Sea Sampling Trip, M/V TREMONT

December 16-19, 1977

Trip Description and Results

by

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TRIP RESULTS

M/V TREMONT

Commercial Groundfish Fishing Trip

December 16-19, 1977

During 16-19 December 1977, I participated in a groundfish fishing trip aboard the M/V Tremont with Capt. Jon Gudjonsson and seven crew members (Table 1). My presence was facilitated through an invitation made by Tom Norris, at a special meeting of the New England Regional Fishery Management Council held 21 November 1977 in Peabody, Massachusetts, to take scientists aboard commercial vessels to obtain biological data directly at sea from the groundfish fleet itself. Within the general context, I established three principal objectives for myself for the Tremont trip:

1. To procure first-hand experience of current groundfish fishing operations with particular regard to the impact of existent management regulations on fishing activities for cod and haddock.

2. To conduct sampling at sea on the quantity and size composition of major groundfish species landed and/or discarded, and evaluate NMFS sea sampling procedures.

3. To assess groundfish data derived from NMFS research surveys and related studies with sea sampling data and associated field observations.

General Trip Description

The Tremont departed Boston at 1600 hours (4:00 PM) on 16 December 1977. A trip of about 8-9 days duration was anticipated by the crew and all seemed prepared to be away from home through Christmas Day. Several indicated that this situation was not atypical and had, in fact, often

occurred in previous years. While some of the crew were not "regulars" and were solicited to "fill-in" only on this trip, all appeared to be knowledgeable, well-experienced fishermen with many years to their credit in the New England fisheries. Almost all of the crew had a brother or father who was a commercial fisherman and hence had strong economic ties to fishing as a family occupation and principal means of financial support.

After a 16-hour steam to Georges Bank ("K Grounds" - approximately 41°30' 67°05'), the Tremont began fishing at 0840, 17 December, in 25-30 fathoms. Five tows were accomplished on this date; three were 2-hour tows and two were 1½ hours in duration (see Table 2, Haulback log sheets). Scrod haddock was the principal species caught; incidental catches of cod and flounder (quantities less than 50 pounds not listed on log sheets) were also taken. Approximately 8500 pounds of haddock was landed in the five tows. No food fish was discarded; only nonmarketable fish (skates, sculpins, dogfish, etc.) were returned overboard.

On 18 December, one early morning (1:45 a.m.-3:00 a.m.) tow yielded about 20,000 pounds of scrod haddock. This seemed to be one of the largest single haulbacks of haddock observed by crew members in some time, and required five hours to process. Three additional tows made later this day were much less fruitful. Total haddock taken in these efforts was less than 600 pounds.

The onset of 35-40 knot winds and 15-20 ft seas during the day, coupled with weather reports of a winter storm of gale force proportions for the next several days curtailed offshore fishing activity. Hence, at 1800 hours (6:00 p.m.) on 18 December the Tremont steamed westward to return to port.

Two final tows were made on the morning of 19 December. The first (1:15-3:45 a.m. at 41°25' 68°55', 80 fathoms) resulted in a torn net, some broken equipment, and no fish. The second tow (10:00 a.m.-12:00 noon at 41°45' 69°15', 100 fathoms) was more productive; 1000 pounds of large redfish were taken along with some haddock and cod.

Upon completion of the second haulback, the Tremont resumed its steam to port and landed in Boston at 10:30 p.m., 19 December. Hail for the trip was 32,400 pounds of fish, of which haddock comprised 29,000 pounds (28,000 scrod; 1,000 market)(see attached Fishery Market News Report B-152--Table 3).

Although the Tremont catch was available to go up for auction on Tuesday morning, 20 December, the catch was not put up for sale until the Wednesday auction.

Sea Sampling Activities

Methods

Length-frequency samples were taken from seven of the 11 tows accomplished. A randon 2-bushel sample was measured for each of the major groundfish species in the haulback. Length measurements were in terms of fork length (nearest centimeter).

Hail weights of each species by tow were obtained from estimates provided by crew members.

Information on vessel location, time of tow, and depth fished was derived from the Captain's observations or directly from instrument readings (i.e., loran bearings, fathometer traces).

Informal, qualitative maturity observations were made on both scrod haddock and scrod cod. These data were secured during fish processing operations ("ripping and gutting") following each haulback.

Results

Length Frequency

A total of 365 fish (285 haddock, 31 cod, and 49 redfish) were measured for length-frequency analysis (Table 4). Haddock samples provided the most complete data set (Figure 1); the haddock length-frequency distribution indicates that a single year-class (1975) was the dominant group within the catch. Approximately 93% (265 of 285) of the sampled haddock comprised this grouping. This compares favorably with the haddock hail for the trip which showed that scrod haddock accounted for 97% of the weight of haddock landed.

