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History of the United States Bottom Trawl Surveys, NAFO Subareas 4-7

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Abstract

The Northeast Fisheries Science Center conducts several surveys within the region from Nova Scotia, Canada to just south of Cape Hatteras, North Carolina. The main surveys are the spring and autumn bottom trawls surveys, but there were also winter surveys as well as an Atlantic States Marine Fisheries Commission shrimp survey. The winter flatfish survey was conducted during 1992-2007. Changes have occurred to a number of these surveys over the time series, although attempts were made to minimize these changes. A complete history and description of each survey is given as well as any changes to the surveys regarding gear, vessel, and protocols.

Introduction

The NEFSC surveys have a history that extends prior to 1963 (Flescher 1977, Overholtz and Monteiro 1976, Survey Working Group 1988, Smith 2002) but the seasonal bottom trawl surveys did not become standardized until 1963 (Grosslein 1969, Flescher 1976). These surveys provide one of the major components of stock assessment in the northeast United States.

Autumn bottom trawl

Coverage

The NEFSC autumn bottom trawl survey was initiated in 1963 (Grosslein 1969, Azarovitz 1981, Azarovitz 1994). At that time, coverage extended from Nova Scotia, Canada to around Hudson Canyon, NY, at depths between 27 (15 fm) and 366 meters (200 fm) (Figure 1, Table 1, Strata 01010-01400). In 1967, strata in the Mid-Atlantic were added (Strata 01610-01760). In 1972, sampling of depths < 27 m (15 fm, strata 03010-03460) was begun for areas south of Massachusetts (Figure 2, Table 1). In 1979, depths less than 27 m (15 fm) north of Massachusetts were added. Additionally, in 1972, sampling south of Cape Hatteras was conducted all the way south to Florida, restricted to Cape Fear in 1973, not sampled from 1974-1978, sampled to the NC/SC border until 1983 and then reduced to about 14 stations just south of Cape Hatteras (Figure 3, Table 1). These stations south of Cape Hatteras were not always sampled (Table 1). In 1987, a stratum in the Bay of Fundy (01350) was split in half into 01351 and 01352, but only the southern portion of the stratum (01351) was ever sampled. When the sampling platform changed in 2009, stations less than 18 m in depth were excluded which eliminated much of the inshore strata and one offshore stratum on the western Scotian Shelf (01330).

Timing

The survey in 1963 was conducted starting in the northern strata in November and working south to Southern New England in December. When the Mid-Atlantic strata were added, the cruise track changed to start just north of Hudson Canyon, working south offshore to Cape Hatteras, and then working north. This cruise track was fairly stable for the rest of the time series with weather and ship breakdowns affecting the final cruise track. The timing of the start of the survey also changed over time, moving earlier to September (Figure 4). From 2009-2013, the survey timing extended further into November and occasionally into December.

Design

Sampling was based on a stratified random design using area and depth zones (Figure 1, Figure 2, and Figure 3).

Between 300 and 600 stations were sampled in each survey (Table 2), with the number of stations allocated to each stratum in proportion to stratum area. Standard tows from 1963-2008 were 30 minutes in duration. Initially, the towing speed was set to approximately 3.5 knots, but in 1996, it was discovered that the speedlog was not working and to go 3.5 knots by the speedlog required a speed of 3.8 knots on the Doppler. Therefore, speed was then changed to 3.8 knots for the rest of the time series. Tow direction was towards the next station unless wind and sea state dictated a different course. For tows in depths ≥ 183 m, a more specific depth is randomly chosen among four depth intervals and then trawling was done along that depth contour. In 2009, the tows were reduced to 20 minutes in duration and speed was reduced to 3.0 knots. The direction of the tows changed to follow the depth contour.

Gear and Vessel

Several gear changes occurred during the time series of the NEFSC autumn survey (Byrne and Forrester 1991). In 1985, "Portuguese polyvalent" (450 kg) doors replaced the "BMV" oval (545 kg) doors used since 1963. Four vessels conducted the survey, the RV *Albatross IV* (AL), RV *Delaware II* (DE), RV *Atlantic Twin* (AT), and the FRV *Henry B. Bigelow* (HB), with the AL being the primary survey vessel from 1963-2008 (Table 2). Conversion factors between the AL and DE were calculated for most species (Byrne and Forrester, 1991). The standard sampling gear used in all autumn surveys was the "#36 Yankee" trawl. The AT surveyed the inshore areas from autumn 1972 to spring 1975 with a $\frac{3}{4}$ scale "#36 Yankee" trawl rigged with a chain sweep and ground cables, but no conversion factors were calculated for this vessel/gear. In 2009, the AL was replaced with the HB and the #36 Yankee net was replaced with a 4-seam, 3-bridle box net with rock-hopper sweep. Conversion factors for this gear/vessel change were derived for most species (Miller et. al 2010).

Spring bottom trawl

Coverage

The spring survey began in 1968 and coverage extended from Nova Scotia to Cape Hatteras at depths > 27 m. In 1973, sampling of depths < 27 m (15 fm, strata 03010-03460) was begun for areas south of Massachusetts (Figure 2, Table 3). In 1979, depths less than 27 m (15 fm) north of Massachusetts were added. Additionally, in 1974, sampling south of Cape Hatteras in inshore waters was conducted, all the way south to Florida, not sampled again until 1979, but only to the NC/SC border, and in 1986 reduced to about 14 stations just south of Cape Hatteras (Figure 3, Table 3). In 1987, a stratum in the Bay of Fundy (01350) was split in half into 01351 and 01352, but only the southern portion of the stratum (01351) has ever been sampled. When the sampling platform changed in 2009, stations less than 18 m in depth were excluded which eliminated much of the inshore strata and one offshore stratum on the western Scotian Shelf (01330).

Timing

The spring survey generally occurs during March and April (Figure 5). There have been some years in which the survey extended until May. In 1973, when the inshore strata were sampled, the AT sampled until May. Ship breakdowns and weather are usually the reasons for late starts or late ends.

Design

Sampling was based on a stratified random design using area and depth zones (Figure 1, Figure 2, and Figure 3).

Between 300 and 600 stations were sampled in each survey (Table 2), with the number of stations allocated to each stratum in proportion to stratum area. Standard tows from 1968-2008 were 30 minutes in duration. Initially, the towing speed was set to approximately 3.5 knots, but in 1996, it was discovered that the speedlog was not working and to go 3.5 knots by the speedlog required a speed of 3.8 knots on the Doppler. Therefore, speed was then changed to 3.8 knots for the rest of the time series. Tow direction was towards the next station unless wind and sea state dictated a different course. For tows in depths ≥ 183 m, a more specific depth is randomly chosen among four depth intervals and then trawling was done along that depth contour. In 2009, the tows were reduced to 20 minutes in duration and speed was reduced to 3.0 knots. The direction of the tows changed to follow the depth contour.

Gear and Vessel

Several gear changes have occurred since the start of the NEFSC spring survey (Byrne and Forrester 1991). In 1985, "Portuguese polyvalent" (450 kg) doors replaced the "BMV" oval (545 kg) doors used since 1968. Four vessels have conducted the survey, the RV *Albatross IV* (AL), RV *Delaware II* (DE), RV *Atlantic Twin* (AT), and the FSV *Henry B. Bigelow* (HB). Conversion factors between the AL and DE have been calculated for most species (Byrne and Forrester, 1991a). The standard sampling gear used in most spring surveys was the "#36 Yankee" trawl, except from 1973 through 1981 when a "#41 Yankee" trawl was used. While the "#41 Yankee" trawl was in use, larger "BMV" oval doors (682 kg) were used. Conversion factors between these two gears were calculated for most species (Byrne and Forrester, 1991b). The AT surveyed the inshore areas from autumn 1972 to spring 1975 with a $\frac{3}{4}$ scale "#36 Yankee" trawl rigged with a chain sweep and ground cables, but no conversion factors were calculated for this vessel. In 2009, the AL was replaced with the HB and the #36 Yankee net was replaced with a 4-seam, 3-bridle box net with rock-hopper sweep. Conversion factors for this gear/vessel change were derived for most species (Miller et. al 2010).

Winter Survey

Coverage

There were sporadic bottom trawl surveys conducted in the winter by the NEFSC after 1963 (Flescher 1976). However, most of these covered a only portion of the area or had a specific purpose (herring) rather than a multi-purpose groundfish survey so these are not listed or discussed in this paper. Surveys were also not conducted every year. In 1992 a new winter survey was initiated to address the perceived low catchability of flatfish in the spring and autumn surveys (Terceiro 2003). This survey ended in 2007 when it was evident that the new gear and vessel would likely capture flatfish well. This survey not only captured flatfish well, it also captured elamobranchs very well. The catchability of species like spiny dogfish and skates was extremely high (NEFSC 2003, NEFSC 2000).

Coverage of this survey generally encompassed the offshore areas from Georges Bank to the Mid-Atlantic (Table 4). Weather and ship breakdowns, as well as the need to use the vessel for the spring survey beginning in March were the primary reasons for poor coverage on Georges Bank. In some years, Georges Bank was not sampled at all (2003, 2007) or only the very southwestern portion (strata 01130-01140) was covered (1993, 2000, 2002, 2005, and 2006). In 1992 and 1995, strata of Georges Bank were covered that were not in most years. These were not covered again due to very bad bottom and significant tear-ups of the net. The inshore strata were initially covered from 1992-1997, but since there are few flatfish of interest in these strata, they were dropped in later years. Deep strata (183-366 m) were not covered consistently until 1998 and some not well covered even then.

Timing

The survey was conducted in February, ahead of the spring survey. The dates were fairly consistent given the restrictions of needing the vessel to start the spring survey at the beginning of March (Figure 6).

Design

Sampling was based on a stratified random design using area and depth zones (Figure 1, Figure 2, and Figure 3).

Between 100 and 150 stations were sampled in each survey (Table 4), with the number of stations allocated to each stratum in proportion to stratum area. Standard tows were 30 minutes in duration. Initially, the towing speed was set to approximately 3.5 knots, but in 1996, it was discovered that the speedlog was not working and to go 3.5 knots by the speedlog required a speed of 3.8 knots on the Doppler. Therefore, speed was then changed to 3.8 knots for the rest of the time series. Tow direction was towards the next station unless wind and sea state dictated a different course. For tows in depths ≥ 183 m, a more specific depth is randomly chosen among four depth intervals and then trawling was done along that depth contour.

Gear and Vessel

The gear used was a standardized "#36 Yankee" flat net rigged with a rubber disc covered chain sweep, 13 floats and 55 meter ground cables (Stauffer, 2005). NEFSC standardized polyvalent trawl doors were used. Two vessels conducted the survey. In 1992, both the AL and DE conducted the survey. In 1994 and 2003, the DE conducted the entire survey while in all other years the AL was the sole vessel conducting the survey. No conversion factors for this gear/vessel combination were calculated.

Shrimp Survey

Coverage

Although shrimp surveys were conducted from 1967-1983 and were used in historical shrimp assessments (Clark and Anthony 1977), the Atlantic States Marine Fisheries Commission (ASMFC) shrimp survey did not start until 1983 (Table 5). In 1983, the coverage of the survey was very limited (Table 5) and was not used in the last shrimp stock assessment (NEFSC 2014). The core coverage for the shrimp assessment includes 04010, 04030, and 04050-04080 and these strata were sampled every year. The shrimp survey data were also used in other stock assessments such as skates and white hake (NEFSC 2007, NEFSC 2013).

Timing

This survey is conducted in the summer anytime from July through August and usually takes about two weeks to complete (Figure 7).

Design

Sampling was based on a stratified random design using area and depth zones (Figure 8). Between 20 and 60 stations were sampled in each survey (Table 5), with the number of stations allocated to each stratum in proportion to stratum area. Standard tows were 15 minutes in duration, at a towing speed of approximately 2.0 knots into the current, resulting in average tow distances of 0.5 nm.

Gear and Vessel

The only vessel to conduct this survey has been the RV Gloria Michelle and only one type of net/doors was used. The net is a 4-seam, 2-bridle trawl with a rock-hopper sweep.

Albatross IV Changes

Over the time period during which the AL was operational (1963-2008), many repairs and changes were made to the vessel as simply parts of routine maintenance, but there were also major changes to the vessel and its equipment that could impact catchability. In December 1976, a major renovation was made to the AL which included expanding the boat deck (second deck) and the following year the main engines were replaced. In 1989, the AL was decommissioned

and was not active until 1992. In 1993-1995, two main changes were made. The first was replacing the trawl winch hydraulic system. It is unknown if the winches were able to haul back at the same speed as the previous system. The second change was to the Raytheon speed log. In 1995 it was deteriorating and was underestimating speed. In 1996, tests were done to determine how fast the vessel had to run according to the Doppler to make the speed log read 3.5. That speed was 3.8 and the decision was made to change the official tow speed to 3.8 knots, making the assumption that tow speed was always higher. In 2000, the 0.875" trawl wires were replaced with 0.91" wires. It is thought at this time that the wires were marked with inaccurate 50-meter markings (NEFSC 2002). That is, the marks were not exactly at true 50-meter intervals over the first 1,000 meters of the warps. The difference in marks from the true values ranged between less than 1 inch to 38.4 inches. Also, some of the marks were not evenly matched between the port and starboard cables. This was discovered in September 2002.

Delaware II Changes

Over the time period during which the DE was operational (1968-2008), many repairs and changes were made to the vessel as simply parts of routine maintenance, but there was at least one major change to the vessel and its equipment that likely impacts catchability. In 1997, the DE underwent a major refit which included changing the winches from slower direct drive to faster free spooling winches and changing the entire deck configuration (Milliken and Fogarty 2009).

