

**RESULTS OF COMMERCIAL SEA SCALLOP SURVEY IN THE
VIRGINIA BEACH CLOSED AREA
SEPTEMBER 2000**

William D. DuPaul and David B. Rudders

Virginia Institute of Marine Science
School of Marine Science
College of William and Mary
Gloucester Point, Virginia

Paul J. Rago

National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

VIMS Marine Resource Report 2000-10

November 11, 2000

Introduction

This report presents the results of the commercial survey of the Virginia Beach Closed Area. The survey was conducted aboard the commercial sea scallop vessel *F/V Alice Amanda* from Hampton VA. Sampling began September 19, 2000 and was completed September 22, 2000.

Methodology

A systematic grid design was utilized with survey stations located approximately 5 nm apart. Survey stations were located both inside and outside the boundaries of the closed area (Figure 1). Additional stations (slice) were added along the western, and northern boundaries in an attempt to resolve the boundary effects on sea scallop abundance and size distribution. Stations were also added (add-in) in depth strata that had a low number of systematic grid stations, but were known from prior surveys (commercial and *R/V Albatross*) to have high concentrations of scallops. In addition to survey stations, two depletion experiments were conducted within the boundaries of the closed area. The results of the depletion experiments will not be included in this report.

The sampling gear consisted of two standard 15 ft. New Bedford style sea scallop dredges. The ring bags of the dredges were knit with 3.5" (88.9 mm) rings. In accordance with current regulations, an 8 inch twine top was used. Due to the soft, clean character of the substrate in the survey area, no tickler or rock chains were used. A NMFS inclinometer was attached to the frame of the starboard dredge to measure dredge angle and bottom contact time. All survey tows were 10 minutes in duration at a speed of 4.5-5.0 kts.

Results

Catch data are shown in Figures 3-5. At each station, scallop catches were separated into two shell height categories: less than 90 mm (Figure 2) and greater than or equal to 90 mm shell height (Figure 3). A total scallop catch at each station is shown in Figure 4.

Sea scallop abundance was examined with respect to samples taken inside or outside of the closed area (Table 1). In order to examine the apparent effect that depth had on the abundance and distribution of sea scallops, survey tows were post-stratified into discrete depth regimes (Table 2). Catch per unit effort is shown for samples inside vs. outside the area (Figure 5) and in assigned depth strata (Figure 6).

Sea scallop biomass within the Virginia Beach Closed Area was also estimated (Tables 3-4). Biomass was estimated using the survey stations both stratified by depth strata and non-stratified. Estimates of biomass for September 2000 were advanced 1 full year (September 2001). The following assumptions were used to calculate biomass:

1. Tows that fell on closed area boundary were included in the calculation.

2. Catches of scallops between 80-100 mm shell height were adjusted to reflect the selectivity of the 3.5" rings.
3. Only scallops with a shell height of 90 mm or greater were included.
4. A nominal tow length of 1 nm. Each tow covered 0.00494 nm².
5. A dredge efficiency of 40%
6. The coefficients of the shell height-meat weight relationship:
a=-12.1628 b=3.2539.
7. The parameters of the von Bertalanffy growth equation:
t₀=1.1256
k=0.2297
L_∞=151.84

Finfish bycatch was quantified throughout the Virginia Beach survey cruise. The total number caught and number caught per 10 minute survey tow are shown in Table 5. Length frequencies are shown for species where the occurrence of that species was greater than 10 instances. Length frequency histograms for goosfish (*Lophius americanus*) and windowpane flounder (*Scopthalmus aquosus*) are shown in Figures 7 and 8.

Table 1 Results of commercial survey in the Virginia Beach Closed Area.

Area	Area (nm²)	N (tows)	Mean (grams)	Variance	Standard Deviation
Outside	-	16	1,293.6	7,684,929	2772
Inside	341	45	9,082.2	353,906,871	18,812

Table 2 Results of commercial survey in the Virginia Beach Closed Area. Catch data stratified by depth.