The Tremont haddock size-frequency distribution was similar to that obtained during the autumn 1977 Georges Bank research bottom trawl survey (Figure 2). Fish smaller than 40 cm (pre-recruits) appear in the survey frequency distribution (but not in the Tremont data) since a 1/2-inch cod end mesh liner is placed in the survey trawl to retain these smaller fish.

The Tremont cod length-frequency measurements showed a broad range of sizes (age groups) within the catch (Table 4). Individuals ranged from 48-115 cm (19-45 inches). Scrod cod (48-63 cm) comprised 52% of the total combined sample, by number, and about 20% of the total sample weight (derived from length-weight relation). The proportion of cod scrod (by weight) in the sampled fish approximated the 29% estimated for the trip catch (500/1700).

Although the total cod length-frequency sample was limited to only 31 fish, the size range and distribution of fish sampled was similar to that derived from the autumn 1977 Georges Bank survey cruise (Figure 3). The 1975 year class (scrod cod) dominated both the Tremont and survey cod catches (numbers of fish).

Redfish length-frequency data were limited to a single sample since this species was only taken in one tow. Sampled fish ranged between 30-59 cm (12-23 inches) in length. Redfish in this size range are generally between 14-30 years old.

Maturity Observations

Maturity stages of scrod haddock and scrod cod were identified during catch processing by the color and size of the gonads in relation to the body cavity of the fish. About 50% of the scrod haddock (females) possessed ripening gonads (R_2 maturity stage: yolked eggs, developed blood vessel network, egg color yellow-orange, ovary 1/3 to 1/2 of body cavity). Only about 20% of the female scrod cod, however, displayed ripening ovaries. These data suggest that the reproductive potential of both scrod haddock and scrod cod (primarily the 1975 year-class in each species) will not be attained until at least the 1979 spawning, and possibly later for cod.

Table 1. Personnel aboard M/V TREMONT Commercial Groundfish Fishing Trip, 16-19 December 1977.

Jon Gudjonsson	Captain/Chief of Party
Tom Kelley	First Mate
Ordway Duncan	Chief Engineer
James Clements	Cook
Kenneth Bradbury	Fisherman
George Walsh	Fisherman
Francis McHugh	Fisherman
Gary Asgeirsson	Fisherman
Fredric Serchuk	Fishery Scientist (NMFS)

Table 2. Scientific haulback logsheets from sea sampling of M/V TREMONT, 17-19 December 1977.

1. VESSEL NAME	2. KIND OF GEAR	3. MESH SIZE (Stretch)
TREMONT	OTTER TRAWL	5-5 1/2"

4. TRIP NO.	5. VESSEL SAILED (Month, Day, Year, Time)	6. VESSEL LANDED (Month, Day, Year, Time)
	12-16-77 4:00 PM	12-19-77 10:30PM

7. WATCH	8. DATE	9. TIME	DATE	TIME	DATE	TIME	DATE	TIME
	12-17-77	8:40 - 10:40 AM	12-17-77	11:30AM - 1:30PM	12-17-77	1:45 - 4:00 PM	12-17-77	9:10 - 10:30PM
10. POSITION WHILE FISHING: (Enter Latitude & Longitude, Unit Area, Loran Bearings, or Fishing Grounds by Name)	416752 (524)		416762 (524)		416762 (524)		416763 "K Ground"	41°30 67°00 (524)
11. DEPTH FISHED IN FATHOMS	25		30		30		30	
12. NUMBER OF TOWS PER WATCH	-		-		-		-	
13. TOTAL TIME NET ON BOTTOM	HRS. 2	MIN. -	HRS. 2	MIN. -	HRS. 2	MIN. 15	HRS. 1	MIN. 20
14. BREAKDOWN BY SPECIES — MARKET FISH — HADDOCK — LARGE (Lbs.)	50							
HADDOCK — SCROD (Lbs.)	100		3000		200		2500	
YELLOWTAIL (Lbs.)								
OTHERS (Name & weight) — COD	200		200		100		100	
					Not towed at haulback - poor tow!			
15. TOTAL HAIL PER WATCH OR TOW								
ESTIMATED DISCARDS — HADDOCK (Lbs.)								
YELLOWTAIL (Lbs.)								
OTHERS (Name & weight)								
16. TOTAL DISCARD	—		—		—		—	

COMMENTS (Continue on reverse if more space is required) (If reverse side is used for comments adjust carbon as necessary to make sure Comments appear on both copies.)

