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A Report of the NOAA Coastal Ocean Program

**Georges Bank Predation Study:
Report of the 1994-96 Field Seasons**

by

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Abstract

The principal focus of the Georges Bank Predation Study is to quantify the joint effects of exploitation and predation on the abundance, production, and species composition of the Georges Bank fish community. In order to develop multispecies models of the synergistic effects of predation and exploitation on fish community dynamics, several complementary objectives must be completed, including two major activities: the construction of a relational database for historical food habits data to permit retrospective analyses, and the completion of field studies to quantify predation at critical phases in the early life history of key species (Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*). Field season data and sample collections were designed to supplement the broad-scale (coarse) data available from the NEFSC bottom trawl survey time series with more specific, temporally appropriate, fine-scale data. A total of 9 process-oriented cruises were conducted on Georges Bank during 1994-96. Cruises were scheduled to coincide with the early larval (April-May), late larval (June), and early demersal (July-August) stages of cod and haddock development each year. Food habits data were collected from 38 species during the period. Over 12,000 stomachs were individually preserved for laboratory analysis; tissue samples from approximately 3,600 stomachs were collected for DNA analysis; and approximately 15,000 ichthyoplankton samples (with 1,500 individual measurements) were collected. This report describes the activities conducted during the 1994-96 field seasons and provides detailed summaries of the data and samples collected with preliminary qualitative analyses of data.

Introduction

The principal focus of the Georges Bank Predation Study is to quantify the joint effects of exploitation and predation on the abundance, production, and species composition of the Georges Bank fish community (NEFSC 1993). While this region has historically supported one of the most valuable fisheries in the United States, its commercially important species are currently over-exploited. The decline in highly exploited groundfish (gadoid and flatfish) species has been accompanied by a concomitant increase in piscivorous species of low commercial value including skates, small sharks, and small pelagic fish (Fogarty and Murawski 1998, NMFS 1998). The commercially important species have therefore been subjected to high levels of fishing and predation mortality. The rate of recovery of the groundfish stocks will be dependent on the extent to which harvesting rates are reduced and on ecological conditions, including the impacts by predation. Evaluation and prediction of the full effects of management actions designed to reduce over-fishing requires an assessment of the broader ecological setting.

Development of multispecies models of the synergistic effects of predation and exploitation on fish community dynamics is essential to evaluate the consequences of alternative harvesting strategies on yield, productivity, and community structure of this system and is contingent on completion of several complementary objectives. These objectives include: 1) construction of a relational database for historical food habits data to permit a retrospective analysis of predator-prey interactions, potential competitive interactions, and consumption rates of key predators to permit parameterization of multispecies models; 2) completion of field studies to quantify predation at critical phases in the early life history of key species (Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*); 3) completion of laboratory studies on gastric evacuation and predation processes in key predators; 4) development of methods for detecting predation on digested cod and haddock larvae using biochemical techniques; 5) refinement of our understanding of critical compensatory processes to complete the specification of models; and 6) completion of sensitivity analyses and trial modeling studies to finalize model structures.

The objectives of the field season data and sample collections were to examine and quantify predation mortality on critical early life stages (larvae through early demersal) of the key species, provide biological samples for the laboratory studies, and supplement the broad-scale (coarse) data available from the NEFSC bottom trawl survey time series with more specific, temporally appropriate, fine-scale (in spatial and temporal terms) data targeting the key species. The fine-scale data derived from these cruises will also provide a more detailed data set from which to extract information on species interactions to more fully develop the multispecies models.

Atlantic cod and haddock encounter different predator fields during various phases of their ontological development and sampling strategies were designed to account for these changes. Prior studies (Michaels 1991) indicate that predation on their earliest life stages by pelagic fish predators (notably Atlantic herring, *Clupea harengus*, and Atlantic mackerel, *Scomber scombrus*) are highly localized events in space and time and chance encounters between patches of larval cod

and haddock and schools of pelagic predators result in highly aggregated loci of predation events. The sampling design and protocols of the cruises conducted to examine these life stages accounted for these events. During the juvenile stages, potential demersal predators such as spiny dogfish, *Squalus acanthias*, and skates, *Raja sp.*, were sampled across the Bank to quantify changes in mortality throughout this phase of their life history.

Field activities included 9 process-oriented cruises on Georges Bank during 1994-96 (the 1997 field season was canceled due to gear malfunctions on the R/V Delaware II), and a special hydroacoustic gear testing cruise in 1995 (see table below). In addition, two cruises were conducted in 1993 funded by the NEFSC prior to implementation of the Georges Bank Predation Study, but with complementary objectives. Cruises were scheduled to coincide with the early larval (April-May), late larval (June), and early demersal (July-August) stages of cod and haddock development each year. Sampling was coordinated with US GLOBEC studies which were focusing on potential invertebrate predators to provide a more complete a picture of the importance of predation during these stages (US GLOBEC 1992).

Summary of COP process-oriented cruises conducted during 1993-96

Cruise	Sampling Design	Trawl Type	Tow Length (min)	Diel Sampling	Acoustic Sampling	Bongo	CTD
DE 93-07	Grids (4)	Yankee 36	15 / 30	Y	-	-	XBT
DE 93-09	Grids (4)	Yankee 36	15 / 30	Y	-	-	XBT
DE 94-04	Mixed (grid, directed)	Yankee 36	30	-	-	Y	Y
DE 94-06	Mixed (coarse, fine grid)	Yankee 36	30 / 15	-	-	Y	Y
AL 94-07	Mixed (grid, site)	Yankee 36	30	Y	-	Y	Y
KT 95-02	Grid (3 replications)	Shuman (midwater)	20 / 30	-	Y	Y	Y
KT 95-04	Mixed (grid, site)	Yankee 36, Shuman	20	Y	Y	-	Y
KT 95-05	Mixed (grid, site)	Yankee 36	20	Y	-	-	Y
AL 96-06	Mixed (grid, site)	Yankee 36	30	-	Y	Y	Y
AL 96-08	Mixed (grid, site)	Yankee 36	30	-	Y	Y	Y
AL 96-10	Partial grid ¹	Yankee 36	30	-	-	-	Y

¹Grid not completed due to time lost during Hurricane Edouard.