Depth strata	Area (nm²)	N (tows)	Mean (grams)	Variance	Standard Deviation
<20 Fathoms	28	5	0	-	-
21-30 Fathoms	134	23	3,453	93,997,337	9,695
31-40 Fathoms	76	11	29,872	712,482,535	26,692
41-50 Fathoms	103	6	109	72,411	109
>50 Fathoms	82	not sampled	-	-	-

Table 3 2000 and 2001 (projected) biomass estimates. Results consist of pooled survey stations inside the closed area.

Area	Area (nm ²)	N (tows)	2000 Biomass (mt)	2001 Projected Biomass (mt)	Growth Potential (%)
Inside	341	45	1,567.3	1,821.3	16.2

Table 4 2000 and 2001 (projected) biomass estimates. Results consist of survey stations inside the closed area stratified by depth.

Depth strata	Area (nm ²)	N (tows)	2000 Biomass (mt)	2001 Projected Biomass (mt)	Growth Potential (%)
<20 Fathoms	28	5	0	0	-
21-30 Fathoms	134	23	234.2	268	14.4
31-40 Fathoms	76	11	1,148.9	1,340	12.2
41-50 Fathoms	103	6	5.7	7	22.8
Total	341	45	1,388.8	1,615	16.3

TABLE 5 Finfish and bycatch encountered on the 2000 Virginia Beach commercial survey.

COMMON NAME	NUMBER OF TOWS	TOTAL CAUGHT	MEAN (#/TOW)	VARIANCE
SKATE UNCL.	45	135	3.00	11.32
SILVER HAKE	45	1	0.02	0.02
RED HAKE	45	5	0.11	0.24
FOURSPOT FLOUNDER	45	4	0.09	0.08
WINDOWPANE FLOUNDER	45	12	0.27	0.47
BLACK SEA BASS	45	6	0.13	0.57
GOOSEFISH	45	119	2.64	18.92

75°00'

74°45'

74°30'

Figure 1 Virginia Beach Closed Area Survey Stations

37°00'

37°00'

36°45'

36°45'

36°30'

36°30'

75°00'

74°45'

74°30'