1. VESSEL NAME	2. KIND OF GEAR	3. MESH SIZE (Stretch)
TREMONT	OTTER TRAWL	5-5½"

4. TRIP NO.	5. VESSEL SAILED (Month, Day, Year, Time)	6. VESSEL LANDED (Month, Day, Year, Time)
	12-16-77 4:00 PM	12-19-77 10:30 PM

7. WATCH	8. DATE	9. TIME	DATE	TIME	DATE	TIME	DATE	TIME
	12-17-77	11:35 PM - 1:00 AM	12-18-77	1:45 - 3:00 AM	12-19-77	8:30 - 11:00 AM	12-18-77	11:45 AM - 1:45 PM

10. POSITION WHILE FISHING: (Enter Latitude & Longitude, Unit Area, Loran Bearings, or Fishing Grounds by Name)	416763 "K Grounds" (524)		416763 "K Grounds" (524)		416763 "K Grounds" (524) Fishing along 1H3-2505 line		416763 "K Grounds" (524)	
11. DEPTH FISHED IN FATHOMS	30		30		30		30	
12. NUMBER OF TOWS PER WATCH	-		-		-		-	
13. TOTAL TIME NET ON BOTTOM	HRS. 1	MIN. 35	HRS. 1	MIN. 15	HRS. 2	MIN. 30	HRS. 2	MIN. -

14. BREAKDOWN BY SPECIES							
MARKET FISH	HADDOCK	LARGE (Lbs.)					
		SCROD (Lbs.)	2500	20,000	250	350	
	YELLOWTAIL (Lbs.)						
	OTHERS (Name & weight)	COD			50	150	
	15. TOTAL HAIL PER WATCH OR TOW						
ESTIMATED DISCARDS	HADDOCK (Lbs.)						
	YELLOWTAIL (Lbs.)						
	OTHERS (Name & weight)						
	16. TOTAL DISCARD		-	-	-	-	

COMMENTS (Continue on reverse if more space is required) (If reverse side is used for comments adjust carbon as necessary to make sure Comments appear on both copies.)

1. VESSEL NAME	2. KIND OF GEAR	3. MESH SIZE (Stretch)
TREMONT	OTTER TRAWL	5-5 1/2"

4. TRIP NO.	5. VESSEL SAILED (Month, Day, Year, Time)	6. VESSEL LANDED (Month, Day, Year, Time)
	12-16-77 4:00 PM	12-19-77 10:30 PM

	8. DATE	9. TIME	DATE	TIME	DATE	TIME	DATE	TIME
7. WATCH	12-18-77	3:00-5:30 PM	12-19-77	1:15-3:45 AM	12-19-77	10:00-12:00 AM NOON		
10. POSITION WHILE FISHING: (Enter Latitude & Longitude, Unit Area, Loran Bearings, or Fishing Grounds by Name)	416763 (524) 416753 "2505 bind"	41°35 67°18 41°30 67°10	416814 (521) 416964	69°00 41°25 68°55 41°25	416952 (521) 1H3-3460; 1H7-2568	69°15 41°45	HAIL FOR ENTIRE TRIP	
11. DEPTH FISHED IN FATHOMS	30		80		100		↓	
12. NUMBER OF TOWS PER WATCH	-		-		-			
13. TOTAL TIME NET ON BOTTOM	HRS. 2	MIN. 30	HRS. 2	MIN. 30	HRS. 2	MIN. -	HRS.	MIN.

14. BREAKDOWN BY SPECIES

MARKET FISH	HADDOCK	LARGE (Lbs.)		No catch.	150	1000
		SCROD (Lbs.)		Next tow, also		28000
	FLOUNDERS: BB + YT ~~YELLOWTAIL~~ (Lbs.)		100	but few boom.		
	OTHERS (Name & weight)	COD	100		150	COD LGE 800
						COD MKT 400
		REDFISH			1000	COD SCROD 500
	15. TOTAL HAIL PER WATCH OR TOW					REDFISH 1000
ESTIMATED DISCARDS	HADDOCK (Lbs.)					BLACK 500
	YELLOWTAIL (Lbs.)					Y.T. 250
	OTHERS (Name & weight)					32450
	16. TOTAL DISCARD		—	—	—	

COMMENTS (Continue on reverse if more space is required) (If reverse side is used for comments adjust carbon as necessary to make sure Comments appear on both copies.)

Table 3. Fishery Market News Report B-152, 21 December 1977.

10 Commonwealth Pier
BOSTON, MASS. 02210
Tel. (617) 542-6070

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Wed., Dec. 21, 1977

FISHERY MARKET NEWS REPORT B-152

BOSTON FISH PIER

LANDINGS FOR 48 hrs. ending 9 a.m.:—In thousands of lbs. & $ per Cwt. Hailing fares. Prices are ex-vessel for first sales unless otherwise specified. Landings and prices are available daily by phone (617) 542-7878.