Cruise Operations

A multidisciplinary approach to sampling potential predators of cod and haddock on Georges Bank was utilized during the field season cruises. Sampling activities during each cruise were generally conducted in two phases (Phase-I and -II). The objective of Phase-I sampling was to determine the distributions of age-0 cod and haddock, along with potential predators and competitors. This objective was carried out utilizing a systematic grid survey across the Bank with stations approximately every 10 nmi (with the exception of cruise DE 94-06 which surveyed only the southwestern part of the Bank; DE 94-07 which surveyed the Northeast Part; and DE 95-02 which surveyed the Southern flank) (Cruise tracks from each cruise are provided in

Appendix I). Ichthyoplankton samples were collected and preliminarily processed onboard on each of the larval stage cruises (April-June) to identify areas of abundance of age-0 cod and haddock; bottom and/or midwater trawl gear was used to determine the distribution and abundance of predators. During cruises targeting the early demersal phase (July-August), bottom trawl gear was used exclusively. In addition, during the 1995 and 1996 larval stage cruises, hydroacoustic methods were employed to estimate the abundance of pelagic predators.

The objectives of Phase-II studies varied depending on the life history stage (and therefore timing of the cruise each year) but generally consisted of more intense sampling in regions of high predator or prey abundance defined during the systematic grid survey. The following is a summary of Phase-II operations during each cruise conducted during 1994-96:

DE 94-04 (May 1994) - A total of 14 stations re-sampled in the center of the highest concentration of gadoid larvae identified during the systematic grid survey.

DE 94-06 (June 1994) - Fine grid systematic sampling conducted at two locations with stations approximately 5 nmi apart. The first site sampled was on the Northern Edge of Georges Bank south of Franklin Basin (27 stations) and the second was on the western part to the east of the Great South Channel (33 stations).

AL 94-07 (August 1994) - A 48 hour series of site-specific sampling (23 stations) on the Northeast Peak of Georges Bank.

KT 95-02 (April-May 1995) - No Phase-II operations; a systematic grid survey across southern Georges Bank was replicated 3 times with hydroacoustic transect sampling between stations.

KT 95-04 (June 1995) - Site-specific sampling on northeastern Georges Bank. A bottom trawl was deployed every 2 hours throughout a 48 hour period to document diel variations in catchability and predation. During a second 48 hour period, a midwater trawl was deployed every 2 hours and hydroacoustic sampling used to determine if diel variability existed in the vertical distribution of age-0 cod and haddock.

KT 95-05 (July 1995) - Site-specific sampling to examine diel patterns of age-0 cod and haddock abundance and mortality due to predation and to compare these patterns between gravel and sandy bottom areas. Trawl samples were collected every 2 hours over a 48 hour period at each site (25 stations per site). A pipe dredge was also deployed at each trawl station to sample bottom sediment.

AL 96-06 (May 1996) - Western portion of the Bank re-sampled with 15 stations. Hydroacoustic transect sampling between stations.

AL 96-08 (June 1996) - Hydroacoustic transect sampling between systematic grid

stations (stations 1-65). A site on the western portion of the Bank re-sampled (15 stations).

AL 96-10 (August-September 1996) - No Phase-II operations: systematic grid survey only because of time limitations due to Hurricane Edouard.

Description of the Gear and Sampling Protocols

At each station, with the exception of cruises KT 95-02 and KT 95-04, a standardized Yankee 36 bottom trawl was fished at a 3:1 scope at 3.5 knots for 15-30 minutes (depending on sampling priorities). The trawl was rigged with 16 inch rollers and 450 kg polyvalent doors. During KT 95-02, a Shuman (Series 68x354cm) midwater trawl was fished at a 4:1 scope at 4-4.5 knots for 20-30 minutes. This trawl had an eight bridle configuration, and was rigged to a pair of 4 m² Morgere (Gourock) 'W' Vertical (type WV 6) doors. During KT 95-04, both the Yankee 36 and Shuman trawls were used. A wireless Furuno Color Net Recorder (Model CN-10B) was used to monitor the tow depth profile and mouth opening of the Shuman trawl. The transmitter attached to the headrope provided an acoustical signal of the bottom-headrope and footrope-headrope distances which was received by a paravane receiver deployed along-side the vessel.

Echo-integration of hydroacoustic signals for density estimates of potential fish predators were made using the Simrad EK500 Scientific System networked to UNIX based BI500 post-processing software. During cruises conducted onboard the charter vessel Katahdin in 1995 (KT 95-02 and KT 95-04), a Simrad VD-282 towed body with 38 kHz frequency transducer was towed mid-ship at 5-6 knots about 8 m below the surface. During cruises aboard the NOAA R/V Albatross IV in 1996 (AL 96-06 and AL 96-08), hull-mounted 38 kHz and 120 kHz transducers were used.

The plankton sampler utilized to determine the density distributions of larval fish during the cruises was a standard MARMAP twin 61 cm bongo with .333 and .505 mm mesh nets, and an attached CTD (Conductivity-Temperature-Depth) profiler. The bongo/CTD array was fished double-obliquely (from the surface to about 3 m off the bottom and back) at about 1.5-2.0 knots and data recorded according to standard NEFSC survey procedures (Jossi and Marak 1983). Bottom salinity samples were generally taken twice daily using a 1.7 liter Niskin bottle for CTD calibration. Navigational, sampling, meteorological, and oceanographic parameters were continuously recorded (every 30 sec) via the vessel's scientific computer system during each cruise.

Ichthyoplankton samples from the .505 mm mesh net were sorted at sea with the aid of a light table and specimens identified to species by dissecting microscope to identify locations of high gadid abundance. Samples were then preserved in 4% formalin for further identification and verification in the laboratory.

Fish and invertebrates from each trawl station were sorted by species, weighed (0.1kg),

and measured (nearest cm) using standard NEFSC sampling protocols; data was recorded on standard NEFSC logsheets. The stomach contents of potential predators on age-0 cod and haddock were either examined on deck or preserved in buffered formalin for later laboratory examination also following standard NEFSC sampling protocols (Grosslein 1969, Azarovitz 1981). Only non-empty stomachs were preserved. Stomachs which contained unidentified gadids (or unidentified fish) were subsampled for possible identification of age-0 cod or haddock as prey using DNA probes. Tissue samples of the unidentified prey for DNA testing were placed in cryo-vials and frozen in liquid nitrogen. Samples of age-0 cod and haddock from the trawl catches were also frozen for age and growth studies.

Sample Summary

The following is a list of general stomach sampling data from each cruise:

Vessel Code	Comp Code	No. Stations	No. Preserved	No. Examined	Total Stomachs
<i>1993</i>					
DE 93-07	9357	83	1899	1928	3827
DE 93-09	9359	96	2501	2414	4915
<i>1994</i>					
DE 94-04	9454	198	702	2007	2709
DE 94-06	9456	106	502	1981	2483
AL 94-07	9457	79	820	964	1784
<i>1995</i>					
KT 95-02	9552	142	1065	1157	2222
KT 95-04	9554	110	1571	969	2540
KT 95-05	9555	126	2233	1044	3277
<i>1996</i>					
AL 96-06	9656	79	380	1077	1496
AL 96-08	9658	85	11	1395	1408
AL 96-10	9650	53	24	1423	1447

Appendix I contains cruise sampling location maps; Appendix II Tables 1-9 provide listings of the number of stomachs examined by cruise and species; Appendix III contains detailed, tow by tow station data for each cruise; and Appendix IV lists the scientific personnel that staffed the cruises.