References

- Azarovitz, T. R. 1981. A brief historical review of the Woods Hole Laboratory trawl survey time series. In Doubleday, W.G. and D. Rivard, (eds.), Bottom trawl surveys. Can. Spec. Publ. Fish. Aquat. Sci. 58:62-67.
- Azarovitz, T.R. 1994. Northeast Fisheries Science Center Bottom Trawl Surveys. In: Atlantic States Marine Fisheries Commission. 1994. Proceedings of the Workshop on the Collection and Use of Trawl Survey Data for Fisheries Management. Special Report No. 35.
- Byrne, C. J. and Forrester, J. 1991a. Relative fishing power of two types of trawl doors. NEFSC SAW/12/Pl. Northeast Fisheries Science Center, Woods Hole, MA.
- Byrne, C. J. and Forrester, J. 1991b. Relative fishing power of NOAA R/Vs Albatross IV and Delaware II. NEFSC SAW/12/Pl. Northeast Fisheries Science Center, Woods Hole, MA.
- Clark, S. and VC Anthony. 1977. An Assessment of the Northern Shrimp Resource of the Gulf of Maine. WH Lab Ref. Doc. 77-06.
- Flescher, D. 1977. Research Vessel Cruises, 1963-1975, National Marine Fisheries Service, Woods Hole, Massachusetts. WH Lab. Ref. Doc. 76-14
- Flescher, D. 1977. Research Vessel Cruises, 1948-1962, National Marine Fisheries Service, Woods Hole, Massachusetts. WH Lab Ref. Doc. 77-09.
- Grosslein, M.D. 1969. Groundfish Survey Methods. WH Lab. Ref. Doc. 69-2
- Miller TJ, Das C, Politis PJ, Miller AS, Lucey SM, Legault CM, Brown RW, Rago PJ. 2010. Estimation of Albatross IV to Henry B. Bigelow calibration factors. Northeast Fish Sci Cent Ref Doc. 10-05; 233 p.
- Milliken HO, Fogarty MJ. 2009. Determination of Conversion Factors for Vessel Comparison Studies. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-07; 18 p.
- NEFSC. 2000. Report of the 30th Northeast Regional Stock Assessment Workshop (30th SAW): Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. US Dep Commer, Northeast Fish Sci Cent Ref Doc 00-10; 486 p.

NEFSC. 2002. Report of the Workshop on Trawl Warp Effects on Fishing Gear Performance, Marine Biological Laboratory, Woods Hole, Massachusetts, October 2-3, 2002. Northeast Fish. Sci. Cent. Ref. Doc. 02-15; 80 p.

NEFSC. 2003. Report of the 37th Northeast Regional Stock Assessment Workshop (37th SAW): Stock Assessment Review Committee (SARC) consensus summary of assessments. Northeast Fish. Sci. Cent. Ref. Doc. 03-16; 597 p.

NEFSC. 2007. 44th Northeast Regional Stock Assessment Workshop (44th SAW): 44th SAW assessment report. US Dep Commer, Northeast Fish Sci Cent Ref Doc 07-10; 661 p.

NEFSC. 2013. 56th Northeast Regional Stock Assessment Workshop (56th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 13-10; 868 p.

NEFSC. 2014. 58th Northeast Regional Stock Assessment Workshop (58th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-04; 784 p.

Overholtz, W.J. and E.S Monteiro. 1976. A Synopsis of Groundfish Survey Cruises (Albatross III, Delaware I) 1948-1962. WH Lab Ref Doc. 76-13.

Overholtz, W.J. and R.R. Lewis. 1978. Effects of Environmental Factors on Trawl Survey Operations and Catches as Evidenced by a Doppler Speed Log. WH Lab Ref Doc No. 78-08.

Sissenwine, M.P. and E.W. Bowman. 1978. An analysis of some factors affecting the catchability of fish by bottom trawls. ICNAF Res Bull. 13:81-87.

Smith, T, D. 2002. The Woods Hole bottom-trawl resource survey: development of fisheries-independent multispecies monitoring. - ICES Marine Science Symposia, 215: 474-482.

Stauffer, Gary (compiler). 2004. NOAA Protocols for Groundfish Bottom Trawl Surveys of the Nation's Fishery Resources. U.S. Dep. Comm, NOAA Tech. Memo. NMFS-F/SPO-65, 205 p.

Survey Working Group, Northeast Fisheries Center. An Evaluation of the Bottom Trawl Survey Program of the Northeast Fisheries Center. NMFS-F/NEC-52

Terceiro, M. 2003. Stock assessment of summer flounder for 2003. Northeast Fish. Sci. Cent. Ref. Doc. 03-09; 179 p.

Table 1. Number of stations successfully completed by stratum for the autumn survey.

Stratum	Offshore Stations North of Cape Hatteras															
	01010	01020	01030	01040	01050	01060	01070	01080	01090	01100	01110	01120	01130	01140	01150	01160
Depth Range (m)	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366	55-110	110-183	183-366	55-110
1963	5	5	5	1	4	7	5	2	4	5	2		5	6	1	7
1964	4	4	4	3	5	5	4	3	5	5	4	3	5	5	3	7
1965	4	4	4	4	3	5	4	4	5	5	4	4	7	5	3	7
1966	4	4	4	4	5	5	5	3	5	5	4	4	6	4	4	7
1967	9	8	3	3	4	9	5	3	6	6	5	4	8	4	3	8
1968	9	7	3	3	5	7	4	3	7	9	3	2	8	4	4	8
1969	7	7	3	3	5	8	3	3	5	8	3	3	9	4	3	10
1970	9	7	3	3	5	8	4	3	7	9	3	2	7	4	4	8
1971	8	7	3	3	8	11	3	3	8	11	3	3	9	4	3	11
1972	7	7	3	3	7	11	3	3	5	9	3	3	9	4	3	12
1973	8	7	3	3	5	8	3	3	5	8	3	3	9	4	3	11
1974	6	7	3	3	6	8	3	3	5	8	3	3	9	4	4	12
1975	8	7	3	2	6	9	3	2	5	9	3	3	9	4	3	11
1976	8	8	3	3	6	8	3	3	5	8	3	3	9	4	3	10
1977	7	7	3	3	5	7	3	2	5	9	3	3	10	4	3	17
1978	8	7	3	1	10	17	3	3	10	15	3	3	18	4	3	30
1979	7	7	3	3	10	16	3	3	15	16	3	3	18	4	2	20
1980	7	7	3	3	4	8	3	2	5	8	3	3	9	5	2	20
1981	7	7	3	3	5	8	3	2	5	8	2	3	9	4	2	10
1982	7	7	3	3	5	8	3	3	5	8	3	3	8	3	3	10
1983	7	7	3	2	5	8	3	2	5	8	3	3	9	5	2	9
1984	7	7	3	3	5	6	3	3	5	8	3	3	9	4	3	10
1985	7	6	3	2	4	8	3	2	4	8	3	3	9	4	2	10
1986	7	7	3	3	5	8	3	3	4	8	3	2	9	3	3	10
1987	7	7	2	1	5	8	2	1	5	8	2	1	10	3	1	10
1988	7	7	2	1	5	7	2	1	5	8	2	1	9	3	1	10
1989	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1990	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	16
1991	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1992	7	7	1	2	5	8	2	1	5	8	2	1	9	3	1	10
1993	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1994	7	7	2	1	6	8	2	1	5	8	2	1	9	3	1	13
1995	7	7	2	1	3	8	2	1	5	8	2	1	9	3	1	11
1996	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1997	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1998	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1999	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2000	7	7	2	1	5	8	2	2	5	8	2	1	9	3	1	10
2001	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2002	7	7	2	1	4	8	2	1	5	8	2	1	9	3	1	10
2003	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	11
2004	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2005	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2006	7	7	2	1	7	11	2	1	7	11	2	1	9	3	1	20
2007	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	20
2008	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	20
2009	8	9	5	3	4	10	4	3	6	10	4	2	10	4	2	14
2010	8	9	5	3	4	9	4	3	5	9	4	3	10	4	2	13
2011	7	8	4	3	4	8	4	3	6	9	4	3	9	4	3	12
2012	7	8	4	3	5	8	4	3	5	9	4	3	10	4	3	13
2013	7	8	4	3	5	8	4	3	5	9	4	3	10	3	3	14

Table 1. continued.

Offshore Stations North of Cape Hatteras																
Year	01170	01180	01190	01200	01210	01220	01230	01240	01250	01260	01270	01280	01290	01300	01310	01320
Depth Range (m)	110-183	183-366	27-55	27-55	55-110	110-183	55-110	110-183	27-55	55-110	110-183	183-366	183-366	183-366	110-183	55-110
1963	5	1	4	4	6	2	3	11	2	7	2	6	15	1	9	6
1964	6	2	6	5	4	5	6	6	4	4	4	5	8	2	5	5
1965	4	4	5	5	5	6	6	6	3	4	4	6	7	3	4	5
1966	5	3	6	5	5	6	5	6	3	4	4	6	4	2	6	5
1967	3	3	9	6	4	4	6	5	4	5	4	7	8	3	5	4
1968	4	3	9	6	4	4	5	6	4	4	4	7	8	3	6	5
1969	4	3	9	6	4	4	5	6	4	5	4	7	8	3	7	5
1970	4	3	9	6	4	4	6	8	2	5	4	7	8	3	8	5
1971	4	3	9	6	4	4	5	7	4	5	4	7	8	3	6	5
1972	4	3	9	6	4	4	5	6	4	5	4	7	9	3	7	5
1973	4	3	9	6	4	4	5	7	4	5	4	7	8	3	7	6
1974	4	3	9	6	4	4	5	6	4	5	4	8	8	3	7	5
1975	4	3	9	6	4	4	5	7	4	15	4	7	8	3	6	5
1976	4	3	9	5	3	3	5	5	4	9	4	6	8	3	7	4
1977	7	1	11	7	8	4	10	12	7	9	9	11	8	3	6	5
1978	8	5	18	14	8	10	11	23	4	15	7	11	16	3	6	4
1979	4	3	18	12	8	8	14	23	11	19	8	15	23	3	5	4
1980	8	3	9	6	7	8	5	6	4	5	4	7	7	3	6	5
1981	4	3	9	9	4	5	4	6	2	6	4	7	8	3	7	5
1982	3	1	9	6	4	4	5	8	4	5	4	7	8	3	7	5
1983	3	3	9	6	4	4	5	6	4	5	4	7	9	3	5	5
1984	4	3	9	6	4	4	4	6	3	4	4	7	8	3	6	6
1985	4	3	8	5	4	4	5	6	4	5	4	7	5	3	5	5
1986	4	3	9	5	4	4	5	6	3	5	4	7	8	3	7	5
1987	3	2	9	6	4	4	5	6	3	5	4	7	8	3		
1988	3	1	9	6	4	4	5	6	4	5	4	7	8	3		
1989	3	1	9	6	4	4	5	6	3	5	4	7	8	3		
1990	3	1	9	6	4	4	5	6	4	5	4	7	8	3		
1991	3	1	9	5	4	4	5	6	3	5	4	7	8	3		
1992	3	1	9	5	4	4	5	6	3	4	5	7	8	3		
1993	3	1	9	6	3	5	5	6	2	4	4	7	8	3		
1994	3	1	9	6	4	4	5	6	4	5	3	7	8	2		
1995	3	1	9	6	4	4	5	6	3	5	4	7	9	3		
1996	3	1	9	6	4	4	5	6	3	5	4	7	7	3		
1997	3	1	9	6	4	4	6	6	4	5	4	7	8	3		
1998	3	1	9	6	4	4	5	6	4	6	5	7	8	3		
1999	3	1	9	6	4	4	5	6	4	9	8	7	7	3		
2000	3	1	9	6	4	3	5	6	3	5	4	7	8	3		
2001	3	1	9	6	4	4	5	6	4	5	4	7	8	3		
2002	3	1	9	6	4	4	5	6	4	3	4	7	8	3		
2003	2	1	9	6	4	4	5	6	4	5	4	7	8	3		
2004	4	2	9	6	4	4	5	6	4	5	4	7	8	3		
2005	3	2	9	6	4	4	5	5	4	5	4	6	8	3		
2006	3	2	9	6	4	4	4	6	4	8	7	7	8	3		
2007	3	2	9	6	4	4	5	6	4	5	4	7	8	3		
2008	3	2	9	6	4	4	5	6	4	5	4	7	8	3		
2009	4	2	9	6	4	4	5	8	2	4	4	5	8	3		
2010	4	4	8	5	4	4	5	7	3	4	4	6	7	3		
2011	4	4	7	5	4	4	5	7	3	4	5	7	7	3		
2012	4	3	8	6	4	4	6	8	3	6	5	7	9	3		
2013	4	4	9	6	4	4	6	7	4	6	5	7	9	3		

Table 1. continued.