	Hadd	Sord	LCod	MCod	Sord	Cusk	Hake	Poll	Ocn Prch 1/	Wolf	B B 2/	Dabs	Dab Y T	GryS 3/	Y T 4/	Total
TUESDAY 12/20:																
Otter Trawlers:																
Large:	$8000	3500	4000	4000	3200	2500	3500	2000	2000	1500	2500 5000	5000	5000	4000 7000	3000 5000	-
Joseph & Lucia III	5	17	5	6	12	3.5	4	6.5	6	-	0.3	3.2	-	5.8	0.1	74.4
Old Colony.....	3.5	27	3	3	3	0.3	1	5	5.5	-	-	-	-	-	-	51.3
Medium:																
Mother & Grace...	3	28	5.5	2.3	1.5	-	2	4.8	1	0.6	-	-	1.2	0.6	-	50.5
Sicily.....	-	-	-	0.7	0.7	-	-	0.7	-	-	1.5	-	-	-	3.5	7.1
4 - Total.....	11.5	72	13.5	12	17.2	3.8	7	17	12.5	0.6	1.8	3.2	1.2	6.4	3.6	183.3
WEDNESDAY 12/21:	$8000	3500	4200	4100	3600	2500	3500	2000	2000 3000	1700	2000 4000 6000	5000	-	7000	5000	-
Otter Trawlers:																
Large:																
Ocean.....	5	25	2.5	2	1.5	0.7	0.8	2	8	-	0.4	1.3	-	0.7	0.5	50.4
Tremont.....	1	28	0.8	0.4	0.5	-	-	-	1	-	0.5	-	-	-	0.2	32.4
Medium:																
Seven Seas.....	2	2.5	3.5	1.8	0.4	0.5	2	1.5	1	0.2	-	3	-	1.5	-	19.9
Small:																
Salvi & Joe.....	-	-	-	0.5	0.6	-	-	-	-	-	3.3	-	-	-	0.5	4.9
4 - Total.....	8	55.5	6.8	4.7	3	1.2	2.8	3.5	10	0.2	4.2	4.3	-	2.2	1.2	107.6

1/ Ocn Prch: Wed.: Lge $30.00, Mixed Sizes 20.00; 2/ B B: Tues.: Lge $50.00, Mixed 25.00;
3/ GryS: Tues.: GryS Lge $70.00, Med 40.00; 4/ Y T: Tues.: Y T Lge $50.00, Med 30.00
SAILINGS: MONDAY & TUESDAY: None 2/ B B: Wed.: Lge $60.00, Inshore $20.00-40.00

NEW BEDFORD, MASS.

LANDINGS FOR 48 hrs. ending 9 a.m.:—In 1,000 lbs. Ex-vessel prices in $/Cwt for landings sold at the New Bedford selling room. Landings and prices are available daily by phone (617) 997-6565.

SCALLOPS, SEA: Tues.: 9 Scallopers Total 131.5 @ $210.00-210.10; Bountiful 11.0, Geraldine 17.0, Hunter 14.5, Jane & Ursula 14.0, Jupiter 19.0, Seafarer 22.5, Texas 14.0, Trade Wind 10.0, Viking Queen 9.5
Wed.: 6 Scallopers Total 60.5 @ $215.00-215.10; Eleanor & Theresa 4.5, Louise 8.0, Montreal 13.0, Poseidon 13.0, Rianda 15.0, Sea Trek 7.0

TUESDAY 12/20:	Hadd	Sord	Cod 1/	B B	LemS & BB 3/	Y T	Poll	SDab	Mixd	Total
	$6000	2500	2000 2500	3000 4010	-	4000 5000	1500 1510	2000	-	-
Aloha.....	12		15	-	6	1	1.5	2	1.5	39.0
Carmen Linda.....	1		2.5	-	2.5	18	0.3	0.8	1.8	26.9
Chivas Regal.....	12		18	0.5	1	1.5	0.3	0.5	-	34.1
Crown Royal.....	17		17	-	8	2	2	-	0.5	46.5
Falcon.....	11		5	-	5	10	-	0.2	-	31.2
Gertrude C.....	-		0.5	-	2	10	-	1.5	1	15.0
Michele & Cindy.	-		7	-	1	6	-	5.5	-	19.5
North Sea.....	-		6.5	2	-	5	-	5	0.5	19.0
Ocean Gem.....	18		18	1	5.5	1.5	6	0.5	3.6	54.1
Pauline H.....	10		12.5	-	9	12.5	0.5	2	-	46.5
Rebecca & Rachael	-		4	5	-	-	-	-	-	9.0
Vasco da Gama...	3		5	1.5	-	16.5	-	6	-	32.0
Venture I.....	-		4	0.2	-	5	0.1	0.1	-	10.4
14 - Total.....	84.5		119.5	13.2	38	104	10.7	26.1	9.2	405.2
WEDNESDAY 12/21:	$6000	2500	2000 2500	3000 5000	-	4000 5000	1500	2000	-	-
Angela W.....	6		4	-	5.5	7	-	1	-	23.5
Atlantic Challenger	8.5		9	-	10	0.5	-	-	-	28.0
Brenda Louise...	-		5.5	-	4.5	24	-	6.5	0.6	41.1
Capt. Mano.....	7.5		15	-	10	8	1	0.3	-	41.8
Flying Dutchman.	-		0.5	-	1.5	9	-	3	0.8	14.8
Gazela.....	1.3		3.2	-	1	14	-	0.8	-	20.3
Narragansett....	1.5		4	1.5	-	2.5	-	0.8	0.3	10.6
Odin.....	14		12	-	4	0.5	-	1.5	0.3	32.3
Santo Antonio...	-		2	2.5	-	22	-	4	1.2	31.7
Tina & Maria....	-		1.5	-	4	25	-	3	0.5	34.0
10 - Total.....	38.8		56.7	4	40.5	112.5	1	20.9	3.7	278.1