Cruise Instructions, descriptions of the proposed sampling operations that are required to be submitted to the Research Vessel Master prior to each cruise, and *Cruise Results*, reports describing the operations from each of the individual cruises are available from the Food Web

Status of the Data and Samples

Process-Oriented Cruise Data

Data collected during the field seasons have been entered, audited, and archived on the NEFSC network computer system utilizing Oracle as the database management system. The database consists of records from the 11 special cruises conducted from 1993-97 (two cruises conducted in 1993 were funded by the NEFSC prior to implementation of the Georges Bank Predation Study).

These data were combined with data collected during the routine NEFSC Bottom Trawl Survey Program which provides information on the feeding ecology of important species inhabiting the northeast US continental shelf from Cape Hatteras, NC to the Gulf of Maine. These broad-scale, multispecies surveys were designed to monitor trends in abundance and distribution and to provide data and samples to study the ecology of the large number of fish and invertebrate species inhabiting the region and provide the basis for analyses of predation, competition, etc.

Sample Processing - Preserved Stomachs

Approximately 12,000 stomach samples of selected fish and squid species, individually preserved in 10% buffered formalin, were collected during 1993-96. Appendix II Tables 1-9 provide listings of the number of stomachs preserved by cruise and species for COP funded cruises. Samples are currently being processed under contract; however, due to budget constraints, only about 8,000 stomachs (64%) of the total will be completed in FY1998-99. The data from these stomachs will be incorporated into the master database upon completion of the contract.

Sample Processing - DNA Analyses

DNA probes designed to detect the presence of cod and haddock in partially or well digested stomach content samples were developed under a COP funded project during 1994-95. During the 1994-96 field season, tissue samples from approximately 3,600 individual stomachs were frozen in liquid nitrogen and are currently being processed under contract. Appendix II Tables 1-9 provide listings of the number of samples preserved by cruise and species. The data from these samples will be available for analysis during the autumn of 1999.

Sample Processing - Ichthyoplankton

Approximately 1,500 samples from ichthyoplankton sampling gear deployed during the 1994-96 field seasons were collected. Sample processing included sorting, larval fish identification, and length measurements of the larvae. Verification of the larval fish identifications were carried out cooperatively with personnel from the NEFSC, J.J. Howard Laboratory, Highlands, NJ. The data from these samples are currently available on the NEFSC computer network.

Distribution of Atlantic cod and haddock and potential predators/competitors

Distribution of Atlantic cod and haddock and potential predators/competitors

Larval stage cod and haddock

An initial qualitative analysis of data from cruises conducted from late April through June of 1994-96 (DE 94-04, DE 94-06, KT 95-02, AL 96-06, and AL 96-08) is provided in Figures 1-5. In these figures, the distribution of larval stage cod and haddock collected with bongo gear during the Phase-I (systematic grid survey) portion of each cruise is displayed along with the distribution of potential pelagic predators, Atlantic herring and Atlantic mackerel collected using trawl gear. For the illustrative purpose of this report, we chose to plot larval fish data from only .333 mesh bongo nets, and when the systematic grids were replicated (2 grids during DE 94-04 and 3 grids during KT 95-02), only data from one grid was chosen for display.

Larval cod and haddock abundance varied from year to year and was generally low. The data also indicated that Atlantic herring and Atlantic mackerel had similar distribution patterns with generally a low frequency of co-occurrence with cod and haddock.

Early demersal stage cod and haddock

Qualitative analyses of data collected during cruises conducted to examine predation on the early demersal phase of cod and haddock from late July through early September 1994-96 cruises (AL 94-07, KT 95-05, and AL 96-10) are provided in Figures 6-14. In these figures, the distribution of age 0 (≤ 20 cm) and age 1+ (> 20 cm) cod and haddock is displayed along with the distribution of potential demersal predators/competitors including spiny dogfish, *Squalus acanthias*, little skate, *Raja erinacea*, winter skate, *Raja ocellata*, silver hake, *Merluccius bilinearis*, pollock, *Pollachius virens*, longhorn sculpin, *Myxocephalus octodecemspinosus*, and sea raven, *Hemitripterus americanus*.

These data also indicated a general low abundance of age 0 cod and haddock. Unlike the larval stage, there was a relatively high level of spatial overlap of cod, haddock, and their potential demersal predators/competitors.