2000 Virginia Beach
Sea Scallop Survey
Survey Stations

- slice
- grid
- add-in

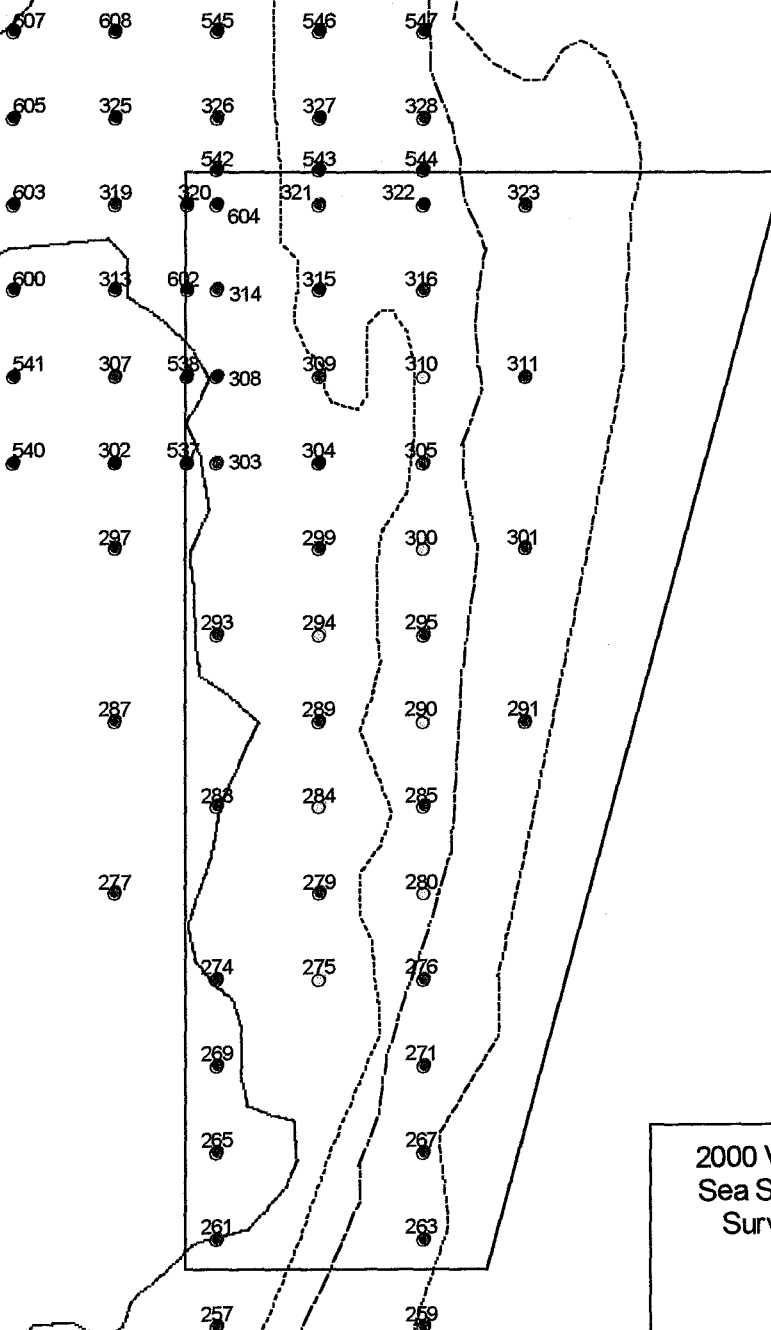