1/ Cod: Tues. & Wed.: LCod & MCod $25.00, CSored 20.00
3/ LemS & BB: Tues.: Georges: LemS & Lge BB $50.00, Sml BB 30.00-40.00
Channel: LemS & Lge BB $40.00, Sml BB 30.00
Wed.: Georges: LemS & Lge BB $50.00, Sml BB 30.00
Shoals: LemS & Lge BB $40.00, Sml BB 30.00 30.00
2/ B B: Tues.: Lge $40.00-40.10, Sml 30.00, Wed.: Lge $40.00-50.00, Sml/
OTHER PRICES: Tues. & Wed.: GryS Lge $40.00, Sml 30.00, Monk 30.00, Hake 10.00; Tues.: Dabs Lge 40.00; Sml 30.00, Wed.: Fluke 25.00-30.00

GLOUCESTER, MASS.

LANDINGS FOR 48 hrs. ending 9 a.m.:—In 1,000 lbs. Landings and prices are available daily by phone (617) 283-1101.

GROUNDFISH: TUES.: Maria & Al Total 40.0; (17.0 hadd, 12.0 cod, 11.0 mxd)
WED.: 2 Otter Trawlers Total 55.0; (12.0 hadd, 3.0 cod, 14.0 poll, 26.0 mixed). *La Regina 35.0, Barbara Jean 20.0
ADD'L FOR 48 hrs.: 4 Otter Trawlers Total 19.0; (3.0 hadd, 7.0 cod, 3.0 poll, 2.0 fldr, 1.0 rnd whit, 3.0 mixed)
*Maiden Trip

PROVINCETOWN, MASS.

Landings in 1,000 lbs.
MONDAY & TUESDAY:

SCALLOPS, SEA:
2 Scallopers Total 5.5

Cod, large.....	2.2
market.....	4.3
sored.....	3.3
Flounder: BB.....	4.3
Sand Dabs....	2.2
Yellowtail...	10.2
Pollock.....	1.0
Red Hake (Ling)...	0.9
Whiting, round....	4.7
Monktail.....	1.6
Mixed.....	0.8
10 Otter Trawlers.	35.5

POINT JUDITH, R.I.

Landings in 1,000 lbs.
MONDAY & TUESDAY:

Butterfish.....	29.5
Cod.....	15.8
Flounder: BB.....	11.9
Sand Dabs....	5.6
Fluke.....	37.7
Sole, lemon..	0.7
Yellowtail...	16.3
Haddock, large....	0.5
Hake.....	0.6
Scup.....	4.5
Squid.....	5.2
Tilefish.....	1.8
Whiting, round....	7.1
Mixed.....	8.8
14 Otter Trawlers.	146.0

NEWPORT, R.I.

Landings in 1,000 lbs.
MONDAY & TUESDAY:

Cod.....	74.5
Flounder: BB.....	28.2
Fluke.....	21.6
Sand Dabs.....	7.3
Sole, gray...	0.8
lemon...	4.6
Yellowtail...	70.0
Haddock, large....	31.0
Whiting, round....	1.8
Monktail.....	3.3
Mixed.....	2.2
13 Otter Trawlers.	245.9

PORTLAND, ROCKLAND, ME. & NEW YORK, N.Y.—See Page 2.

Table 4. Length-frequency data derived from sea sampling of catch of M/V TREMONT, 17-19 December 1977.