Year	Offshore Stations North of Cape Hatteras															
	01330	01340	01350	01351	01360	01370	01380	01390	01400	01610	01620	01630	01640	01650	01660	01670
Depth Range (m)	55-110	110-183	110-182	110-183	183-366	110-183	110-183	55-110	55-110	27-55	55-110	110-183	183-366	27-55	55-110	110-183
1963	4	5			9	5	7	2	3							
1964	4	6	4		8	5	6	3	2							
1965	4	5	4		5	5	7	3	4							
1966	4	5	4		6	5	5	4	3							
1967	3	5	4		7	4	4	3	4	5	2	2	2	7	3	3
1968	4	5	2		9	5	4	3	3	5	2	2	2	10	3	2
1969	3	5	3		8	5	5	3	3	3	2	2	2	7	4	2
1970	4	5	3		9	5	6	3	3	5	2	2	2	9	3	2
1971	4	6	3		10	6	5	5	2	3	2	2	2	7	4	3
1972	4	6	4		9	5	5	5	3	3	2	2	2	7	3	2
1973	3	5	3		10	5	6	3	4	4	2	2	2	7	3	2
1974	4	6	5		10	6	5	5	3	4	2	2	2	8	3	2
1975	4	7	4		9	6	5	5	3	5	2	2	2	8	3	2
1976	4	6	1		8	6	5	4	2	4	2	2	2	10	3	2
1977	3	4	3		9	7	8	4	3	5	2	2	2	10	3	1
1978	4	6	5		9	15	19	14	11	4	2	2	2	7	3	2
1979	4	6			8	14	18	11	10	3	2	1	1	7	3	2
1980	3	6	4		8	5	5	4	3	3	2	1		7	3	1
1981	4	6	4		8	5	5	5	2	3	2	2	2	7	3	2
1982	3	6	4		9	5	5	5	3	3	2	2	2	7	2	2
1983	4	5			4	5	5	3	3	3	2	2	2	7	3	2
1984	4	6	4		8	5	5	4	3	3	3		3	7	3	2
1985	2	6	4		8	5	5	5	3	3	2	2	2	7	3	2
1986	4	6	4		8	5	5	5	3	3	2	2	2	7	3	2
1987	4	6		2	8	5	5	3	3	3	2	2	1	7	3	2
1988	3	6		2	7	5	5	5	3	3	2	2	1	7	3	2
1989	4	6		2	8	5	5	3	3	3	2	2	1	7	3	2
1990	4	6		2	8	5	5	5	2	3	2	2	1	7	3	2
1991	4	6		2	8	5	5	5	3	3	2	2	1	7	3	2
1992	3	6		2	8	5	5	4	2	3	3	1	1	7	3	2
1993	4	6		2	8	5	4	5	3	3	2	2		7	3	2
1994	5	6		2	8	5	5	4	3	3	2	2	1	7	3	1
1995	4	6		2	8	6	7	5	3	3	2	2	1	7	3	2
1996	1	6		2	8	5	5	5	3	3	2	2	1	7	3	2
1997	4	6		2	8	5	5	4	3	3	2	2	1	7	3	2
1998	3	6		2	11	5	8	8	6	3	2	2	1	7	3	2
1999	4	5		2	9	10	9	5	3	3	2	2	1	7	3	2
2000	4	6		2	7	5	5	5	3	3	2	2	1	7	3	2
2001	4	5		2	8	5	5	6	3	3	3	1		7	3	2
2002	3	6		2	8	5	4	4	3	3	2	2	1	7	3	2
2003	4	6		2	8	5	5	4	2	3	2	2		7	3	2
2004	3	6		2	8	5	4	3	1	3	2	2	1	7	3	2
2005	3	6		2	8	5	5	4	3	3	2	2		7	3	2
2006	3	6		2	8	5	5	4	3	3	2	2	1	7	3	2
2007	4	6		2	8	5	5	5	3	3	3	1	1	7	3	2
2008	4	6		2	8	5	5	5	3	3	2	2	1	7	3	2
2009		5		3	11	6	7	2	3	6	3	2	2	9	3	2
2010		6		3	9	5	7	3	3	6	3	3	3	9	3	3
2011		4		2	3	5	6	3	3	5	3	3	2	7	3	3
2012		6		4	9	7	8	3	3	5	3	3	3	7	3	3
2013		5		4	9	7	8	3	3	5	3	3	3	7	3	3

Table 1. continued.

Year	Offshore Stations North of Cape Hatteras										Inshore Stations North of Cape Hatteras					
	01680	01690	01700	01710	01720	01730	01740	01750	01760	01990	03010	03020	03030	03040	03050	03060
Depth Range (m)	183-366	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366	>366	0-18	18-27	0-9	9-18	18-27	0-9
1963																
1964																
1965																
1966																
1967	2	8	3	3	3	7	5	3	2							
1968	2	9	5	2	2	7	5	2	2							
1969	2	6	4	2	2	5	4	3	2							
1970	2	8	4	2	2	7	5	1	2							
1971	2	7	4	2	3	5	4	2	2							
1972	2	6	4	2	2	5	4	2	2		2	2	2	2	2	2
1973	2	6	4	2	2	6	4	2	2		2	2	2	2	2	2
1974	2	5	4	2	1	5	4	2	2			2		2	2	
1975	2	7	4	2	2	5	5	2	2		2	2	2	2	2	1
1976	2	10	4	2	2	8	5	2	2		1	2	1	2	2	
1977	2	10	4	2	2	8	5	2	2		1	1	1	2	2	1
1978	2	6	4	2	1	5	4	2	2		1	2	1	2	2	
1979	1	6	4	2	2	5	4	2	2		1	2	1	2	2	1
1980	2	7	4	2	2	5	4	2	2			2	1	2	2	1
1981	2	6	4	2	2	5	4	2	1		1	2	1	2	2	
1982	2	6	4	2	1	5	5	1	2		1	2		3	2	
1983	2	6	4	2	2	5	4	2	2		1	2		3	2	
1984	1	5	4	2	2	5	4	2	2		1	2		2	1	
1985	2	7	4	2	2	5	4	2	2		1	2	1	2	2	1
1986	2	6	4	2	2	5	3	2	2		1	2	1	2	2	1
1987		6	4	2	1	5	4	2	1		1	2		2	2	
1988	1	6	4	2	1	5	3	2	1		2	2		1	3	
1989	1	6	2	2	1	5	4	2	1			2		3	2	
1990	1	6	4	3		5	4	1	1			2	1	2	2	
1991	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1992		6	4	2		5	4	2	1			2	1	2	2	1
1993	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1994	1	6	4	2	1	6	4	2	1			2		3	2	1
1995	1	5	4	2	1	5	4	2	1			2	1	2	2	1
1996	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1997	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1998	1	6	4	2	1	5	4	2	1			1	1	2	2	1
1999	1	6	4	1	1	5	4	2	1			2	1	2	2	1
2000	1	6	4	2	1	5	4	2	1			2	1	2	2	1
2001	1	6	4	2	1	5	4	2	1	2		2	1	2	2	1
2002	1	6	4	2	1	5	4	2	1			2	1	2	2	
2003	1	6	3	3	1	5	4	2	1			2		3	2	1
2004	1	6	4	1	1	5	5	2	1	1		2	1	2	2	1
2005	1	6	4	2		5	4	2	1			2	1	2	2	1
2006		6	4	2	1	5	4	2	1			2	1	2	2	1
2007	1	6	4	2	1	5	5	1	1			2	1	2	2	1
2008	1	6	4	2	1	5	4	2	1			1	1	2	2	1
2009	2	8	5	3	2	7	6	2	2			2			2	
2010	3	8	5	3	4	7	6	3	3			3			3	
2011	3	7	5	3	3	6	5	3	3			3			3	
2012	3	7	5	3	3	6	5	3	3			3			3	
2013	3	7	5	3	3	6	5	3	3			3			3	

Table 1. continued.

	Inshore Stations North of Cape Hatteras															
Year	03070	03080	03090	03100	03110	03120	03130	03140	03150	03160	03170	03180	03190	03200	03210	03220
Depth Range (m)	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18
1963																
1964																
1965																
1966																
1967																
1968																
1969																
1970																
1971																
1972	2	2	2	2	3	5	4	5	3	3	4	2	4	3	3	3
1973	2	2	2	4	8	6	6	19	2	2	3	3	3	4	2	2
1974	1	4		2	3		2	4		2	3		2	4		3
1975	3	2	2	2	3		3	3		3	3	2	3	2	2	2
1976	3	2	1	2	2	1	2	2		3	2	1	2	2	1	2
1977	2	2	1	2	2	1	2	2	1	2	2	1	2	2		2
1978	3	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1979	2	2	1	1	3	1	2	2	1	2	2	1	2	2	1	2
1980	2	2	1	2	2	1	2	1		2	2	1	2	2	1	2
1981	3	2	1	2	2	1	2	2		3	2	1	2	2	1	2
1982	2	3	1	2	2		3	2	1	2	2		3	2	1	2
1983	3	2		3	2	1	2	2	1	2	2		2	3	1	2
1984	3	2	1	2	2	1	2	2		3	2	1	2	2	1	2
1985	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1986	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1987	2	2		2	2		2	2		2	2		2	2		2
1988	1	2		2	2		1	2		2	2		2	2		2
1989	3	2		3	2	1	2	2		3	2		3	2	1	2
1990	3	2	1	2	2		1	4	1	2	2		3	2	1	2
1991	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1992	2	2	1	2	2	1	2	2		3	2	1	2	2	1	2
1993	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1994	2	2	1	2	2	1	2	2	1	2	2	1	2	2		2
1995	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1996	2	2	1	2	2	1	2	2		2	2	1	2	2		2
1997	2	2	1	2	2	1	2	2		2	2	1	2	2		2
1998	2	2	1	2	2	1	2	2	1	2	2	1	2	2		2
1999	2	2	1	2	2	1	2	2	1	2	2		2	2		2
2000	2	2	1	2	2	1	2	2	1	2	2	1	2	2		2
2001	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2002	3	2	1	2	2	1	2	2		2	3	1	2	2	1	2
2003	2	2	1	2	2	1	2	2	1	2	2	2	2	2		2
2004	2	2	1	2	2	1	2	2		3	2	1	2	2	1	2
2005	2	2	1	2	2		2	2	1	2	2	1	2	2	1	2
2006	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2007	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2008	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2009		3			3			2			3			4		
2010		3			3			3			3			4		
2011		3			3			3			3			4		
2012		3			3			3			3			4		
2013		3			3			3			3			4		

Table 1. continued.

Year	Inshore Stations North of Cape Hatteras															
	03230	03240	03250	03260	03270	03280	03290	03300	03310	03320	03330	03340	03350	03360	03370	03380
Depth Range (m)	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27
1963																
1964																
1965																
1966																
1967																
1968																
1969																
1970																
1971																
1972	3	3	4	3	1	3	3	4	3	2	2	3	2	3	4	3
1973	2	2	3	2	2	3	2	2	4	2	1	3	2	2	4	3
1974	2		3	2		3	3		3	2		3	2	2	4	4
1975	2	2	2	2	2	2	2	2	3	2	2	2	2	1	3	2
1976	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1977	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1978	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1979	2	1	2	2	1	2	2		2	2	1	2	2	1	2	2
1980	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1981	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1982	2	1	2	2		3	2		3	2		3	2	1	2	2
1983	2	1	2	2		3	2		3	2	1	2	2	1	2	2
1984	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1985	2	1	2	1	1	2	2	1	2	2	1	2	2	1	2	2
1986	2	1	2	2		2	2	1	2	2	1	2	2		2	2
1987	2		2	2		2	2		2	2		2	2		2	2
1988	2		2	2		2	2		2	2		2	2		2	2
1989	2	2	2	2	1	2	2	1	2	2	1	2	2	1	3	2
1990	2	2	3	2		2	2	1	2	2	1	2	2	2	2	2
1991	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1992	2	1	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1993	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1994	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1995	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1996	2	2	2	2	1	2	2	1	2	2		2	2	1	2	2
1997	2	2	2	2		2	2	1	2	2	1	2	2	2	2	2
1998	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1999	2	3	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2000	2	2	2	2		3	2	1	2	2		3	2	2	2	2
2001	2	2	2	2		3	2	1	2	2	1	2	2	2	2	2
2002	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2003	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2004	2	2	2	2		2	2		2	2		2	2	2	2	2
2005	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2006	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2007	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2008	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2009	3			3			3			2			2			3
2010	3			3			3			3			3			3
2011	3			3			3			3			3			3
2012	3			3			3			3			3			3
2013	3			3			3			3			3			3

Table 1. continued.

	Inshore Stations North of Cape Hatteras															
Year	03390	03400	03410	03420	03430	03440	03450	03460	03520	03550	03560	03580	03590	03600	03610	03630
Depth Range (m)	0-9	9-18	18-27	0-9	9-18	18-27	18-27	18-27	9-18	18-27	18-27	9-18	18-27	27-41	41-55	9-18
1963																
1964																
1965																
1966																
1967																
1968																
1969																
1970																
1971																
1972	2	3	4	2	3	4	1									
1973	2	3	4	2	2	4										
1974		2	4			4										
1975	2	2	2	1	4	3	2									
1976	1	2	2	1	2	2										
1977	1	2	2	1	2	2	2	2								
1978	1	2	2	1	2	2	2	2								
1979	1	2	2	1	2	2	1	2		4	1	1	1	2	2	
1980	1	2	2	1	2	2	2	2		4	1	1	1	2	2	
1981	1	2	2	1	2	2	1	2		3					2	
1982		3	2	1	2	2	2	2		2		1	1	2	2	
1983	1	2	2	1	2	2	1	2		4		1	1	2	2	
1984	1	2	2	1	2	2	2	2		4	1	1	1	2	2	
1985	1	2	2	1	2	2	1	2	4	3		1	1	2	1	
1986	2	2	2	1	2	2	2	2		2	1		1	2	2	
1987		2	2		2	2	2	2		4	1	1	1	2	2	2
1988		2	2		2	2	1	2		4	1	1	1	2	2	
1989	1	2	2		3	2	2	2		4			1	2	2	
1990	1	2	2	1	2	2	2	2		5	1		1	1	2	
1991	1	2	2	1	2	2	2	2		5	1	1	1	2	2	
1992	1	1	2	1	2	2	2	2		5	1	1	1	2	2	1
1993	1	2	2	1	2	2	2	2		5	1	1	1	2	2	
1994	1	2	2	1	2	2	2	2		5		1	1	2	3	1
1995	1	2	2	1	2	2	2	2		5	1			2	1	
1996	1	2	2	1	2	2	2	3		4	1	1	1	2	2	1
1997	1	2	2	1	2	2	2	2		5	1	1	1	2	2	
1998	1	2	2	1	2	2	3	2		5	1	1	1	2	2	1
1999	1	2	2	1	2	2	2	2		5	1	1	1	2	2	1
2000	1	2	2	1	2	2	2	2		5		1	1	2	2	
2001	1	2	2	1	2	2	2	2		3		1	1	2	2	
2002	1	2	2	1	2	2	1	2		5	1	1	1	1	2	
2003	1	2	2		2	2	2	2		4				2	2	
2004		2	2		2	2	2	2		4	1	1	1	2	2	
2005	1	2	2	1	2	2	2	1		5	1	1	1	2	2	1
2006	1	2	2	1	2	2	2	2		4	1	1	1	2	4	
2007	1	2	2	1	2	2	2	2		5	1	1	1	1	2	1
2008	1	2	2	1	2	2	2	2		5	1	1	1	2	2	
2009			5			4	3	4			2		2	3	3	
2010			5			4	3	4			2					
2011			5			4	3	4			2		3	3	3	
2012			5			4	3	4			2		3	3	3	
2013			5			4	3	4			3		3	3	3	

Table 1. continued.

