

Characterization of the Trawl Fishery

Chris Orphanides and
Gisele Magnusson,
Protected Species Branch, NEFSC, NMFS
Woods Hole, MA

Presentation Overview

- Purpose of presentation is to describe where and when fishing trawl activity occurs, with what gear types and configurations, and for which species
- I will focus on providing an overview of the fishery from 1996-2004, Gisele will discuss changes over the years focusing on economic value
- A corresponding paper is currently in review and should be available soon

Vessel Trip Reports (VTR)

- Mandatory reporting requirement by vessels permitted in most federally managed species
- One report per trip where gear and location are consistent

NOAA Form No. 88-30 OMB No. 0648-0212
Expires 7/31/05

FISHING VESSEL TRIP REPORT

DID NOT FISH DURING MONTH/YEAR 1 10209618

1. VESSEL NAME Albatross		2. USCG. DOC. or STATE REG. NO. 123456		3. VESSEL PERMIT NUMBER 330123	
4. DATE/TIME SAILED DATE (mm/dd/yy) 01/30/03 TIME (24 hrs.) 03 30		5. TRIP TYPE (CHECK ONE) <input checked="" type="checkbox"/> COMMERCIAL <input type="checkbox"/> PARTY <input type="checkbox"/> CHARTER		6. NO. OF CREW 5	
7. NO. OF ANGLERS		8. GEAR FISHED OTF		9. MESH/RING SIZE 5 1/2	

FILL OUT A NEW PAGE FOR EACH CHART AREA OR GEAR OR MESH/RING SIZE FISHED

12. CHART AREA 537		14. LATITUDE/LONGITUDE or LORAN LATITUDE _____ LONGITUDE _____		15. NO. OF HAULS 3	
13. AVG. DEPTH 50 fathoms		19. STATION BEARING #1 14500		20. STATION BEARING #2 43400	
17. SPECIES CODE NAME		18. KEPT POUNDS (Comm) COUNT (Rec)		19. DISCARDED POUNDS (Comm) COUNT (Rec)	
Fluke		700 35		12345 The Fish Co.	
COD		50 1		1 1	
FLYT		75 25		1 1	

23. PORT and STATE LANDED Pt. Judith, R.I.		24. DATE LANDED (mm/dd/yy) 01/31/03		TIME LANDED 16 50	
--	--	---	--	-----------------------------	--

I certify that the information provided on this form is true, complete and correct to the best of my knowledge, and made in good faith. Making a false statement on this form is punishable by law (18 U.S.C. 1001).

25. OPERATOR'S NAME (printed) and PERMIT NUMBER (if required) Joseph Fisher 10001010		26. OPERATOR'S SIGNATURE Joseph Fisher		DATE 01/31/03	
--	--	--	--	-------------------------	--

NMFS COPY

Fisheries Characterized

Bottom Trawls

- Bottom Fish Otter Trawl (OTF) (96.73%)
- Bottom Other Otter Trawl (OTO) (0.15%)

Mid-water Trawls

- Mid-water Single Trawl (OTM) (1.80%)
- Mid-water Paired Trawl (PTM) (1.32%)

Scallop Otter Trawl is NOT included since no bycatch had been observed through 2004

(% of all 1996-2004 trawl trips in yellow)

Fishing Effort Calculation

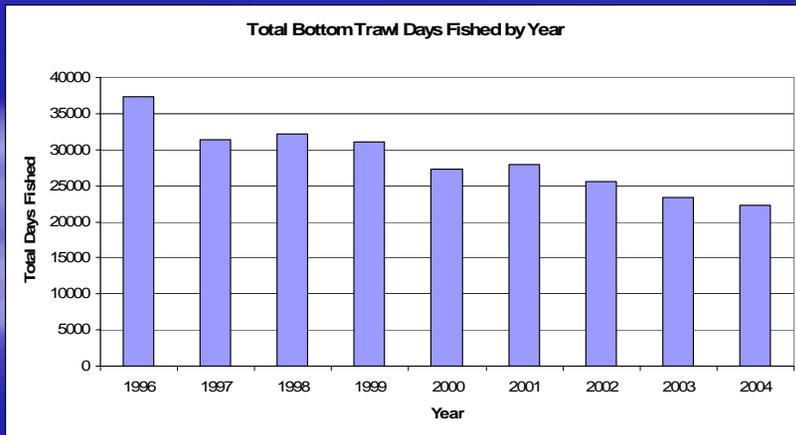
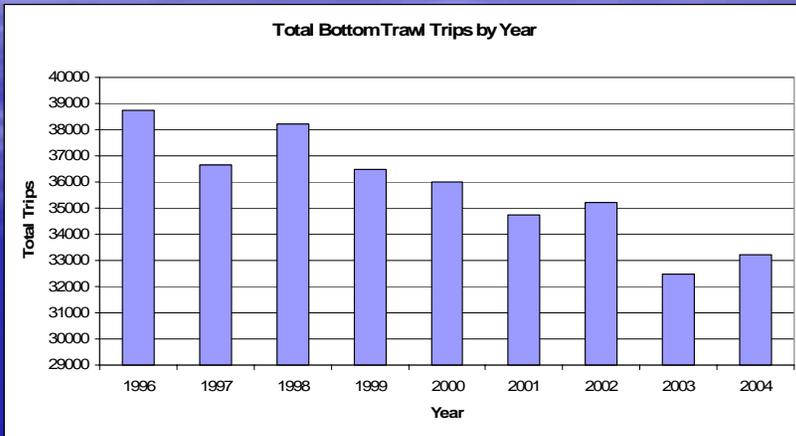
- Measures of effort include days absent, trips, landings, and days fished
- Effort maps displayed in this presentation use “days fished” per trip to depict effort

*days fished = average soak time * number of hauls*

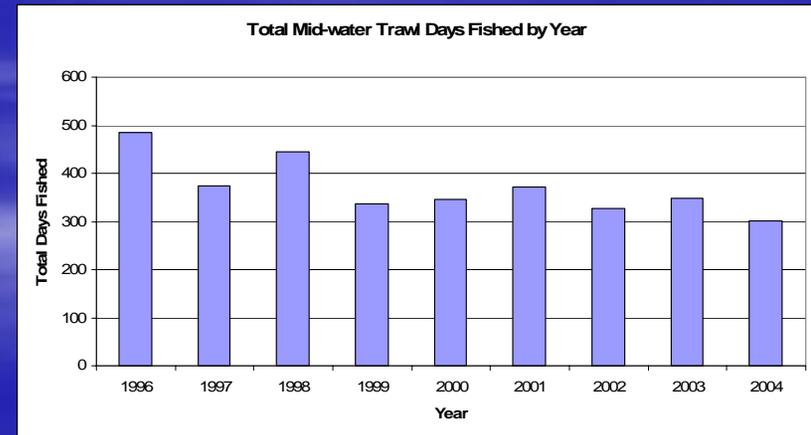
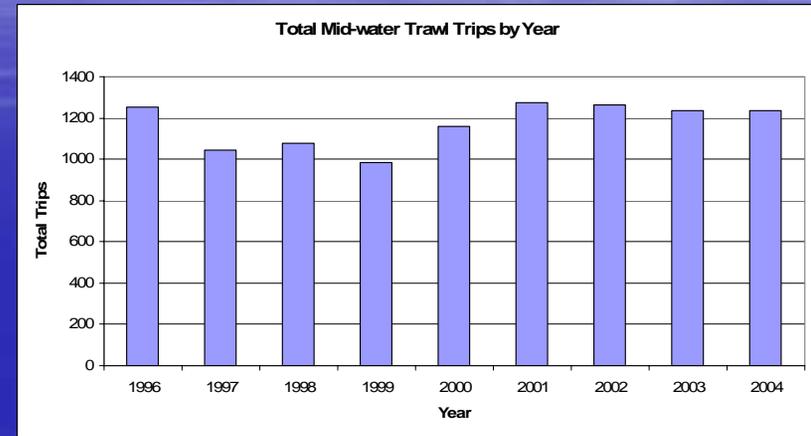
Where average soak time is converted to decimal days, and the number of hauls is the total number of hauls for the trip

Days Fished and Trips Effort by Year

BOTTOM TRAWL

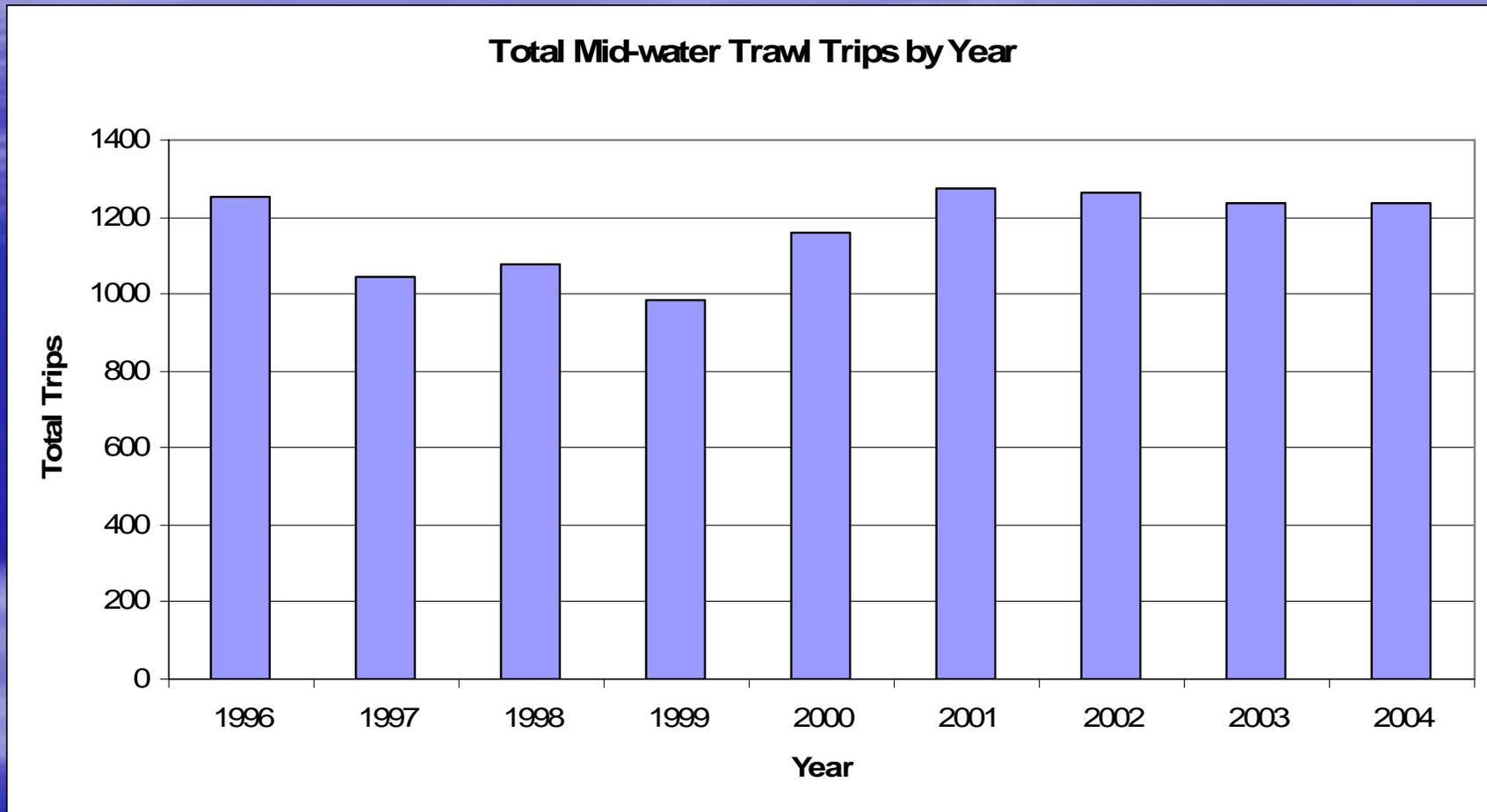


MID-WATER TRAWL



Days Fished and Trips Effort by Year

BOTTOM TRAWL

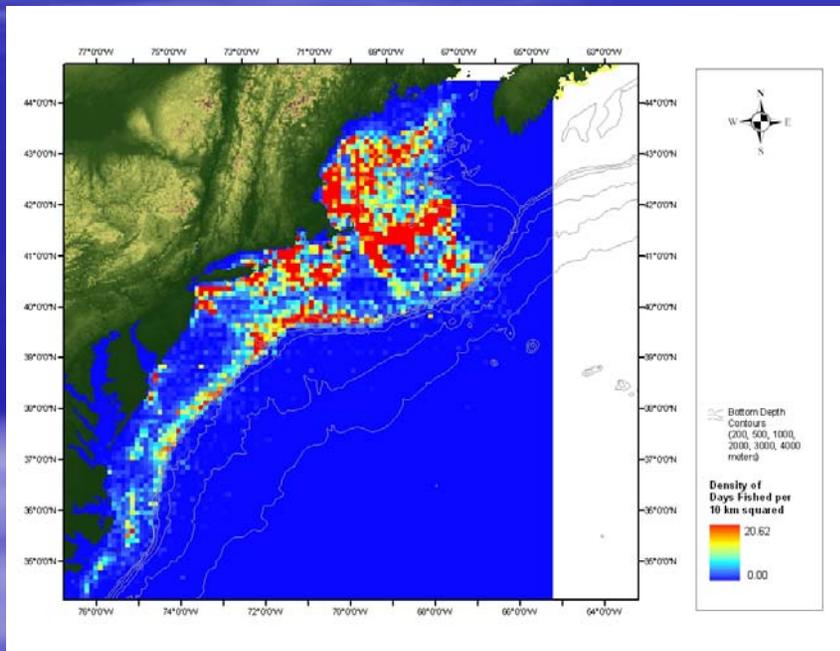


MID-WATER TRAWL

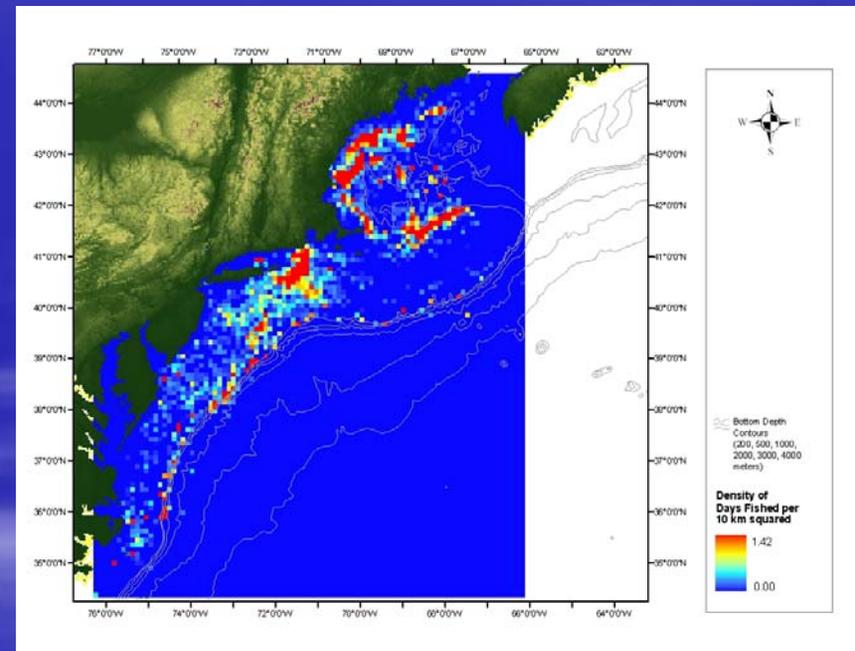
Fishing Effort Maps

Bottom and Mid-water Comparison

Bottom Trawl Effort by Days Fished

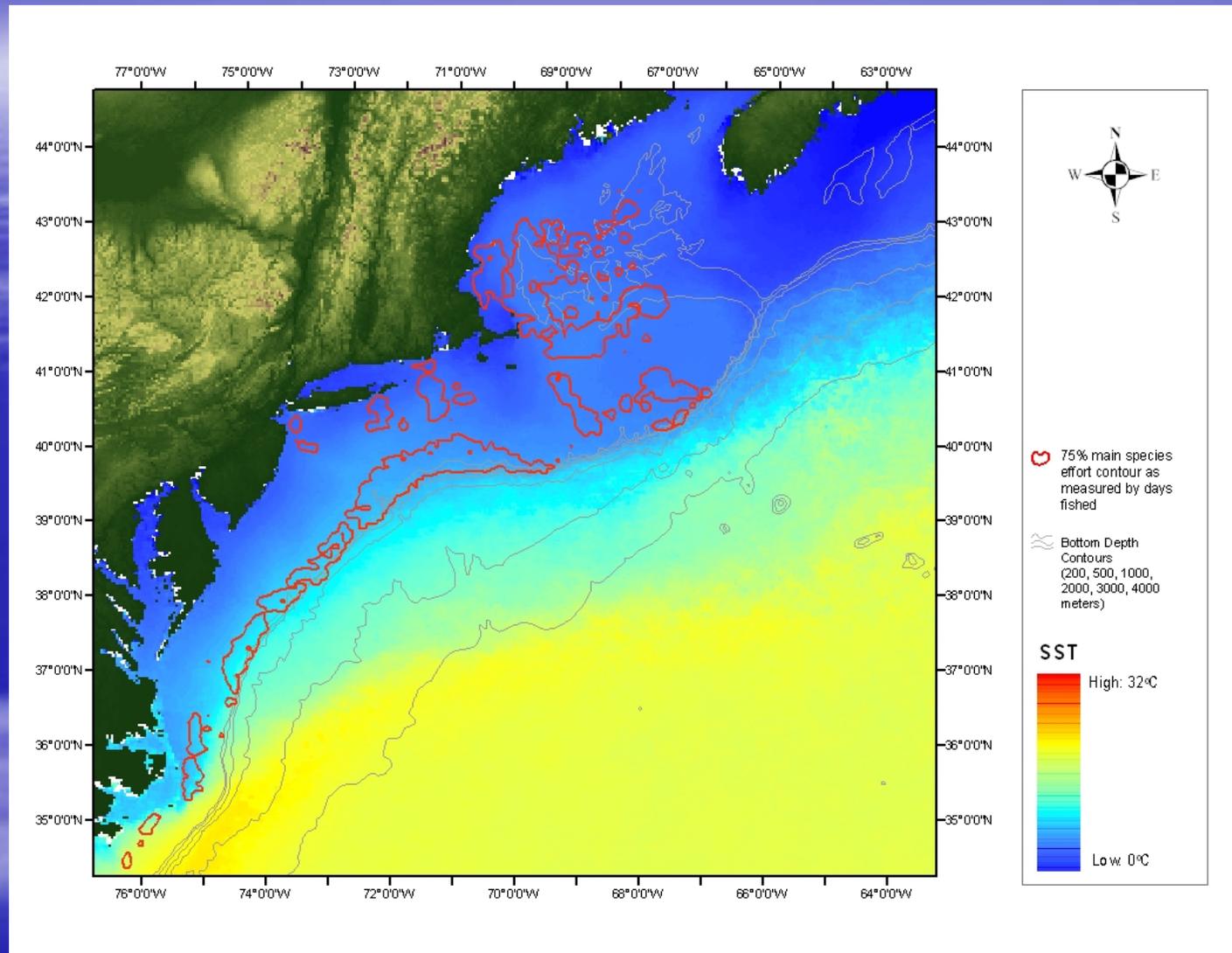


Mid-water Trawl Effort by Days Fished



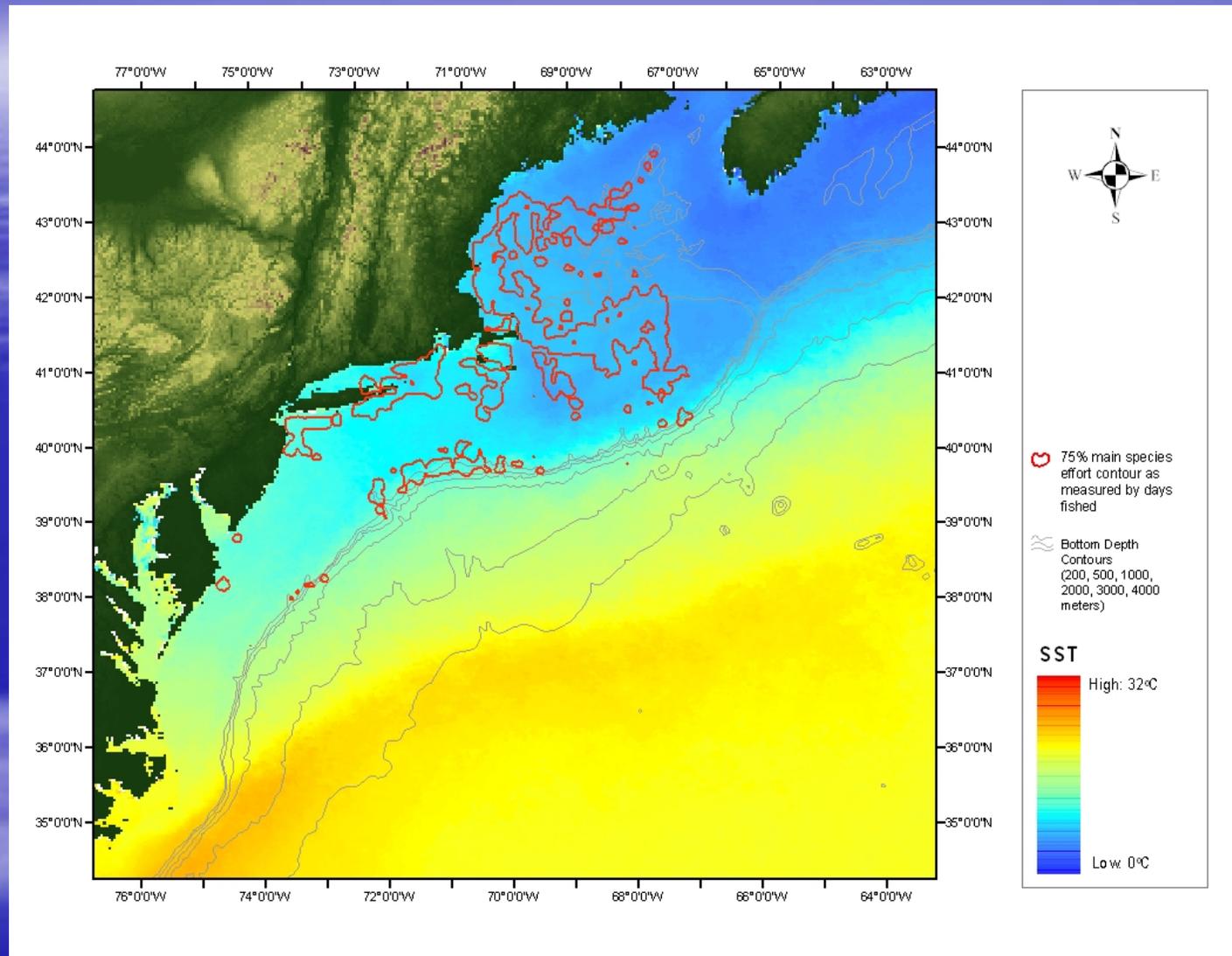
Data from 1996-2004

Bottom Trawl Effort by Quarter/Season



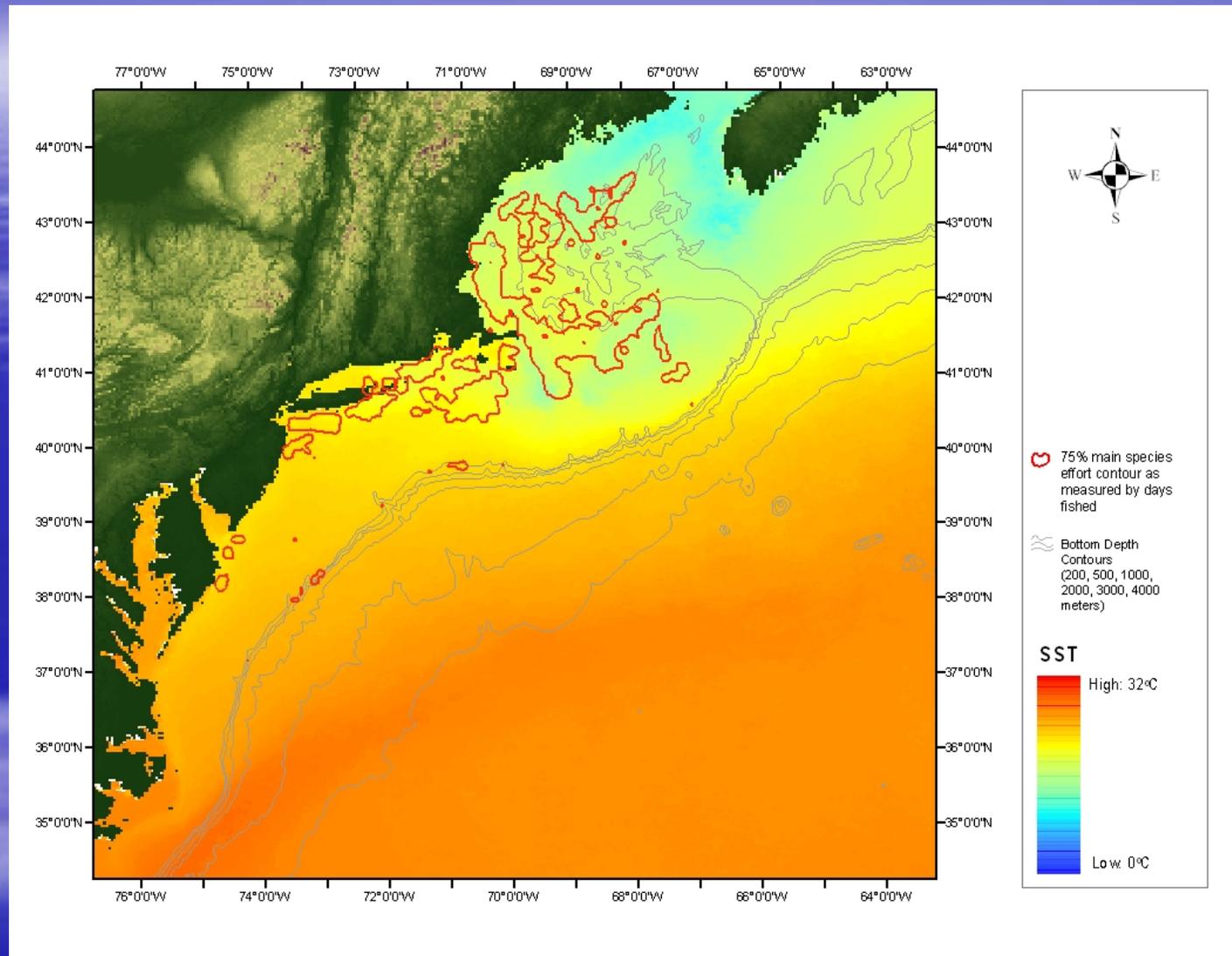
1st Quarter (January-March)