LENGTH MEASUREMENTS (CM), FORK LENGTH

	HADDOCK		ATLANTIC COD			REDFISH	
	30		30			30	1
	1	1	1		81	1	4
	2	2	2		2 1	2	2
	3	3	3		3 1	3	2
	4	4	4		4 2	4	1
	5	5	5		5	5	2
	6	6	6		6 1	6	4
	7	7	7		7	7	6
	8	8	8		8 1	8	4
	9	9	9		9 1	9	7
	40 1	0	40		90	40	2
	1 2	1	1		1 2	1	6
	2 3	2	2		2	2	3
	3 11	3	3		3	3	1
	4 18	4	4		4	4	
	5 24	5	5		5	5	
	6 22	6	6		6	6	
	7 33	7	7		7 1	7	1
	8 38	8	8	1	8	8	2
	9 21	9	9		9	9	1
	50 28	0	50		100	50	
	1 23	1	1	2	1	1	
	2 15	2	2		2	2	
	3 8	3	3	1	3	3	
	4 7	4	4	3	4	4	
	5 2	5	5	3	5	5	
	6 6	6	6	1	6	6	
	7 2	7	7	1	7	7	
	8 1	8	8	2	8	8	
	9 1	9	9	1	9	9	
	60 1	0	60		110 1	60	
	1 1	1	1		1	1	
	2 1	2	2		2	2	
	3 1	3	3	1	3	3	
	4 3	4	4		4	4	
	5 2	5	5		5 1	5	
	6 2	6	6		6	6	
	7 1	7	7		7	7	
	8 2	8	8		8	8	
	9 –	9	9		9	9	
	70 1	0	70		120	70	
	1 –	1	1		1	1	
	2 1	2	2	1	2	2	
	3 1	3	3		3	3	
	4 2	4	4		4	4	
	5	5	5		5	5	
	6	6	6		6	6	
	7	7	7	1	7	7	
	8	8	8	1	8	8	
	9	9	9		9	9	
	80	0	80		0	80	
TOTAL	285				31		49

Samples taken:

Haddock	-	8	2-bushel baskets (from 7 tows)
Cod	-	3	2-bushel baskets (from 3 tows)
Redfish	-	1	2-bushel basket (from 1 tow)
TOTAL	-	12	2-bushel baskets