Acknowledgments

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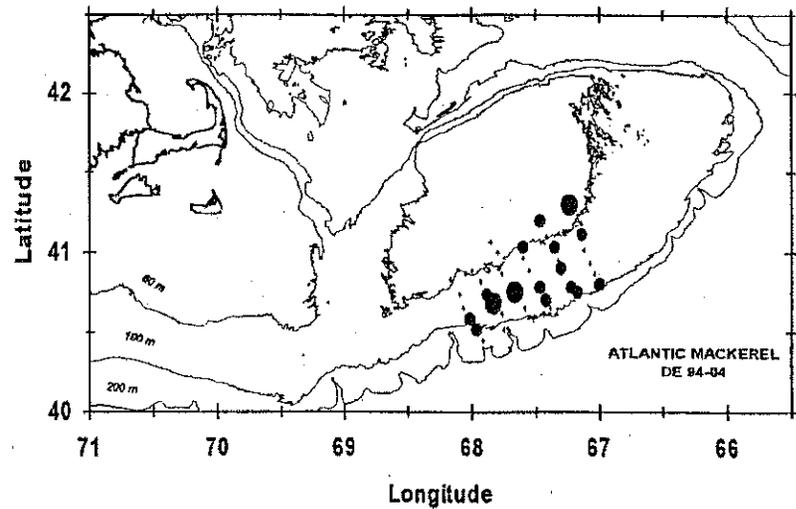
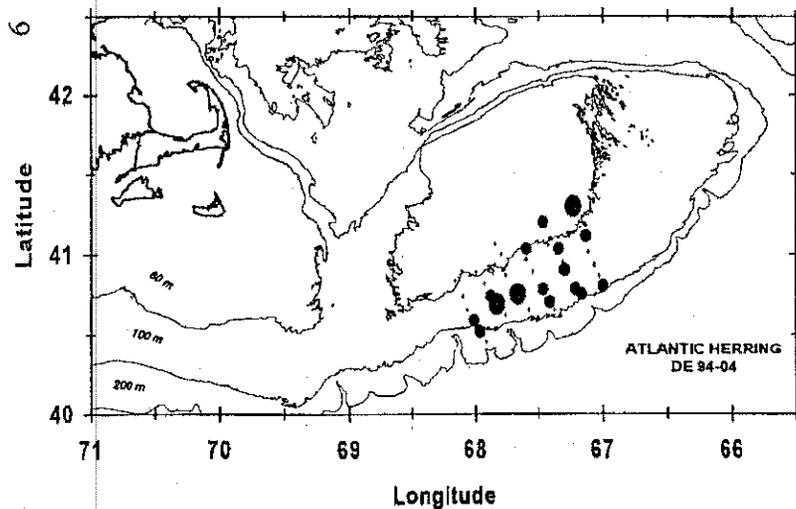
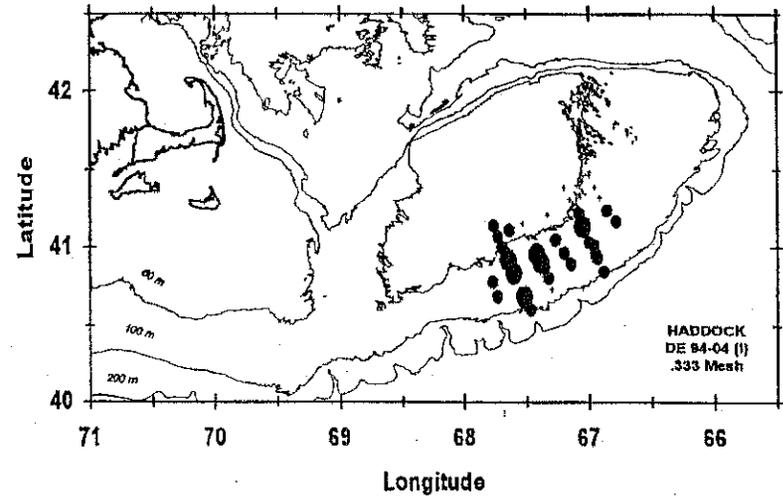
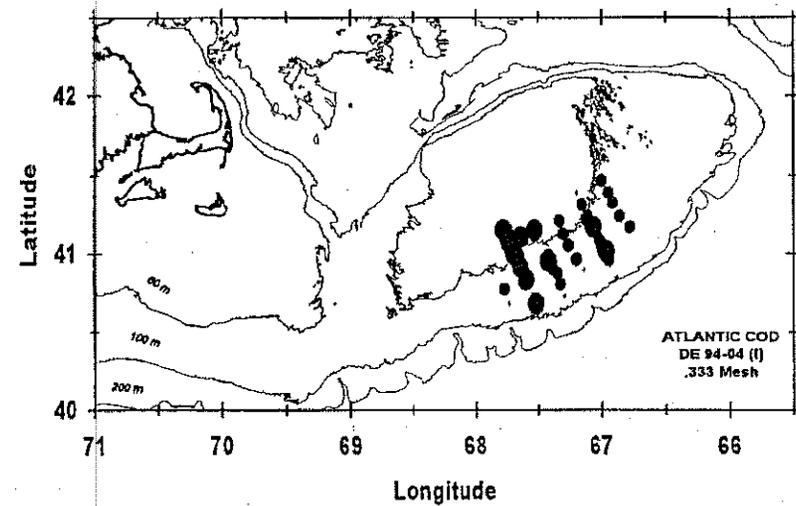


Figure 1. Distribution of larval Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, and potential predators, Atlantic herring, *Chupea harengus*, and Atlantic mackerel, *Scomber scombrus*, from the systematic grid survey during cruise DE 94-04. For illustrative purposes, only .333 mesh bongo data from Grid I are displayed.

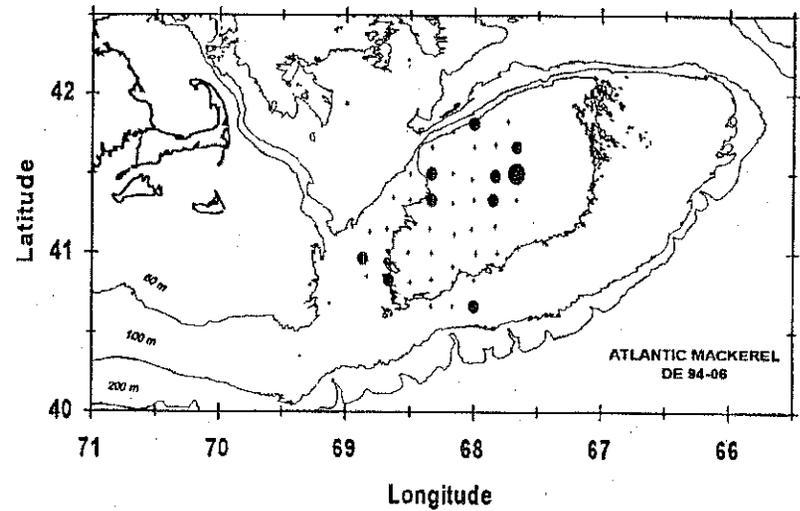
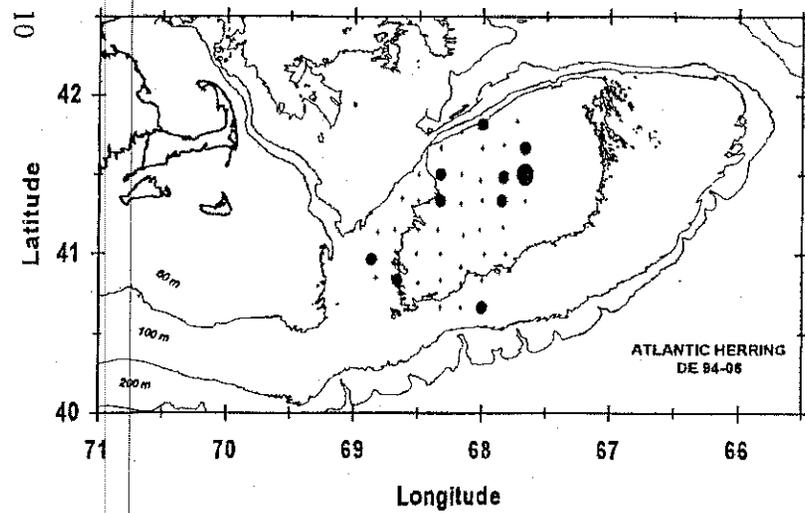
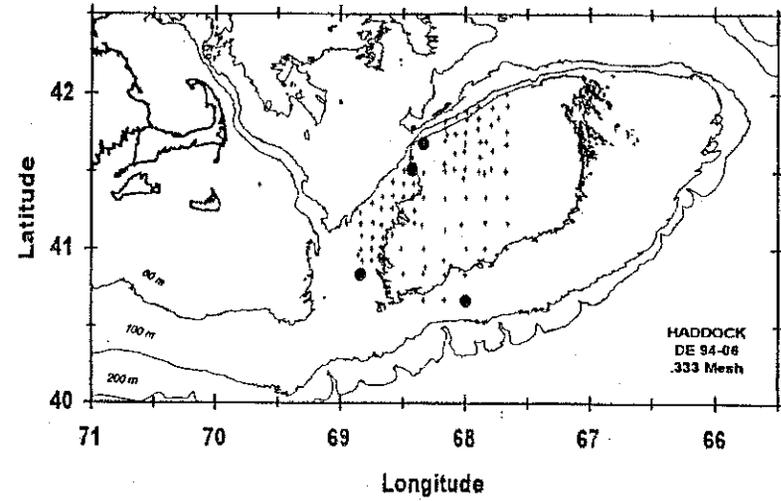
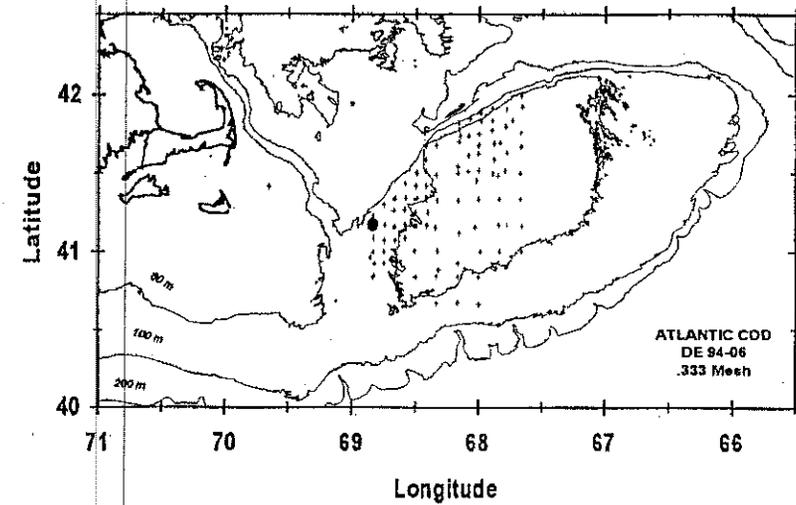