	Inshore Stations North of Cape Hatteras					Offshore Stations on Eastern Scotian Shelf						Inshore Stations South of Cape Hatteras		
Year	03640	03650	03660	03890	03900	01410	01420	05430	05440	05480	01490	07500	07510	07520
Depth Range (m)	18-27	27-41	41-55	18-55	55-110	110-182	55-110	92-183	183-366	92-183	183-366	0-9	9-18	18-27
1963														
1964														
1965						5	1							
1966						4	2							
1967						6	4							
1968						6	3				1			
1969						6	4							
1970						15	6	2	5	2	3			
1971						17	6	4	3		3			
1972						18	6	2	4	1	3	2	2	2
1973						15	6				3		4	1
1974						18	6	4	3		3			
1975						16	6	3	2	2	3			
1976														
1977						18	6	2	2	1	3			
1978												2	2	2
1979		1	2									2	2	2
1980		1	3									2	2	2
1981	1	1	3									2	2	2
1982	1	1												
1983		1	2									1	3	2
1984			1											
1985	1	2	2	1	2									
1986		1	2										2	2
1987	1	1	2										2	2
1988		1	2										2	2
1989												2	2	2
1990		1	2										2	2
1991	1	1	1										2	2
1992	1	1	2										2	2
1993		1	2										2	2
1994	1	1	1										2	2
1995			1									4	2	2
1996	1	1	2										2	1
1997		1	2										2	2
1998	1	1	2											
1999	1	1	2										2	2
2000	1	2	2										2	2
2001	1	2	2										2	2
2002	1		3										2	2
2003	2		1										2	2
2004			2										1	
2005	1		3											1
2006	1	1	4										2	2
2007	1	1	2										2	2
2008	1	1	2										2	2
2009	2	2	3											2
2010	2	2	2											3
2011	2	2	3											
2012	3	3	3											3
2013	3	3	3											3

Table 1. continued.

[illegible]

Table 1. continued.

[illegible]

Table 1. continued.

	Inshore Stations South of Cape Hatteras							Offshore Stations South of Cape Hatteras								
Year	07850	07860	07870	07880	07890	07900	07910	08500	8510	8520	08530	08540	08550	08560	08570	08580
Depth Range (m)	18-27	1-11	11-18	18-29	1-11	11-18	18-29	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366	27-55
1963																
1964																
1965																
1966																
1967																
1968																
1969																
1970																
1971																
1972	3	2	2	5	2	2	2	5	2	2	2	9	2	2	3	7
1973																
1974																
1975																
1976																
1977																
1978																
1979								3	2	2	2	6	2	2	1	5
1980								4	2			6	2			5
1981								4	2	2	2	6	2	2	4	5
1982								4	2	2	2	6	2	2	4	5
1983								4	2	1	2	6	1	3	4	5
1984																
1985																
1986								4	1	2	2					
1987								4	2	2	1					
1988								4	2	1						
1989								4	2	2						
1990								4	2	2						
1991								4	2	2						
1992								5	2	1	1					
1993								4	2	2						
1994								3	2	2						
1995									2	2						
1996								3	1	2						
1997								4	2	2						
1998																
1999								2								
2000								5	1	3						
2001								4	2	2						
2002								4	1	1						
2003								4	2	2						
2004								1	1							
2005								4	2	2						
2006								4	2	2						
2007								4	2	2						
2008								4	2	1	1					
2009								4	2	2						
2010								4	3	3						
2011								3	3	3	2					
2012								3	3	3	3					
2013								3	3	3	3					

Table 1. continued.

[illegible]

Table 1. continued.

	Offshore Stations South of Cape Hatteras		
Year	08910	08920	08930
Depth Range (m)	55-110	110- 183	183- 366
1963			
1964			
1965			
1966			
1967			
1968			
1969			
1970			
1971			
1972	2	2	2
1973			
1974			
1975			
1976			
1977			
1978			
1979			
1980			
1981			
1982			
1983			
1984			
1985			
1986			
1987			
1988			
1989			
1990			
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			

Table 2. Total number of stations attempted (total) and successfully completed (comp) by survey from 1963-2013. The vessel which participated in the surveys is also given if there was more than one for a survey.

	Autumn			Spring			Winter			Shrimp	
Year	Total	Comp.	Vessel	Total	Comp.	Vessel	Total	Comp.	Vessel	Total	Comp.
1963	194	183	AL								
1964	185	184	AL								
1965	193	192	AL								
1966	194	190	AL								
1967	276	272	AL								
1968	279	275	AL	265	263	AL					
1969	282	265	AL	268	267	AL					
1970	312	301	AL /DE	342	288	AL					
1971	334	310	AL	419	311	AL					
1972	646	646	AL /AT	366	306	AL					
1973	451	451	AL /AT	495	495	AL/AT					
1974	379	379	AL /DE	416	416	AL/AT/DE					
1975	406	406	AL /DE	305	270	AL/AT					
1976	340	340	AL	384	384	AL/DE					
1977	419	419	DE	355	355	AL/DE					
1978	556	556	DE	397	397	AL					
1979	600	588	AL/DE	477	477	AL/DE					
1980	420	420	DE	468	468	AL/DE					
1981	421	416	AL/DE	395	395	DE					
1982	449	411	AL	443	420	DE					
1983	476	407	AL	428	401	AL				22	20
1984	433	337	AL	407	391	AL				39	39
1985	368	339	AL/DE	391	371	AL				55	55
1986	364	352	AL/DE	368	361	AL				54	54
1987	335	316	AL	349	334	AL/DE				57	57
1988	326	307	AL/DE	321	314	AL				44	43
1989	342	321	DE	299	291	DE				49	49
1990	345	332	DE	322	311	DE				48	47
1991	354	328	DE	333	324	DE				56	55
1992	353	324	AL	326	307	AL	138	129	AL/DE	57	55
1993	339	325	DE	329	319	AL	125	122	AL	53	53
1994	341	331	AL	345	326	DE	164	92	DE	49	45
1995	360	326	AL	335	325	AL	155	144	AL	53	35
1996	365	320	AL	350	335	AL	140	129	AL	58	34
1997	369	327	AL	345	327	AL	130	121	AL	55	40
1998	374	332	AL	374	360	AL	138	134	AL	61	39
1999	346	339	AL	329	322	AL	148	138	AL	61	45
2000	337	329	AL	333	324	AL	130	124	AL	55	38
2001	339	330	AL	325	317	AL	175	167	AL	57	40
2002	342	321	AL	331	317	AL	159	153	AL	54	40
2003	336	322	AL	332	321	DE	107	99	DE	62	44
2004	319	311	AL	332	326	AL	140	135	AL	54	44
2005	332	322	AL	334	329	AL	108	99	AL	68	59
2006	367	357	AL	344	339	AL	132	127	AL	54	32
2007	349	342	AL	363	355	AL	139	132	AL	79	50
2008	441	341	AL	344	335	AL				69	44
2009	381	345	HB	436	379	HB				88	59
2010	374	348	HB	403	377	HB				88	57
2011	374	337	HB	756	683	HB				83	57
2012	396	365	HB	396	353	HB				89	60
2013	392	367	HB	407	382	HB				83	54

Table 3. Number of stations successfully completed by stratum for the spring survey.

Stratum	Offshore Stations North of Cape Hatteras															
	01010	01020	01030	01040	01050	01060	01070	01080	01090	01100	01110	01120	01130	01140	01150	01160
Depth Range (m)	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366	27-55	55-110	110-182	182-366	55-110	110-182	182-366	55-110
1968	6	5	4	4	4	6	4	3	4	6	4	3	7	4	4	9
1969	7	7	3	3	5	8	3	3	5	8	3	3	9	4	3	14
1970	7	9	6	3	5	9	4	3	5	10	4	3	9	4	3	10
1971	8	7	3	3	5	11	3	3	6	9	3	3	9	4	3	12
1972	7	8	5	4	5	9	4	3	5	8	4	4	8	4	3	13
1973	16	14	6	3	10	16	3	3	5	8	3	3	9	4	3	10
1974	7	6	3	3	4	8	3	3	4	8	3	3	8	3	3	10
1975	7	8	3	3	6	9	3	2	5	7	3	3	9	4	3	10
1976	8	7	3	2	5	9	3	3	5	10	3	3	9	4	3	10
1977	7	7	3	3	5	8	3	2	6	9	3	3	9	5	3	9
1978	8	8	3	1	7	10	3	4	5	8	3	2	9	5	3	12
1979	7	7	2	3	10	8	3	3	15	8	3	3	18	4	3	20
1980	7	7	3	2	17	28	3	3	18	20	3	2	8	4	3	10
1981	8	7	3	1	3	8	3	2	5	8	3	3	9	4	2	10
1982	7	7	3	3	5	8	3	3	5	8	3	3	9	4	3	10
1983	7	7	3	3	4	8	3	3	5	8	3	3	9	4	3	10
1984	7	7	3	3	4	9	3	3	5	7	3	2	9	4	3	11
1985	7	5	3	2	5	8	3	3	6	7	4	2	9	5	2	10
1986	7	7	3	3	5	8	3	3	5	8	3	3	8	4	3	10
1987	7	7	4	3	5	8	3	1	5	8	3	3	9	4	3	10
1988	7	7	2	1	6	8	2	1	5	8	2	1	9	3	1	10
1989	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1990	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1991	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1992	7	7	2	1	4	8	2	1	5	8	2		9	3	1	10
1993	7	7	2	1	4	8	2	1	5	8	2		9	3	1	10
1994	7	7	2	1	5	8	2	1	5	8	3		9	3	1	10
1995	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	9
1996	8	7	2	1	4	8	2	1	5	8	2	1	9	3	1	10
1997	7	7	2	1	5	8	2	1	5	8	2		9	3	1	10
1998	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
1999	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2000	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2001	7	7	2	1	5	8	1	1	5	8	3	1	9	3	1	10
2002	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2003	6	6	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2004	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2005	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2006	7	7	2	1	5	8	2	1	5	8	2	1	9	3	1	10
2007	7	7	4	3	5	8	2	1	5	8	2	1	9	3	1	20
2008	7	7	1	1	5	8	2	1	5	8	2	1	9	3	1	20
2009	8	9	5	3	5	10	4	3	7	12	4	2	9	4	3	14
2010	8	9	5	3	5	9	4	3	5	9	4	3	10	4	3	14
2011	7	8	4	3	5	8	4	3	5	9	4	3	10	4	3	13
2012	7	8	4	3	5	7	4	3	5	7	4	3	9	4	3	12
2013	7	8	4	3	5	8	4	3	5	9	4	3	15	4	3	13

Table 3. Cont.

Stratum	Offshore Stations North of Cape Hatteras															
	01170	01180	01190	01200	01210	01220	01230	01240	01250	01260	01270	01280	01290	01300	01310	01320
Depth Range (m)	110-182	182-366	27-55	27-55	55-110	110-182	55-110	110-182	27-55	55-110	110-182	182-366	182-366	182-366	110-182	55-110
1968	4	3	8	6	4	4	6	6	4	5	4	7	8	3	6	5
1969	4	3	8	6	4	4	5	6	4	5	4	7	8	3	7	5
1970	4	3	8	5	4	4	5	6	4	5	4	7	9	3	11	5
1971	4	2	9	6	5	3	5	7	4	5	5	7	8	3	10	7
1972	4	3	9	6	4	5	5	7	4	5	4	7	9	3	7	5
1973	4	3	9	6	4	4	5	6	4	5	2	7	7	4	7	4
1974	3	3	9	6	5	2	5	6	3	5	4	6	5	2	6	4
1975	4	3	9	6	4	4	5	6	4	15	3	7	6	3	7	5
1976	3	2	9	6	4	4	6	6	3	14	3	8	8	3	7	5
1977	4	2	9	6	4	4	6	7	3	14	4	9	8	3	7	5
1978	4	3	9	6	4	5	6	9	4	5	5	8	10	4	8	5
1979	4	3	18	12	8	8	10	12	7	9	8	7	8	3	6	5
1980	5	2	9	6	4	4	5	6	2	5	4	7	8	3	7	5
1981	4		9	6	4	4	4	6	4	6	4	7	8	2	5	4
1982	4	3	9	6	4	4	5	6	5	7	4	7	8	3	6	3
1983	4	2	9	6	4	4	5	6	3	5	4	7	8	3	7	3
1984	4	3	9	6	4	4	5	6	4	4	4	7	8	3	5	5
1985	4	2	9	6	3	5	4	5	2	5	4	6	7	3	6	3
1986	4	3	9	6	4	4	5	6	4	5	4	7	8	3	4	5
1987	4	3	9	6	4	4	5	6	4	3	3	7	8	3	6	5
1988	3	1	9	6	4	4	4	6	4	5	4	7	9	3		
1989	3	1	9	6	4	4	4	6	2	5	4	7	8	2		
1990	3		9	6	4	4	5	6	4	5	4	7	8	3		
1991	3	1	9	6	4	4	5	6	3	4	4	7	8	3		
1992	3	1	9	6	4	4	4	6	4	5	4	7	8	3		
1993	3	1	9	6	4	4	6	6	3	5	4	7	8	2		
1994	3	1	9	6	4	4	4	6	3	5	5	6	8	3		
1995	3	1	9	6	4	4	4	6	3	5	4	7	8	3		
1996	3	1	9	6	4	4	4	4	2	5	4	7	8	3		
1997	3	2	9	6	4	4	5	6	3	5	4	7	8	3		
1998	3	1	9	6	4	4	5	9	4	8	6	11	9	3		
1999	3	1	9	6	4	4	5	6	4	5	4	7	8	3		
2000	3	1	9	6	4	4	5	6	4	5	4	7	7	3		
2001	3	1	9	6	4	4	5	6	4	5	4	7	8	3		
2002	3	1	9	6	3	4	5	6	4	5	4	7	8	3		
2003	3	1	9	4	4	4	5	6	3	5	4	7	8	3		
2004	3	1	9	6	4	4	5	6	4	5	4	7	8	3		
2005	3	1	9	6	4	4	5	6	3	5	5	7	8	3		
2006	3	2	9	6	4	4	5	6	4	7	5	9	8	3		
2007	3	2	9	6	4	4	5	6	3	5	4	7	8	3		
2008	3	1	9	6	4	4	3	6	4	5	4	7	8	3		
2009	3	3	9	6	4	4	9	8	4	8	7	7	9	3		
2010	3	3	9	5	4	3	6	8	3	6	5	7	10	3		
2011	4	4	9	5	4	4	6	8	2	5	4	6	7	3		
2012	4	4	9	5	4	3	6	8	2	10	10	7	9	3		
2013	5	4	9	6	4	4	8	8	4	9	5	7	9	3		

Table 3. Cont.