SOUNDINGS IN FATHOMS

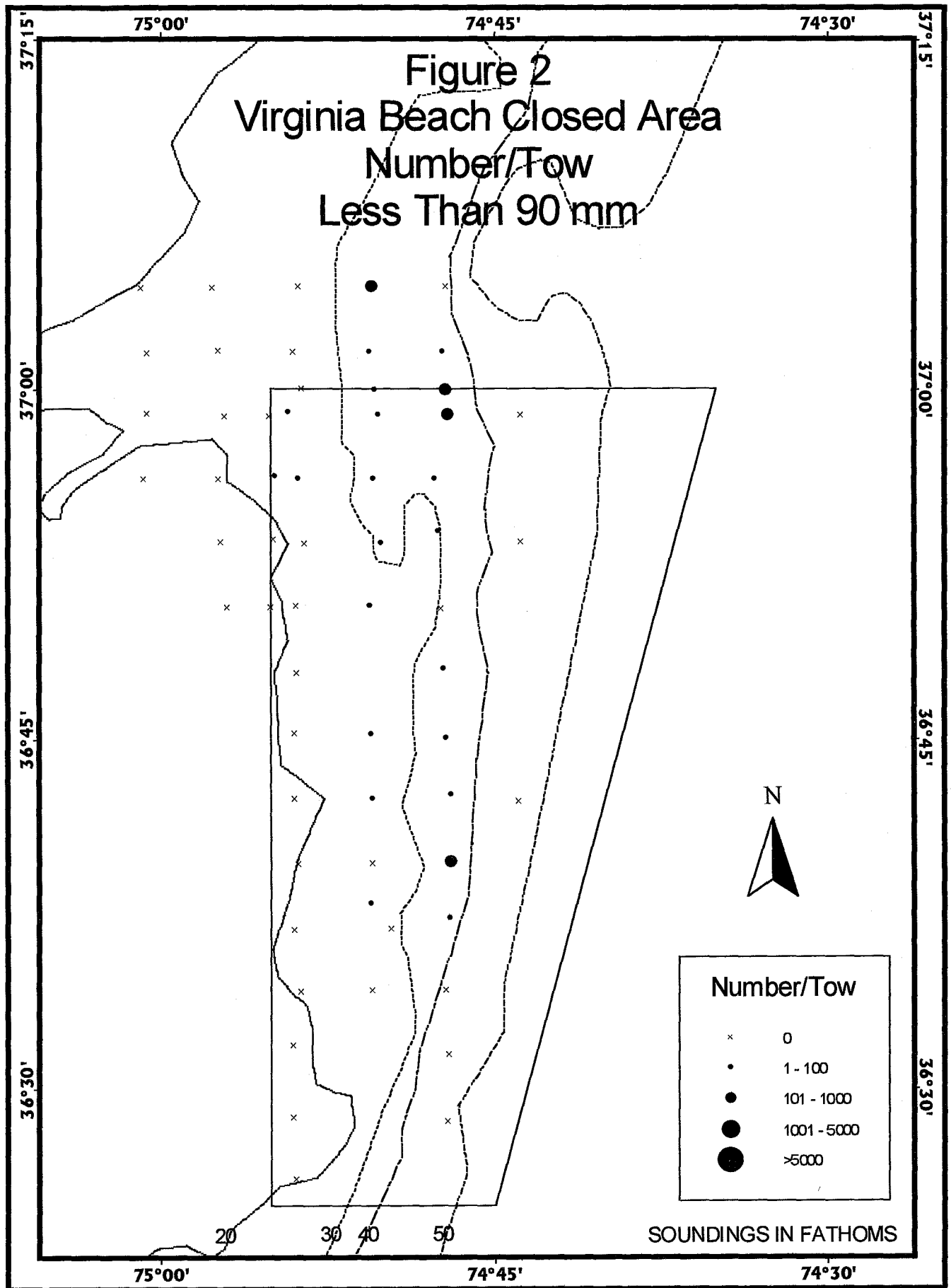
20

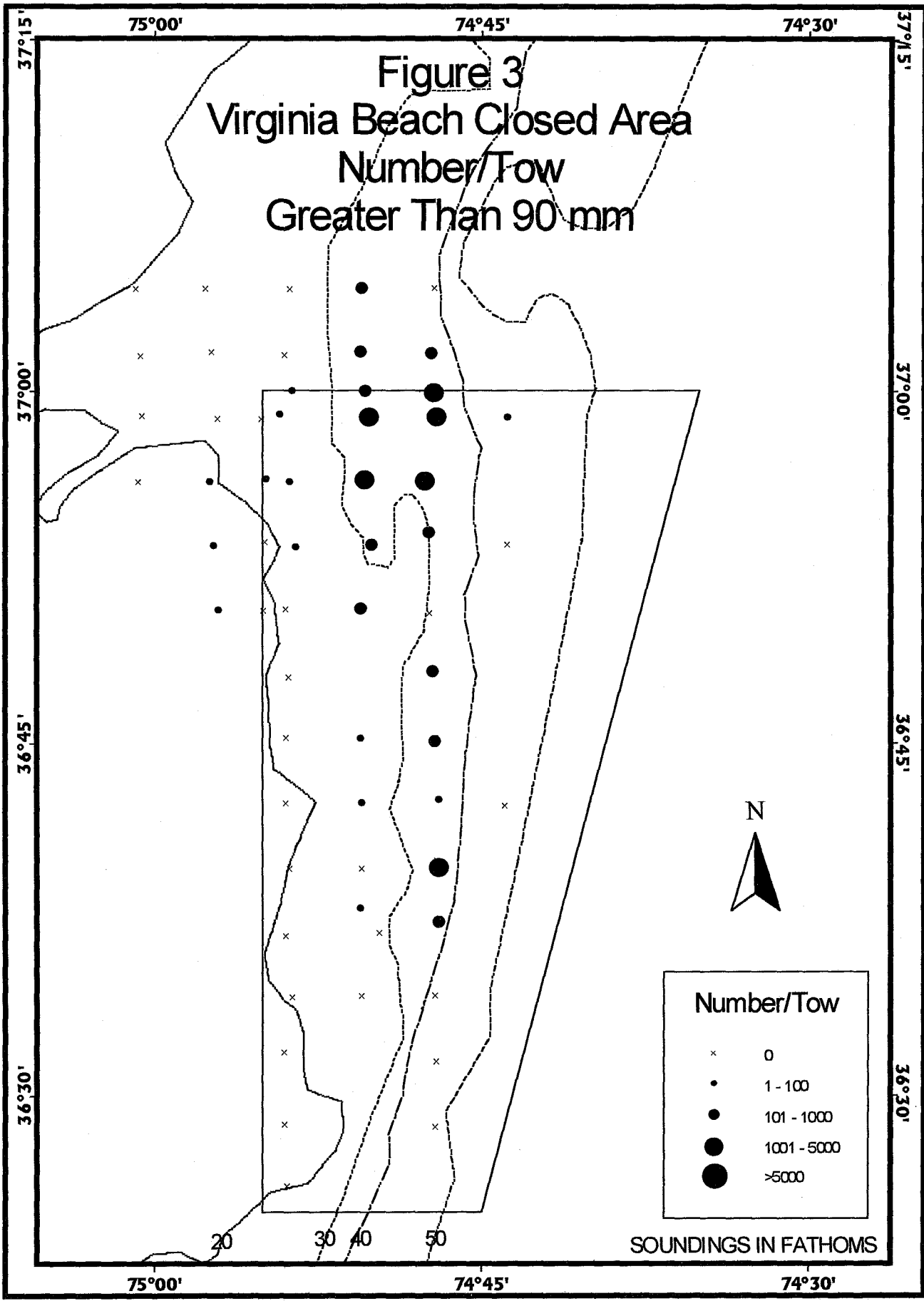
30

40

50