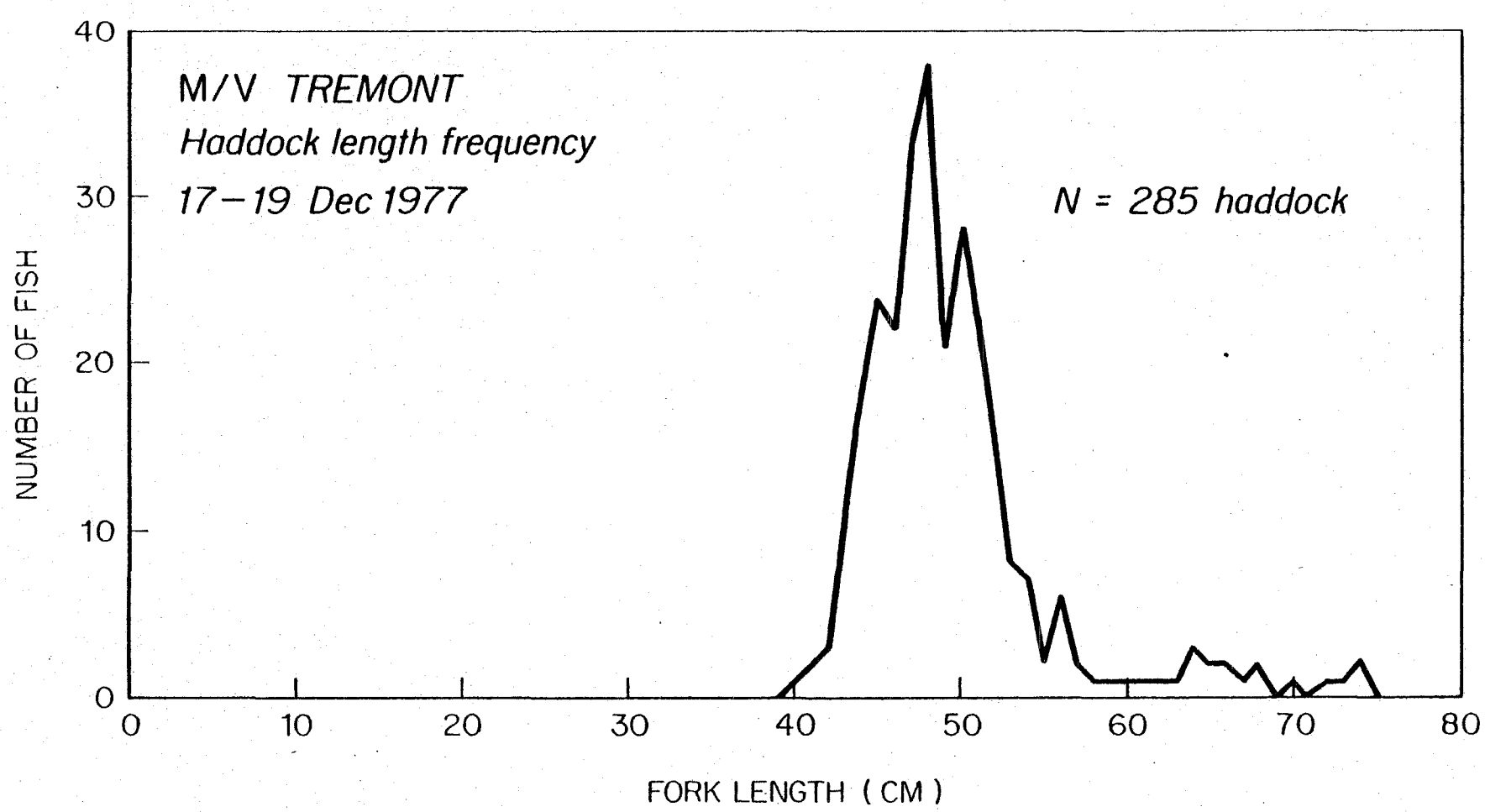
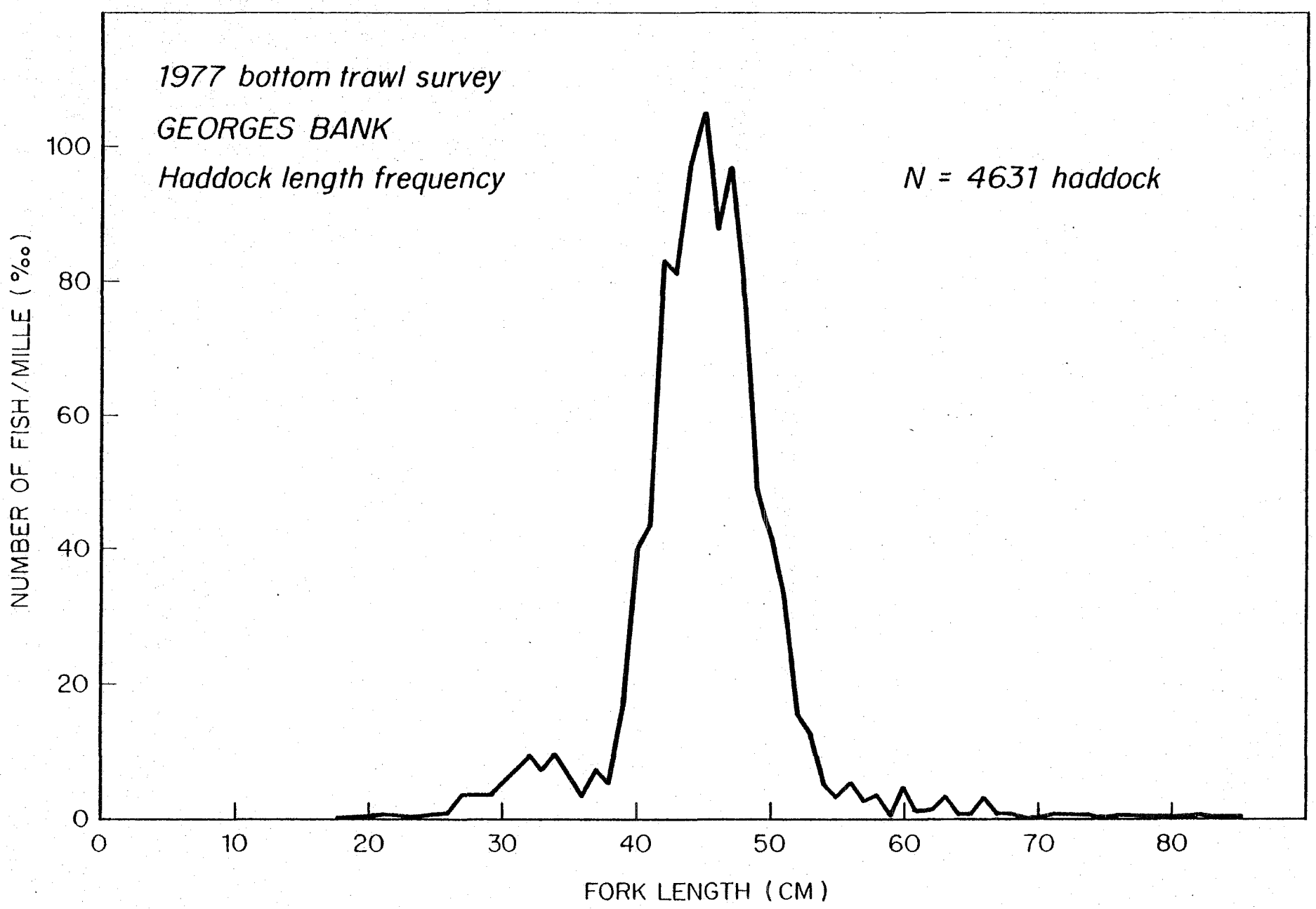


Figure 1. Length-frequency distribution of haddock sampled from catch of M/V TREMONT, 17-19 December 1977.