Figure 2. Distribution of larval Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, and potential predators, Atlantic herring, *Clupea harengus*, and Atlantic mackerel, *Scomber scombrus*, from the systematic grid survey during cruise DE 94-06. For illustrative purposes, only .333 mesh bongo data are displayed.

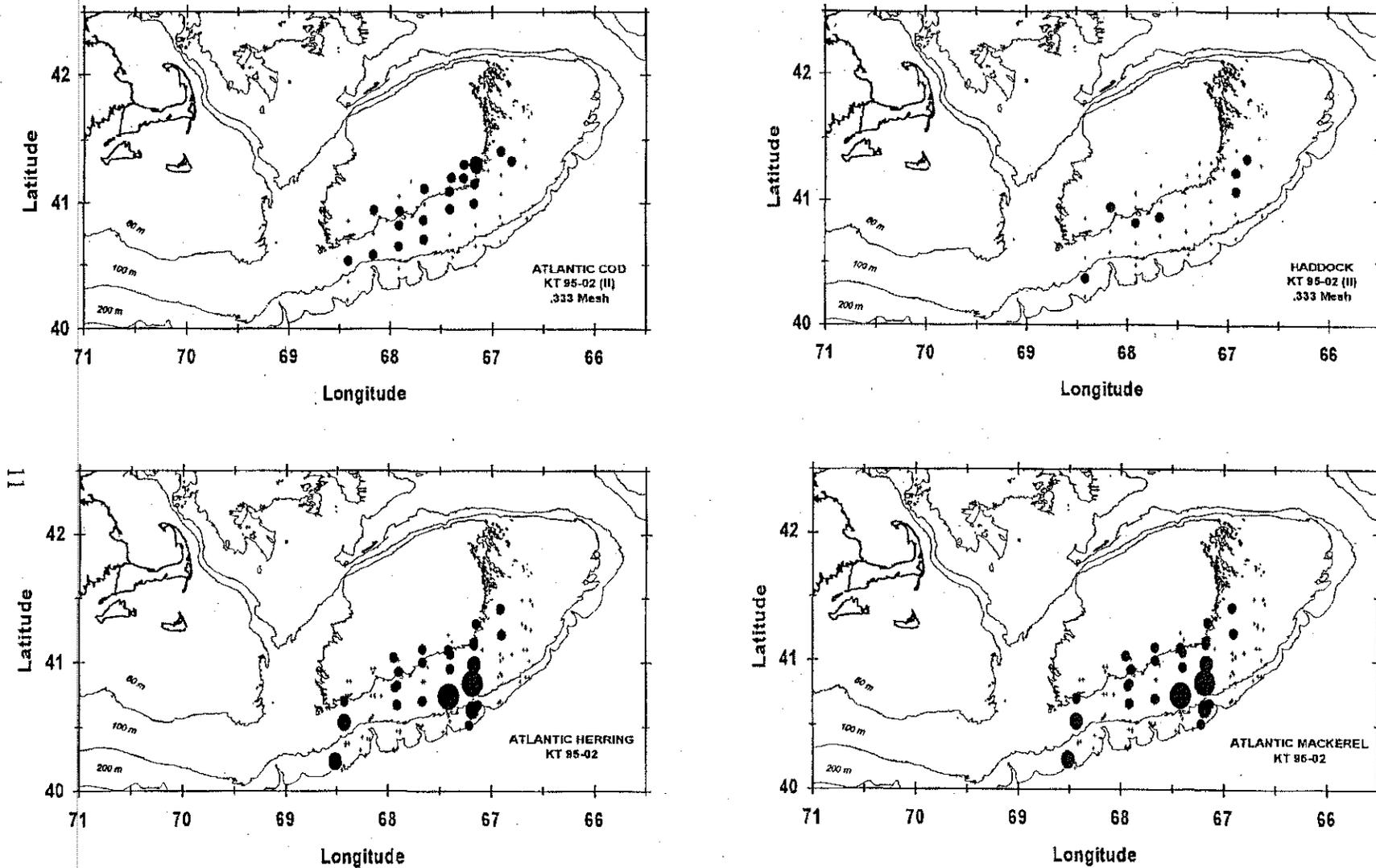


Figure 3. Distribution of larval Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, and potential predators, Atlantic herring, *Clupea harengus*, and Atlantic mackerel, *Scomber scombrus*, from the systematic grid survey during cruise KT 95-02. For illustrative purposes, only .333 mesh bongo data from Grid II are displayed.