Bottom Trawl Effort by Quarter/Season



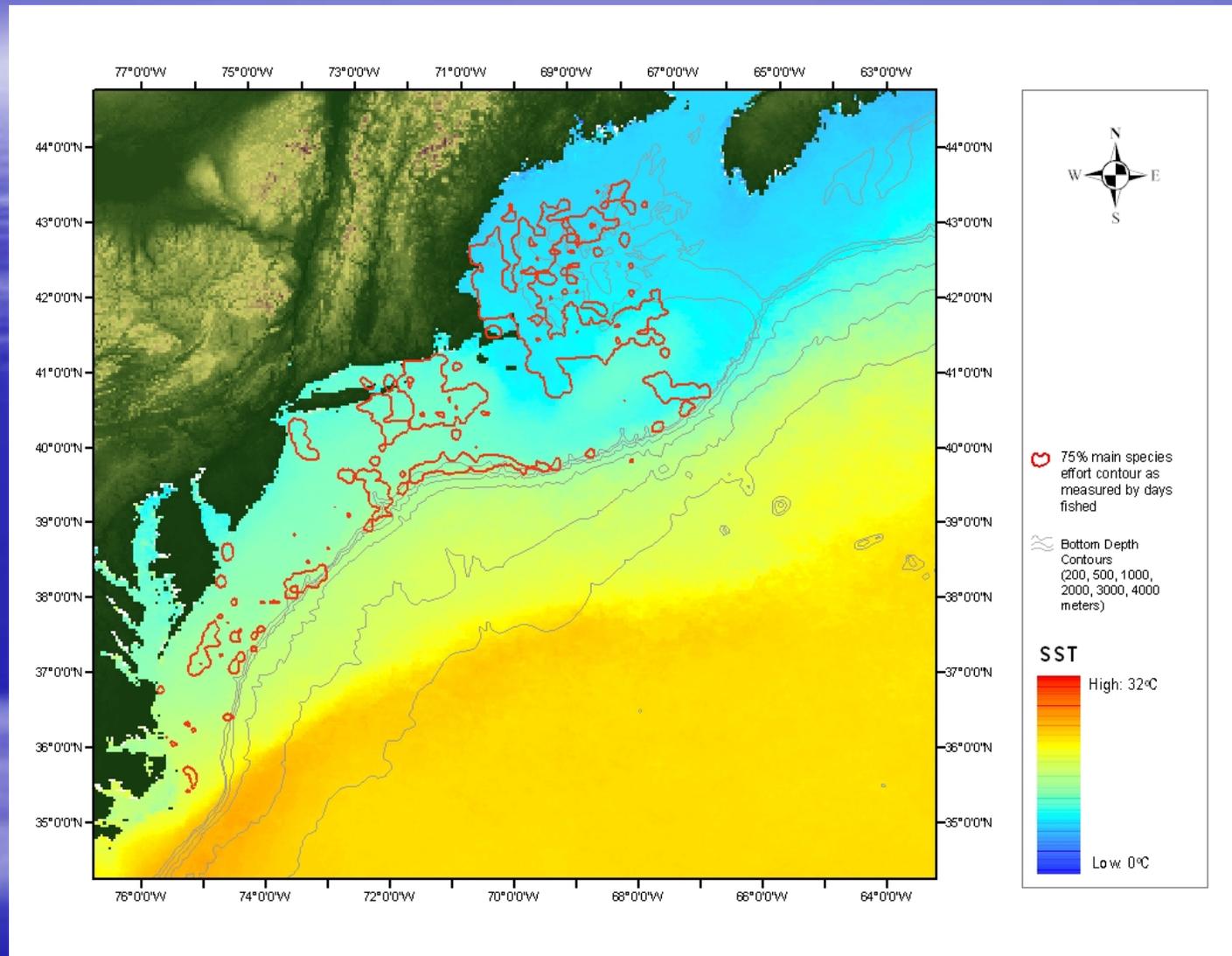
2nd Quarter (April-June)

Bottom Trawl Effort by Quarter/Season



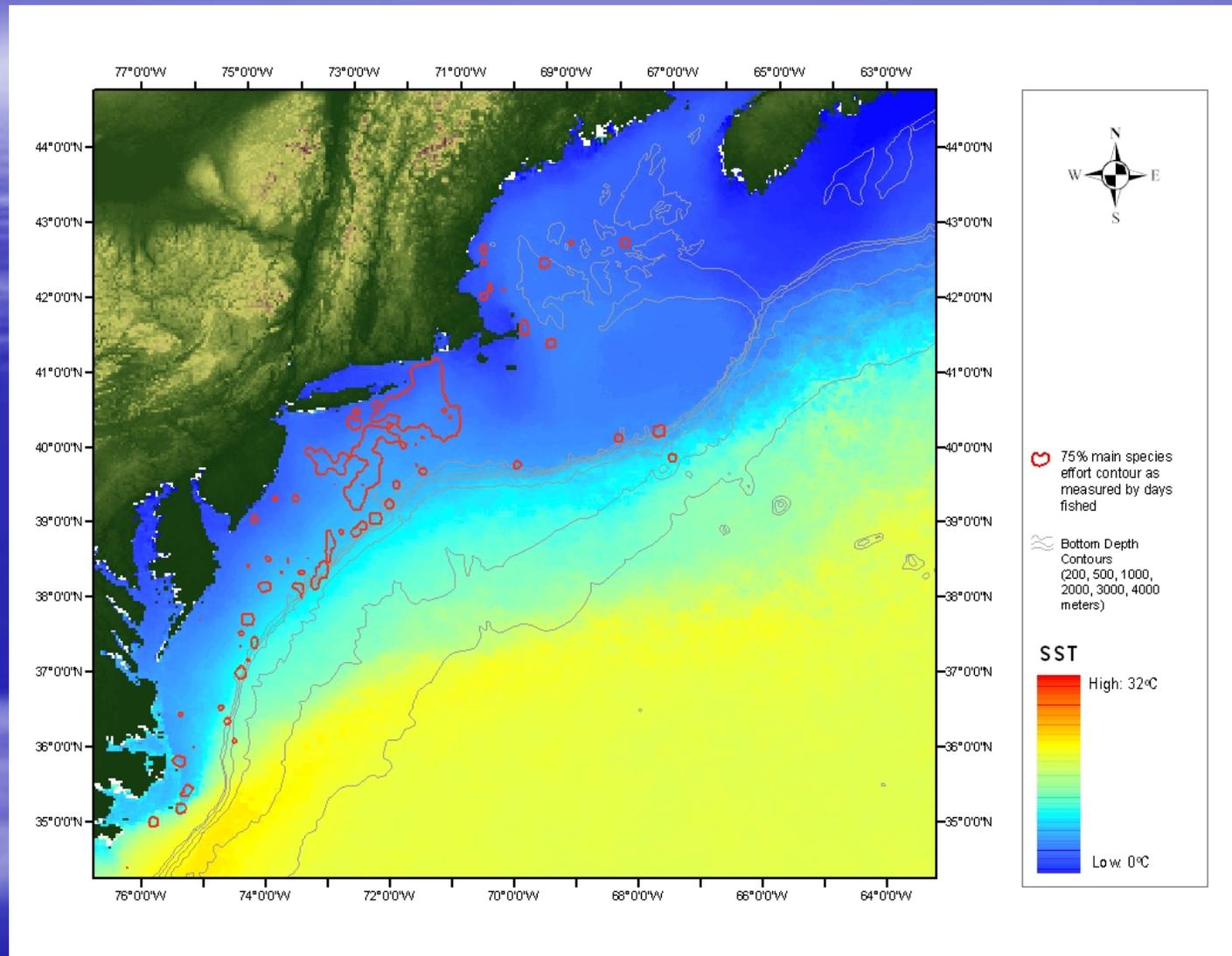
3rd Quarter (July-September)

Bottom Trawl Effort by Quarter/Season



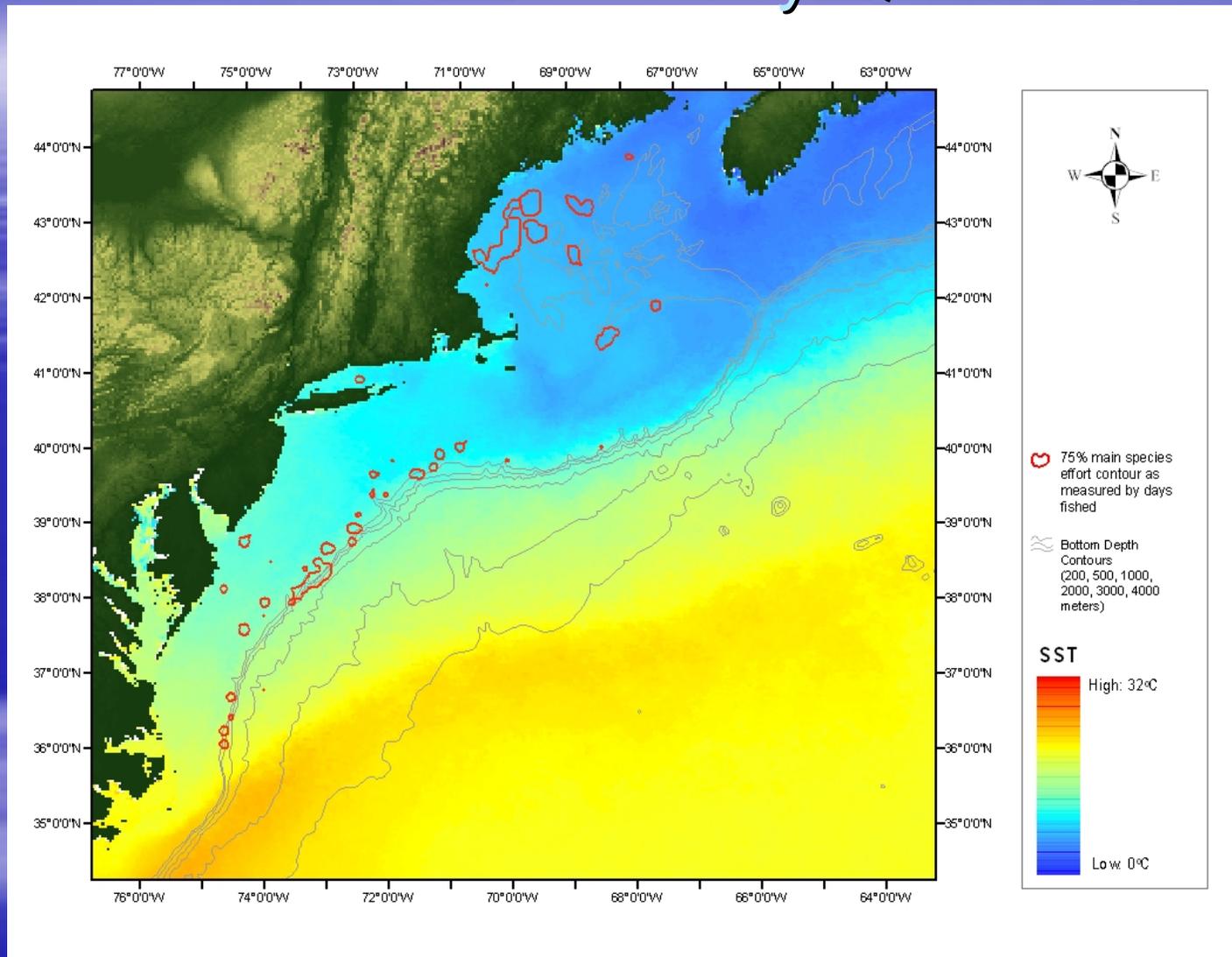
4th Quarter (October-December)

Mid-water Trawl Effort by Quarter/Season



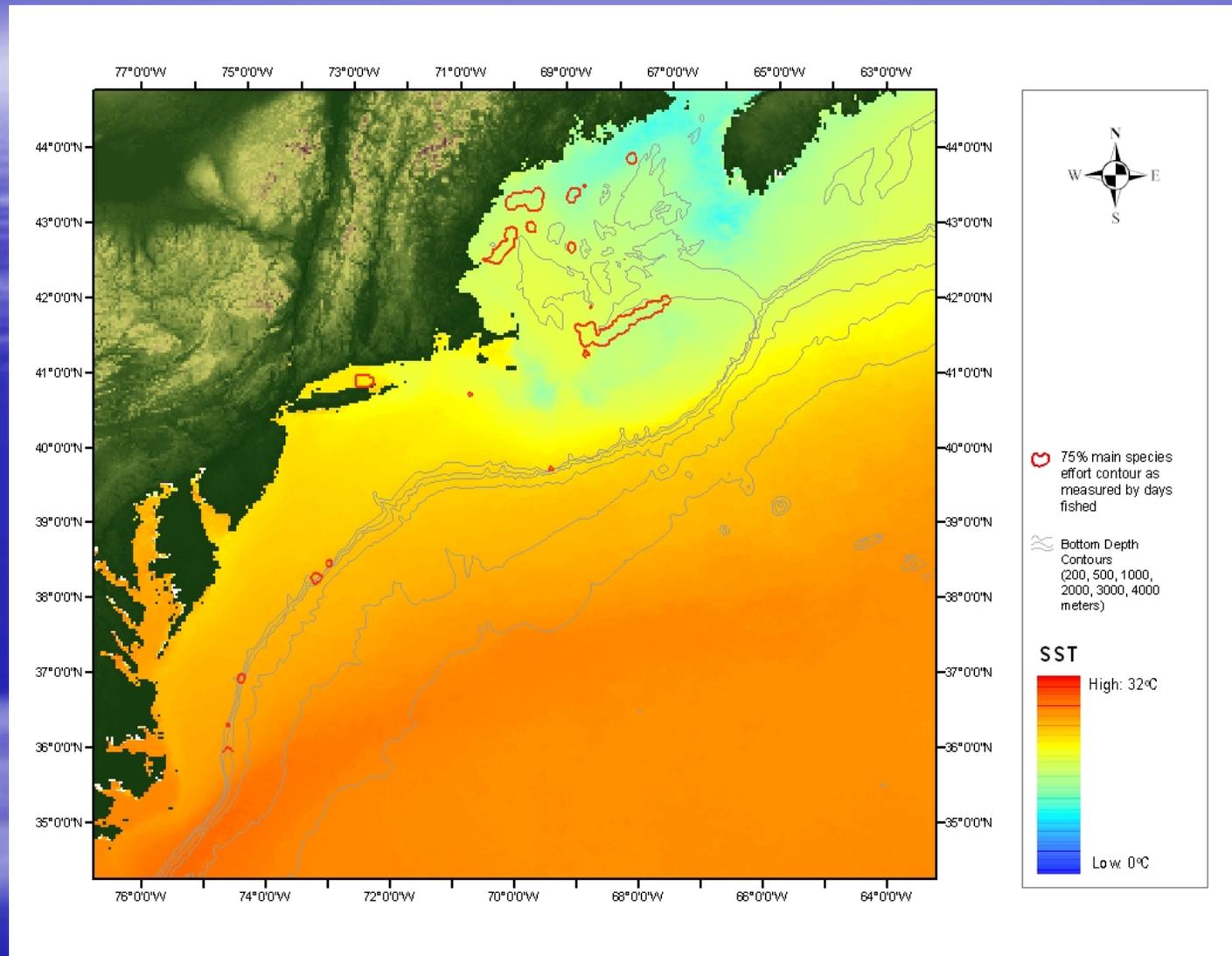
1st Quarter (January-March)

Mid-water Trawl Effort by Quarter/Season



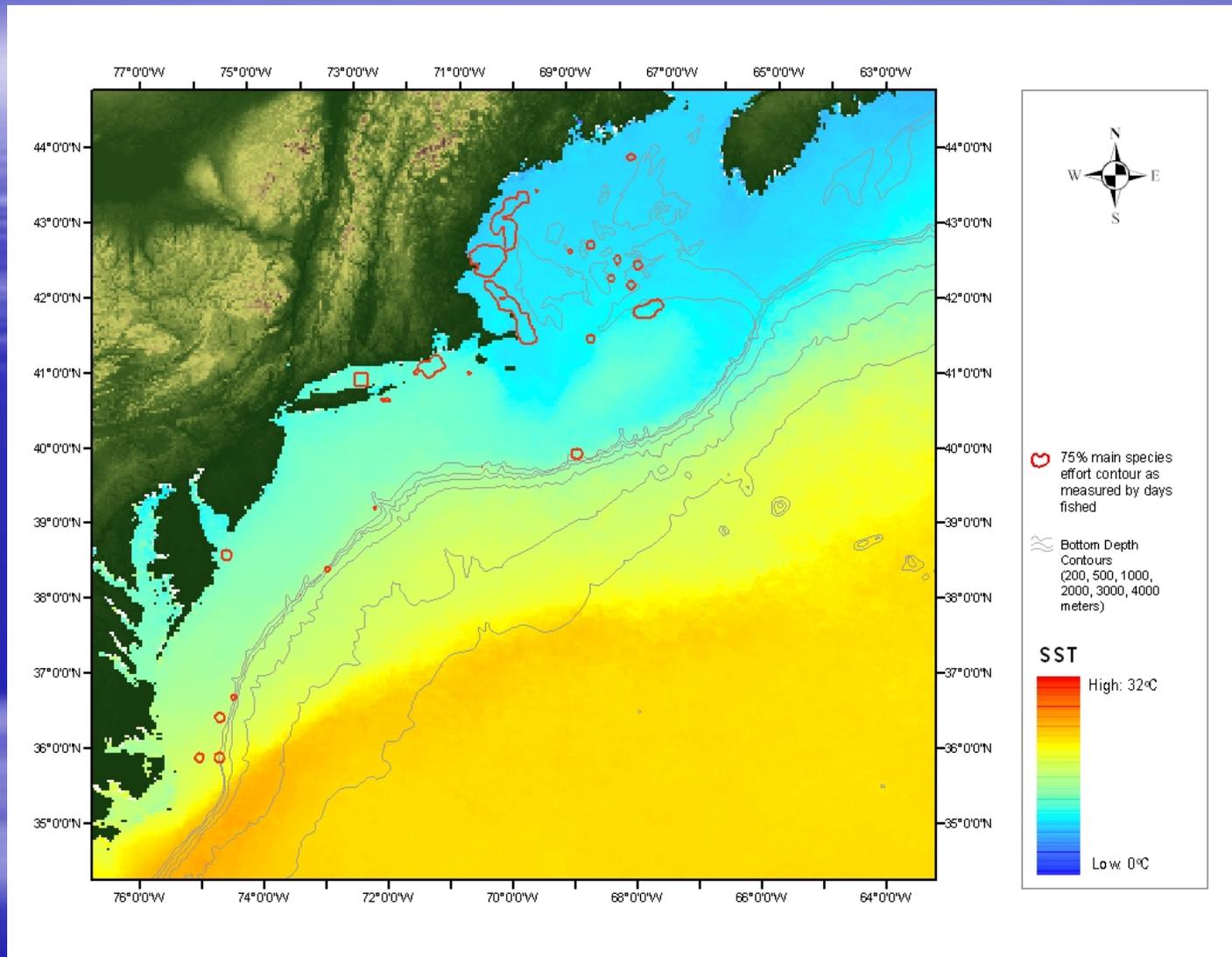
2nd Quarter (April-June)

Mid-water Trawl Effort by Quarter/Season



3rd Quarter (July-September)

Mid-water Trawl Effort by Quarter/Season



4th Quarter (October-December)

Bottom Trawl Trips by “Main Species” Designation

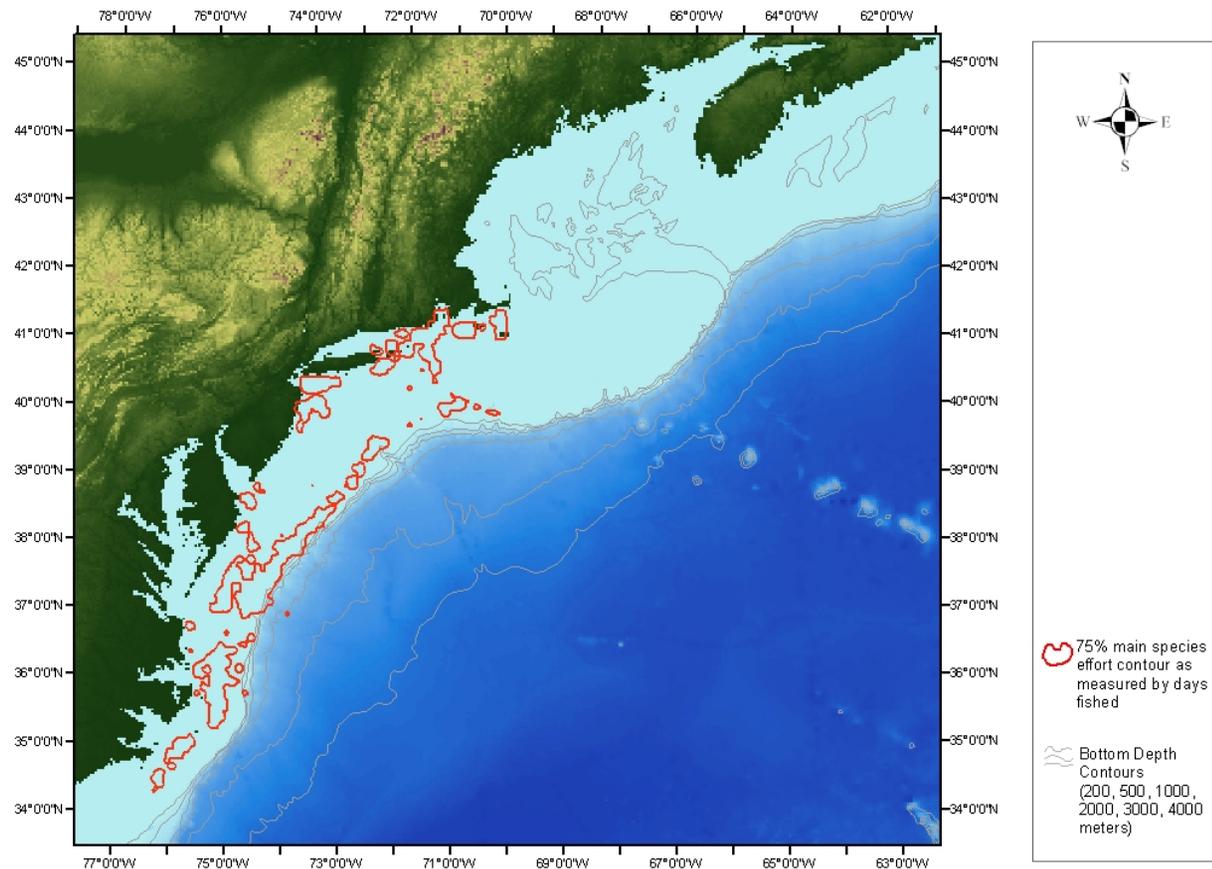
■ Fluke	17.83%	■ Atl. Herring	3.12%
■ Squid, <i>Loligo</i>	10.34%	■ Witch Fl.	2.96%
■ Cod	8.27%	■ Scup	2.84%
■ Winter Fl.	8.08%	■ Spiny Dogfish	1.58%
■ Silver Hake	6.68%	■ Haddock	1.21%
■ Yellowtail Fl.	6.18%	■ Atl. Mackerel	0.79%
■ Skate	5.83%	■ Squid, <i>Illex</i>	0.66%
■ Am. Plaice	4.76%	■ Other Species	12.97%
■ Monkfish	4.15%		

“Main species” designation is the species with the most live weight per trip

Bottom Trawl Effort by Species

Fluke (Summer Flounder)

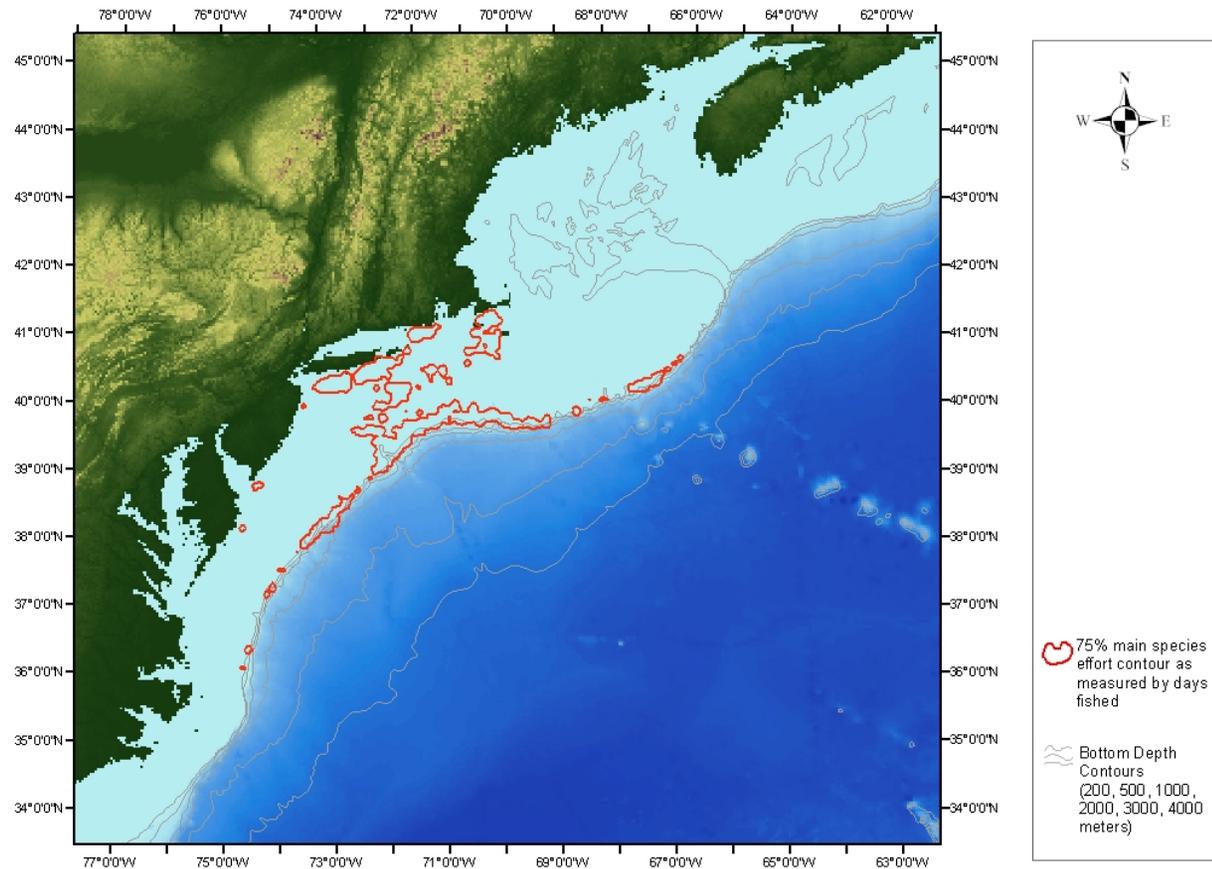
Landings peak from November through March, with the most landings in January