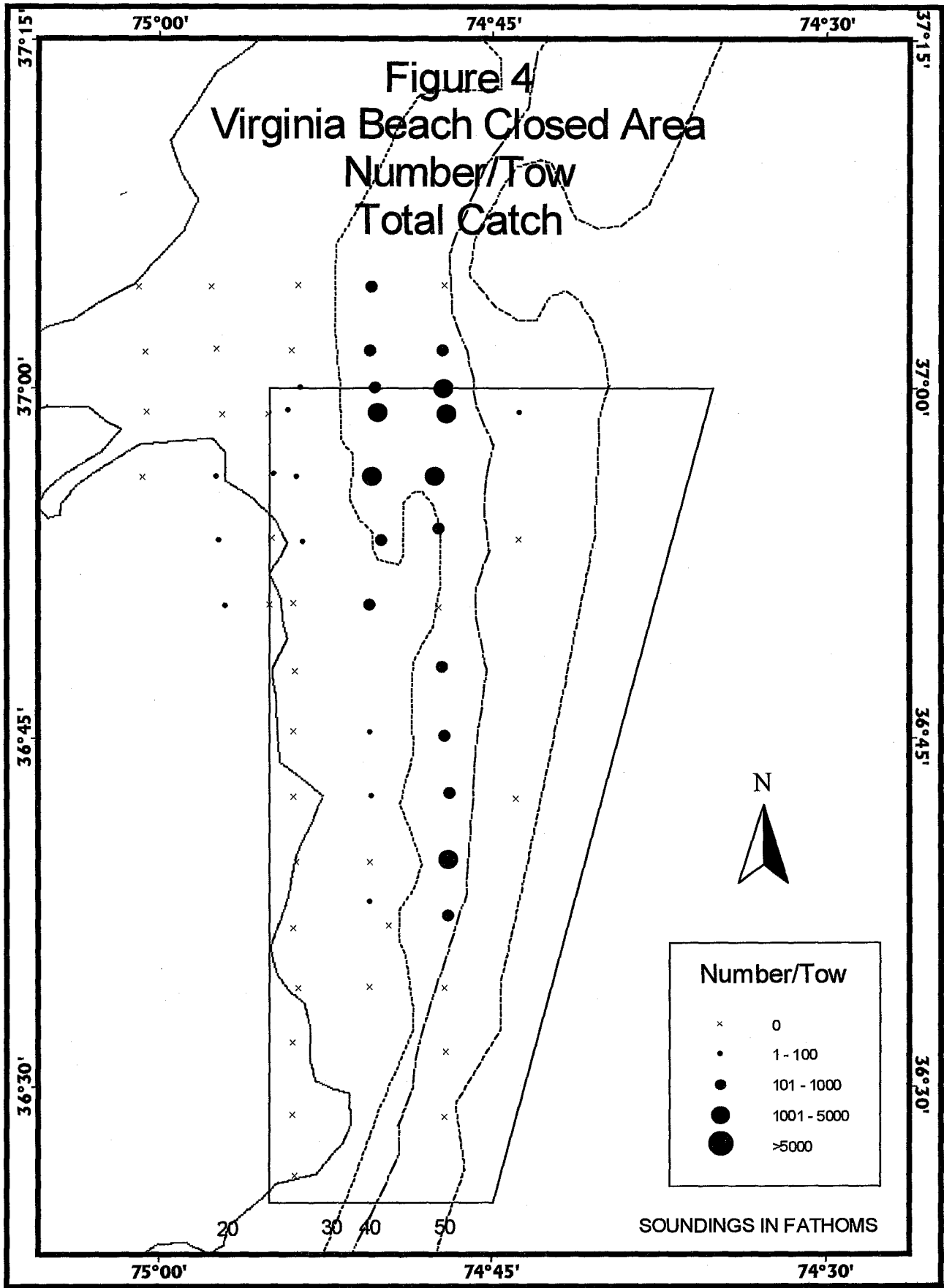


FIGURE 5
AVERAGE NUMBER OF SCALLOPS CAUGHT PER TOW
VIRGINIA BEACH CLOSED AREA