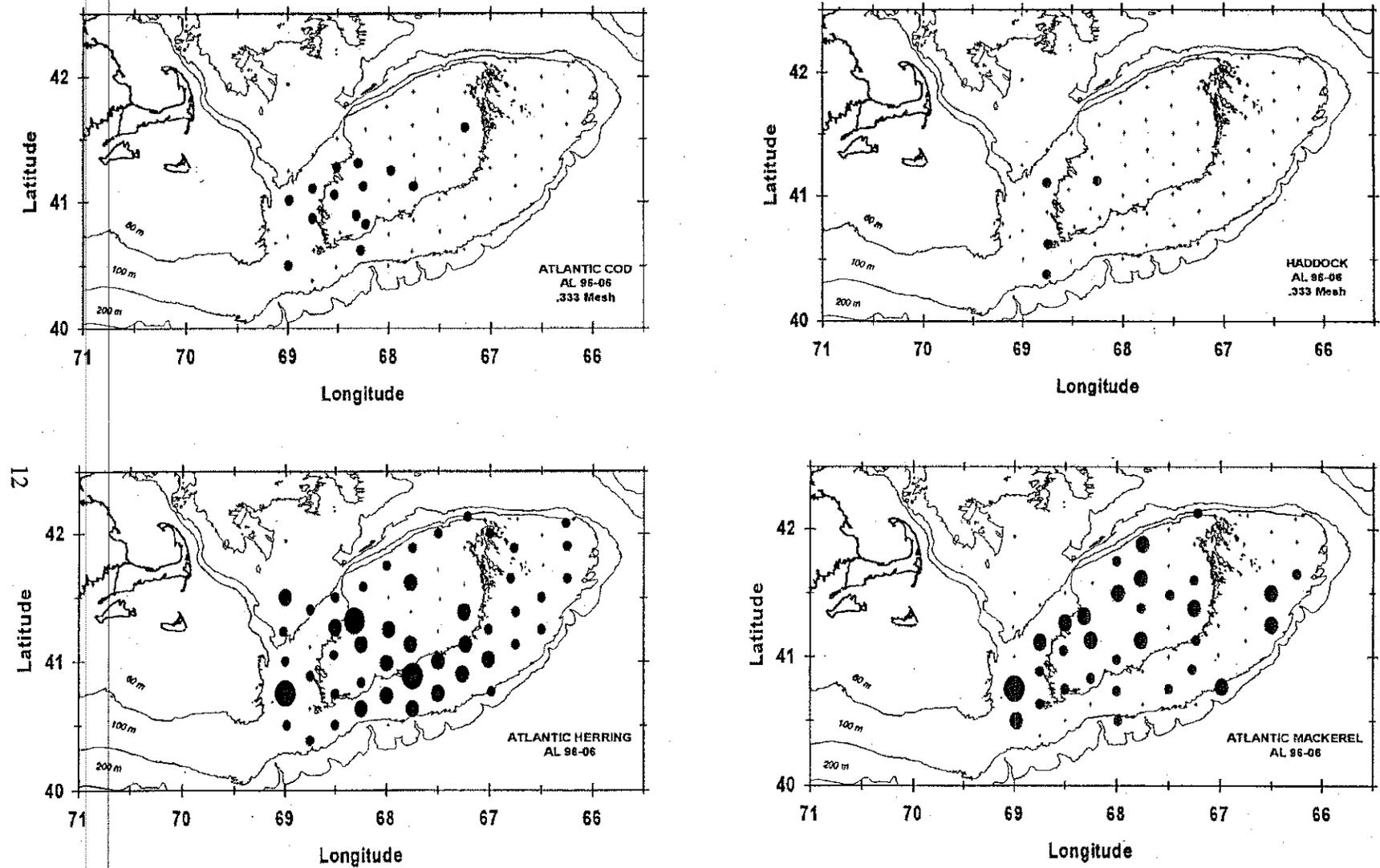


Figure 4. Distribution of larval Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, and potential predators, Atlantic herring, *Clupea harengus*, and Atlantic mackerel, *Scomber scombrus*, from the systematic grid survey during cruise AL 96-06. For illustrative purposes, only .333 mesh bongo data are displayed.