Bottom Trawl Effort by Species

Loligo squid

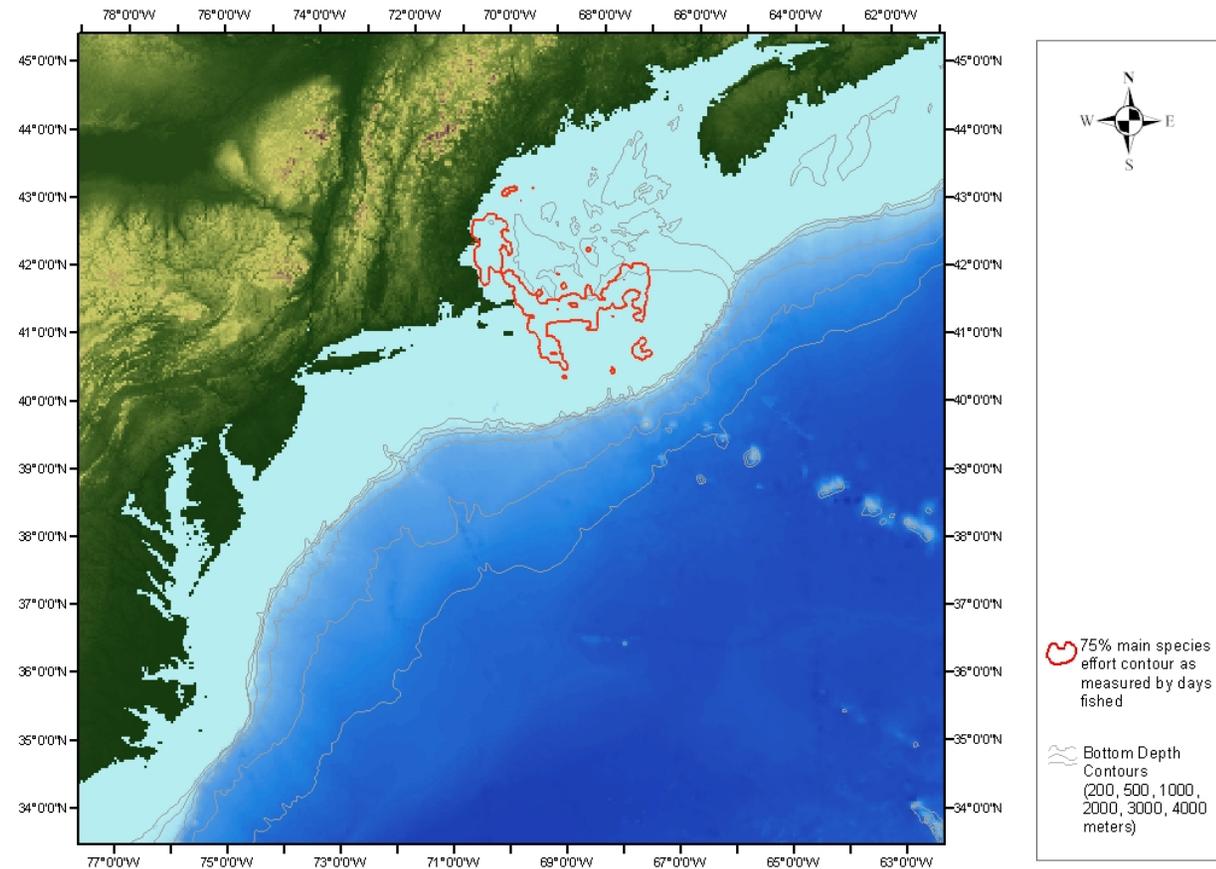
Landings peak from October through April, with the most landings in February



Bottom Trawl Effort by Species

Cod

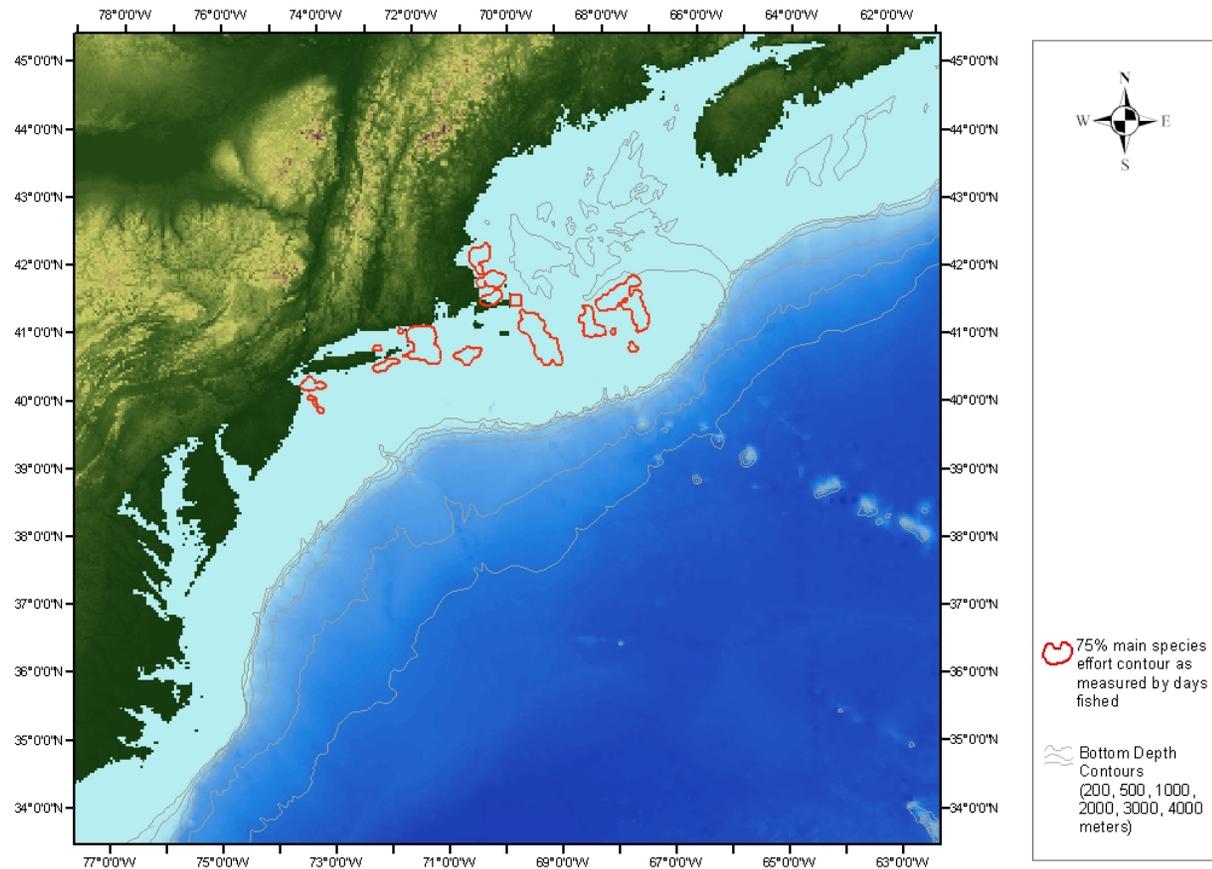
- Most landings are in June in the Gulf of Maine and April on Georges Bank.
- Landings fairly consistent throughout the year in the Gulf of Maine
- Landing peak on Georges Bank between March and June



Bottom Trawl Effort by Species

Winter Flounder

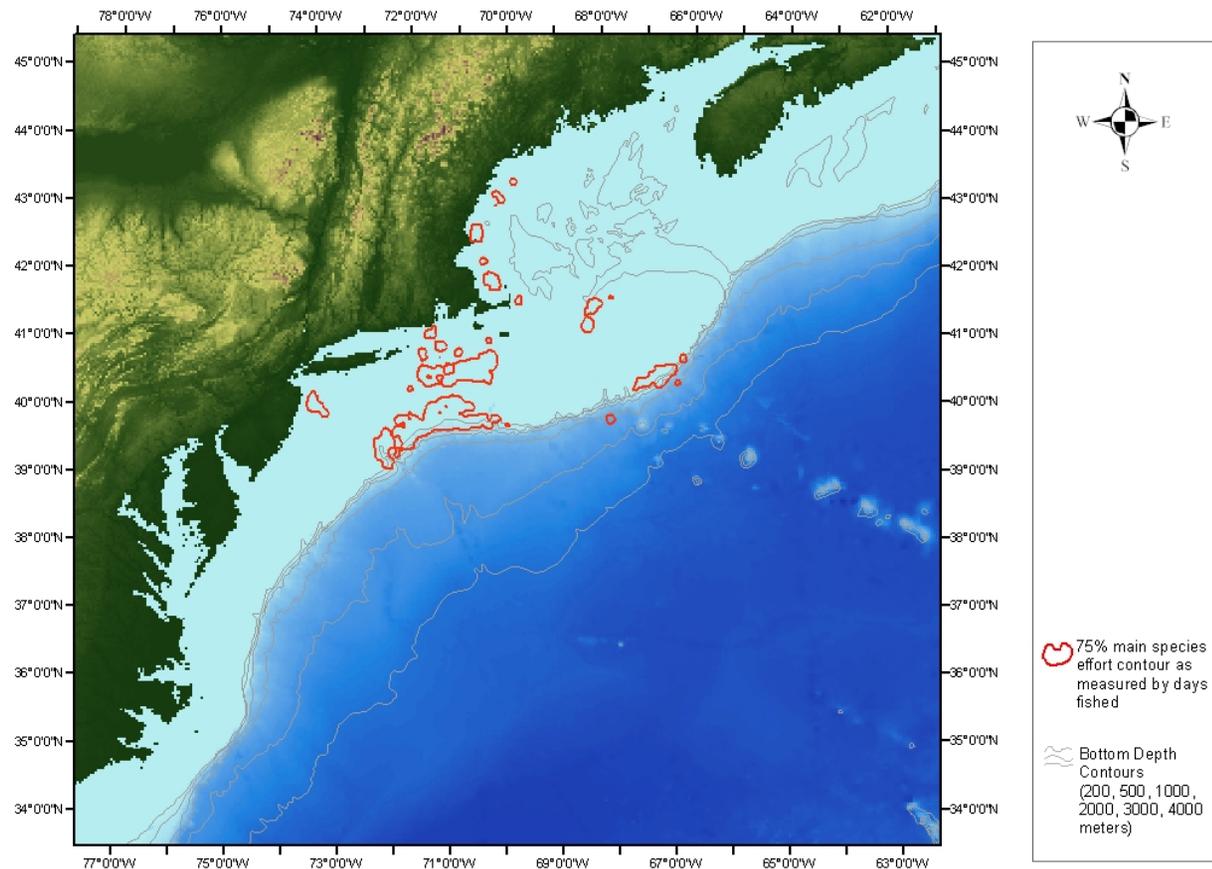
Landings peak in October in the Gulf of Maine, June on Georges Bank, and May south of New England



Bottom Trawl Effort by Species

Silver Hake

- Caught in significant numbers throughout the year south of New England, but landings peaked in March
- Peak in landings on Georges Bank is from May to September
- Peak in landings in the Gulf of Maine is in October



Mid-water Trawl

Trips by “Main Species” Designation

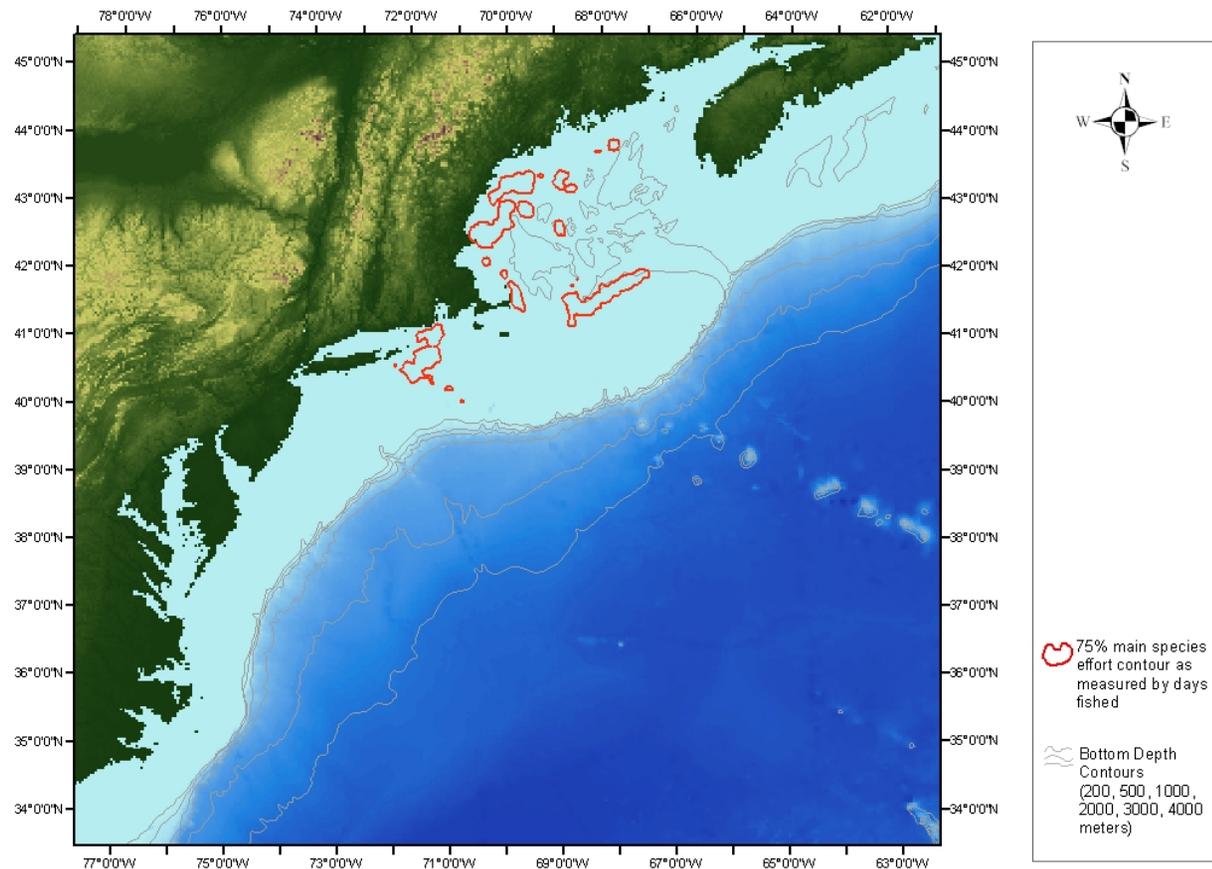
■ Atl.Herring	82.75%
■ Atl. Mackerel	9.62%
■ Atl. Croaker	1.39%
■ Bluefish	1.27%
■ Squid, <i>Illex</i>	1.20%
■ Squid, <i>Loligo</i>	0.84%
■ Scup	0.51%
■ Other Species	2.42%

**“Main species” designation is the species
with the most live weight per trip**

Mid-water Trawl Effort by Species

Atlantic Herring

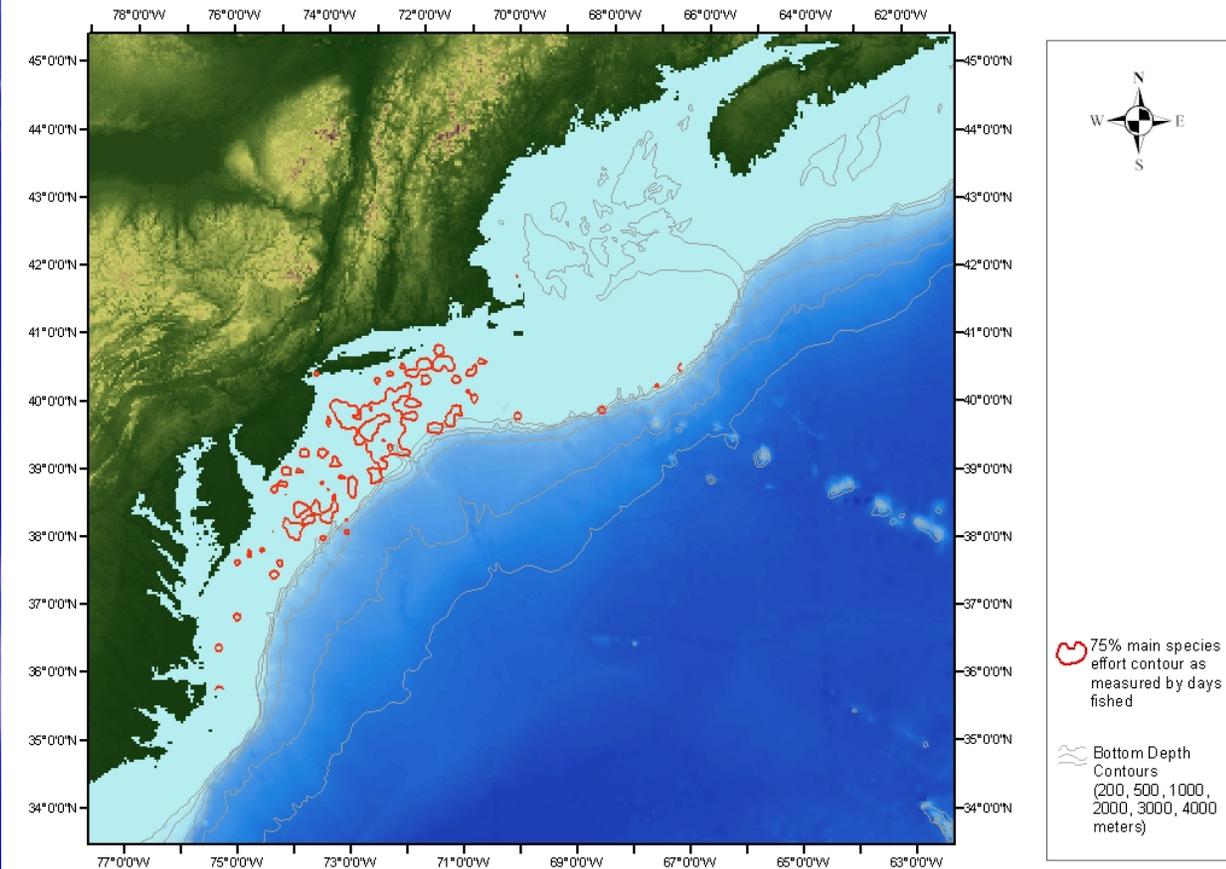
Atlantic herring landings peak in June and November in the Gulf of Maine, August on Georges Bank, and in January south of New England



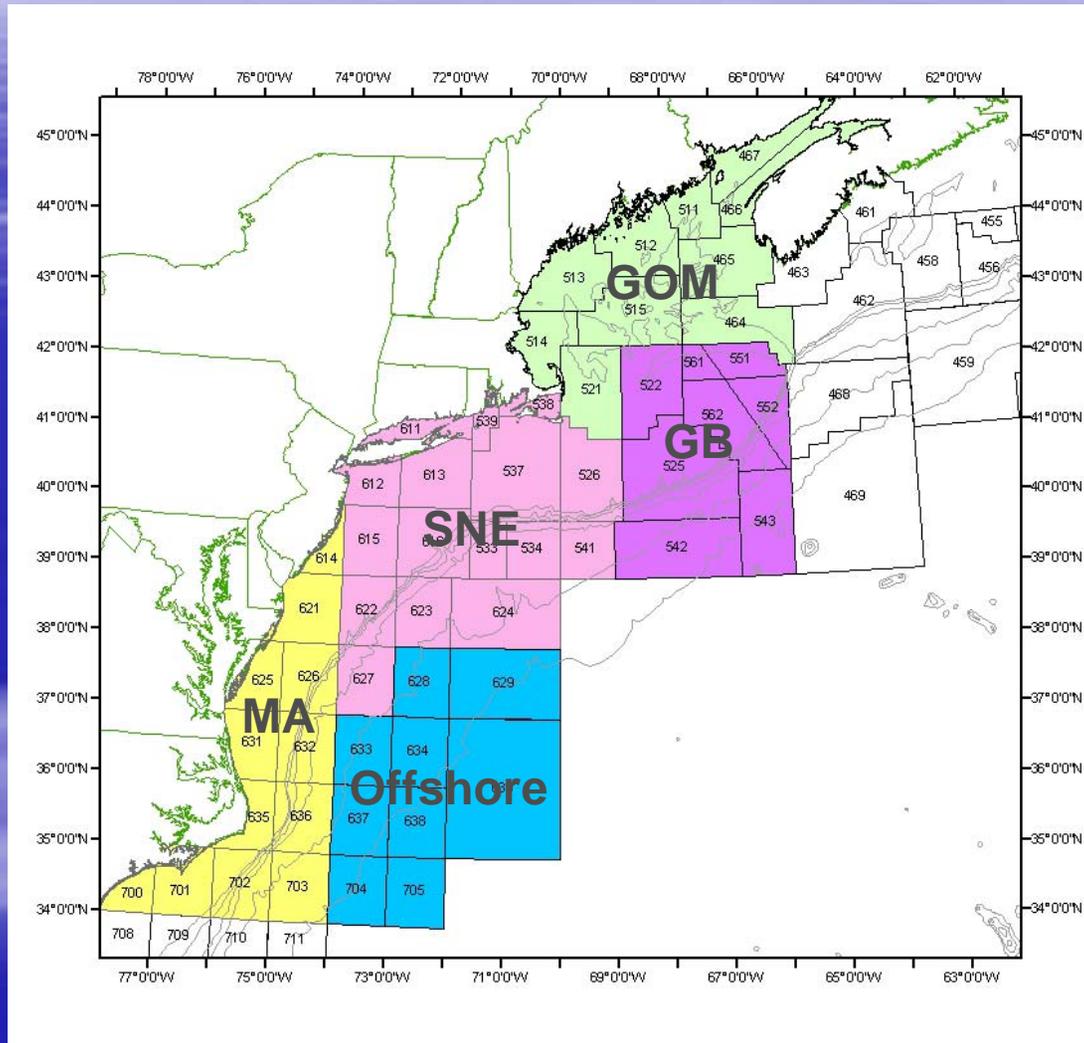
Mid-water Trawl Effort by Species

Atlantic Mackerel

Atlantic mackerel landings peak from January through March, with almost no recorded catch from June to November



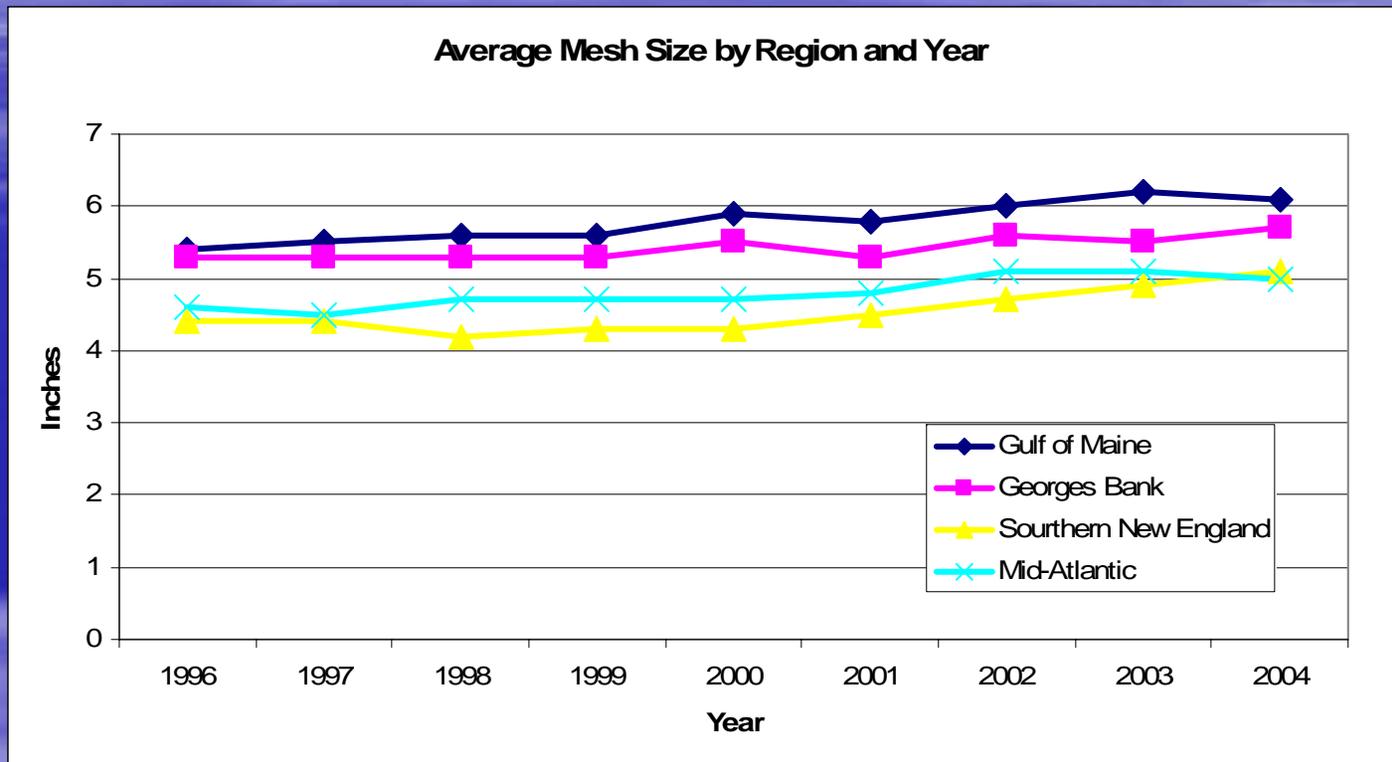
Regional Map



GOM = Gulf of Maine
GB = Georges Bank
SNE = S. New England
MA = Mid-Atlantic
Offshore = Offshore

