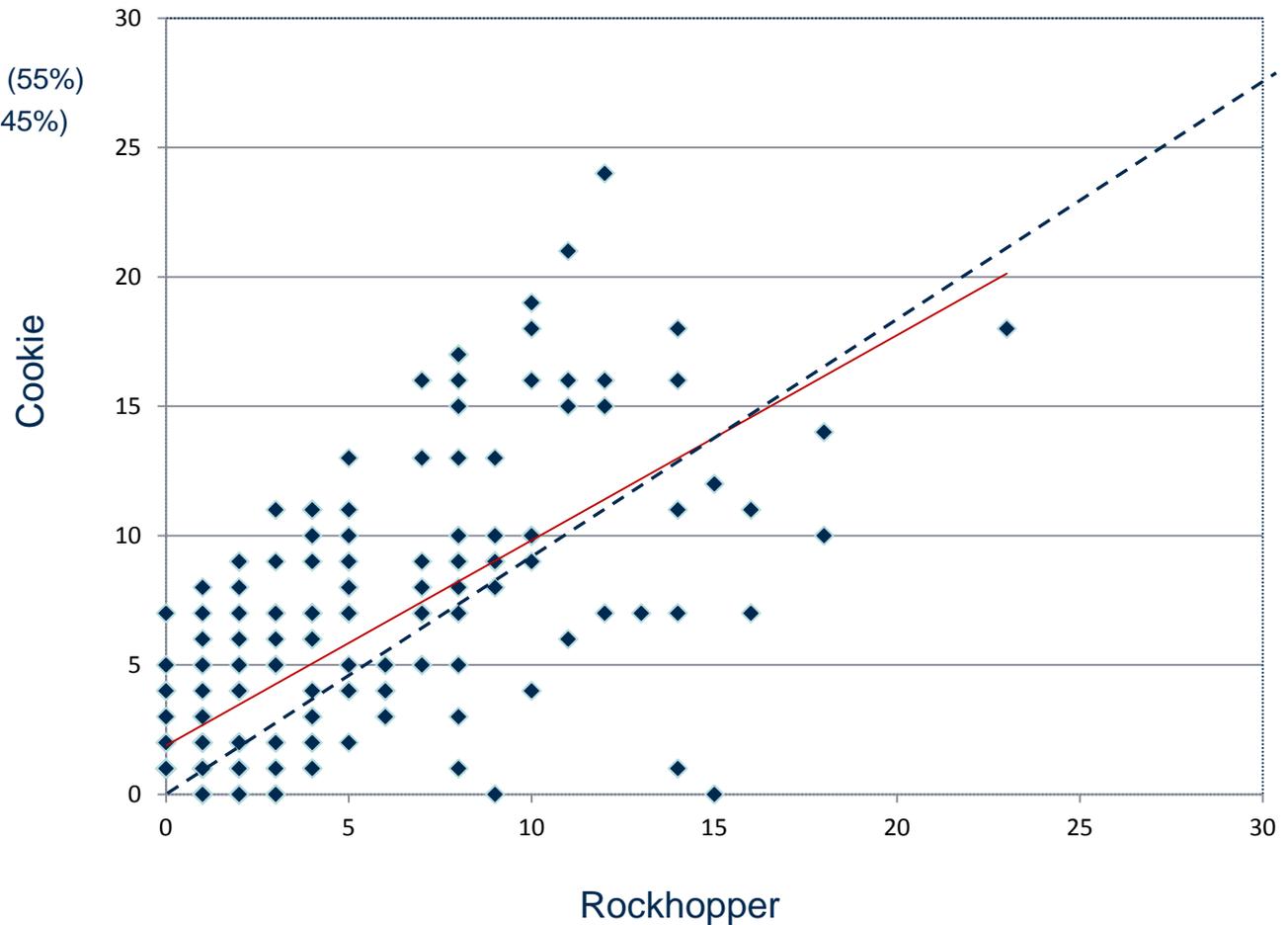
Sweep Study Results for Georges Bank Yellowtail Flounder