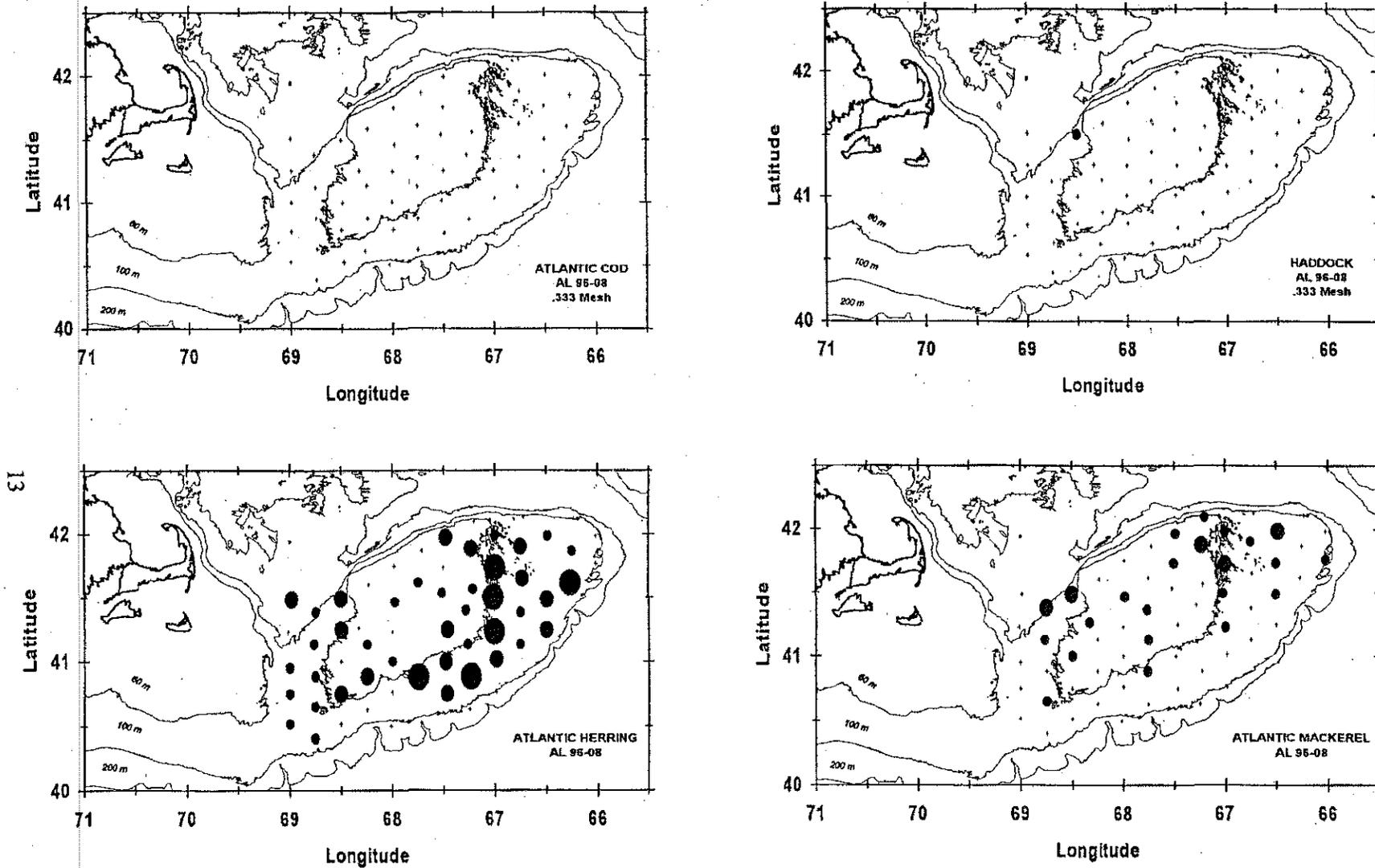


Figure 5 Distribution of larval Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, and potential predators, Atlantic herring, *Clupea harengus*, and Atlantic mackerel, *Scomber scombrus*, from the systematic grid survey during cruise AL 96-08. For illustrative purposes, only .333 mesh bongo data are displayed.

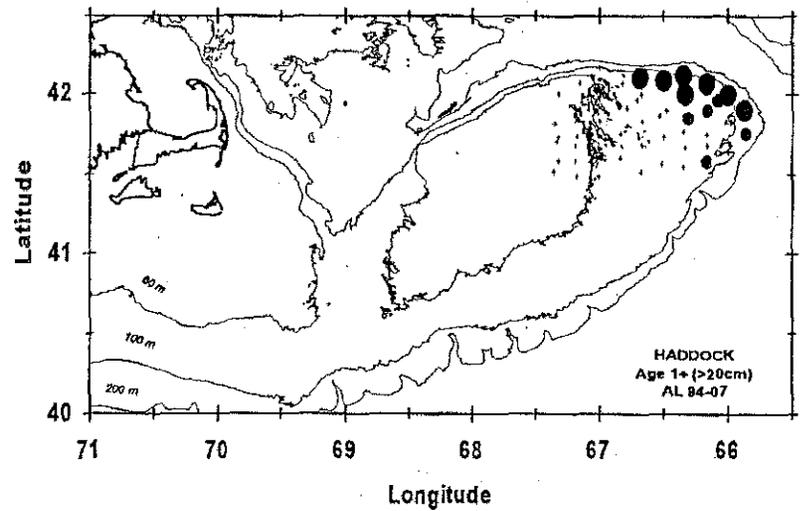
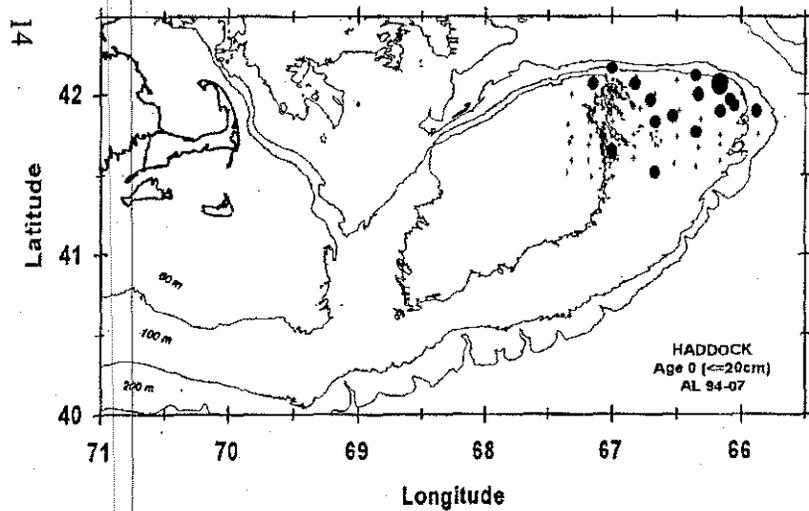
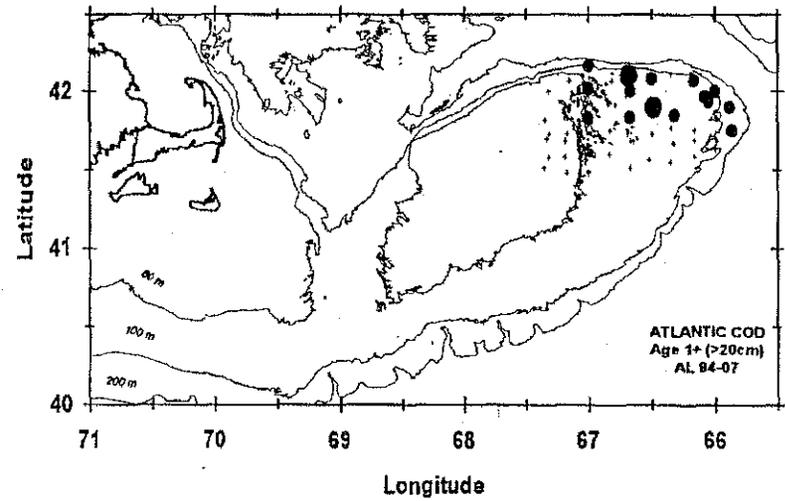
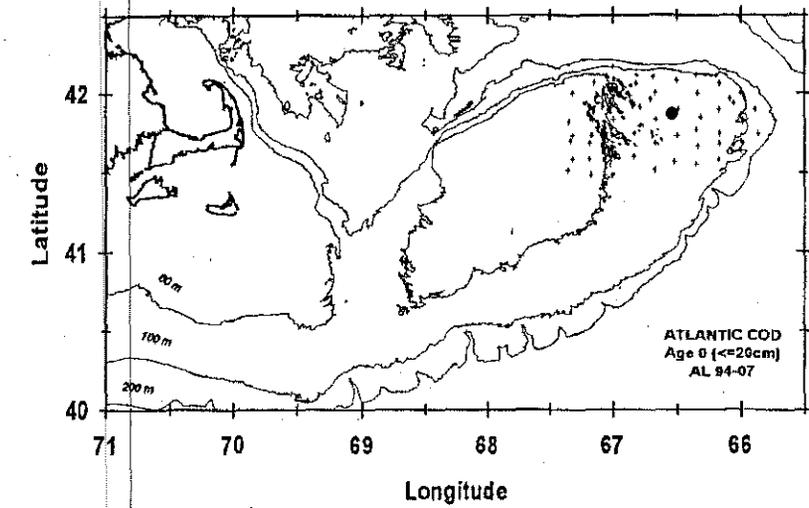