Regions divided
by statistical area
and based on
ecological and
management
boundaries

Bottom Trawl Mesh Size by Region



Offshore and unknown areas not shown because of small sample size

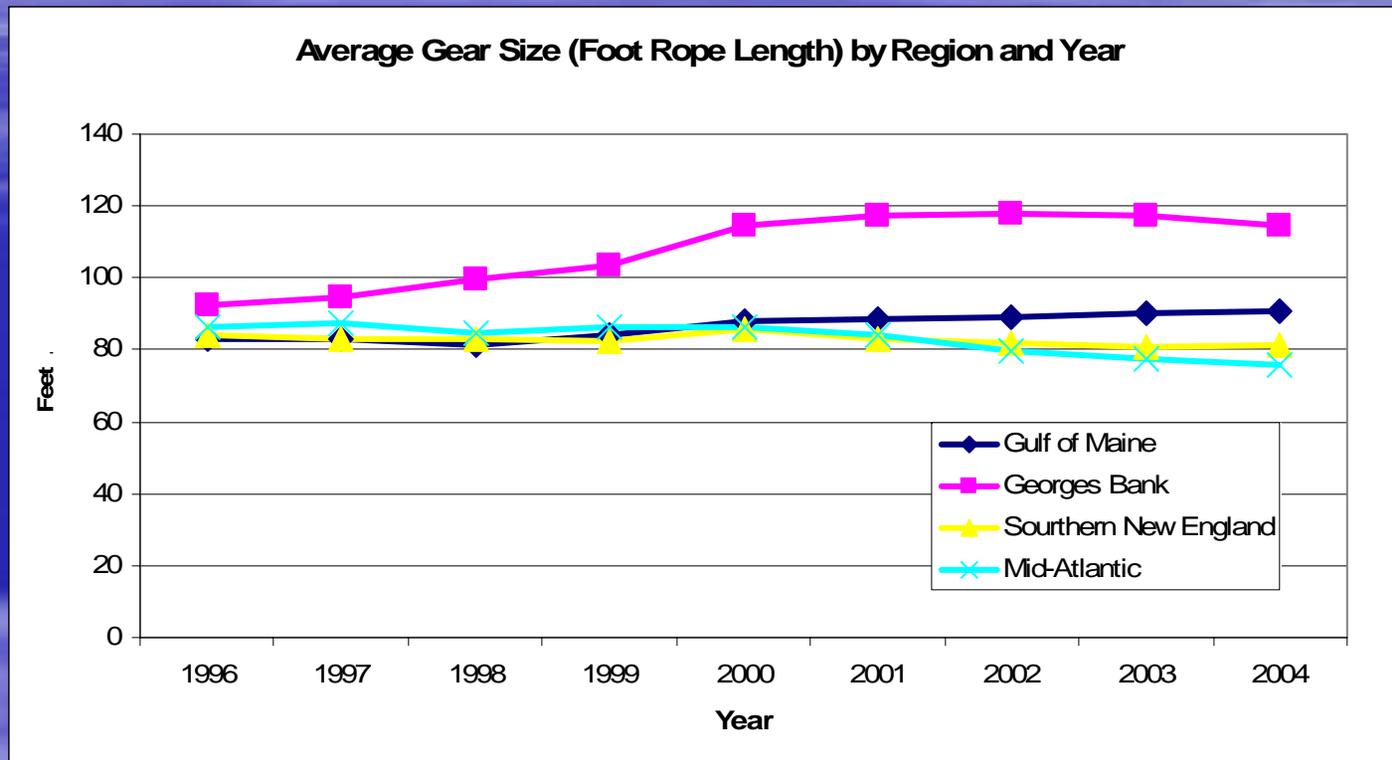
Bottom Trawl Mesh Size by Species

Southern species	MESH	STDEV
croaker	3.89	(0.77)
<i>illex</i> squid	2.07	(0.77)
Mid-Atl, S. GB, RI	MESH	STDEV
butterfish	3.05	(1.00)
scup	4.51	(1.31)
<i>loligo</i> squid	2.66	(1.19)
fluke	5.53	(1.05)
mackerel	2.80	(1.07)

RI, GB, GOM	MESH	STDEV
monkfish	6.21	(0.67)
silver hake	2.84	(1.02)
skates	5.79	(1.01)
winter flounder	6.06	(0.47)
yellowtail flounder	6.13	(0.35)
N. GB, GOM	MESH	STDEV
cod	6.13	(0.32)
haddock	6.16	(0.42)
American plaice	6.04	(0.34)
witch flounder	6.18	(0.35)

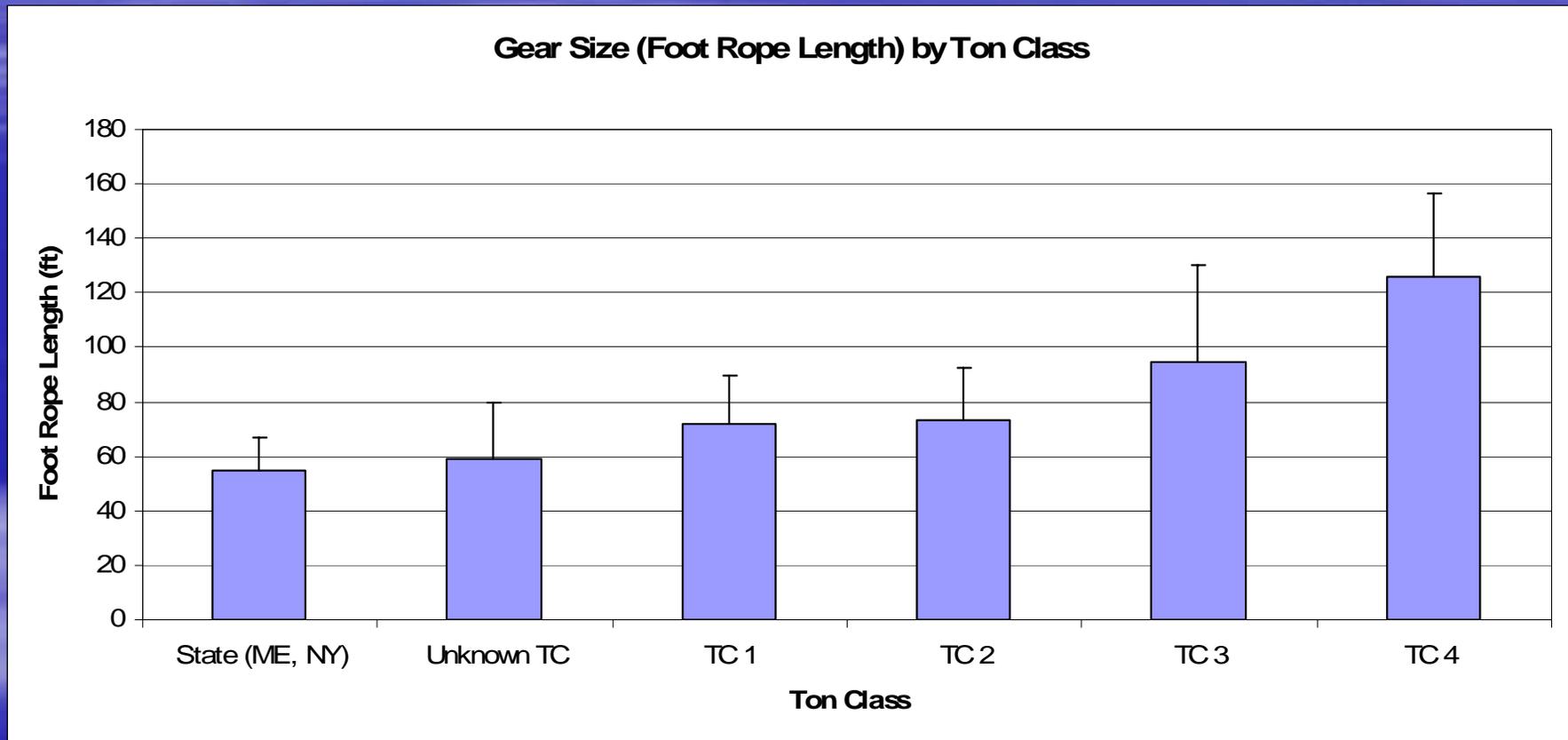
Entire Area	MESH	STDEV
dogfish	4.37	(1.77)
herring	2.24	(0.77)

Bottom Trawl Gear Size by Region

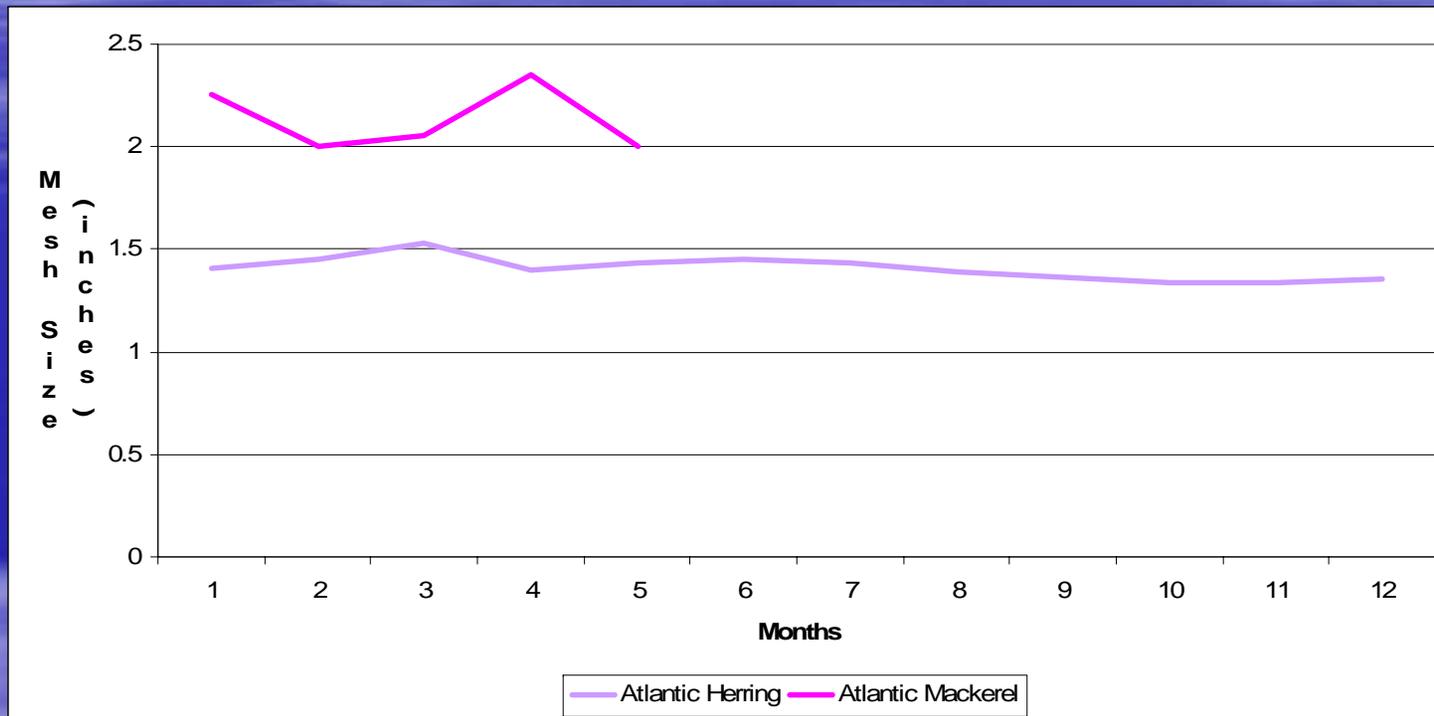


Offshore and unknown areas not shown because of small sample size

Bottom Trawl Gear Size by Ton Class

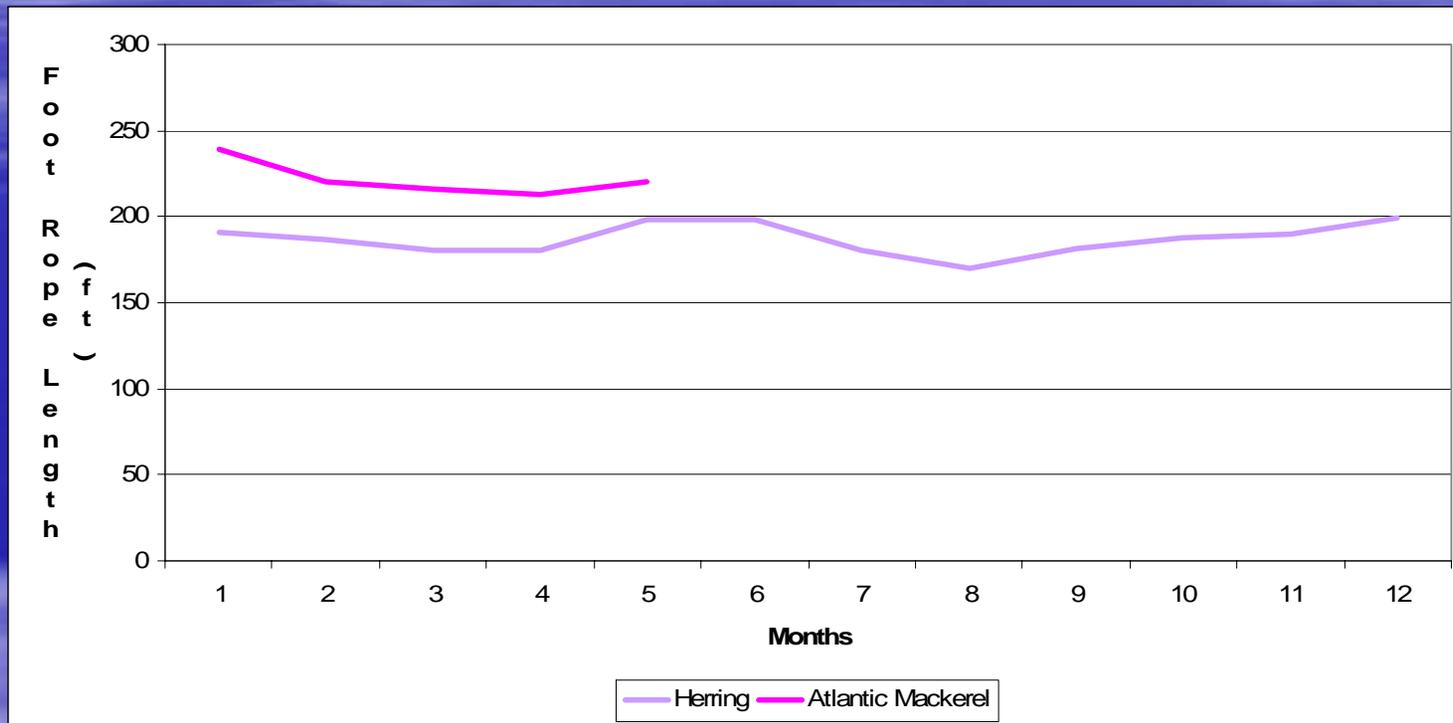


Mid-water Trawl Mesh Size by Species



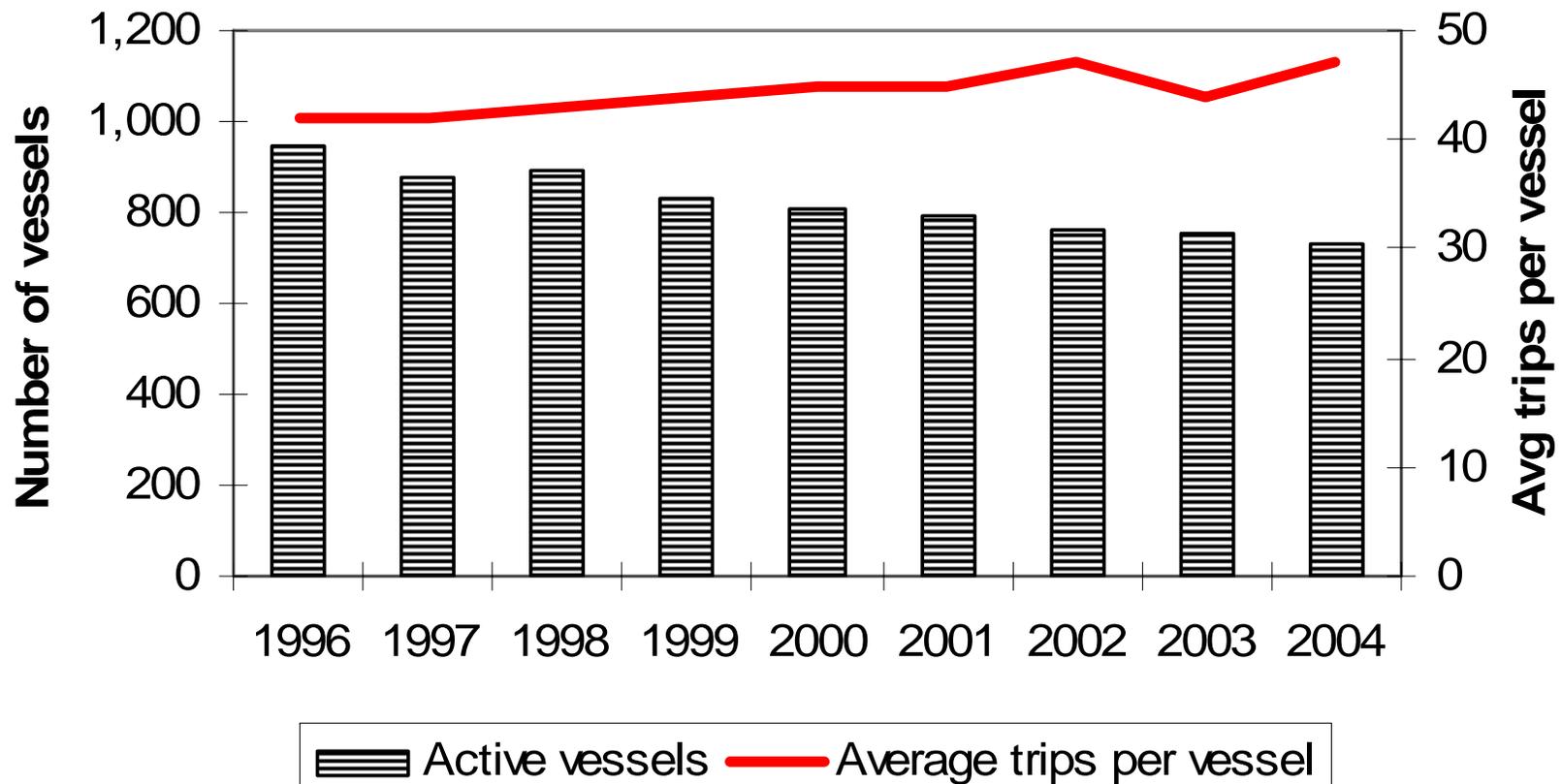
- Herring effort is throughout the year, with a smaller mesh size
- Mackerel effort is only a portion of the year, with a larger mesh size

Mid-water Trawl Gear Size by Species

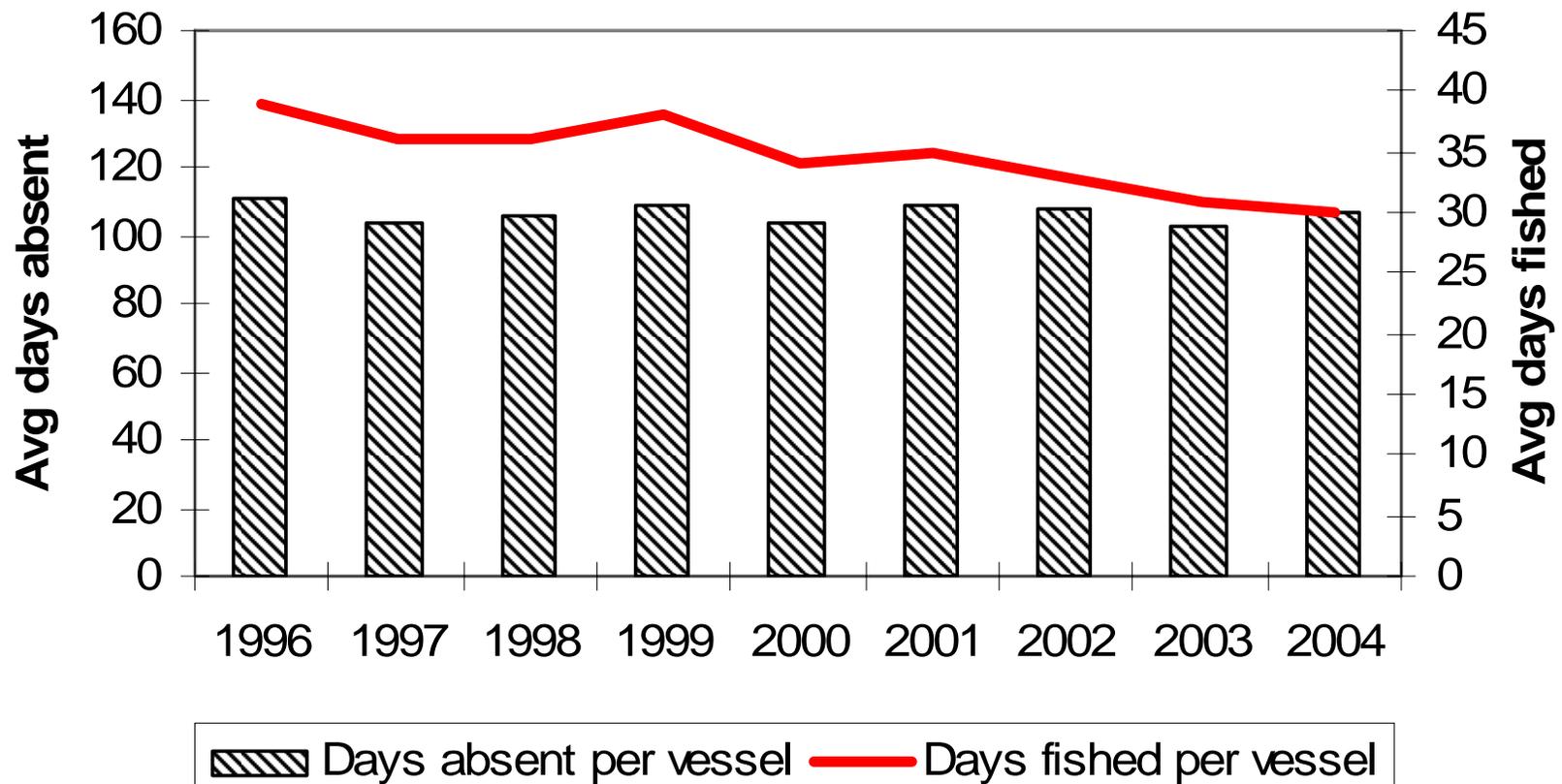


- Herring effort is throughout the year, with a smaller gear size
- Mackerel effort is only a portion of the year, with a larger gear size