SEPTEMBER 2000

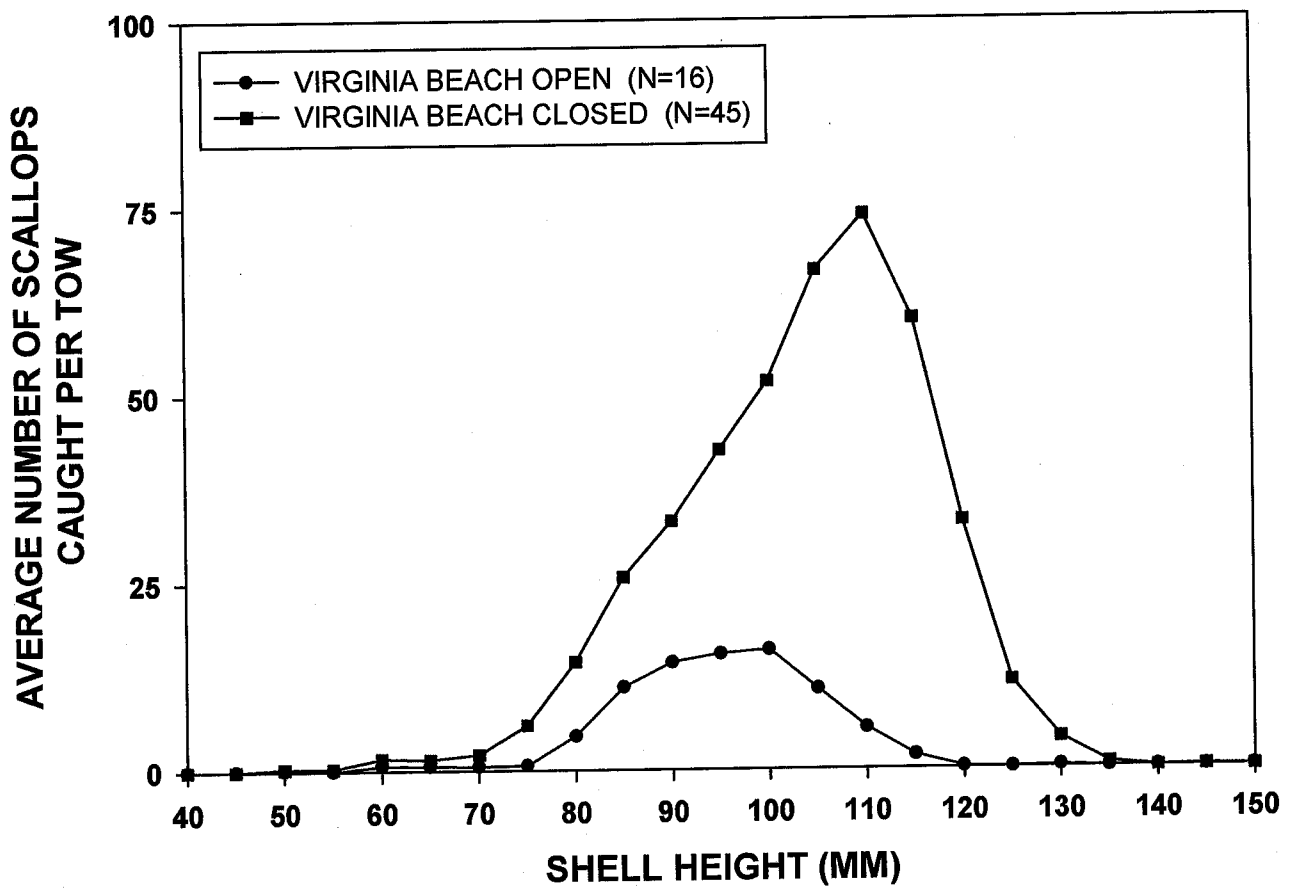


FIGURE 6
AVERAGE NUMBER OF SCALLOPS CAUGHT PER TOW BY DEPTH