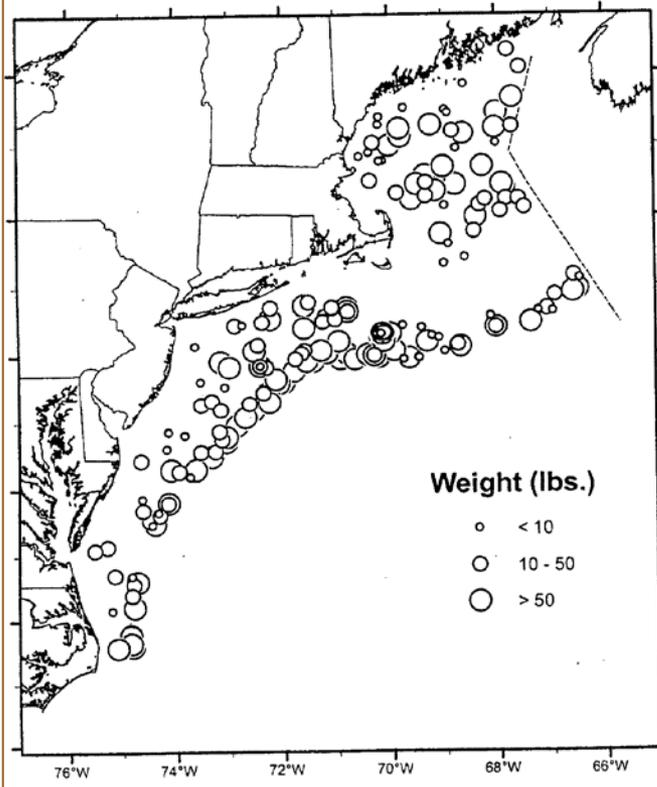
Sweep Study Results for Monkfish – All Areas

224 Pairs
Cn = 1205 (55%)
Rn = 986 (45%)

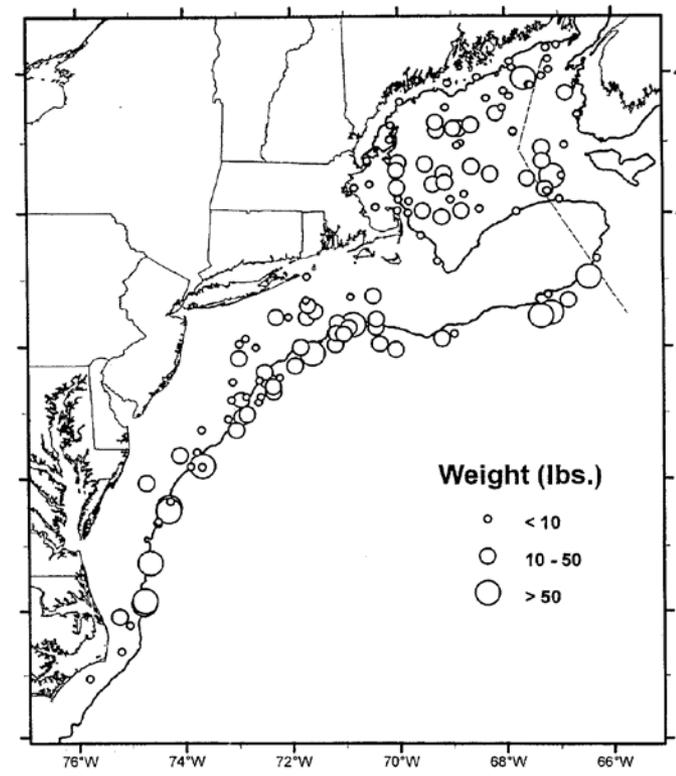




MONKFISH
NOAA Fisheries Service
Cooperative Monkfish Survey
9 February to 6 June 2009



GOOSEFISH
NOAA Fisheries Service
Bottom Trawl Survey
27 February to 9 May 2009





Monkfish Catch Rate Comparison

Albatross

Survey	Total Tows	Tows with Monkfish	Percent w/Monks	Total Catch
SPRING 2006	343	44	13	62
FALL 2006	367	77	21	142
SPRING 2007	362	53	15	124
FALL 2007	347	55	16	94
SPRING 2008	344	43	13	93
FALL 2008	438	67	15	147
Mean	367	57	15	110
TOTAL TOWS		339		
TOTAL MONKS		662		
AVG MONKS/TOW		2.0		

HB Bigelow

Survey	Total Tows	Tows with Monkfish	Percent w/Monks	Total Catch
SPRING 2009	404	139	34	652
FALL 2009	365	154	42	642
SPRING 2010	396	134	34	511
FALL 2010	369	164	44	840
SPRING 2011	367	145	40	888
FALL 2011	362	166	46	907
Mean	377	150	40	740
TOTAL TOWS		902		
TOTAL MONKS		4440		
AVG/TOW		4.9		