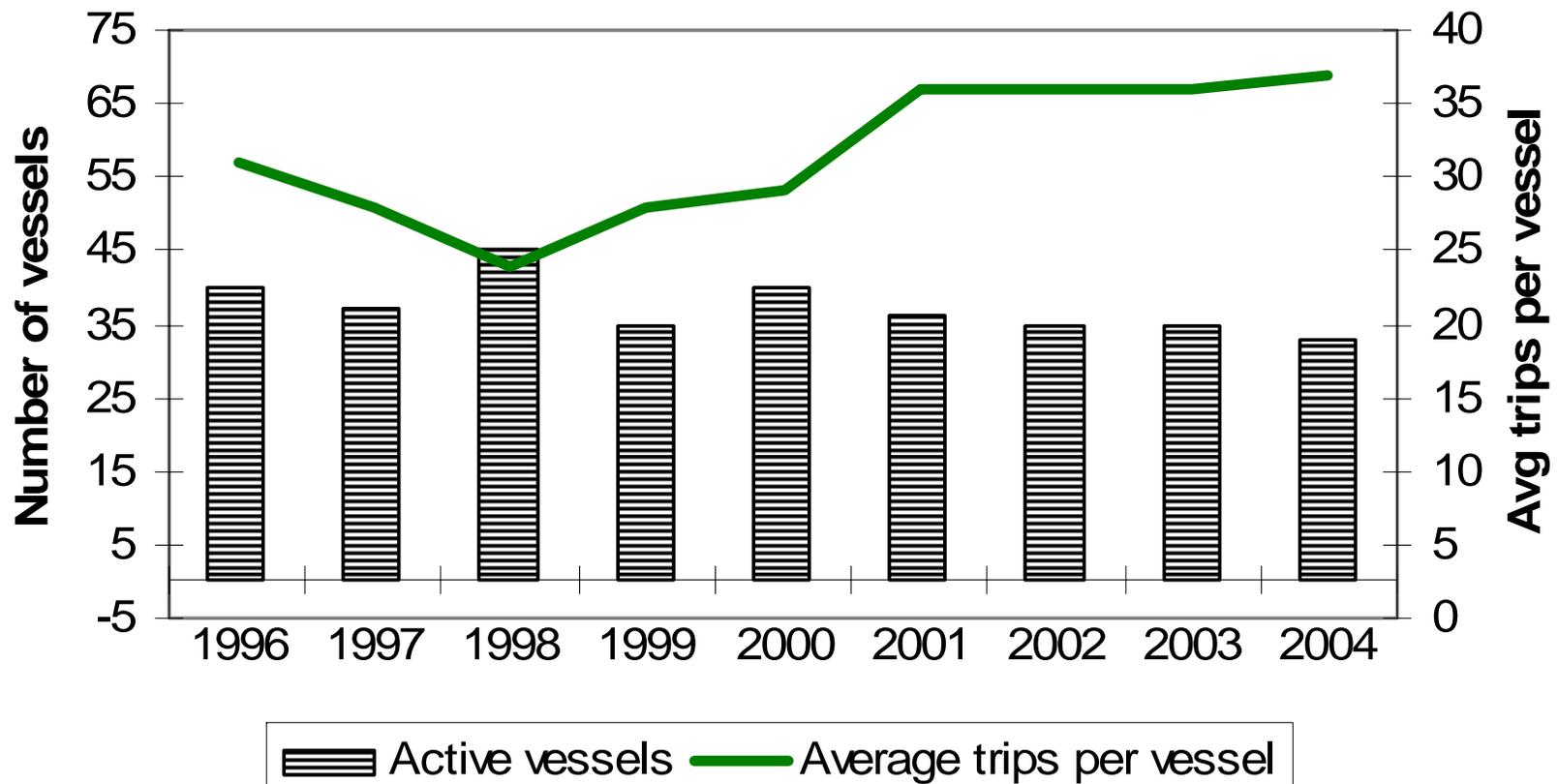
Bottom Trawl Effort Declined



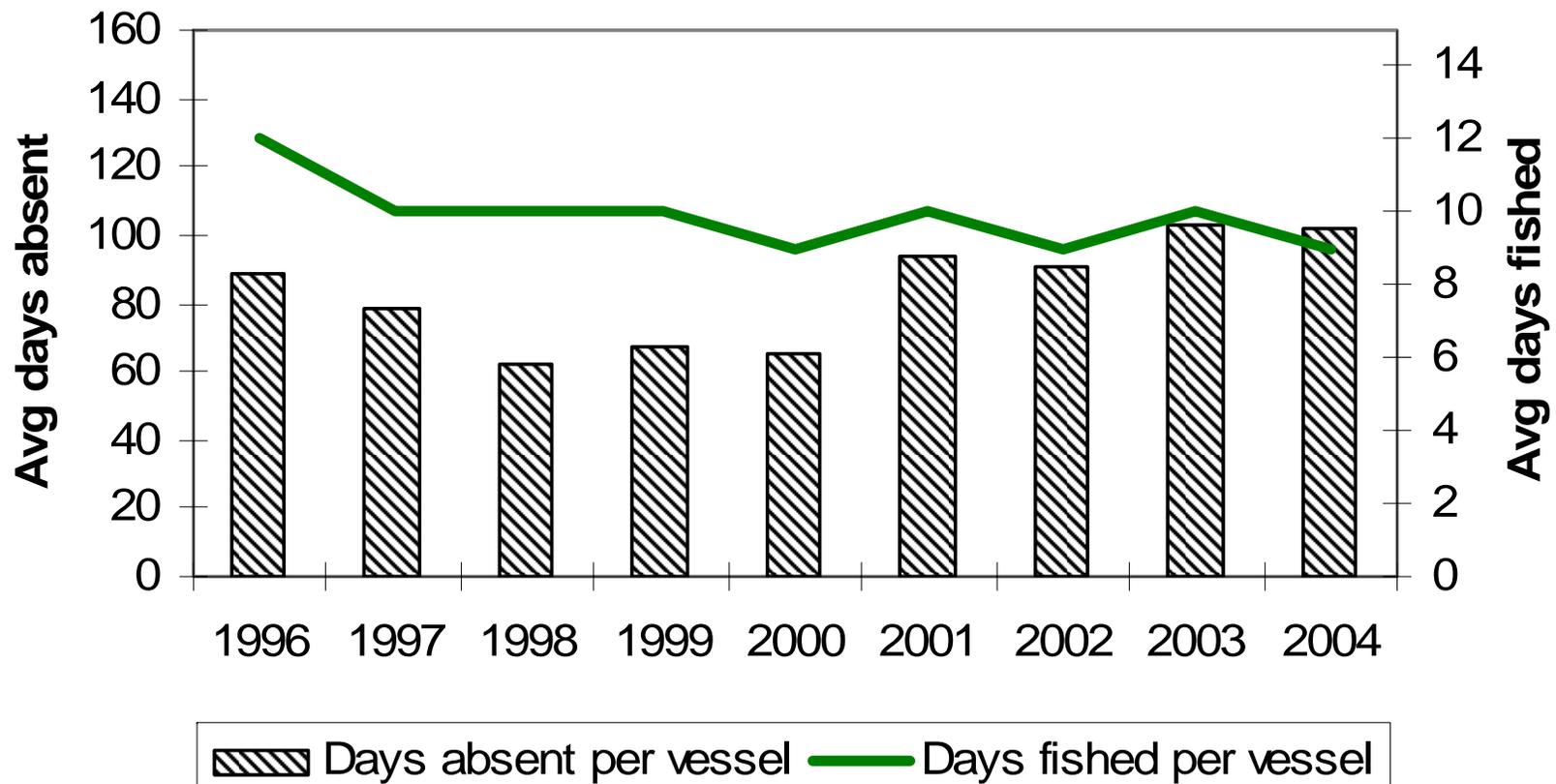
Bottom Trawl Effort Declined



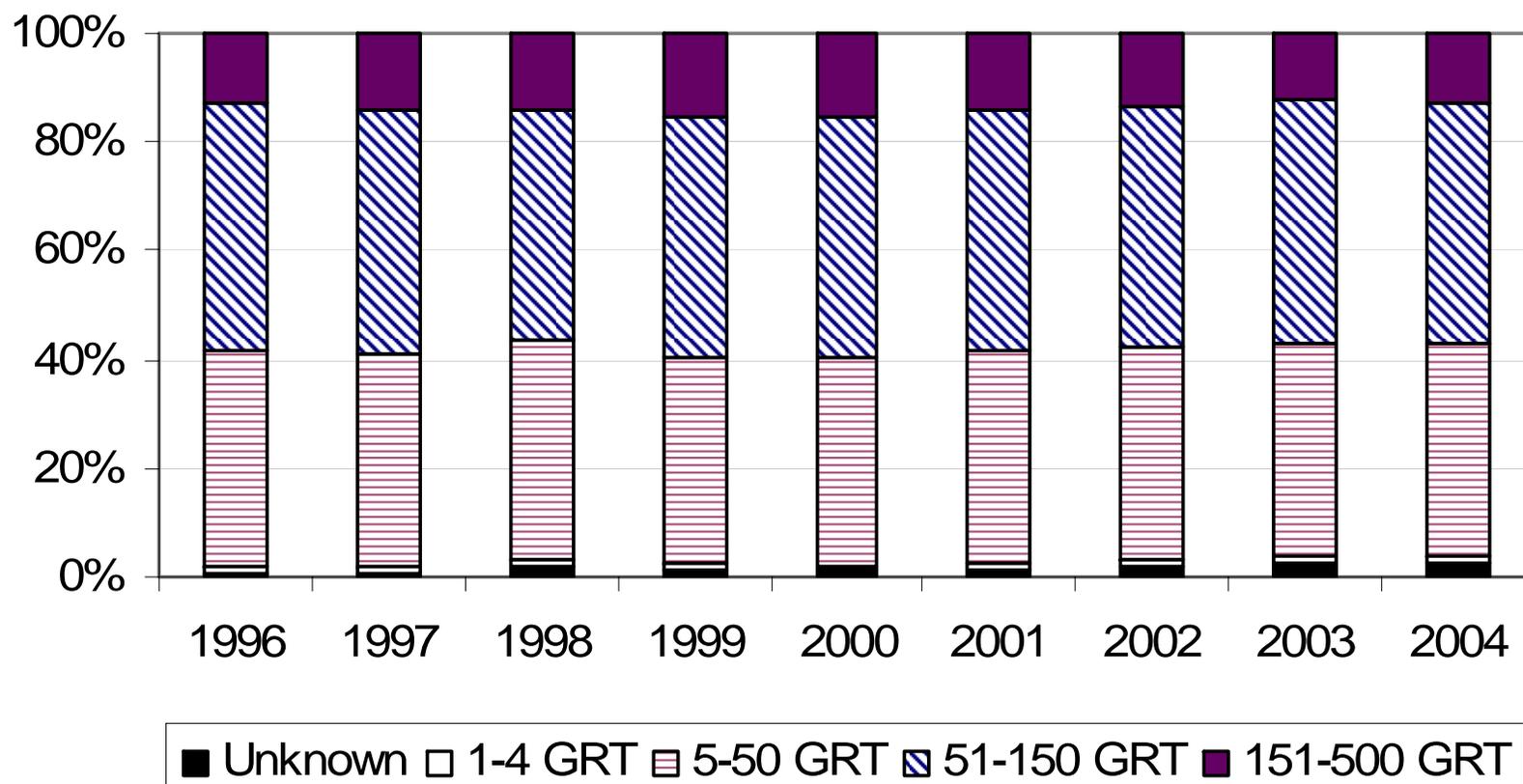
Mid-water Trawl Effort Declined



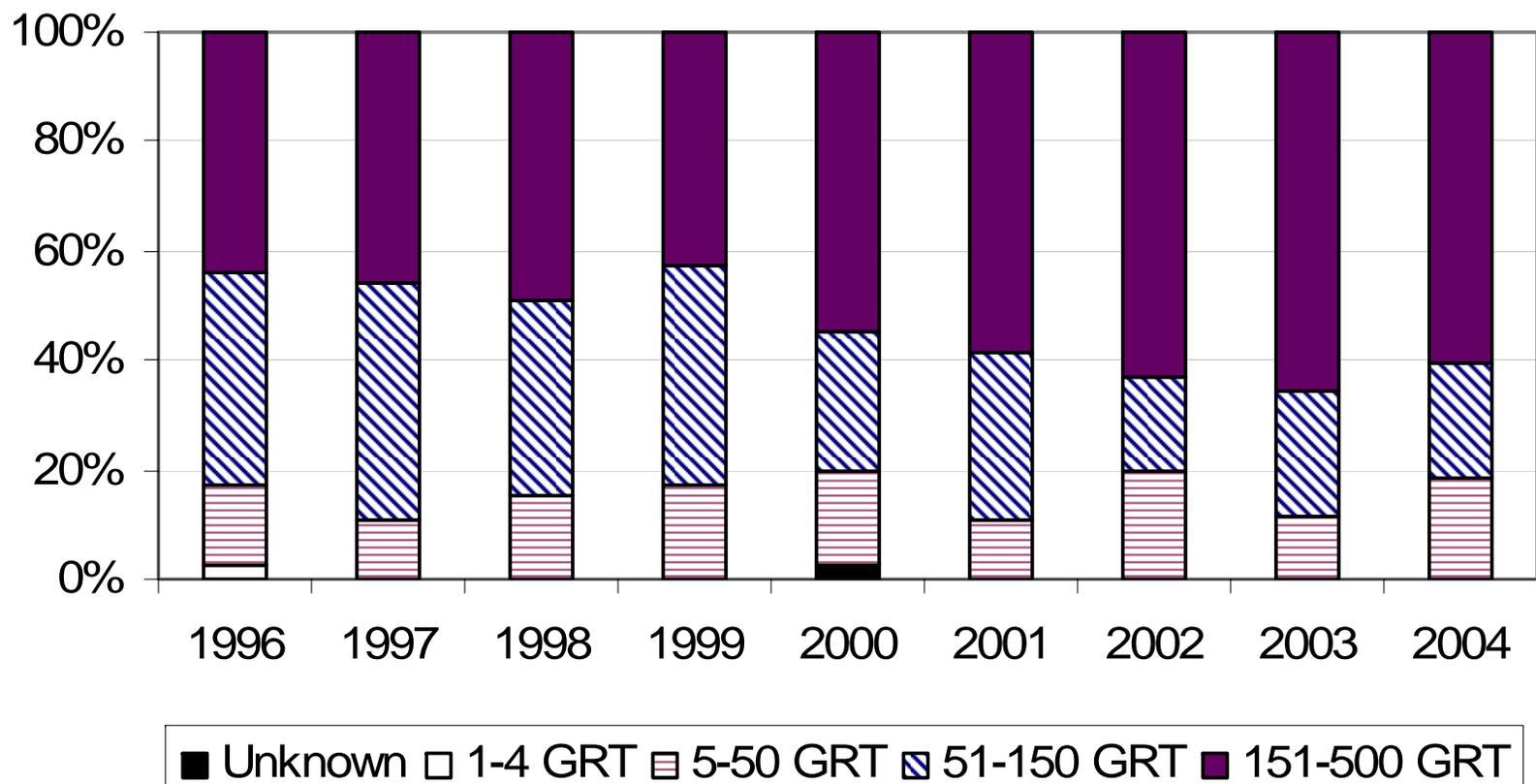
Mid-water Trawl Effort Declined



Bottom Trawl Vessel Size

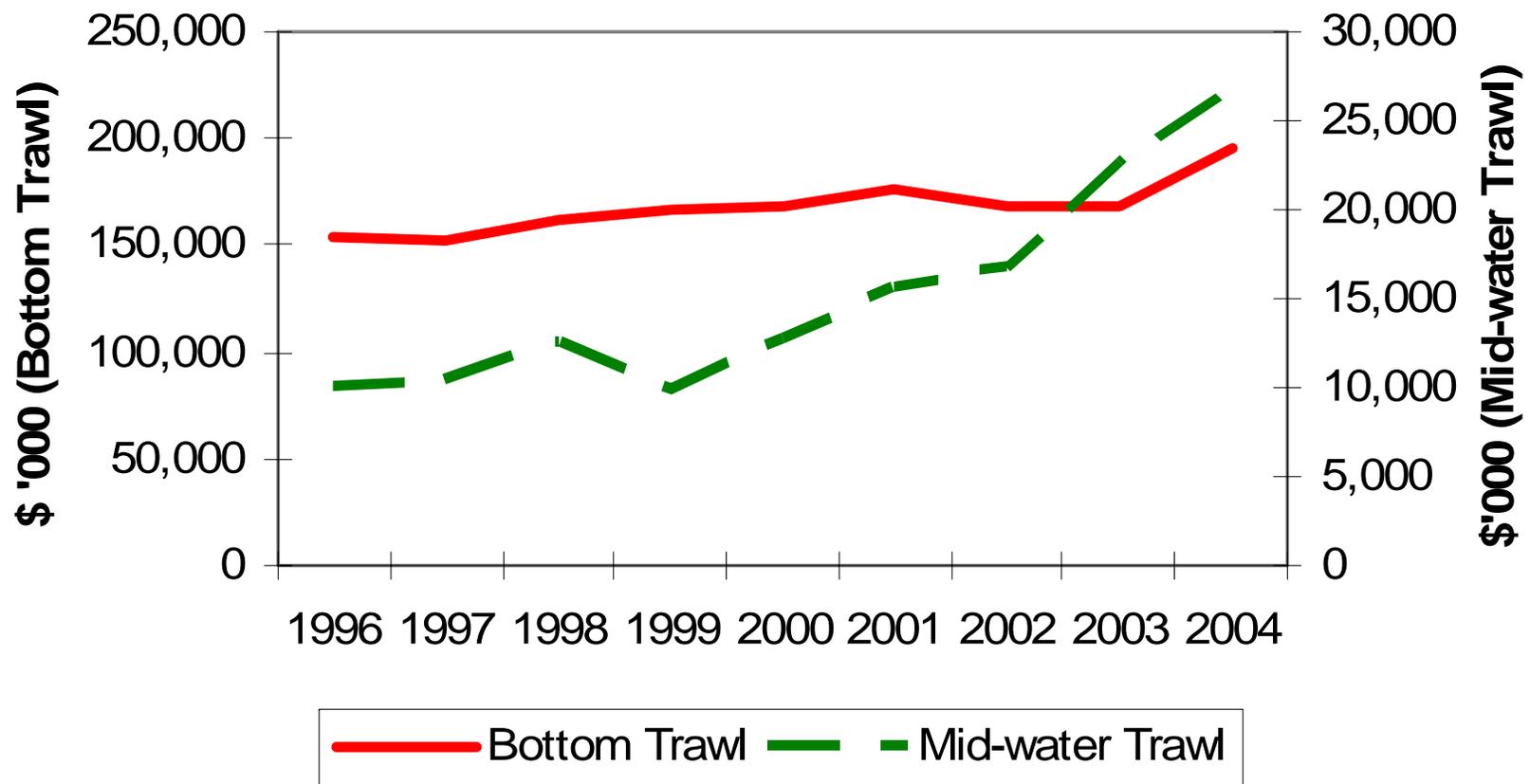


Mid-water Trawl Vessel Size



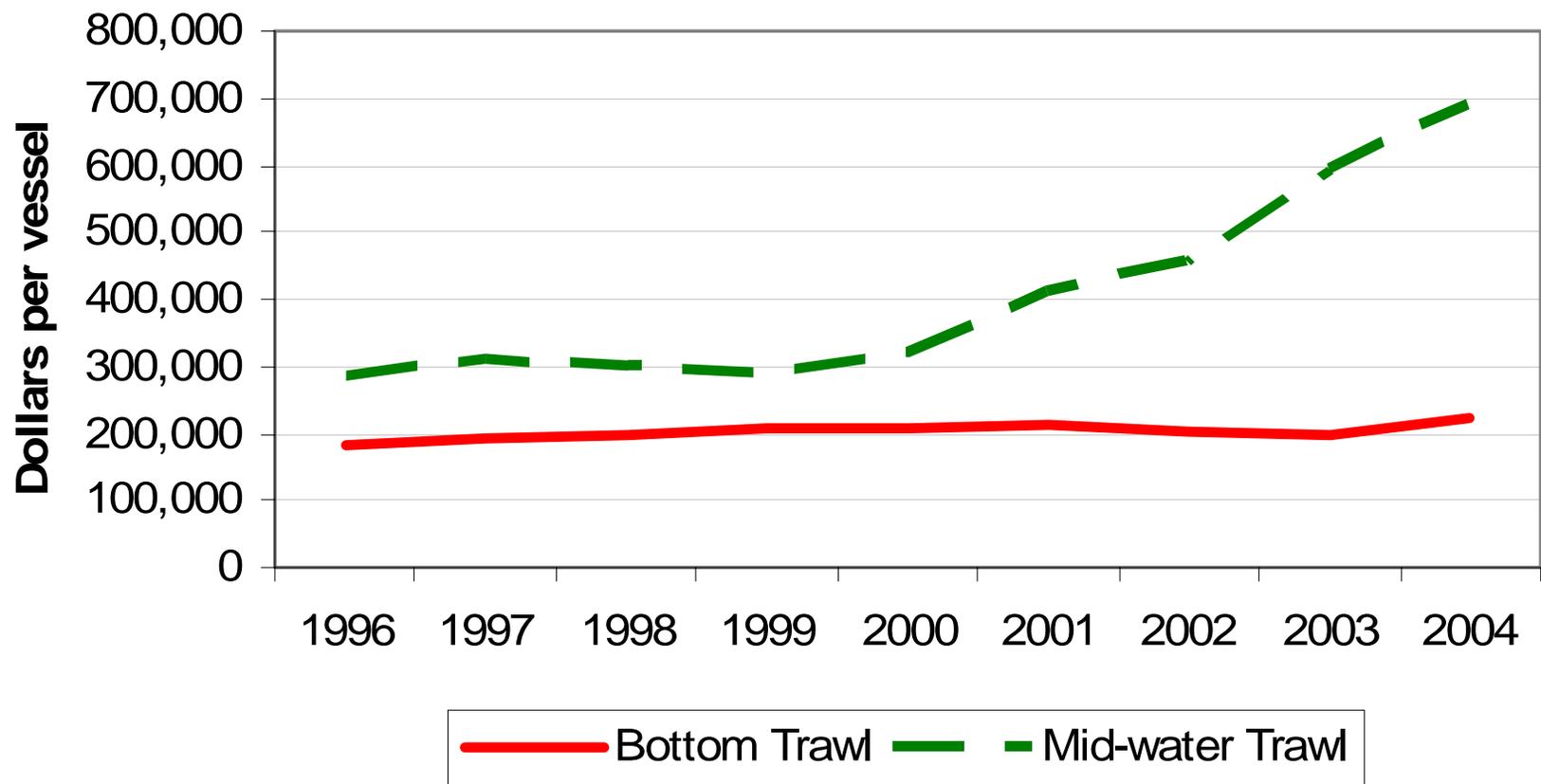
Total Revenues by Fishery

Adjusted for Inflation with year 2000=100



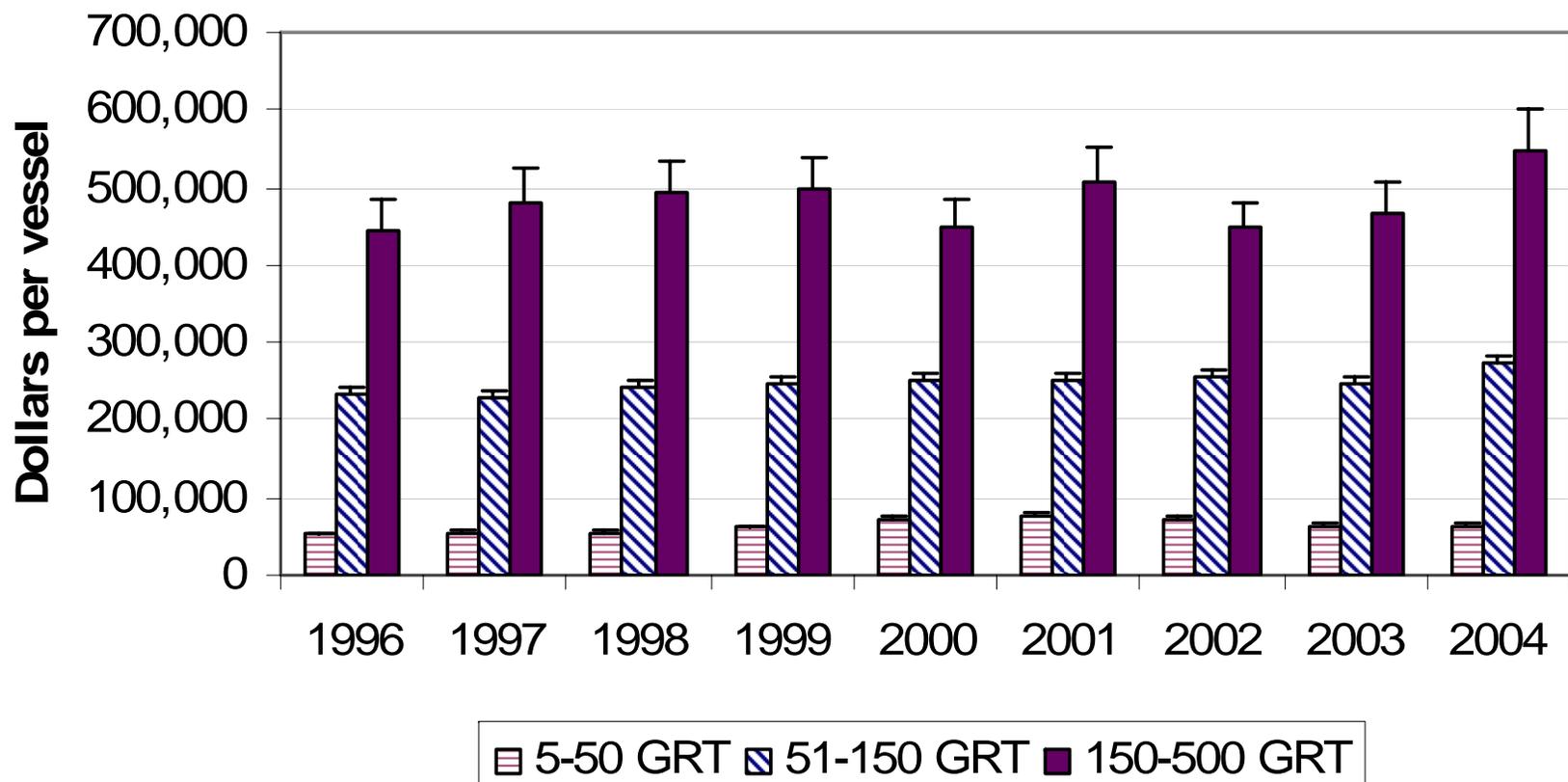
Average Revenues by Fishery

Adjusted for Inflation with year 2000=100



Bottom Trawl Revenues by Vessel Size

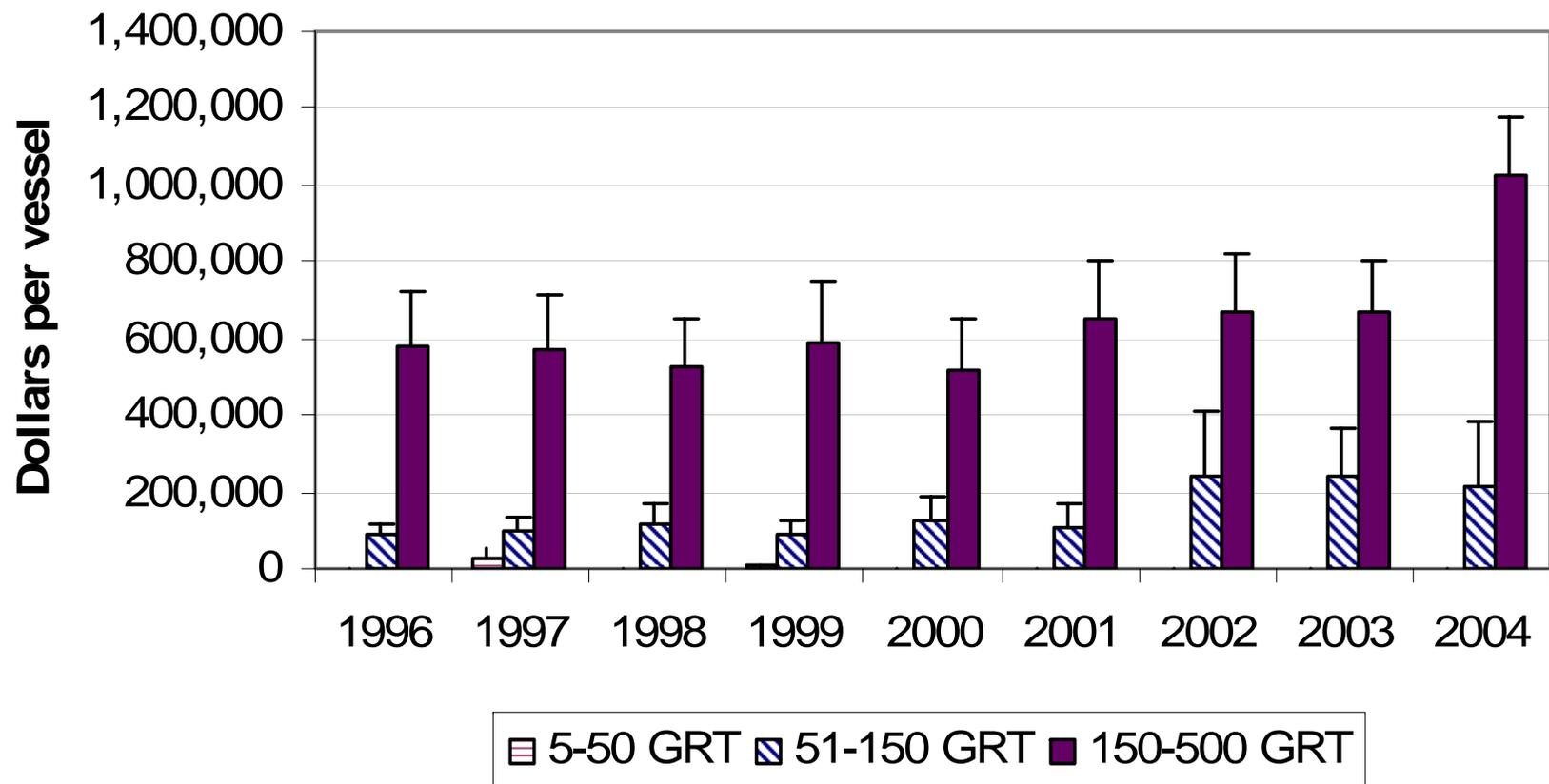
Adjusted for Inflation with year 2000=100