Stratum	Offshore Stations North of Cape Hatteras															
	01330	01340	01350	01351	01360	01370	01380	01390	01400	01610	01620	01630	01640	01650	01660	01670
Depth Range (m)	55-110	110-182	110-182	110-182	182-366	110-182	110-182	55-110	55-110	27-55	55-110	110-182	182-366	27-55	55-110	110-182
1968	4	5	3		8	5	6	2	2	3	2	2	2	8	4	2
1969	3	4	3		8	5	5	3	3	3	2	2	2	8	3	2
1970	5	6	4		8	5	5	3	3	3	2	2	2	6	4	1
1971	4	7	2		9	5	6	5	4	4	2	2	2	8	3	2
1972	3	6	4		9	5	6	5	2	4	2	2	2	8	3	1
1973	4	5	5		8	4	5	4	2	3	2	2	2	7	3	2
1974	4	5	4		8	5	5	5	2	1	1	1	1	3	3	1
1975		6			7	4	5		2					1	3	2
1976	4	4	2		9	5	7	4	3	5	2	2	2	9	3	2
1977	4	6	4		9	5	7	5	3	5	2	2	1	9	3	2
1978	5	8	5		10	5	10	5	4	4	2	2	2	7	4	1
1979	4	6	4		8	5	9	9	6	3	2	2	1	6	4	2
1980	4	6	2		8	5	5	3	2	3	2	2	2	7	3	2
1981	3	5	2		7	5	6	4	3	3	2	1	3	7	3	1
1982	4	5	4		8	5	5	3	3	3	2	2	2	7	3	2
1983	3	6	3		8	5	5	5	3	3	2	2	1	7	3	2
1984	3	6	1		7	5	5	4	3	3	2	2	2	7	3	2
1985	3	6	3		6	5	5	3	3	3	2	2	2	7	4	1
1986	3	6	3		8	5	5	5	2	3	2	2	2	7	4	1
1987	4	5		2	8	5	5	2	3	4	2	2	2	6	3	2
1988	3	6		2	8	5	5	5	3	3	2	2	1	7	3	2
1989		6		2	8	4	5	5	3	3	2	2	1	7	3	2
1990	4	6		2	8	5	5	5	2	3	2	2	1	7	3	2
1991	3	6		2	8	5	5	3	3	3	2	2	1	7	3	2
1992		3			8	5	5	4	3	3	2	2		7	3	2
1993	3	6		2	8	5	5	3	3	3	2	2		7	3	2
1994	3	6		2	8	5	5	5	3	3	2	2	1	7	3	2
1995	4	6		2	8	5	5	5	3	3	2	2	1	7	3	1
1996	2	4		2	8	5	5	4	3	4	3	3	2	8	4	3
1997	4	6		2	8	5	5	5	3	3	2	2	1	7	3	2
1998	4	6		2	11	8	7	7	5	3	2	2	1	7	3	2
1999		6			8	5	5	5	2	3	2	2	1	7	3	2
2000	3	6		2	8	5	5	5	3	3	2	2	1	7	3	2
2001	4	6		2	8	5	5	4	3	3	2	2	1	7	3	2
2002	3	6		2	8	5	5	5	5	3	2	1	2	7	3	2
2003	4	6		2	8	5	5	4	3	3	2	2	1	6	3	2
2004	3	6		3	8	5	4	3	3	3	3	1	1	7	3	2
2005	4	6		2	8	5	5	3	2	3	2	2	1	7	3	2
2006	4	5		2	8	5	6	4	4	3	2	2	1	7	3	2
2007	4	6		2	7	5	4	4	3	3	2	2	1	7	3	4
2008	4	6		2	8	5	5	3	3	3	2	2	1	7	3	2
2009		7		4	12	7	8	5	4	6	5		2	9	3	2
2010		7		4	10	7	8	5	3	6	3	3	2	9	3	3
2011		5		4	8	5	7	5	3	5	3	2	1	7	3	3
2012		7		3	8	6	8	5	6	5	3	3	3	6	3	3
2013		7		4	9	7	8	5	3	5	3	3	3	7	3	3

Table 3. Cont.

Year	Inshore Stations North of Cape Hatteras										Inshore Stations North of Cape Hatteras					
	01680	01690	01700	01710	01720	01730	01740	01750	01760	01990	03010	03020	03030	03040	03050	03060
	182-366	27-55	55-110	110-182	182-366	27-55	55-110	110-182	182-366	>366	0-18	18-27	0-9	9-18	18-27	0-9
1968	2	7	4	3	3	6	4	3	3							
1969	2	7	4	2	2	5	4	2	2							
1970	2	7	5	3	2	6	5	4	2							
1971	2	6	5	2	2	6	5	1	2							
1972	2	7	4	2	2	6	4	2	2							
1973	2	6	4	2	1	9	6	2	2		2	2	2	2	2	2
1974	1	5	4	2	2	5	4	2	2		2	2	2	2	2	
1975	2	4	4	2	2	6	4	2	2			1	1			1
1976	2	9	4	3	2	7	5	2	2		1	1	1	2	2	1
1977	2	10	4	2	2	8	5	2	2		1	2		2	3	
1978	2	7	4	2	2	6	4	2	2		1	1	1	2	2	1
1979	1	6	6	2	3	5	5	2	2			2	1	2	2	
1980	2	6	4	2	2	5	4	2	2		2	3	2	4	4	
1981	2	6	4	3	1	5	4	2	2		1	2	1	2	2	1
1982	2	6	4	2	2	5	4	2	2		1	2		3	2	
1983	2	6	4	2	2	5	4	2	2		1	2	2	2	1	1
1984	2	6	4	2	2	5	4	2	2		1	2	1	1	3	
1985	2	7	4	2	2	5	4	2	2		1	2		3	2	
1986	2	6	4	2	2	5	4	2	2		1	2		2	3	1
1987	2	6	4	2	2	5	5	2	2			2		2	2	
1988	1	6	4	3		5	4	2	1			2		2	2	
1989	1	6	2	2	1	5	4	2	1			2		2	2	
1990	1	6	2	2	1	5	4	2	1			2		2	2	
1991	2	6	4	2	1	5	4	2	1			2		3	2	1
1992	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1993	1	6	4	2	1	5	4	2	1			2	1	2	2	
1994	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1995	1	6	4	2	1	5	4	2	1			2	1	2	2	1
1996	1	7	5	3	2	6	4	2	1			2		2	2	1
1997	1	6	4	2		5	4	2	1			2	1	2	2	1
1998	1	6	4	2	1	5	4	3				2	1	2	2	1
1999	1	6	4	2	1	5	4	2	1			2	1	2	2	1
2000	1	6	4	2	1	5	4	2	1			2		2	2	1
2001	1	6	4	2	1	5	4	2	1			2	1	2	2	1
2002	1	6	4	2	1	5	4	2	1			2		2	2	1
2003	1	5	4	2	1	4	3	2	1			2	1	2	2	1
2004	1	6	4	2	1	5	4	2	1			2	1	2	2	
2005	1	6	4	2	1	5	4	2	1	1		2	1	2	2	1
2006	1	6	4	2	1	5	4	3				2	1	2	2	
2007	3	6	4	4	3	5	4	4	3			2	1	2	2	1
2008	1	6	4	2	1	5	4	2	1			2	1	2	2	1
2009	2	8	5	3	2	7	6	2	2			2			3	
2010	3	8	5	4	2	7	6	3	3			3			3	
2011	3	7	5	3	3	6	5	3	3			3			3	
2012	2	6	5	3	3	6	5	3	3			3			3	
2013	3	7	5	3	3	6	5	3	3			3			3	

Table 3. Cont.

Year	Inshore Stations North of Cape Hatteras															
	03070	03080	03090	03100	03110	03120	03130	03140	03150	03160	03170	03180	03190	03200	03210	03220
Depth Range (m)	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18
1968																
1969																
1970																
1971																
1972																
1973	2	2	3	3	3	5	9	23	3	3	4	3	4	6	3	2
1974	4	2	2	3	9	4	4	13	2	3	4	2	3	3		2
1975	1	3		3	4	1	1	3	1	1	6	2	3	4		
1976	2	2	1	2	2	1	2	2	1	2	2	1	2	3	1	2
1977	2	2		2	2	1	2	2		3	2	1	2	2	1	2
1978	2	2	1	3	3	1	1	1		2	2		2	2		2
1979	3	2	1	2	2	1	1	2	1	2	2	1	2	2	1	2
1980	3	2	1	2	1	1	2	2	1	2	2	1	2	2		2
1981	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1982	3	2	1	2	2	1	2	2	1	1	2	1	2	2	1	2
1983	2	2	1	2	2		2	2	1	2	2	1	2	2	1	2
1984	3	2	1	2	2		2	3	1	2	2	1	2	2	1	2
1985	3	2	1	2	2		1	3		3	2		2	3	1	2
1986	1	3	1	1	3		2	3		3	2	1	2	2	1	2
1987	2	2	1	2	2		2	2		2	1		2	2		2
1988	2	2		2	2		2	2		2	2		2	2		2
1989	2	2		2	2		2	2		2	2		2	2		2
1990	2	2		2	2		2	2		2	2		2	2		2
1991	2	2	1	2	2	1	2	2		2	2	1	2	2	1	2
1992	2	2	1	2	2		2	2	1	2	2	1	2	2	1	2
1993	3	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1994	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1995	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1996	2	3	1	1	3		2	3		2	3	1	3	3	1	3
1997	2	2	1	2	2	1	2	2		2	2	1	2	2	1	2
1998	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
1999	2	2	1	2	2	1	2	1	1	2	2	1	2	2		2
2000	2	2	1	2	2	1	2	2		2	2		2	2	1	2
2001	2	2	1	2	2	1	2	2	1	2	2	1	2	2		2
2002	3	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2003	2	2	1	2	2	1	2	2		3	2	1	2	2	1	2
2004	2	2	1	2	2	1	2	2	1	2	2		2	2	1	2
2005	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2006	3	2	1	2	2		3	2	1	2	2	1	2	2	1	2
2007	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2008	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2
2009		3			3			2			3			4		
2010		3			3			3			3			4		
2011		3			3			3			3			4		
2012		3			3			3			3			4		
2013		3			3			3			3			4		

Table 3. Cont.

Year	Inshore Stations North of Cape Hatteras															
	03230	03240	03250	03260	03270	03280	03290	03300	03310	03320	03330	03340	03350	03360	03370	03380
Depth Range (m)	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27	0-9	9-18	18-27
1968																
1969																
1970																
1971																
1972																
1973	2	2	3	2	3	4	4	3	6	3	3	4	2	2	5	4
1974	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2
1975																
1976	2		2	2	1	2	2	1	2	2	1	2	2	1	2	2
1977	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1978	2	1	2	2	1	2	2		2	2		2	2	1	3	2
1979	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1980	2		3	2	1	2	2		2	2	1	2	2	1	2	2
1981	2	1	2	2		3	2	1	2	2	1	2	2	1	2	2
1982	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1983	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1984	2	1	2	2	1	2	2	1	2	2	1	2	2		2	3
1985	2	1	2	3		2	1		3	2		2	2		4	2
1986	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
1987	2		2	2		2	2		2	2		2	2		2	2
1988	2		2	2		2	2		2	2		2	2		2	2
1989	2		2	2		2	2		2	2		2	2		2	2
1990	2		2	2		2	2		2	2		2	2		2	2
1991	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1992	2	1	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1993	2	2	2	2		3	2	1	2	2	1	2	2	2	2	2
1994	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1995	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1996	2	1	3	3		3	3	2	3	2	2	3	2	3	3	3
1997	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1998	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
1999	2	2	2	2		3	2	1	2	2	1	2	2	2	2	2
2000	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2001	2	2	2	2	1	2	2	1	2	2		3	2	2	2	2
2002	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2003	2	1	2	2	1	2	2	1	2	3	1	2	2	2	2	2
2004	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2005	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2006	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2007	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2008	2	2	2	2	1	2	2	1	2	2	1	2	2	2	2	2
2009	3			3			3			2			2			3
2010	3			3			3			4			3			3
2011	3			3			3			3			3			3
2012	3			3			3			3			3			3
2013	3			3			3			2			3			3

Table 3. Cont.