VIRGINIA BEACH CLOSED AREA
SEPTEMBER 2000

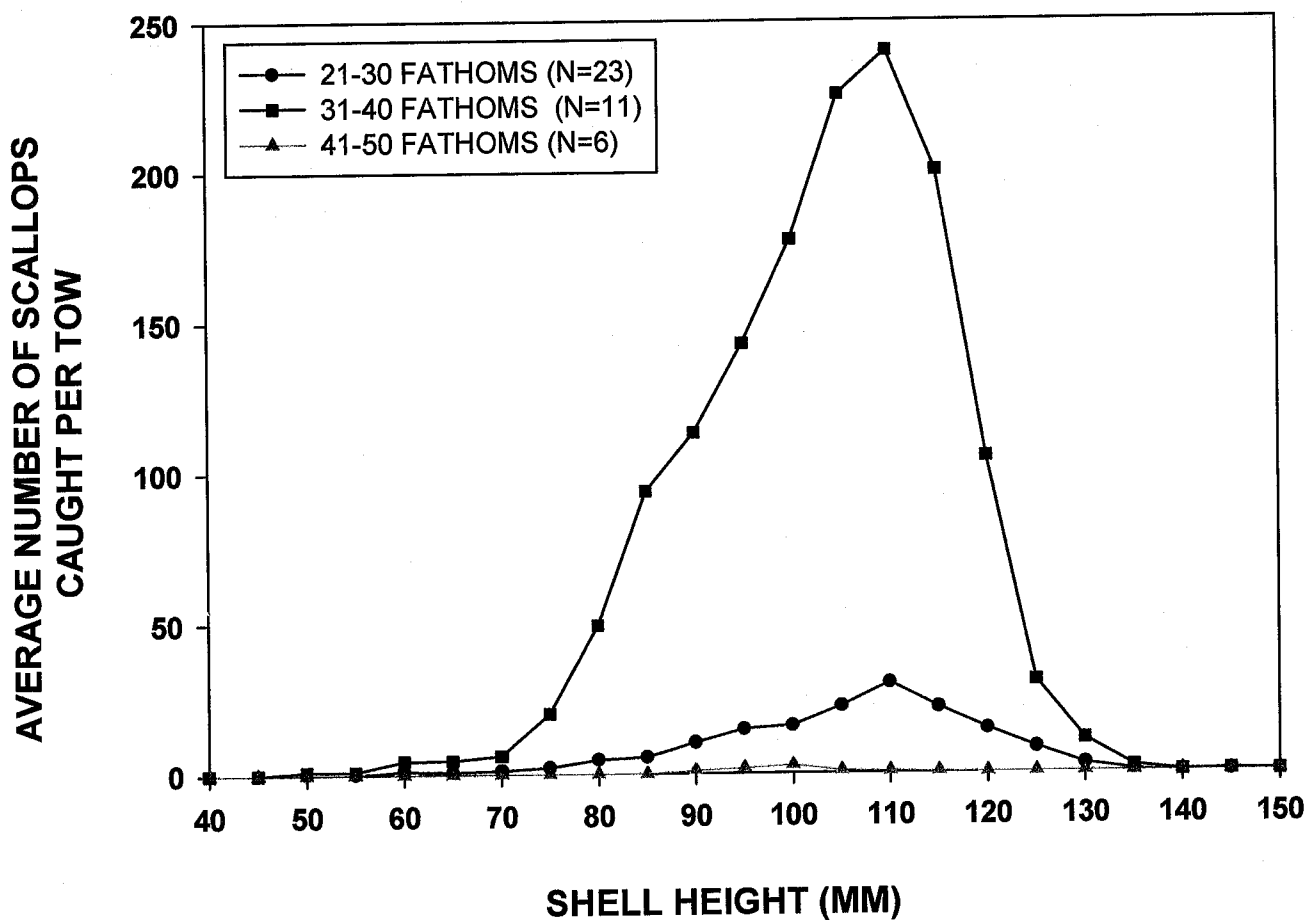


Figure 7
Goosefish Length Frequency
Virginia Beach September 2000