Mid-water Trawl

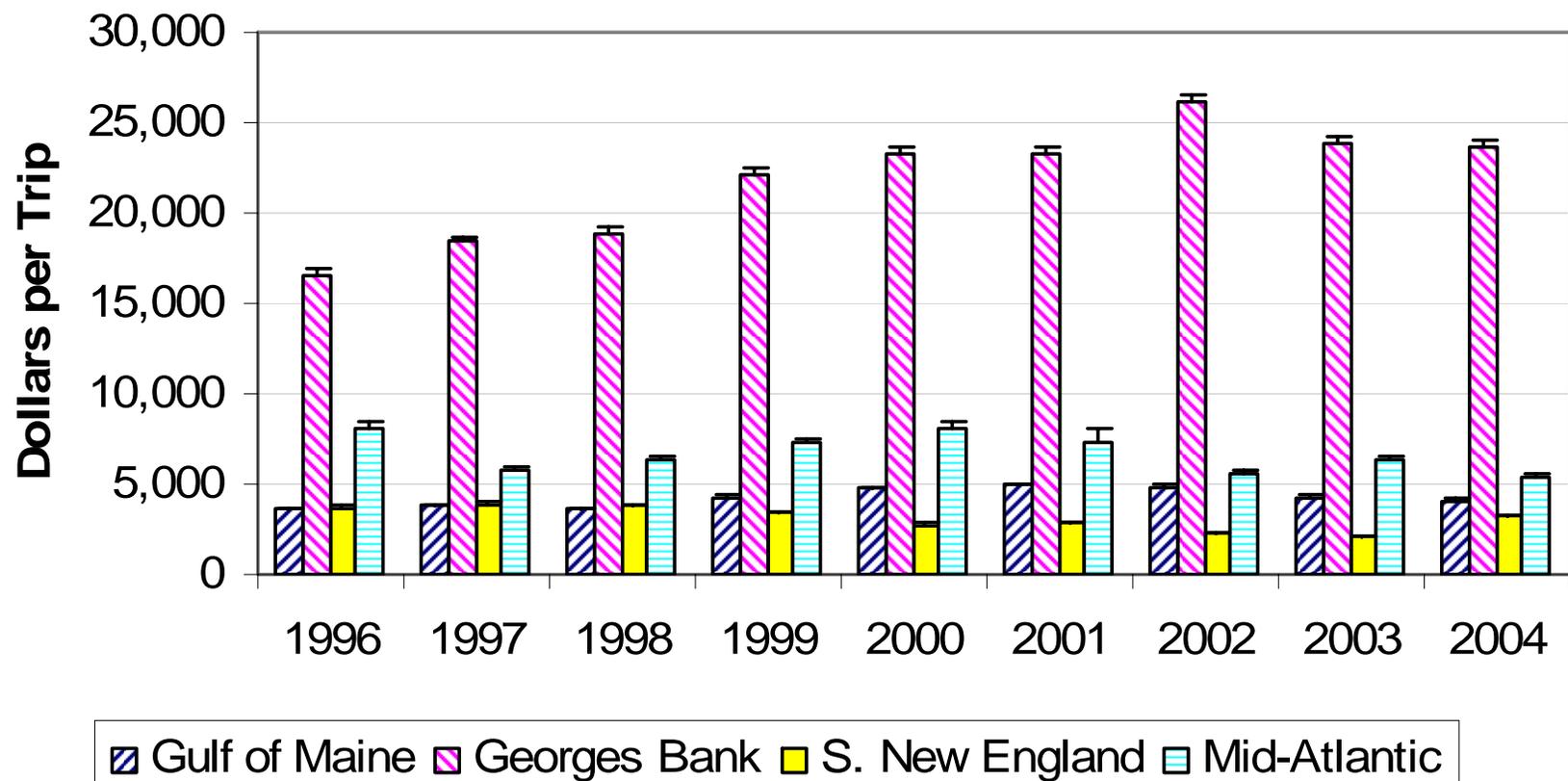
Revenues by Vessel Size

Adjusted for Inflation with year 2000=100



Bottom Trawl Trip Revenues by Fishing Region

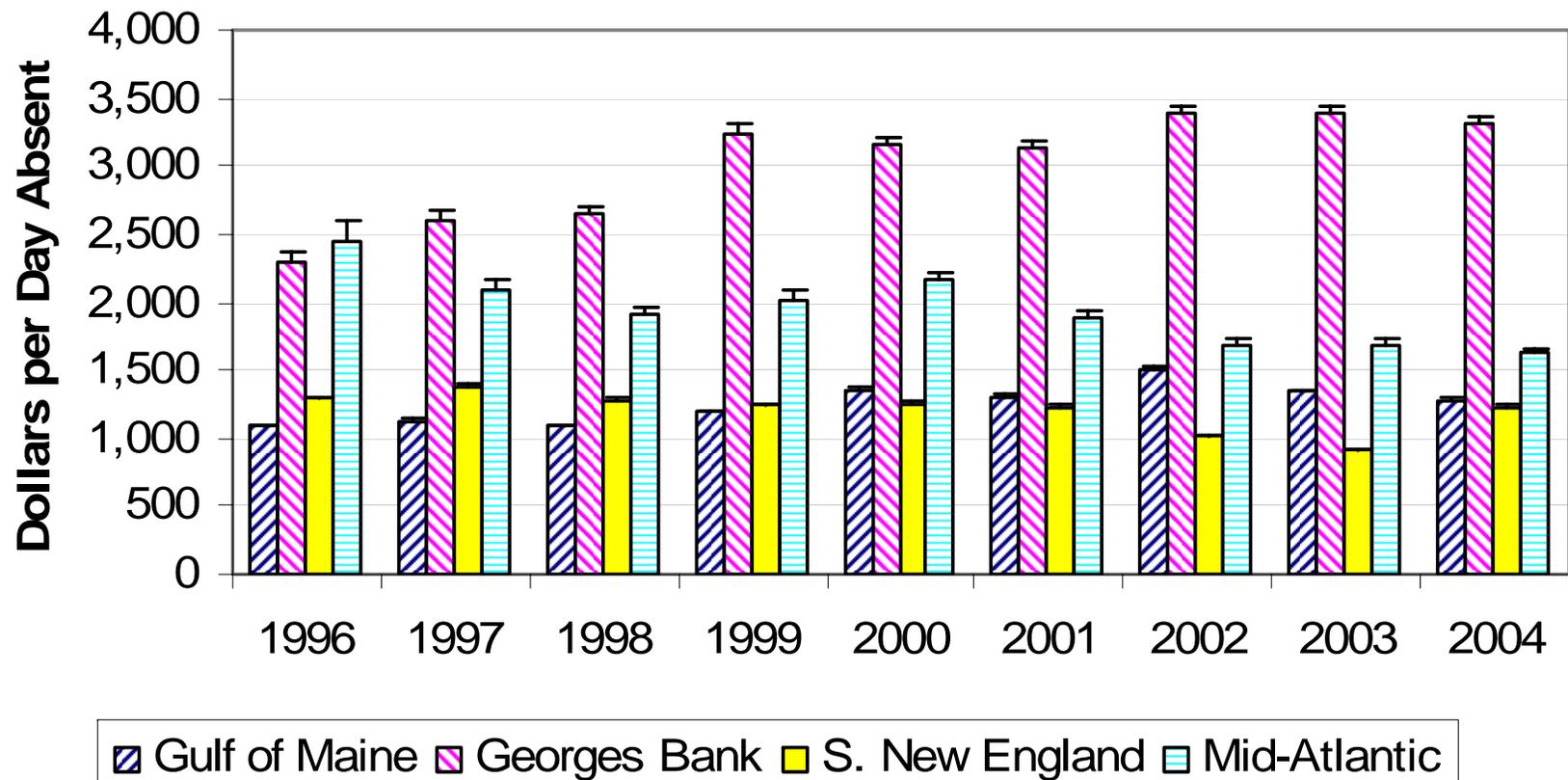
Adjusted for Inflation with year 2000=100



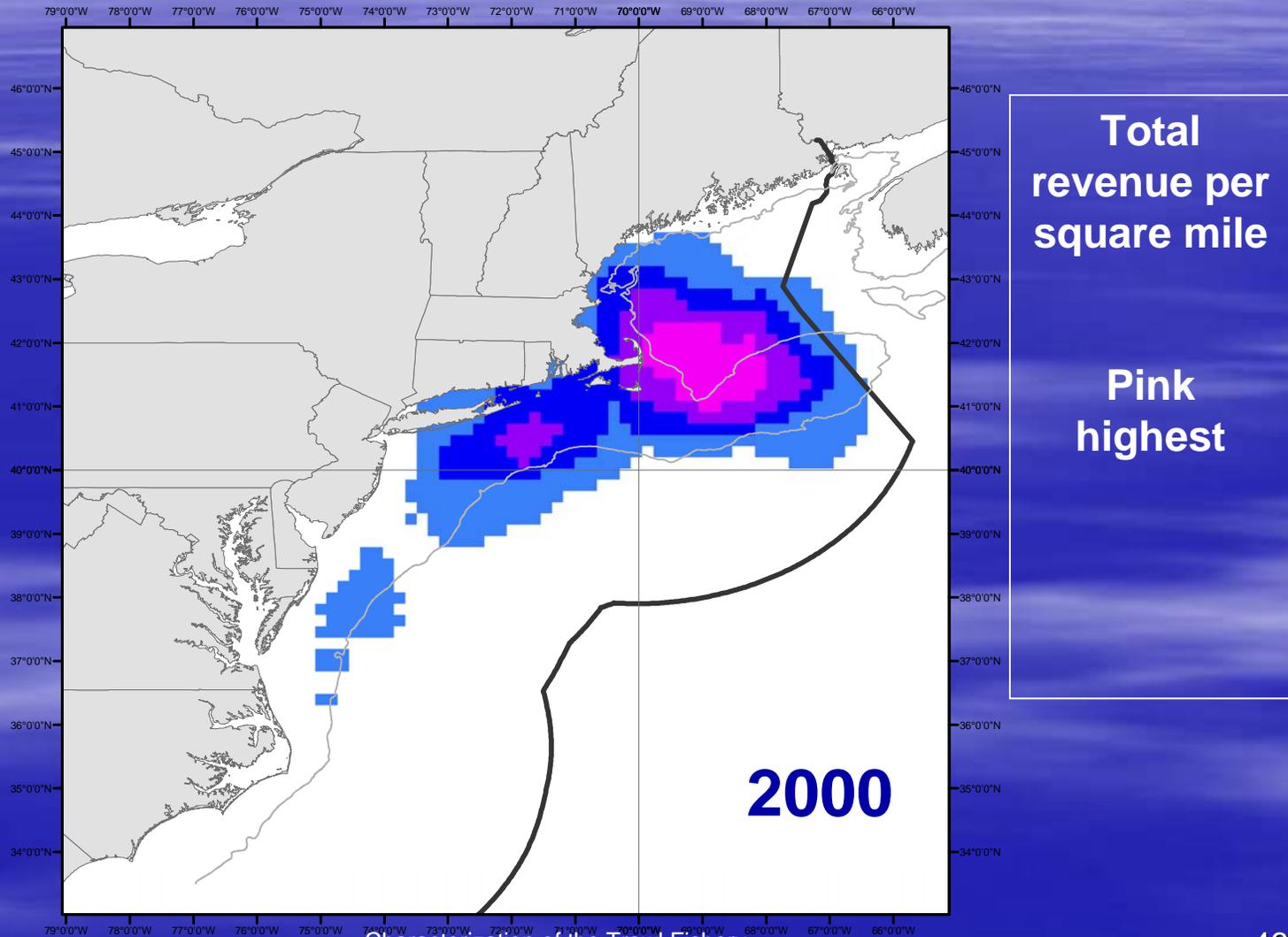
Bottom Trawl

Revenues per DA by Fishing Region

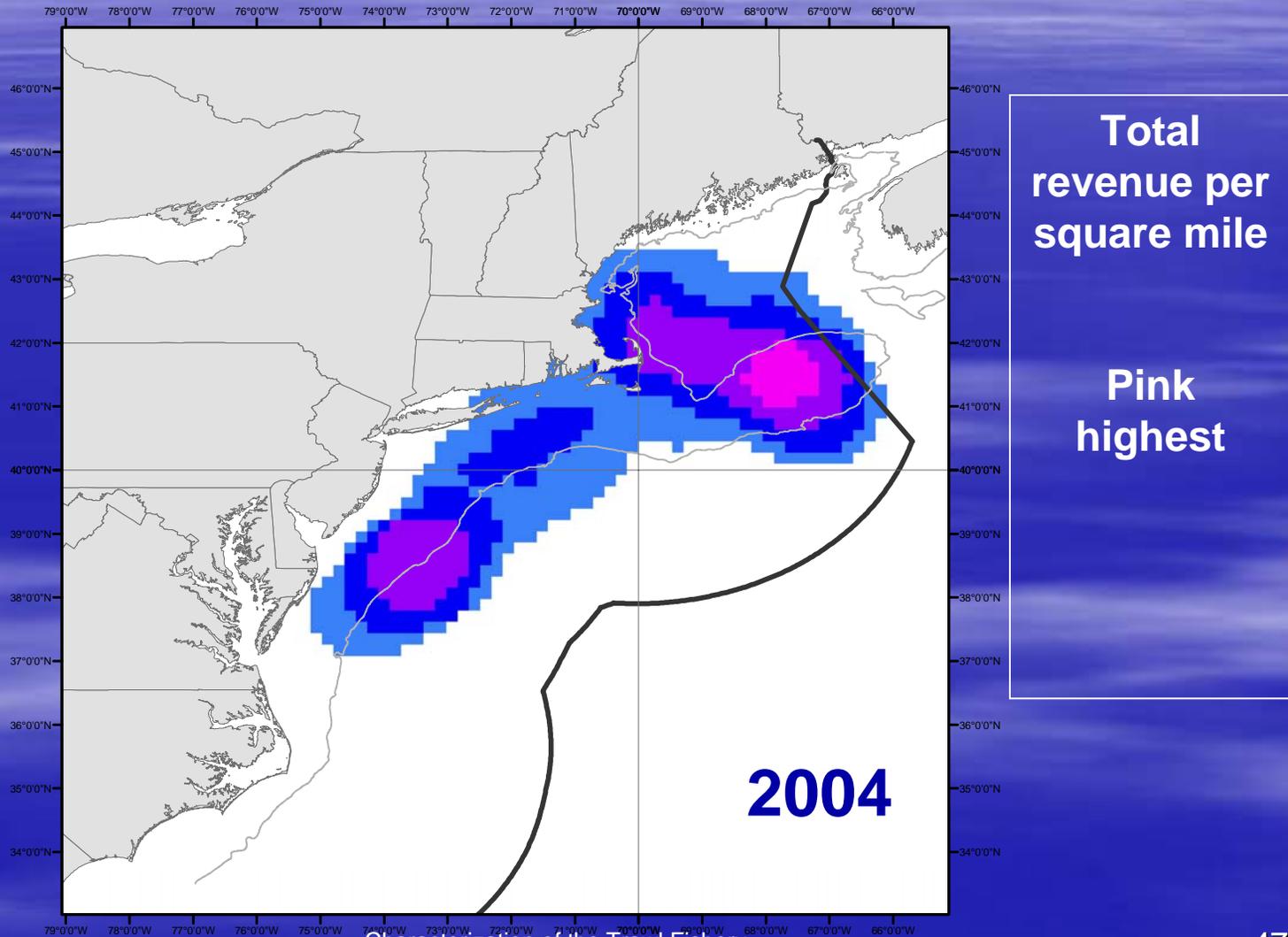
Adjusted for Inflation with year 2000=100



Bottom Trawl Revenue Shift

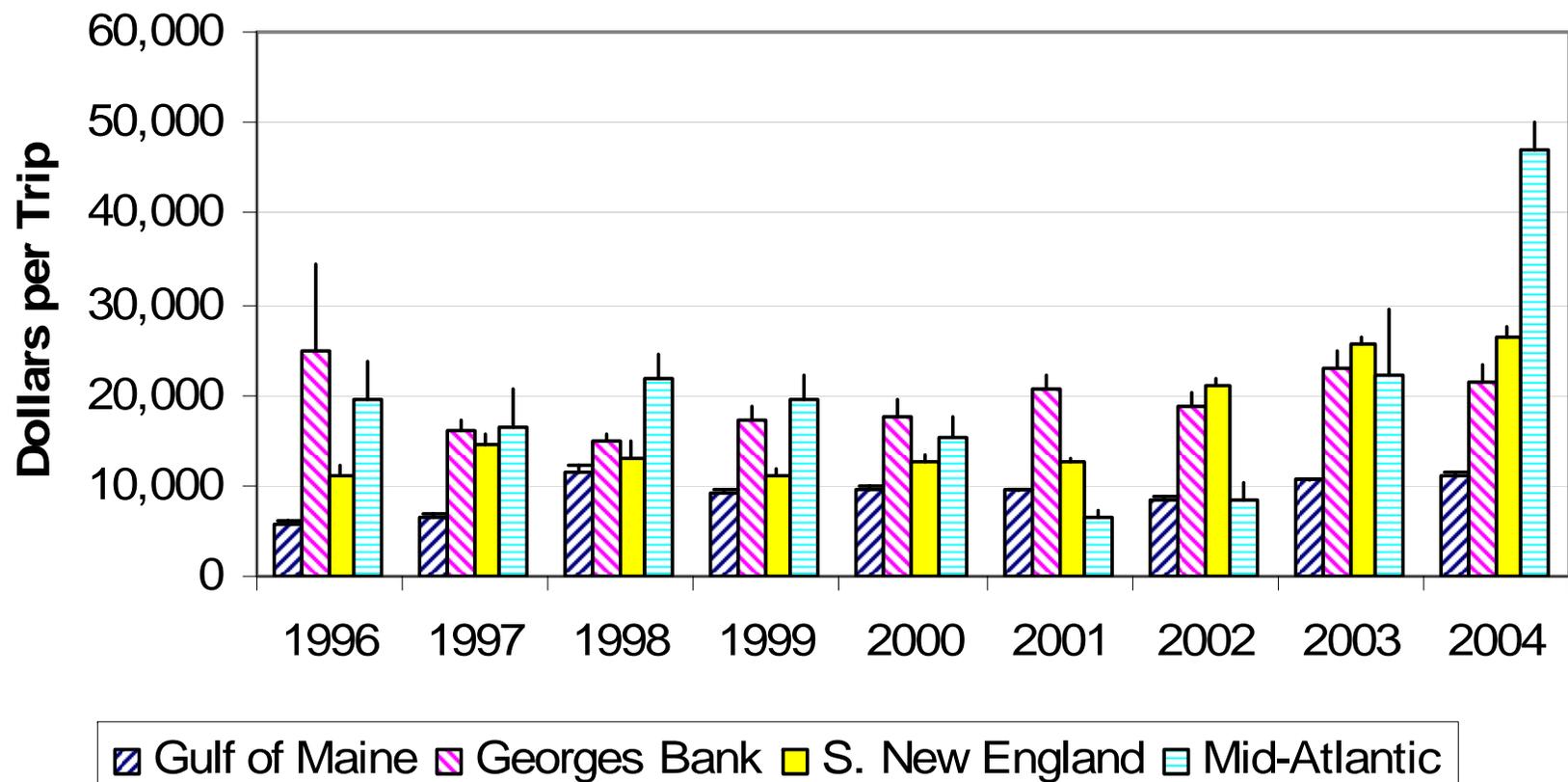


Bottom Trawl Revenue Shift



Mid-water Trawl Trip Revenues by Fishing Region

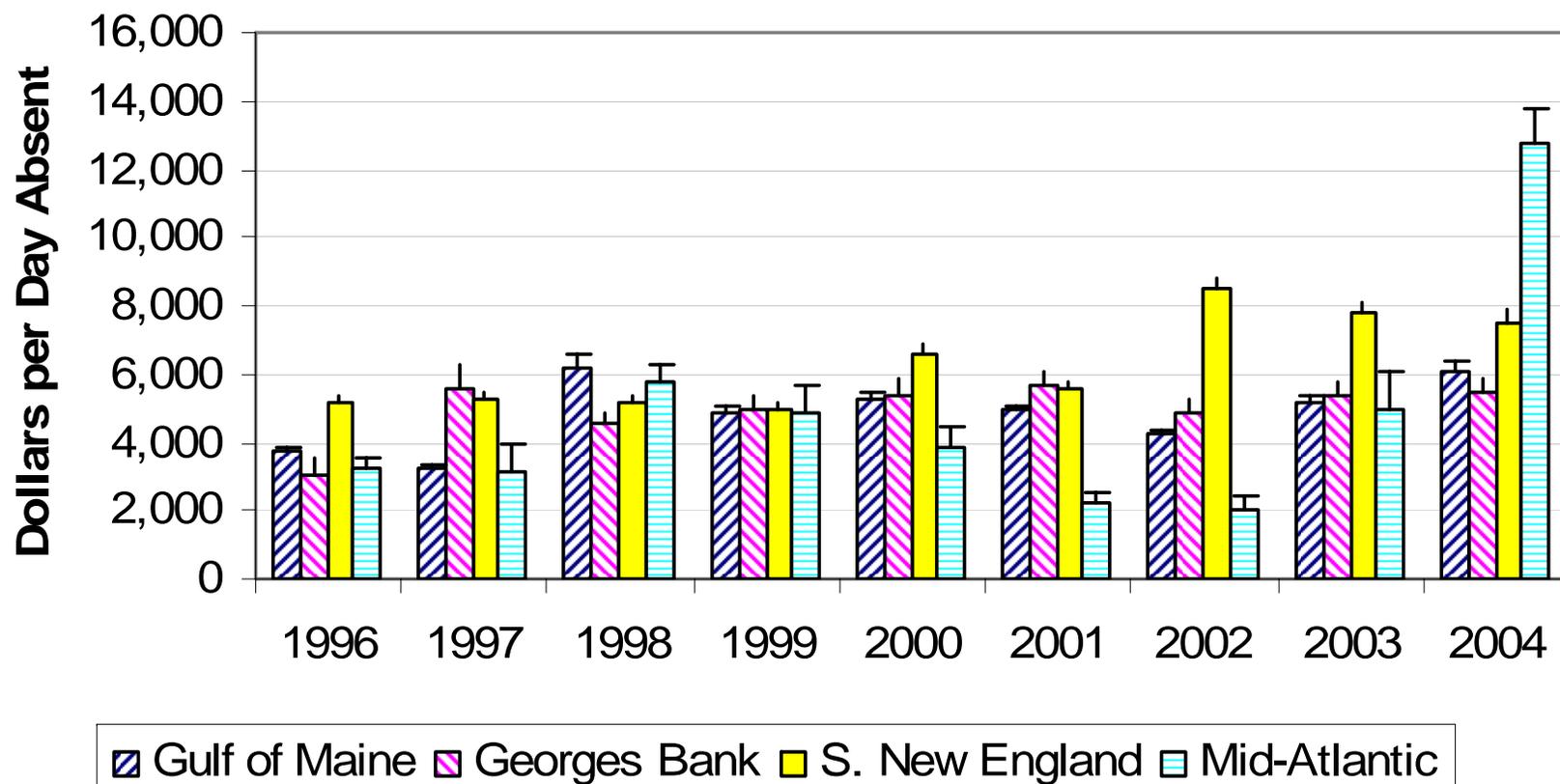
Adjusted for Inflation with year 2000=100