Inshore Stations North of Cape Hatteras																
Year	03390	03400	03410	03420	03430	03440	03450	03460	03550	03560	03580	03590	03600	03610	03630	03640
Depth Range (m)	0-9	9-18	18-27	0-9	9-18	18-27	18-27	18-27	18-27	18-27	9-18	18-27	27-41	41-55	9-18	18-27
1968																
1969																
1970																
1971																
1972																
1973	3	4	7	2	3	5	2									
1974	2	3	4	2	2	2		7								
1975																
1976	1	2	3	1	2	2		2								
1977	1	2	2	1	2	2										
1978		2	2	1	2	2	2	2								
1979	1	2	2	1	2	2	4	3	4		1	1	1	2		1
1980	1	2	2	1	2	2	4	4	4		1	1	2	2		1
1981	1	2	2	1	2	2	2	2	3		1	1	2	2	1	1
1982	1	2	2	1	2	2	2	2	4		1	1	2	2		2
1983	1	2	2	1	2	2	2	2	4	1	1	1	2	2	1	1
1984	1	2	2	1	2	2	1	1	4	1	1	1	2	2	1	
1985		2	2		5	2	1	2	3	1	1	1	2	2		
1986	1	2	2	1	2	2	2	2	5		1	1	2	2		
1987		2	2		2	2	2	2	4			1	2	2		1
1988		2	2		2	2		2	5	1		1	2	2		1
1989		2	2		2	2	2	2	5							
1990		2	2		2	2	2	2	5	1	1	1	2	1		
1991	1	2	2	1	2	2	2	2	5		1	1	2	2	1	
1992	1	2	2	1	2	2	2	2	1	1	1	1	2	1	1	
1993	1	2	2	1	2	2	2	2	4	1	1	1	2	2	1	
1994		3	2		2	2	2	2	5	1	1	1	2	2	1	1
1995	1	2	2	1	2	2	1	2	4	1	1	1	2	2		1
1996	1	3	3	1	3	3	2	2	4		1	1	2	2	1	1
1997	1	2	2	1	2	2	2	1	5		1	1	2	2	1	1
1998	1	2	2	1	2	2	2	2	5		2	2	3	3		2
1999	1	2	2	1	2	2	2	2	5		1	1	2	2	1	1
2000	1	2	2	1	2	2	2	2	5	1	1	1	2	1	1	1
2001	1	2	2	1	2	2	2	2	5		1	1	2	2		2
2002	1	2	2	1	2	2	1	1	5	1	1	1	2	2	1	
2003	1	2	2	1	2	2	2	2	5	1	1	1	2	2	1	1
2004	1	2	2	1	2	2	2	2	5		1	1	2	2	1	1
2005	1	2	2	1	2	2	2	2	4	1	1	1	2	2	1	1
2006	1	2	2	1	2	2	2	2	5	1	1	1	2	2	2	1
2007	1	2	2	1	2	2	2	2	5	1	1	1	2	2	1	1
2008	1	2	2	1	2	2	1	2	4	1	1	1	2	2	1	1
2009			5			4	3	4		2		2	3	4		2
2010			5			4	3	4		3		3	3	3		3
2011			5			4	2	3		2		2	2	3		2
2012			4			3	3	4		2		3	4	3		3
2013			5			4	3	4		2		3	3	4		3

Table 3. Cont.

Year	Inshore Stations North of Cape Hatteras			Offshore Stations on Eastern Scotian Shelf						Inshore Stations South of Cape Hatteras						
	03650	03660	03940	01410	01420	05430	05440	05480	01490	07500	07510	07520	07530	07540	07550	07560
Depth Range (m)	27-41	41-55		110-182	55-110	92-183	183-366	92-183	183-366	0-9	9-18	18-27	0-9	9-18	18-27	0-9
1968				6	4											
1969				6	4											
1970				8	4											
1971				15	6	3	5	1	3							
1972				17	6	3	3		3							
1973			4	16	6	4	4	1	3							
1974				13	6				3	2	1	1	2	2	2	2
1975																
1976				14	6	3	4	2	3							
1977																
1978				19	6	3	4		3							
1979		1								2	2	2	1	2	2	1
1980	1	3								2	2	2	2	2	3	1
1981	1	1								1	2	2	2	2	3	2
1982	1									2	1	2	2	2	3	2
1983	1	2									2	2	2	2	2	2
1984	1	2								2	2	2	2	2	3	2
1985	2	2								1	1	2	1	3	3	
1986	1	2								2	2	2	1	1	2	
1987	1	2									2	2				
1988	1	2									2	2				
1989											1	1				
1990		2								2	2	2				
1991	1	1									2	2				
1992		2										2				
1993	1	3									1	2				
1994	1	1									2	2				
1995	1	2									2	2				
1996	1	1														
1997	1	2									1	2				
1998	1	2									2	2				
1999	1	2									2	2				
2000		1									2	2				
2001	1	2														
2002	1	2														
2003		3									2	2				
2004	1	2									2	2				
2005	1	2									2	2				
2006	1	2									2	2				
2007	1	2									2	2				
2008	1	2									2	2				
2009	3	3										2				
2010	2	3										3				
2011	2	3										2				
2012	3	3														
2013	4	3										2				

Table 3. Cont.

[illegible]

Table 3. Cont.

Offshore Stations South of Cape Hatteras												
Year	08500	08510	08520	08530	08540	08550	08560	08570	08580	08590	08600	08770
Depth Range (m)	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366	27-55	55-110	110-183	183-366
1968												
1969												
1970												
1971												
1972												
1973												
1974												
1975												
1976												
1977												
1978												
1979	3	2	2	2	6	2	2	3				
1980	3	1	2	1	5	2	2		5	2	3	
1981	4	2	1	2	6	2	2	2	3	2	2	3
1982	4	2	2	2	6	2	2	4	5	2	3	4
1983	4	2	2	1	6	2	2	3	4	2		
1984	4	2	2	1	6	2	2	4				
1985	4	2	2	2	6	2	2	4				
1986	4	1	1	3								
1987	4	2	1									
1988	4	3	2	1								
1989	4	2	2									
1990	4	2	1	2								
1991	4	2	2									
1992	4	2	2									
1993	2	1	1									
1994	3	2	2									
1995	4	2	2									
1996												
1997	4	2	2	1								
1998	4	2	2									
1999	4	2	2									
2000	4	2	2									
2001												
2002												
2003	4	2	1									
2004	4	2	2									
2005	4	2	2									
2006	4	2	2									
2007	4	2	2									
2008	4	2	2									
2009	4	3	2									
2010	4	3	3									
2011	4	3	2	2								
2012				1								
2013	3	3	3	3								

Table 4. Number of stations successfully completed by stratum for the winter flatfish survey.

Year	01010	01020	01030	01040	01050	01060	01070	01080	01090	01100	01110	01120	01130	01140	01150	01160	01170	01180	01190	01200	01210	01220
1992	9	7	3		7	9	2		5	6	2		7	1		5			5			
1993	8	7	2		4	9	3		3	8	2		9	3								
1994	6	5	2		3	5	1		4	8	2		7	2		1			4			
1995	8	7	2	1	5	9	2	1	5	8	2		9	3		9	1		5		3	1
1996	8	8	3		5	10	2		4	10	3		7	4		2	2					
1997	7	7	2	1	5	9	2	1	6	8	2	1	9	3	1	5	1					
1998	8	7	3		4	9	3	1	5	8	3	1	9	4	1	10	3					
1999	8	7	3	1	5	8	3	1	5	9	3	1	9	4	1	8	3		4			
2000	8	8	4	1	5	10	4		3	7	4		4	2								
2001	8	8	4	2	7	12	4	2	7	12	4	2	9	4	2	6	2	1				
2002	8	8	4	2	7	11	4	2	5	12	4	2	8	4								
2003	4	4	2	2	4	5	2	1	3	6	2	2										
2004	6	7	4	1	4	11	4	2	5	10	4	1	4	4	1							
2005	5	5	3	1	3	7	3	1	4	7	3	1	2									
2006	7	7	3	2	9	11	3	1	4	8	4	2	2	1								
2007	6	7	4	2	4	10	4	2	5	9	3	2										

Table 4. Cont.

Year	01230	01240	01610	01620	01630	01640	01650	01660	01670	01680	01690	01700	01710	01720	01730	01740	01750	01760	03020	03050	03070	03080
1992	2	1	4	1	1		7	2	2		8	4	2		5	4	2		1	2	2	2
1993			5	2			9	3	1		10	5	2		6	5	2	1	1			1
1994			3	1	2		5	1	2		5	4	1		3	4	1			1		1
1995	1		4	2	1		8	4	2		8	4	2		5	4	2		1	2		2
1996			4	2	2		9	4	3		9	5	3		6	5	3					
1997			4	2	2		8	3	3		8	4	2	1	5	4	2	1				
1998			4	2	3	1	9	3	3	1	8	4	3	1	5	4	3	1				
1999			4	2	3	1	9	3	3	1	8	4	3	1	5	4	3	1				
2000			5	3	3	1	10	4	4	1	9	5	4	1	3	5	4	1				
2001			6	2	2	2	12	4	4	2	9	5	4	3	5	5	5	1				
2002			7	5	3		12	4	4	2	9	5	4	1	5	5	5	1				
2003			7	3	3	2	10	3	4	2	6	4	4	2	3	3	4	2				
2004			7	3	4	1	10	4	4	2	6	5	4	2	4	5	4	2				
2005			6	1	2		8	3	3	1	7	4	3	2	4	5	3	2				
2006			5	4	1	3	11	3	3	2	8	4	3	2	5	4	4	1				
2007			7	3	3	2	13	4	4	2	9	5	4	2	5	5	4	2				

Table 4. Cont.

[illegible]

Table 5. Number of stations successfully completed by stratum for the shrimp survey.

CRUISE	04010	04020	04030	04040	04050	04060	04070	04080	04090	04100	04110	04120
Depth Range (m)	50-191	46-93	54-178	30-180	152-287	69-217	122-267	8-233	154-228	81-237	144-244	94-196
198370	5	1	8	1	5							
198470	6		10	1	3	11	2	5	1			
198570	6	1	10	2	4	12	5	7	3			5
198670	6		10	1	4	10	4	6	2	5	4	2
198770	5		10		4	12	3	7	2	6	4	4
198870	6		8	2	4	11	5	7				
198970	7		9	2	5	10	6	6	2			2
199070	6		8	2	5	11	6	7	1			1
199170	6		10	2	5	11	6	5	2		1	7
199270	7	2	10	2	5	12	5	6	3		3	
199370	6	2	10	2	5	12	6	7		1		2
199470	6		9	2	5	11	6	6				
199570	4		9		3	10	4	5				
199670	5		8	2	3	7	3	6				
199770	5		10		3	12	3	7				
199870	5		9	2	3	10	4	4	2			
199970	6		9	1	4	10	6	7		2		
200070	5		9	2	3	9	4	5		1		
200170	7	2	7	1	3	10	3	6	1			
200270	6		9	1	2	10	4	7				1
200370	6		8	2	3	10	4	6	2			3
200470	6		8	1	3	9	4	5	2	2		4
200570	7		11	2	4	12	5	7	2	4		5
200670	5		8	2	1	6	2	7	1			
200770	6	1	9	1	5	11	5	7	2	3		
200870	2	1	9	1	4	11	4	7	2	3		
200970	6	2	9	2	6	13	6	9	2	4		
201070	7	2	10	2	6	13	5	8	1	3		
201170	7	1	10	2	6	11	6	7	3	4		
201270	7	2	8	2	6	14	6	8	3	4		
201370	5	1	10	1	4	14	6	7	2	4		