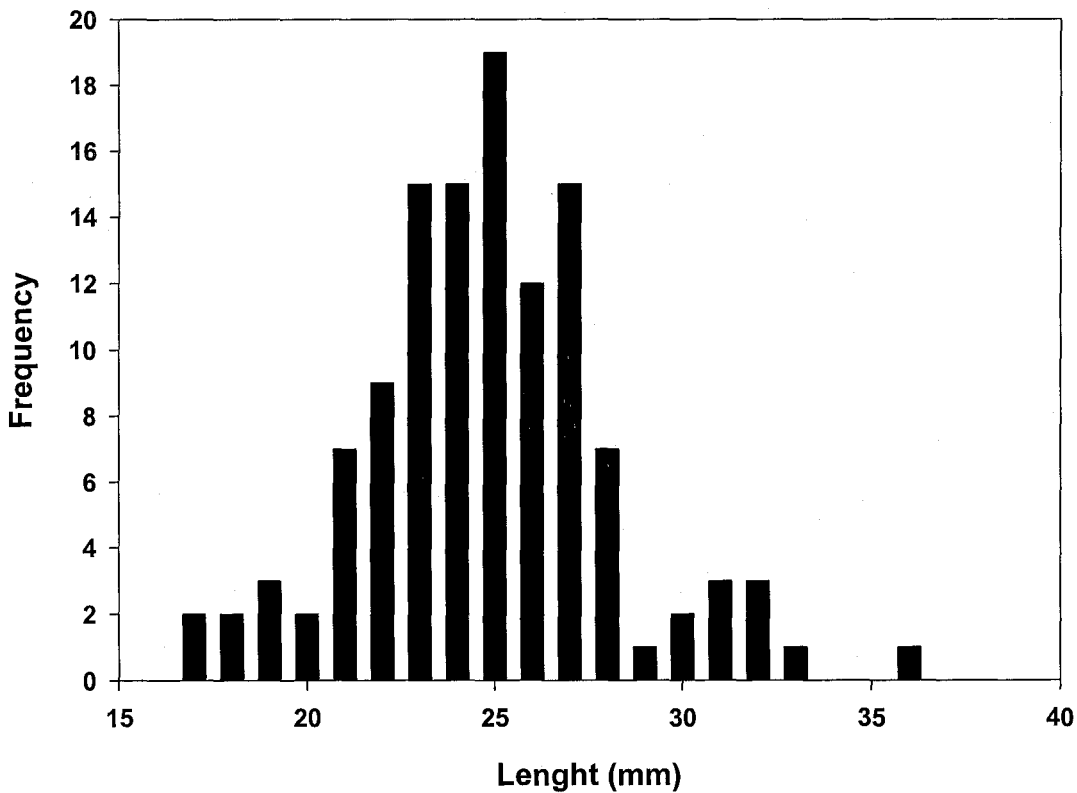


Figure 8
Windowpane Length Frequency
Virginia Beach September 2000