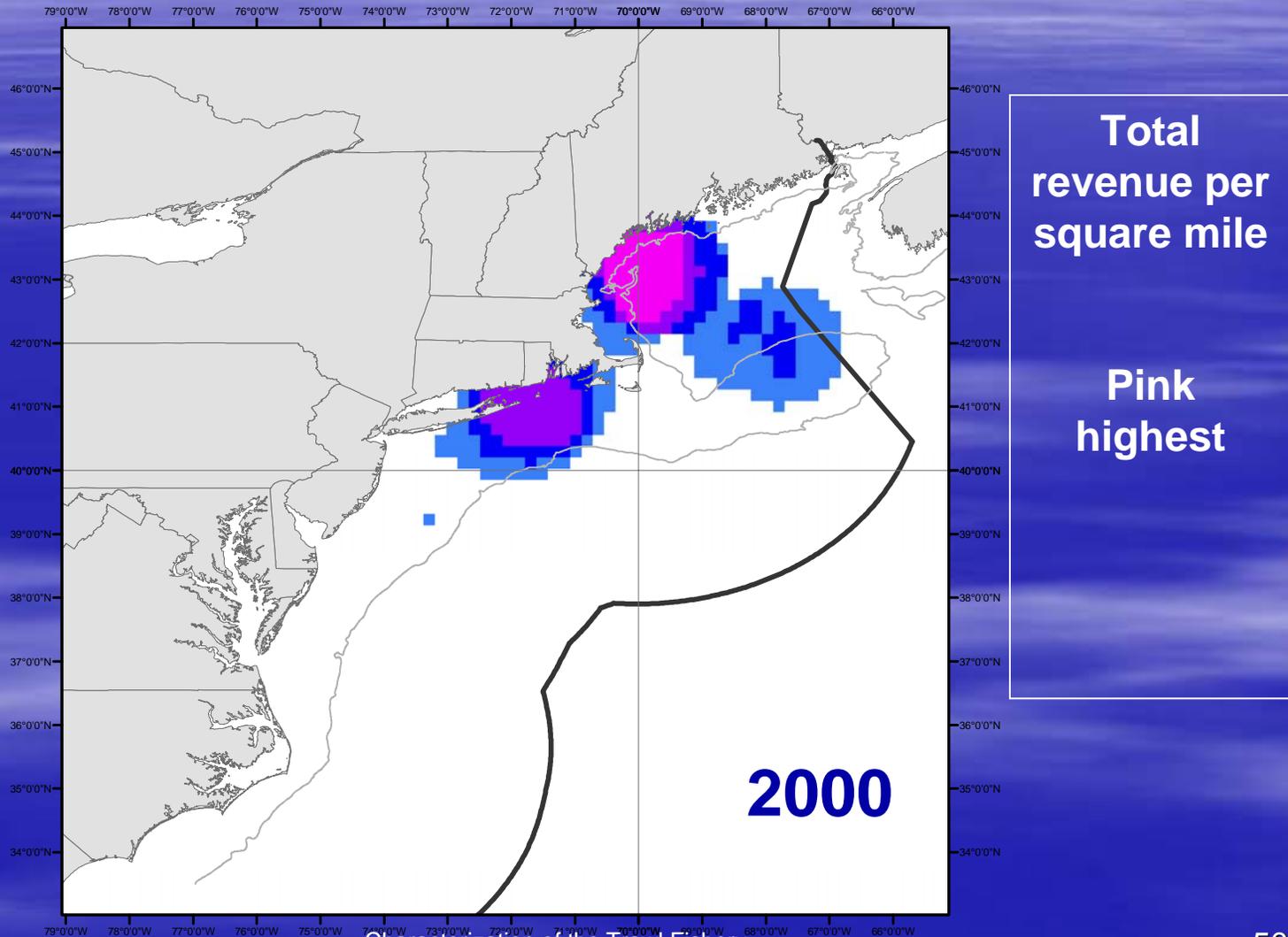
Mid-water Trawl

Revenues per DA by Fishing Region

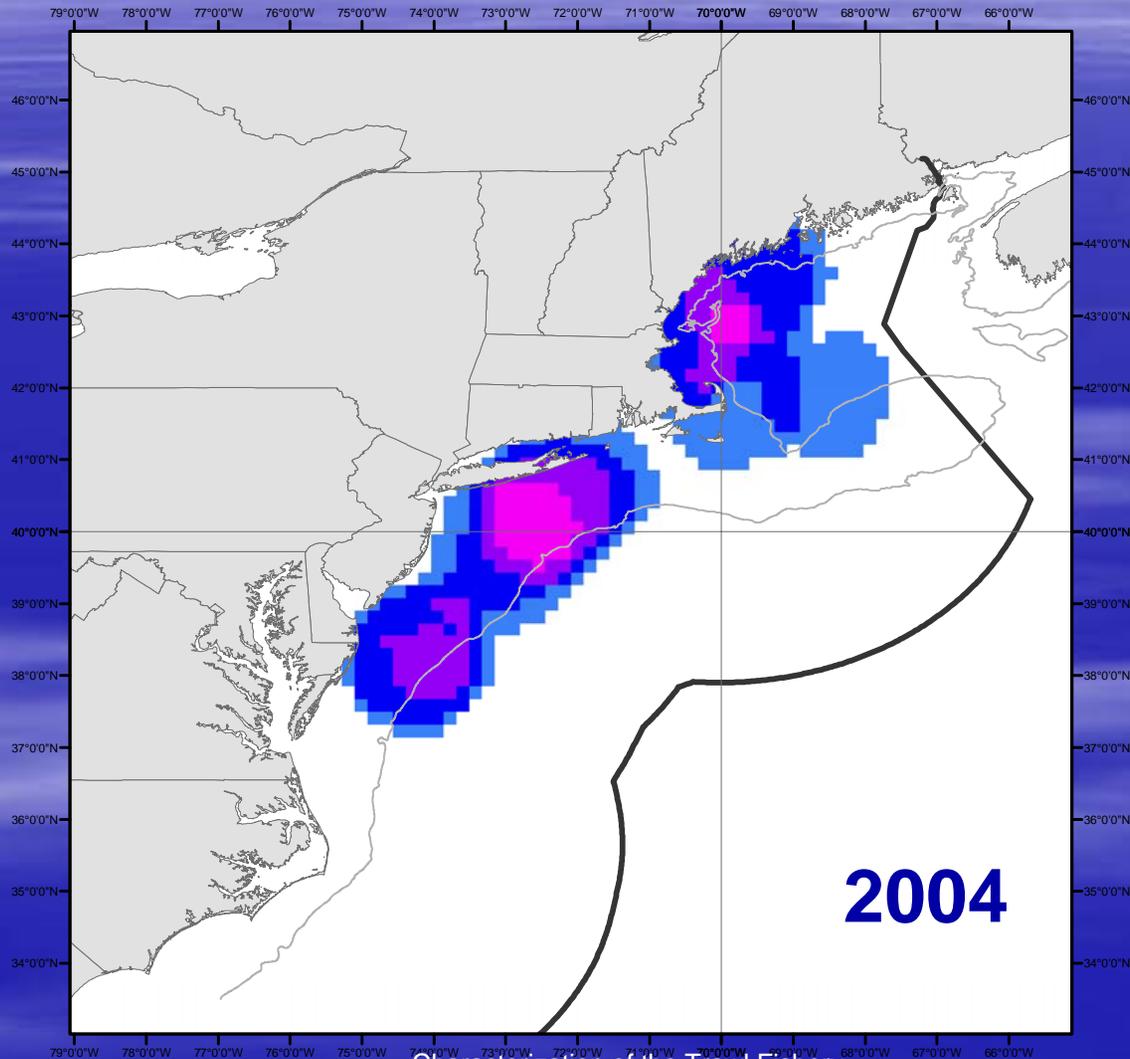
Adjusted for Inflation with year 2000=100



Mid-water Trawl Revenue Shift



Mid-water Trawl Revenue Shift



Total
revenue per
square mile

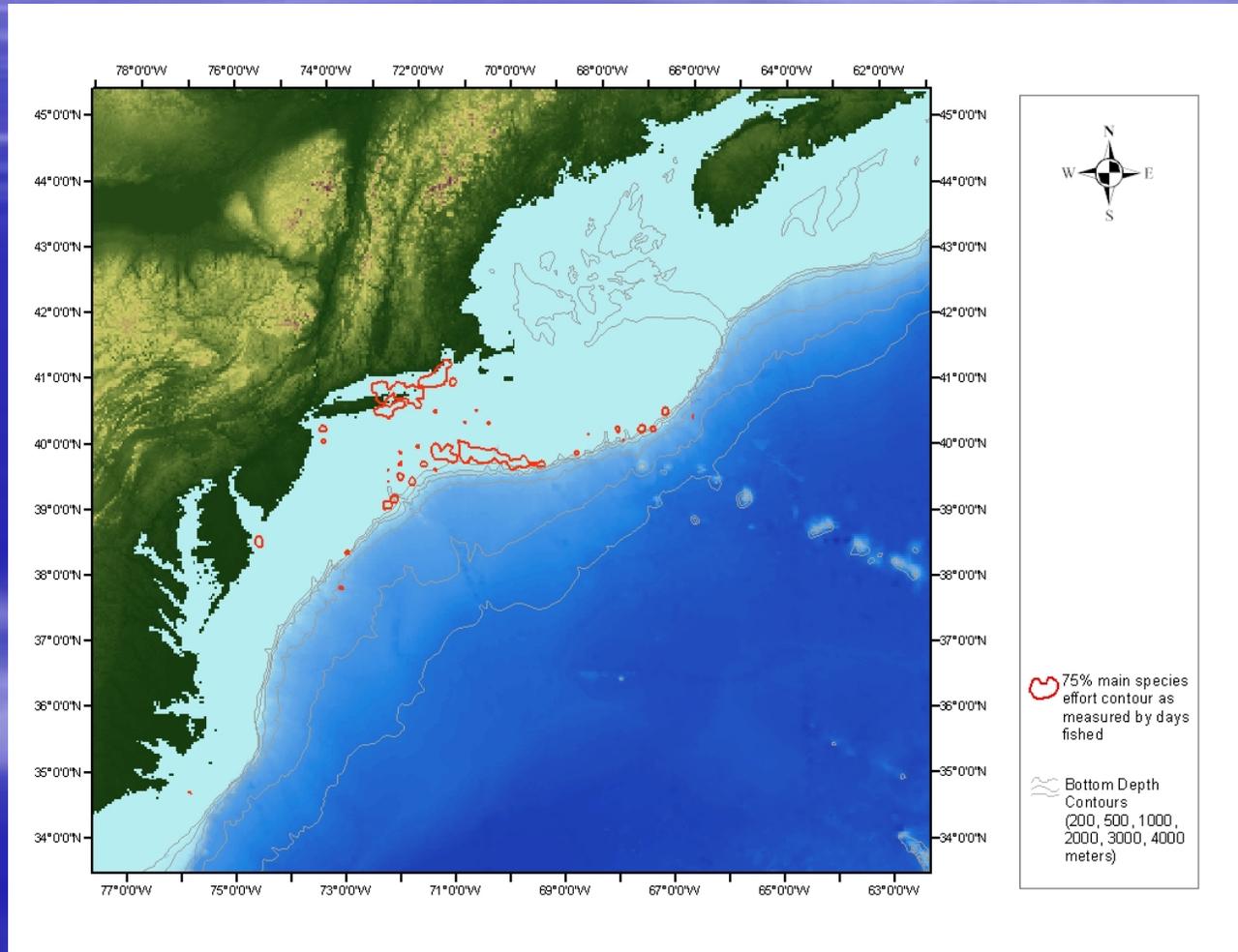
Pink
highest

Conclusion

- Bottom and Mid-water trawl fisheries are different
 - Where and what fished
 - Scale of fisheries (effort, revenues)
 - Vessel characteristics
- There have been many changes – will they continue?