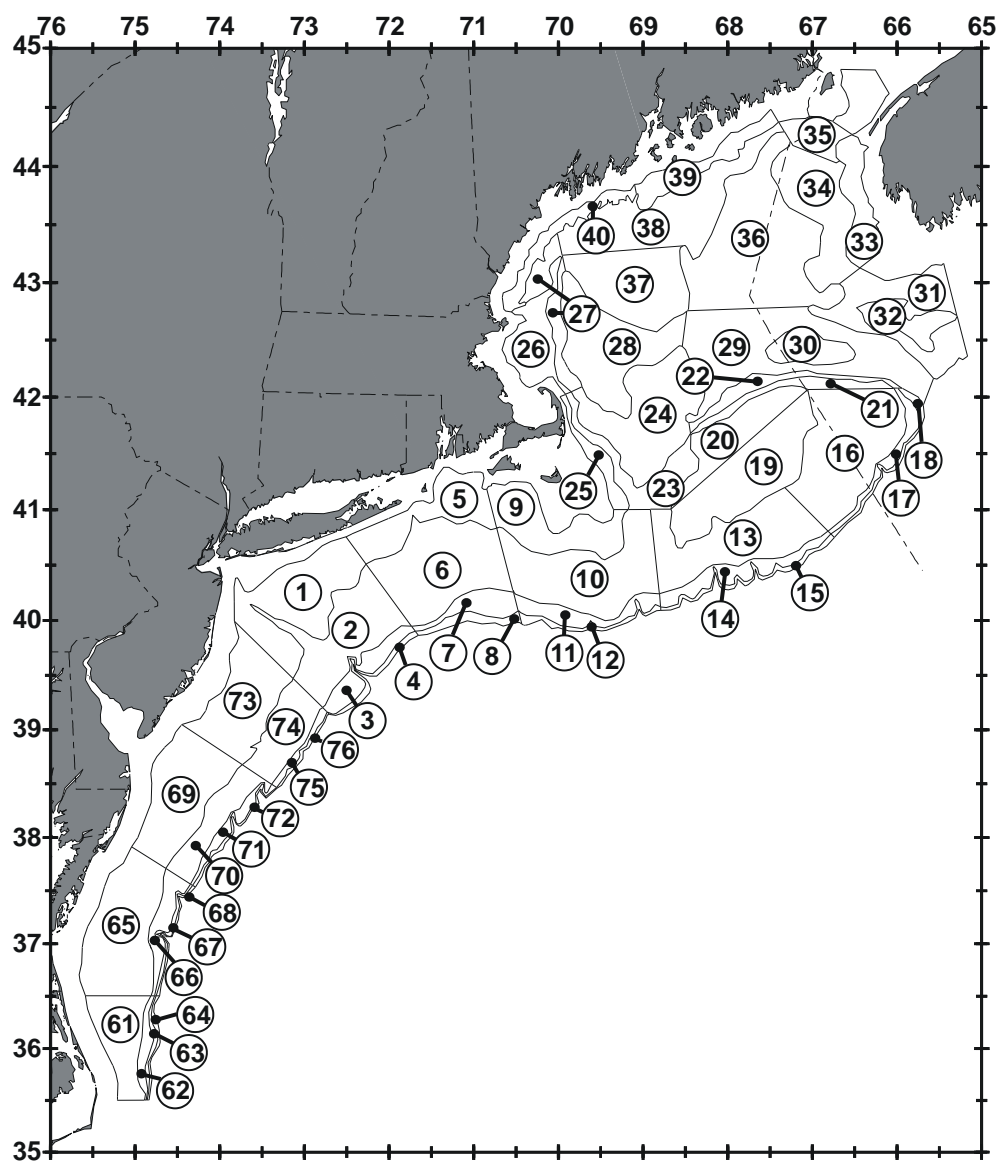


Figure 1. Map of offshore strata (01 code) for the autumn, spring and winter surveys.

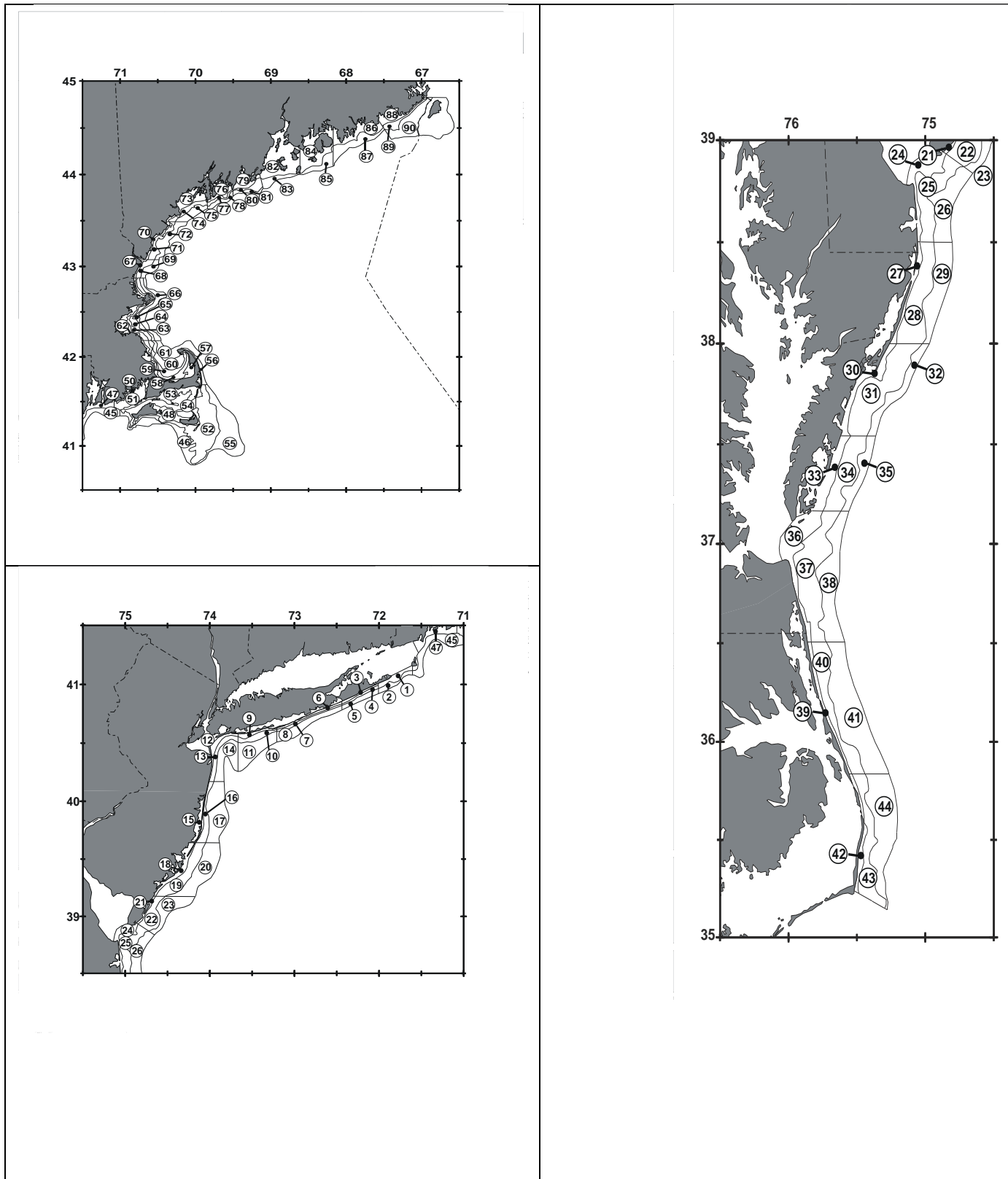


Figure 2. Map of offshore strata (03 code) for the autumn, spring and winter surveys.

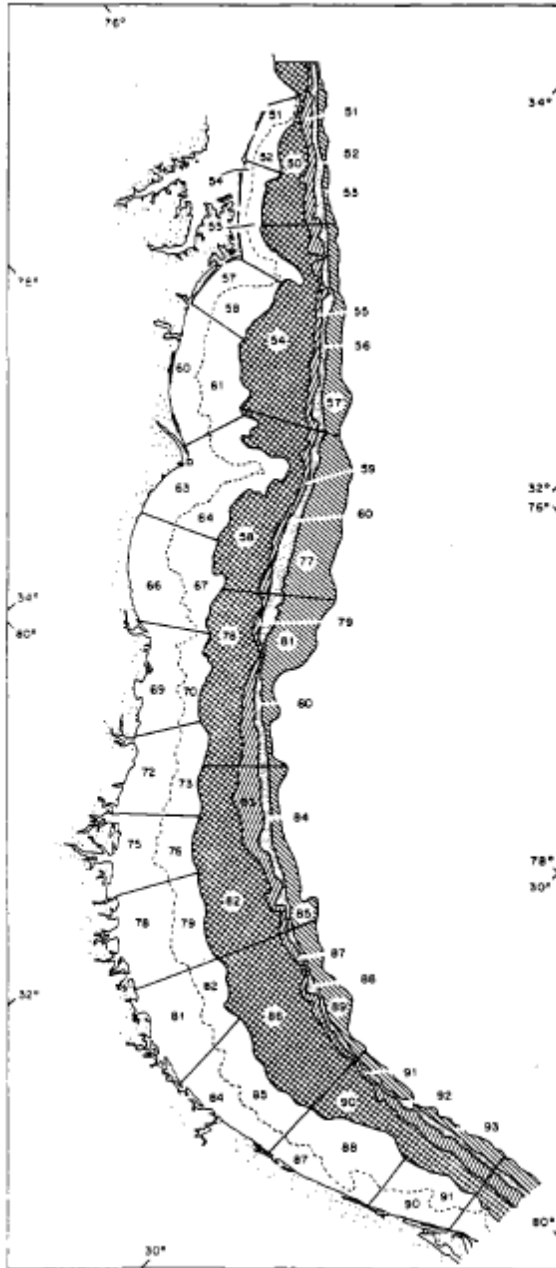


Figure 3. Strata sampled on NEFC inshore (07 code) and offshore (08 code) bottom trawl surveys between Cape Hatteras, North Carolina and Cape Canaveral, Florida.

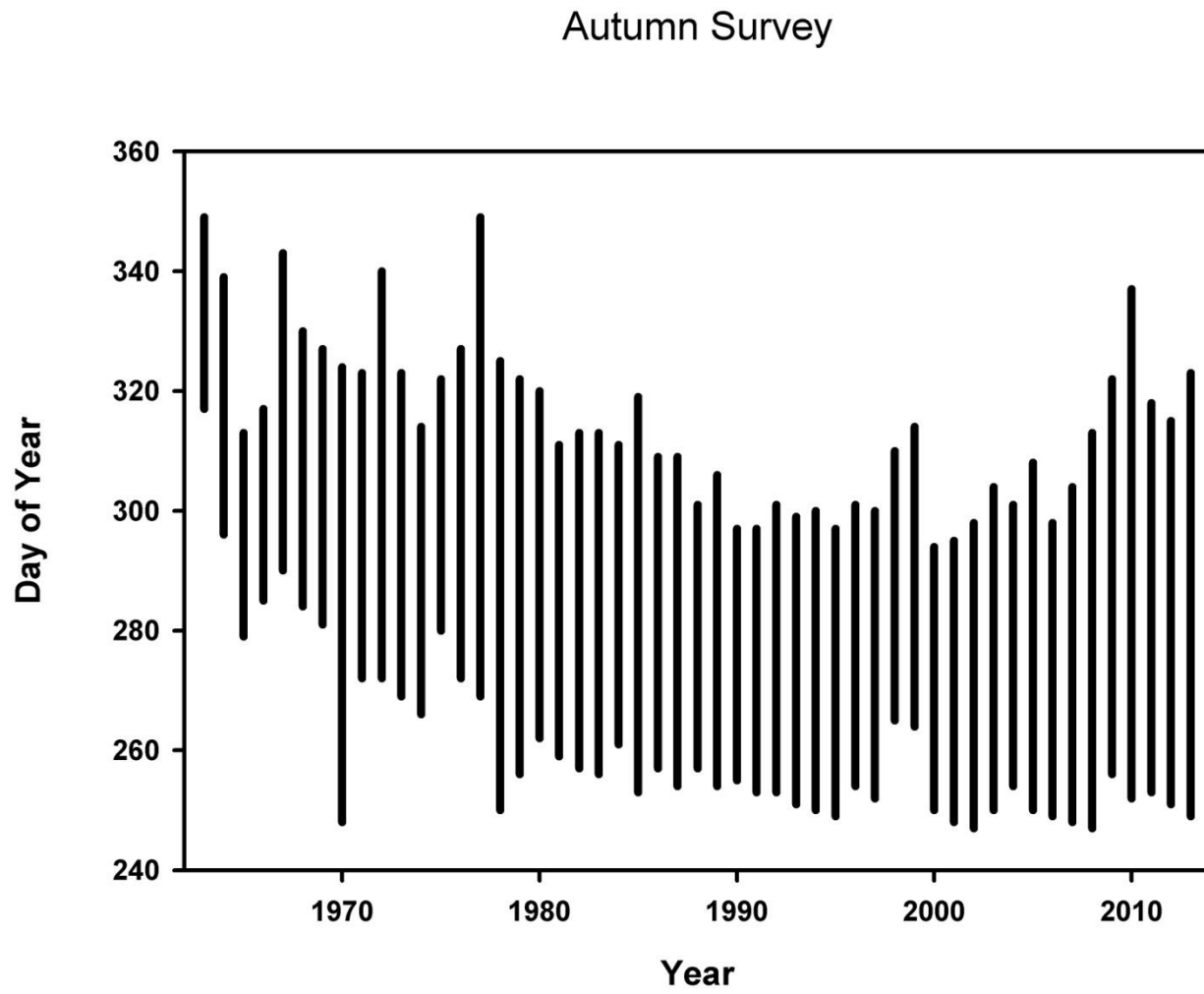


Figure 4. Timing of the autumn bottom trawl survey from 1963-2013.