Figure 2. Length-frequency distribution of Georges Bank haddock caught during the 1977 USA autumn research bottom trawl survey.



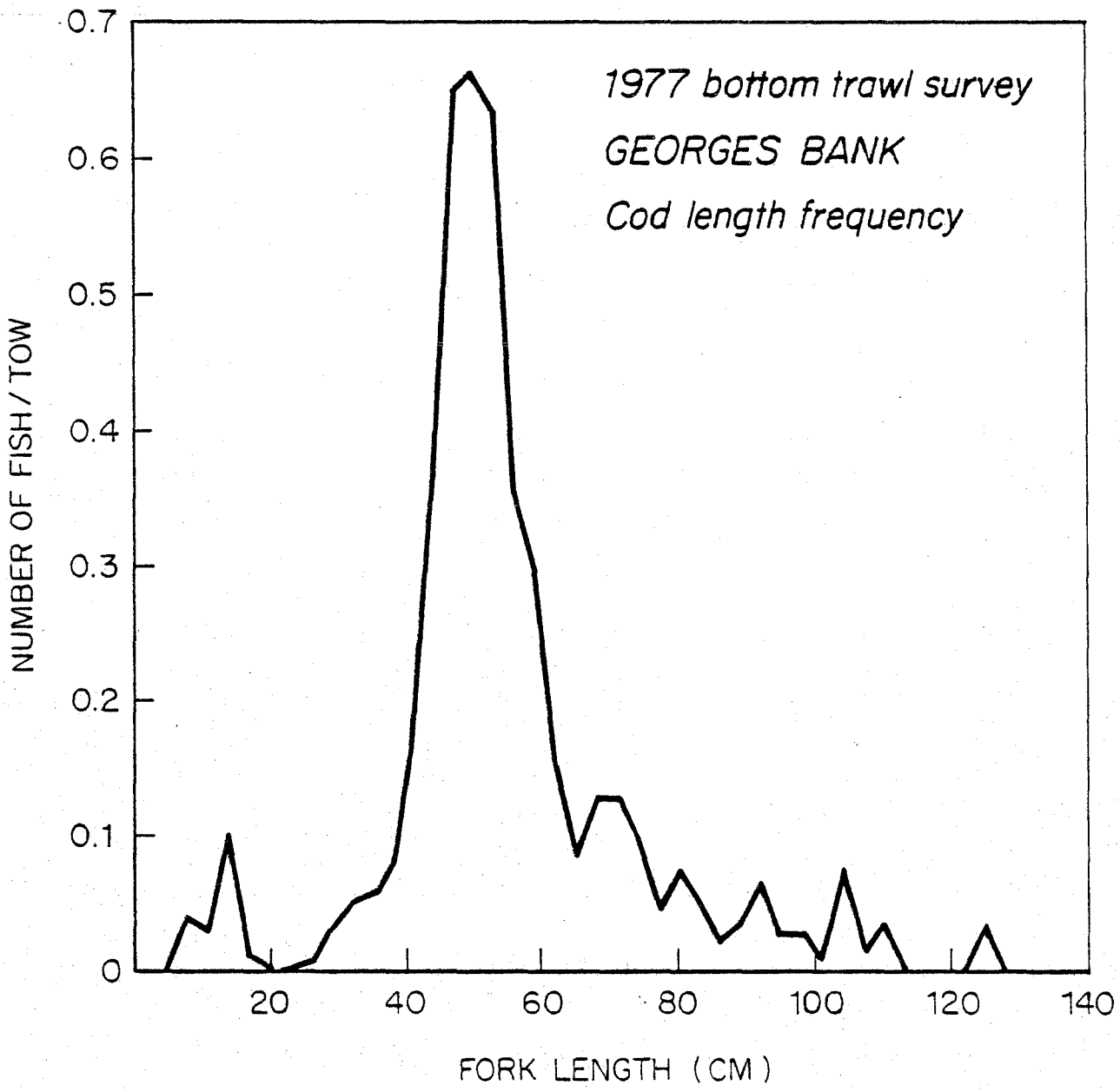


Table 3. Length-frequency distribution of Georges Bank cod caught during the 1977 USA autumn research bottom trawl survey.