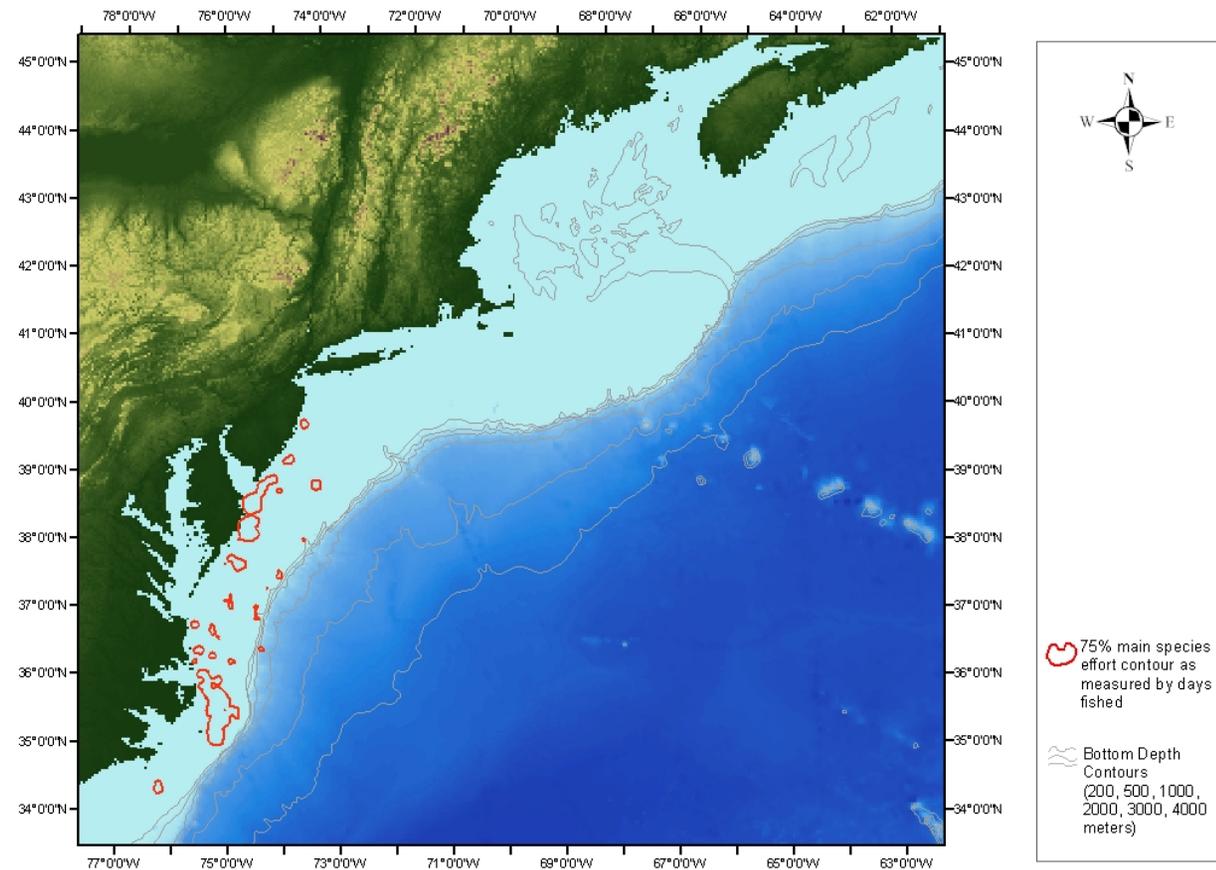
Bottom Trawl Effort by Species

Butterfish



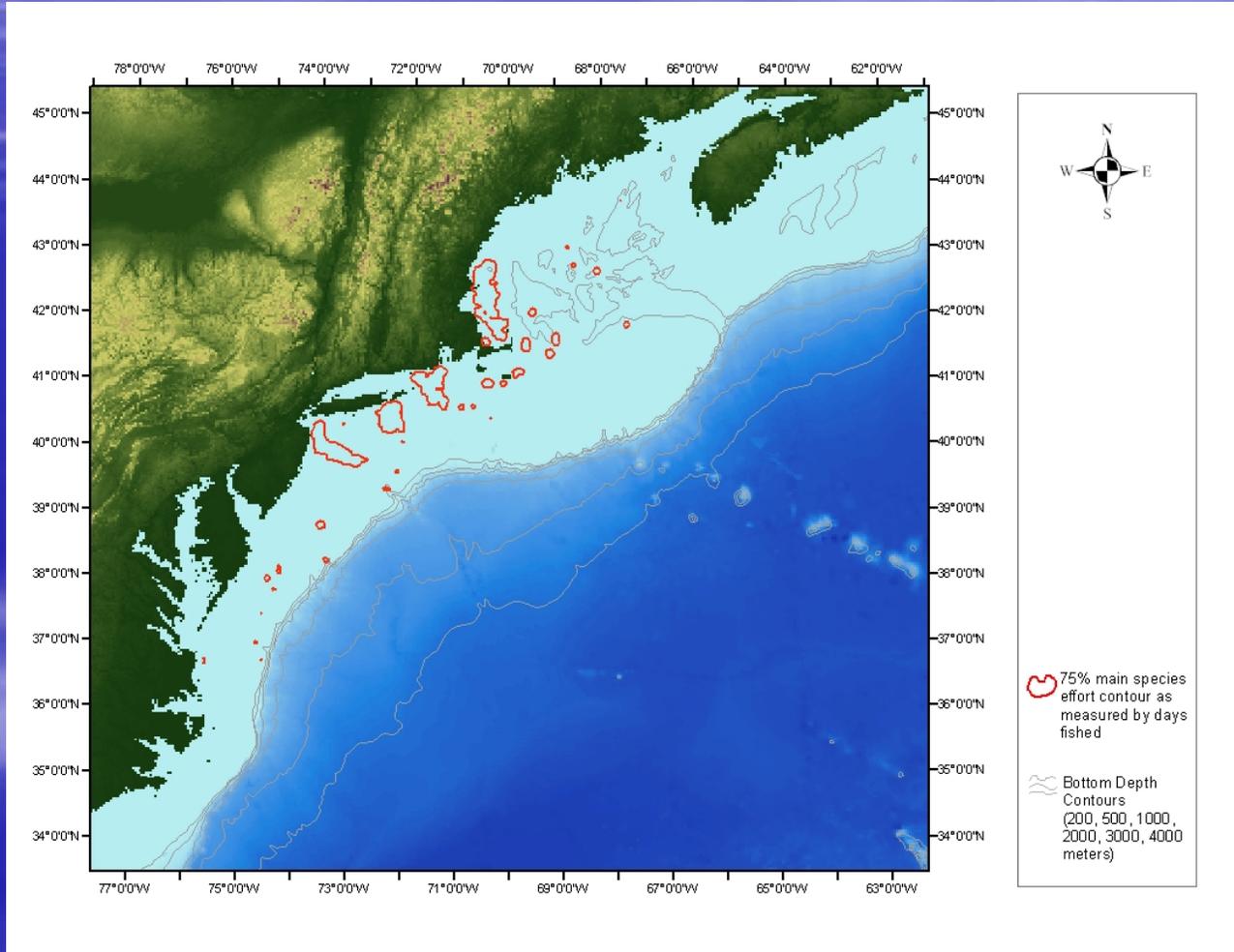
Bottom Trawl Effort by Species

Croaker



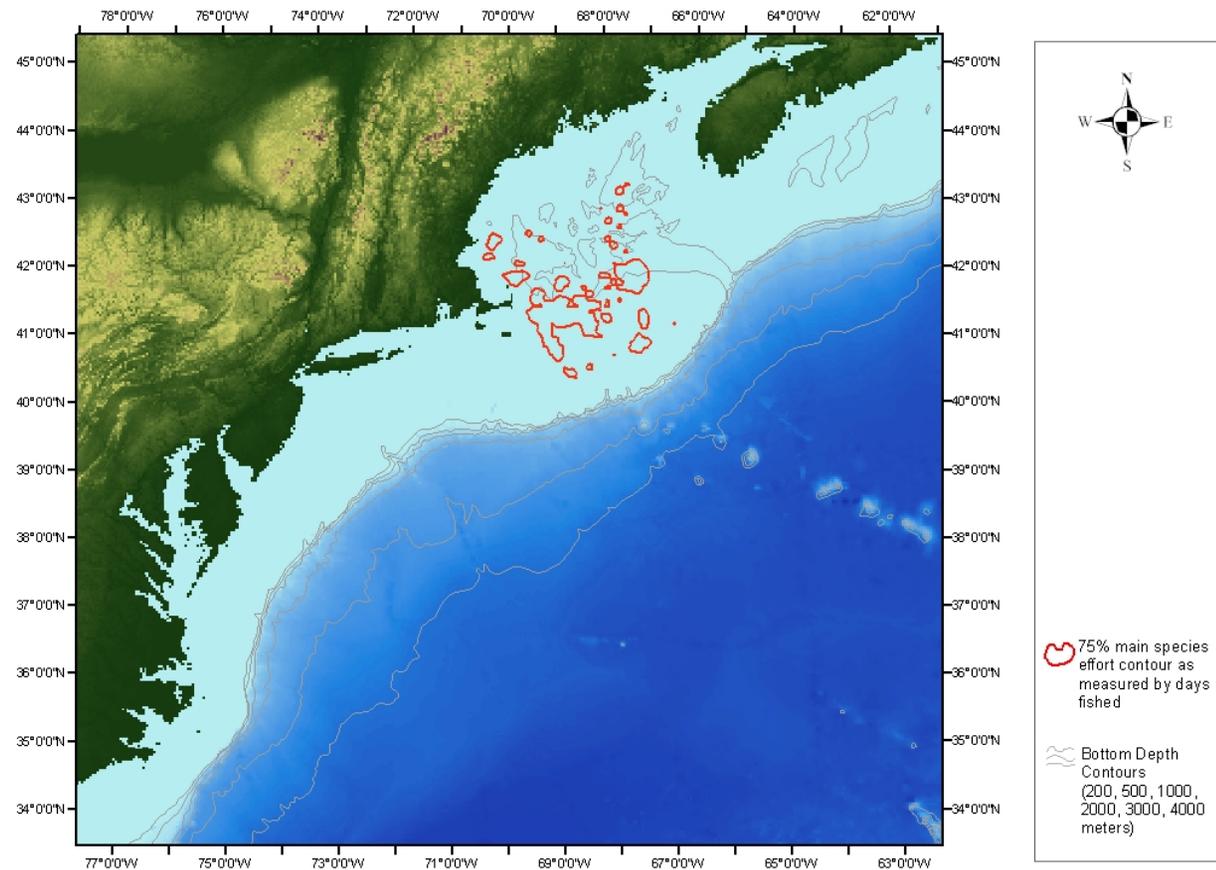
Bottom Trawl Effort by Species

Spiny and Unidentified Dogfish



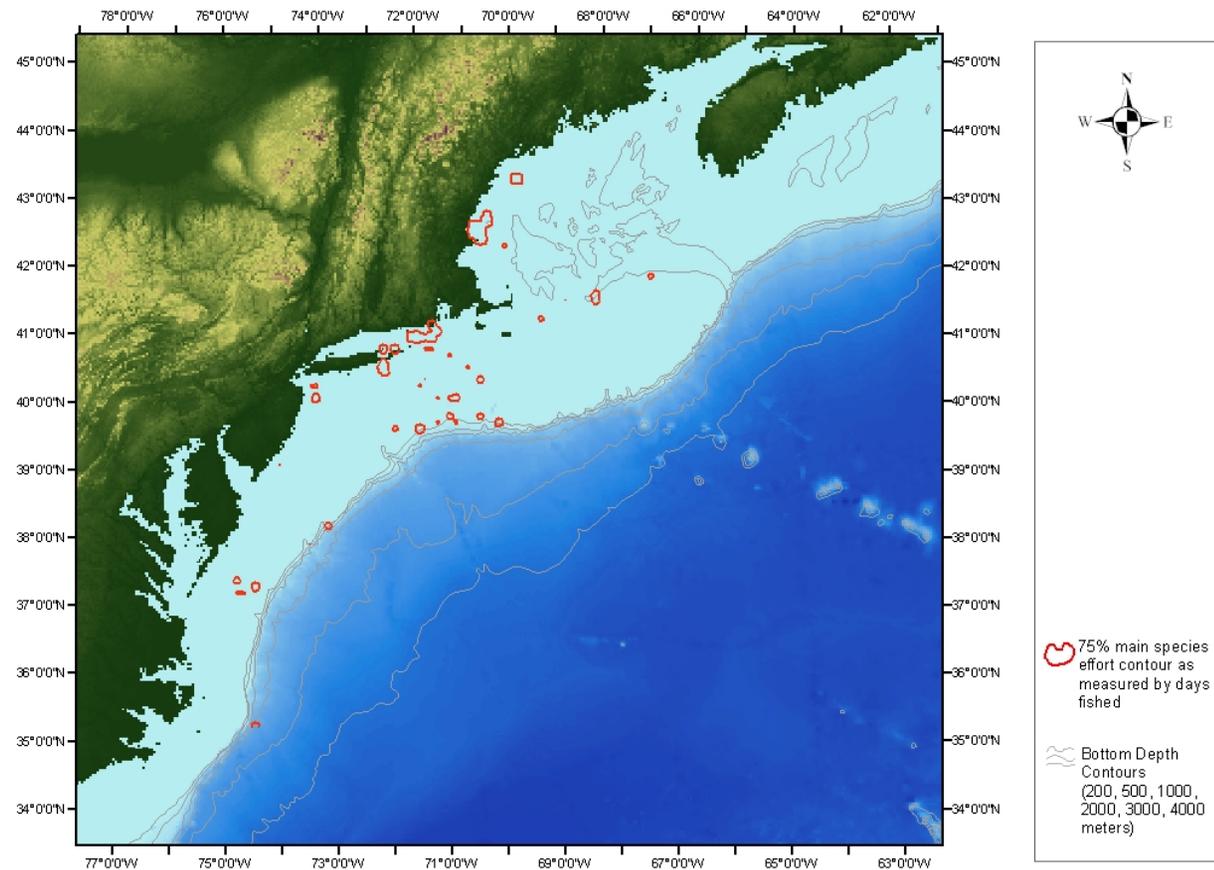
Bottom Trawl Effort by Species

Haddock



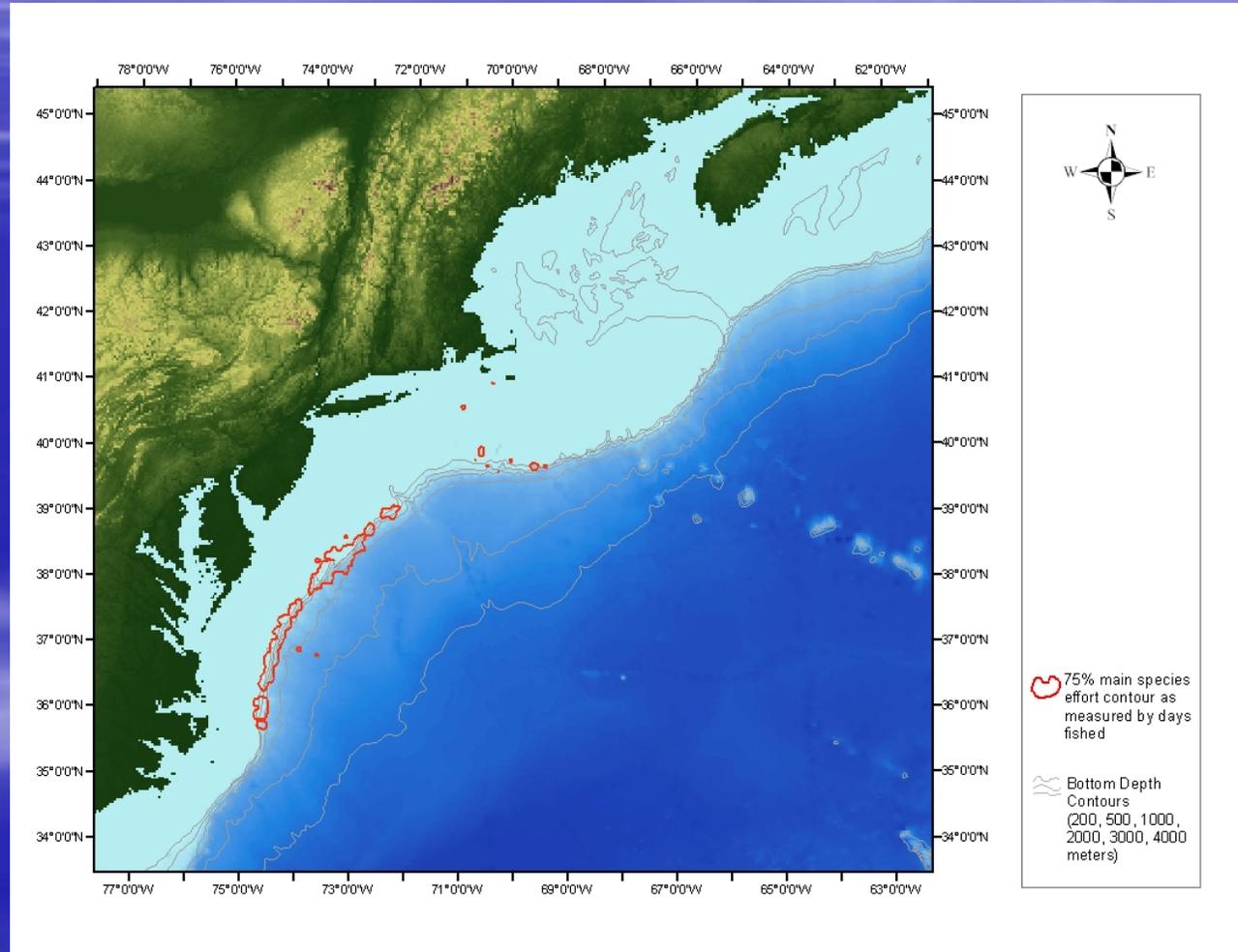
Bottom Trawl Effort by Species

Atlantic Herring



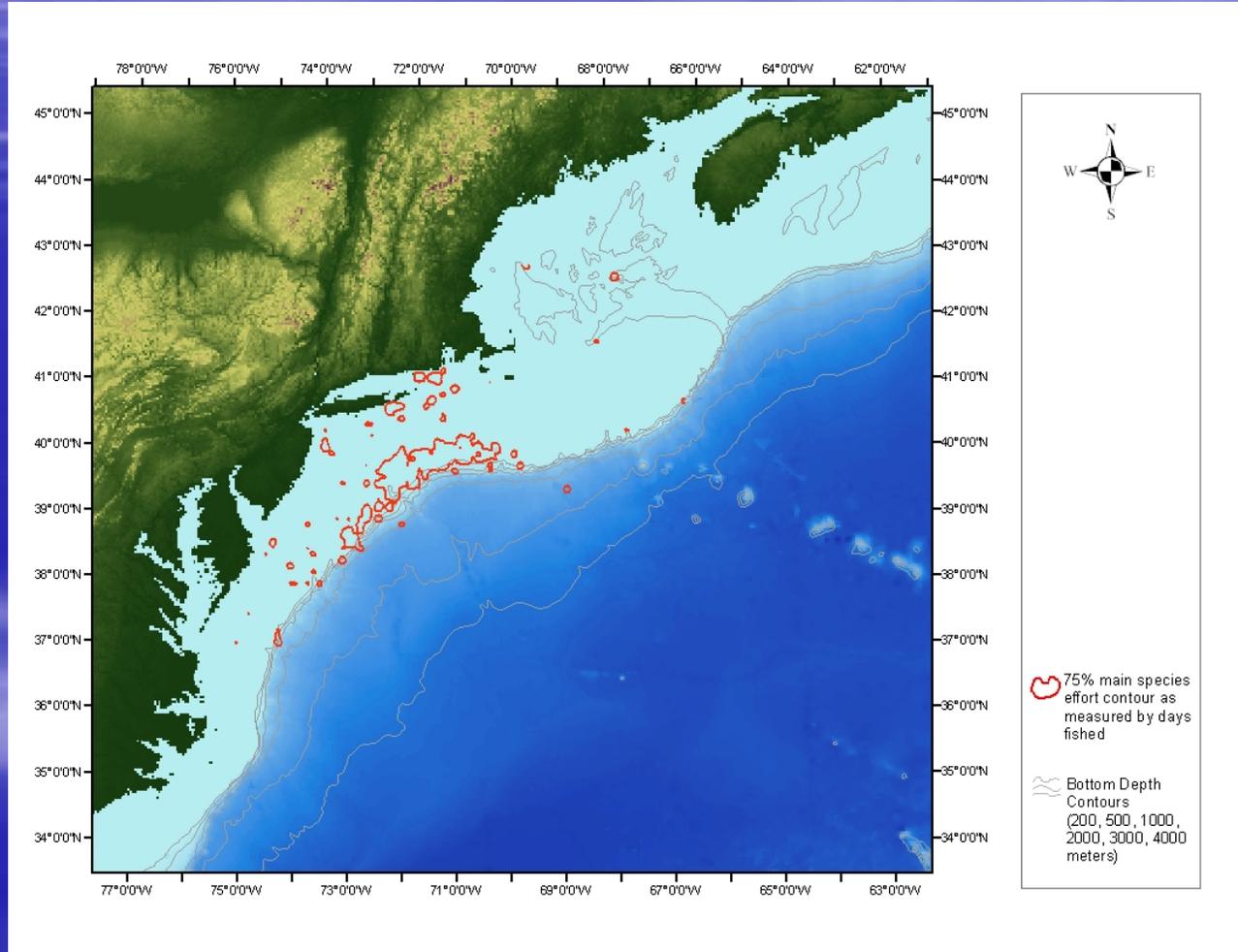
Bottom Trawl Effort by Species

Illex squid



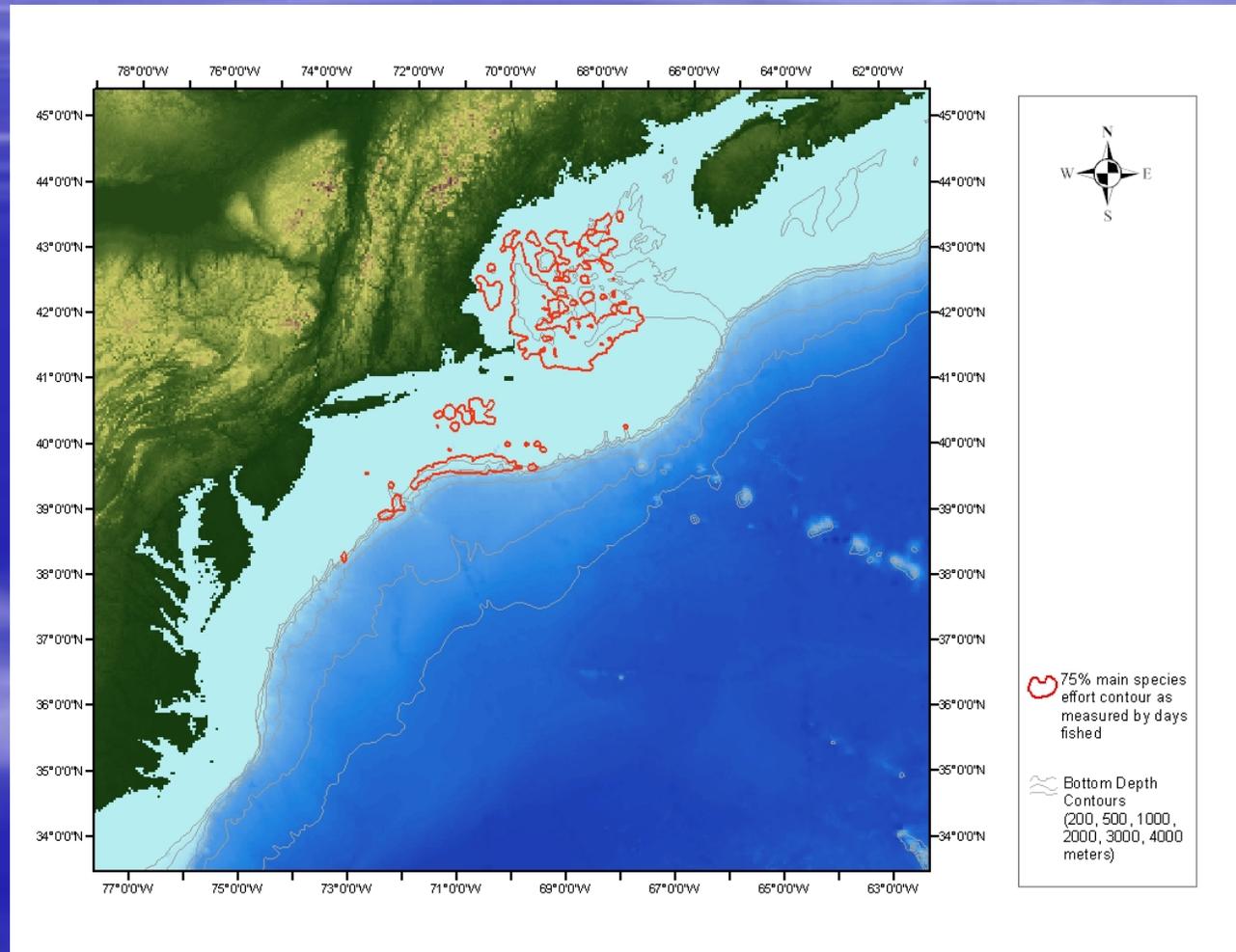
Bottom Trawl Effort by Species

Atlantic Mackerel



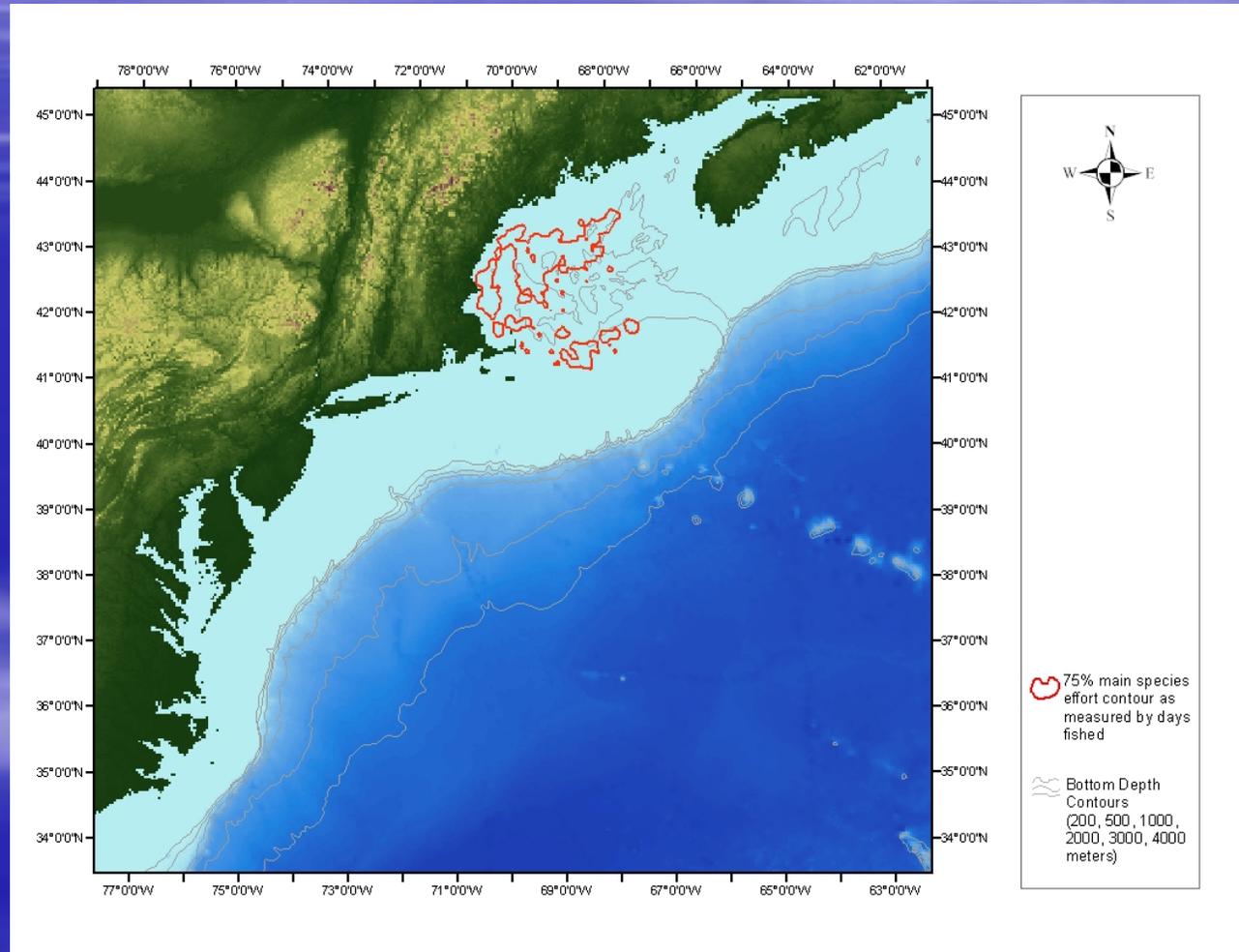
Bottom Trawl Effort by Species

Monkfish



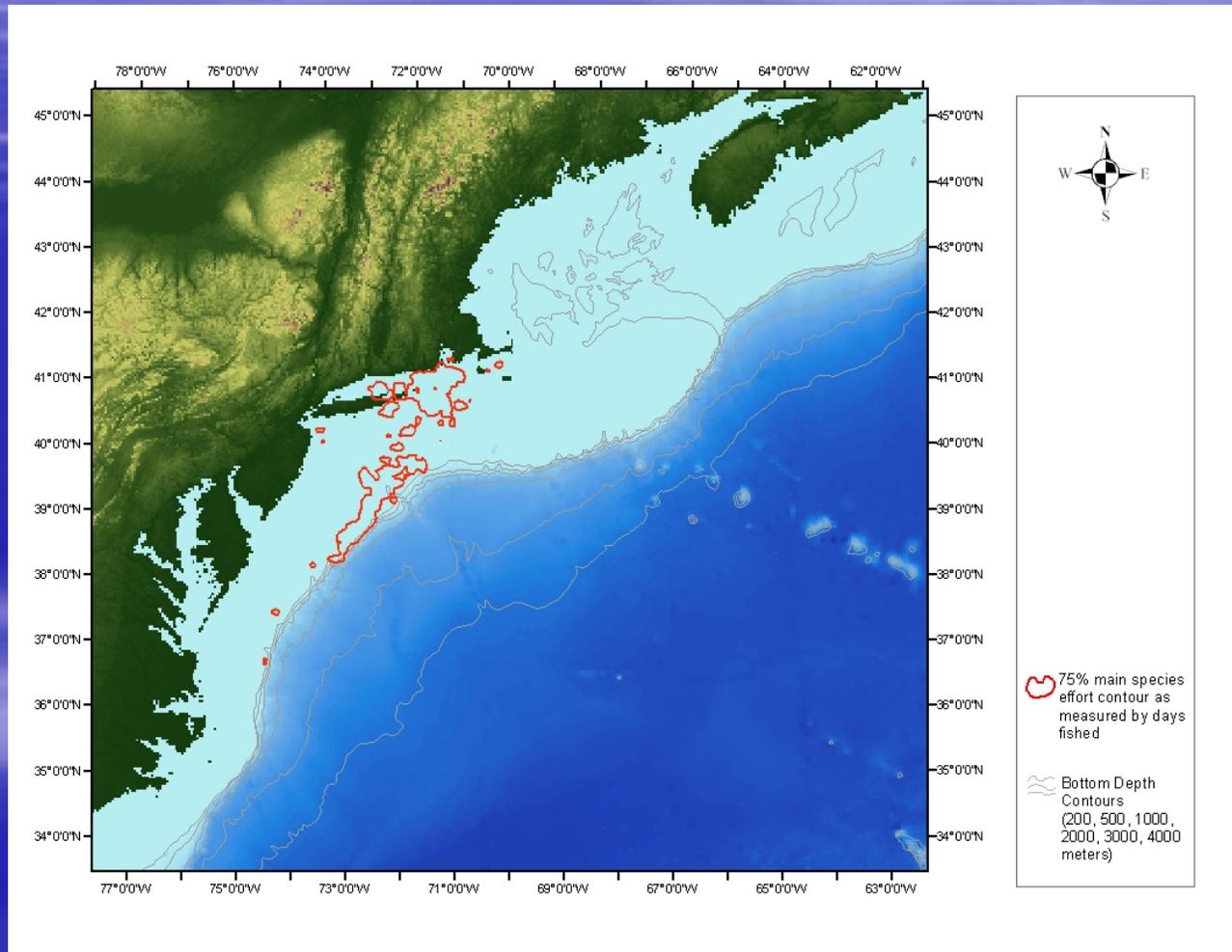
Bottom Trawl Effort by Species

American Plaice



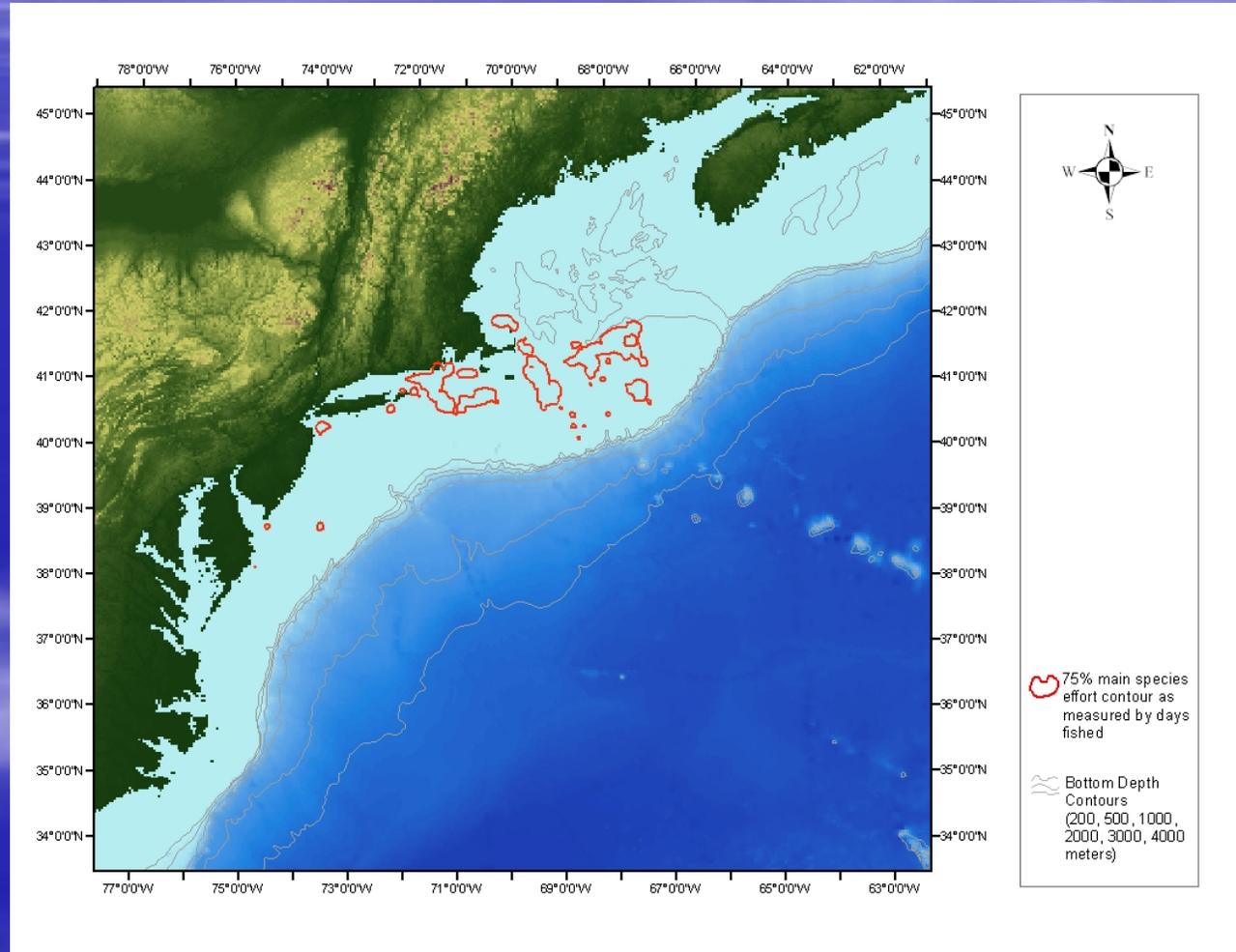
Bottom Trawl Effort by Species

Scup



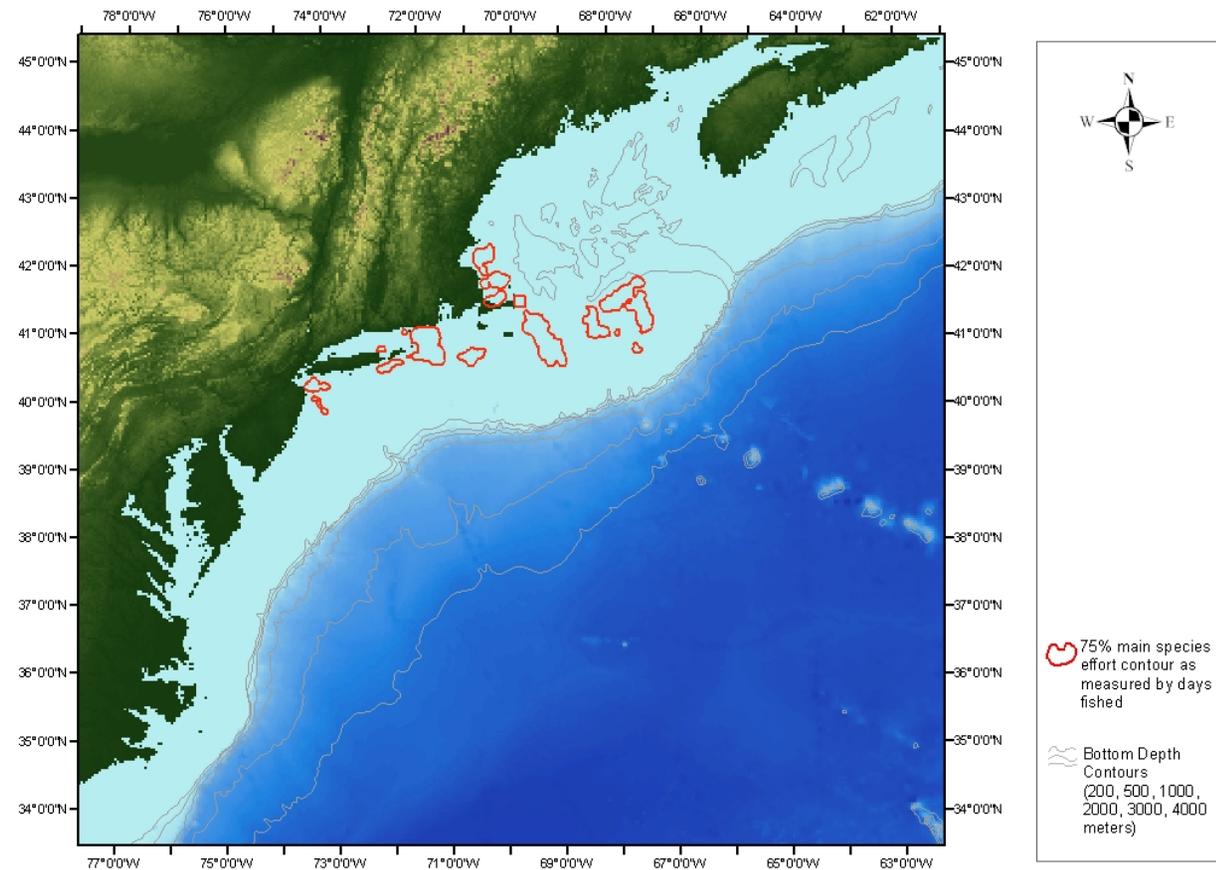
Bottom Trawl Effort by Species

Skates



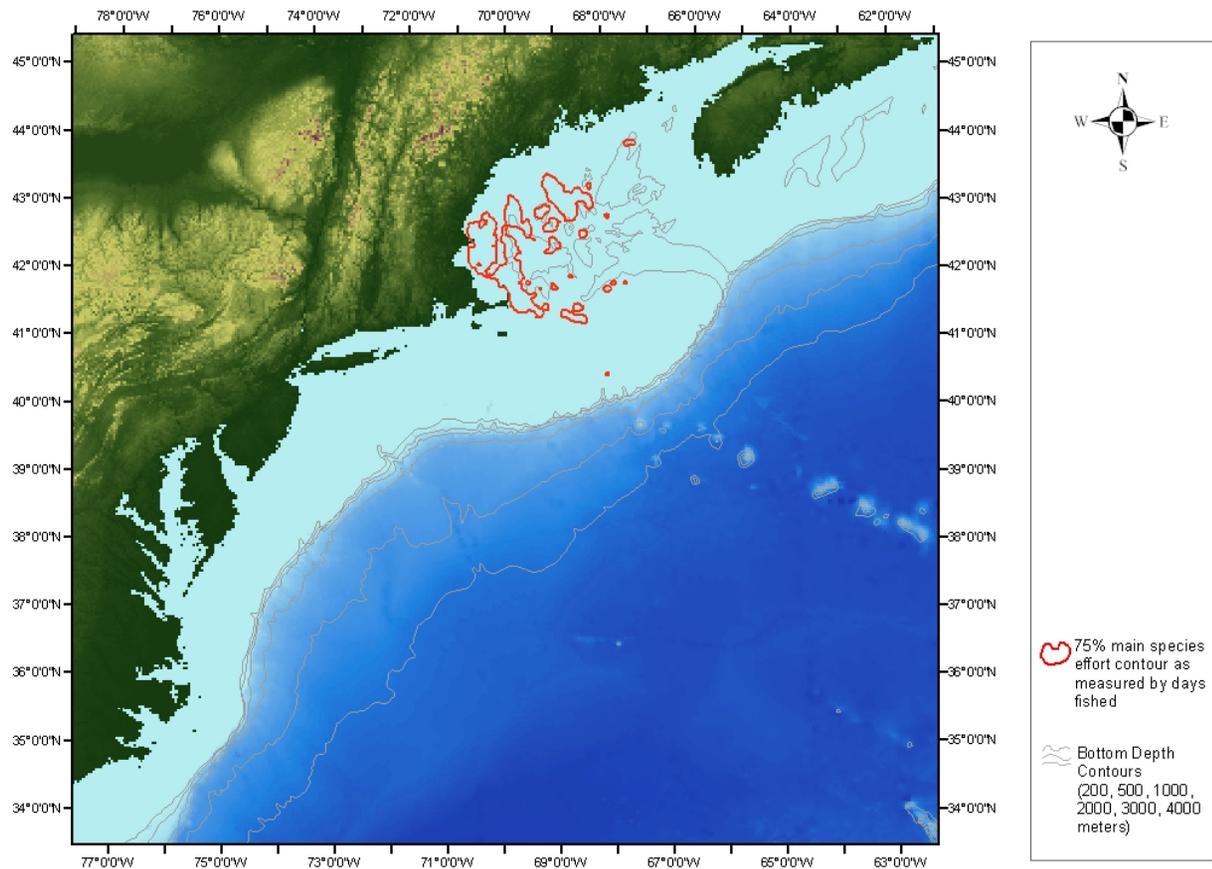
Bottom Trawl Effort by Species

Winter Flounder



Bottom Trawl Effort by Species

Witch Flounder



Bottom Trawl Effort by Species

Yellowtail Flounder