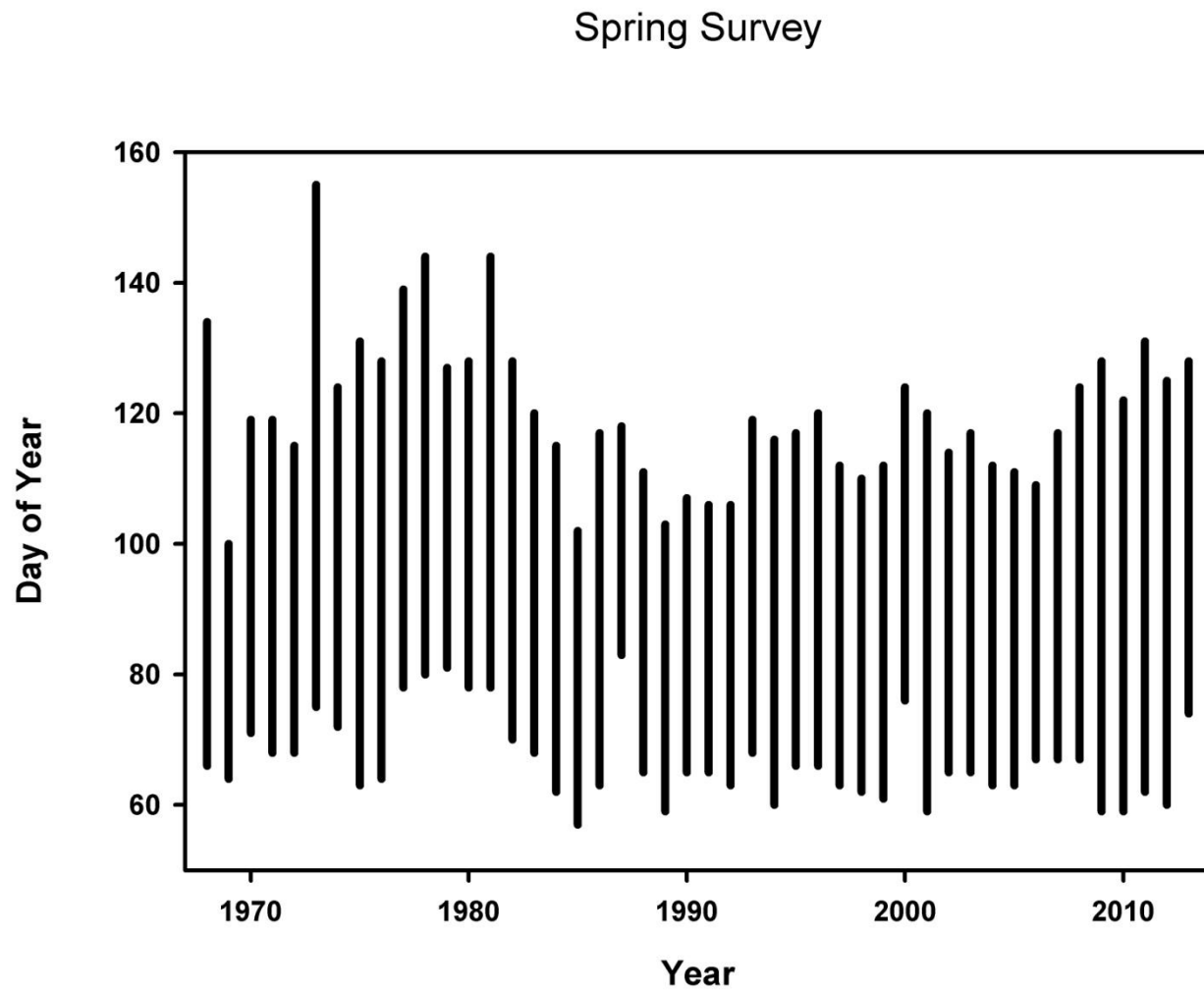


Figure 5. Timing of the spring bottom trawl survey from 1968-2013.

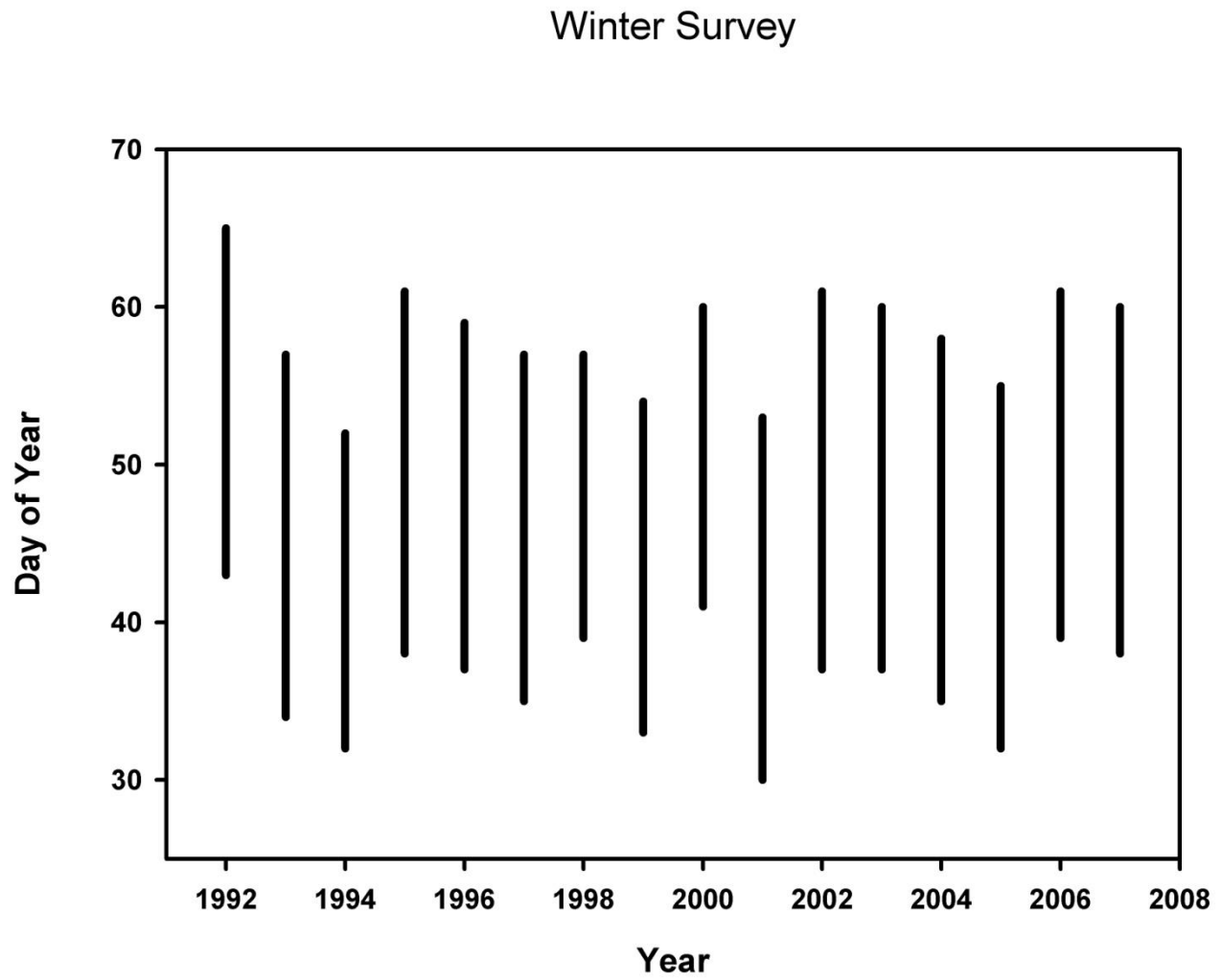


Figure 6. Timing of the winter bottom trawl survey from 1992-2007.

Shrimp Survey

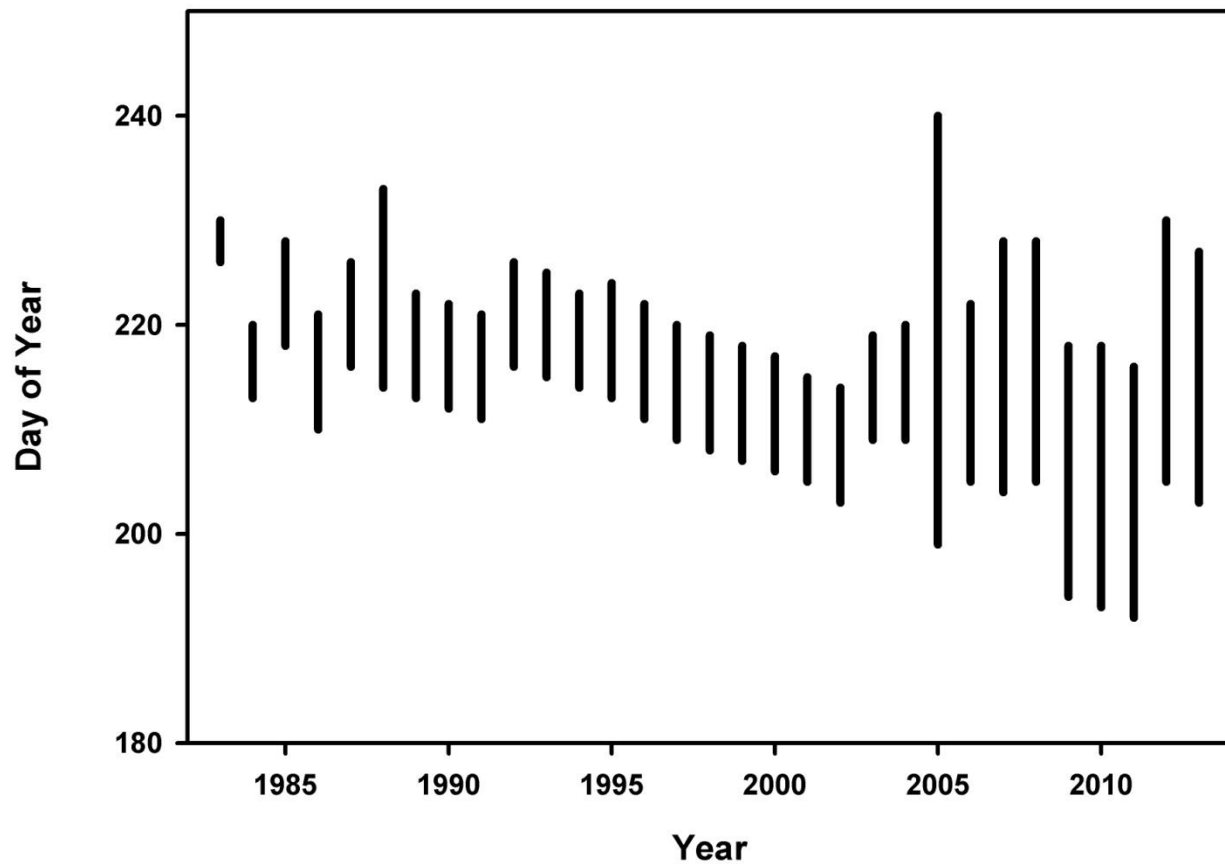


Figure 7. Timing of the shrimp bottom trawl survey from 1983-2013.

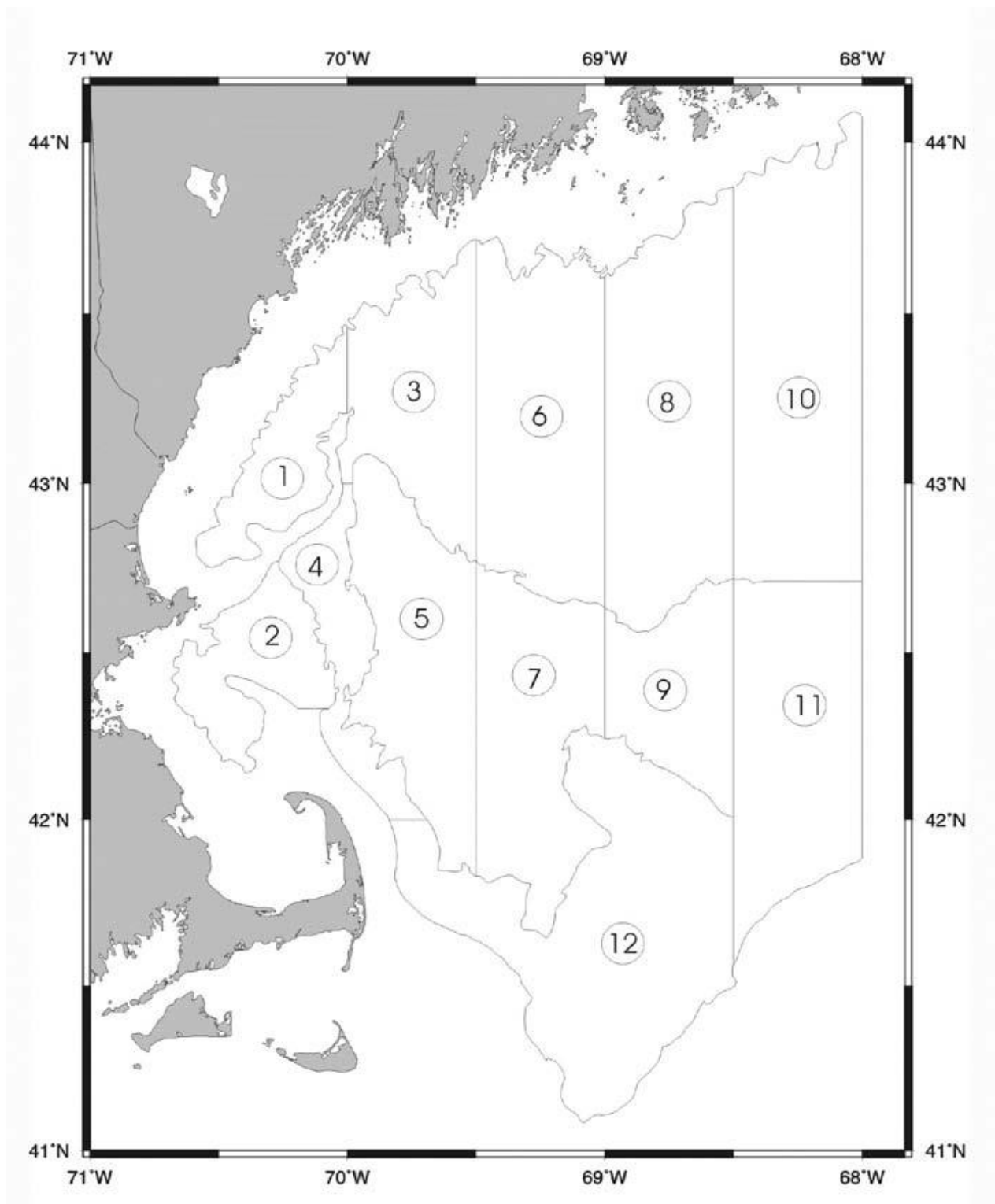


Figure 8. Strata used for the shrimp survey.