Figure 6. Distribution of Age 0 and 1+ Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, from the systematic grid survey during cruise AL 94-07.

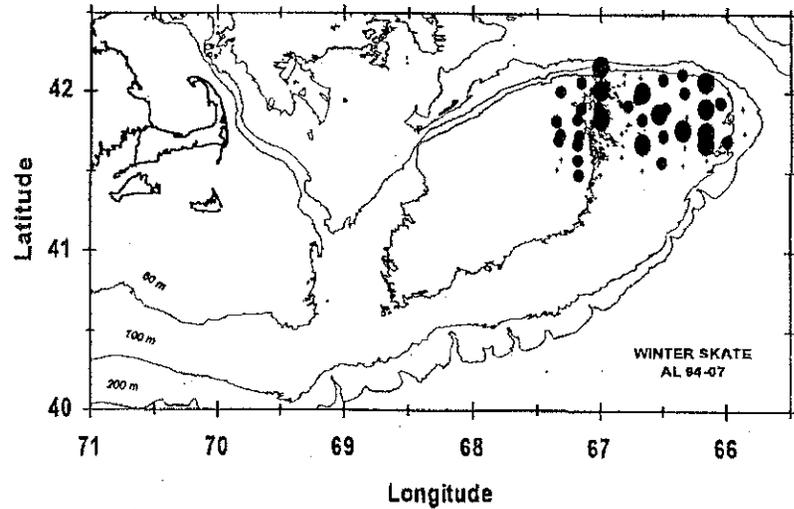
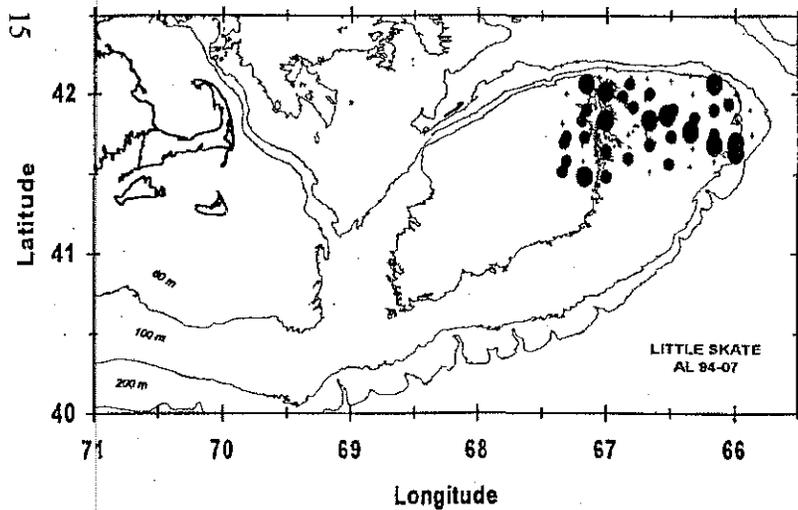
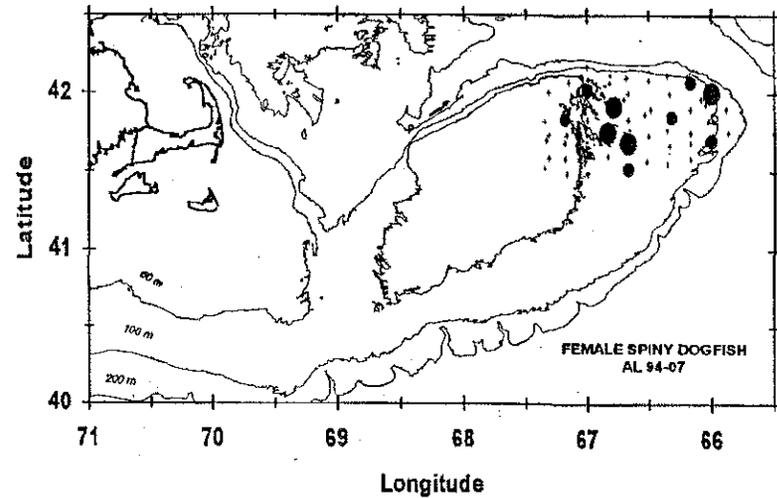
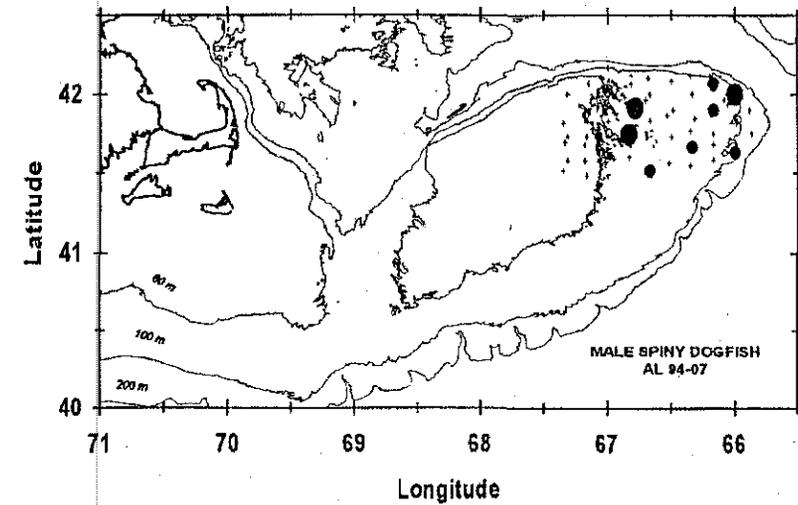


Figure 7. Distribution of spiny dogfish, *Squalus acanthias*, little skate, *Raja erinacea*, and winter skate, *Raja ocellata*, from the systematic grid survey during cruise AL 94-07.

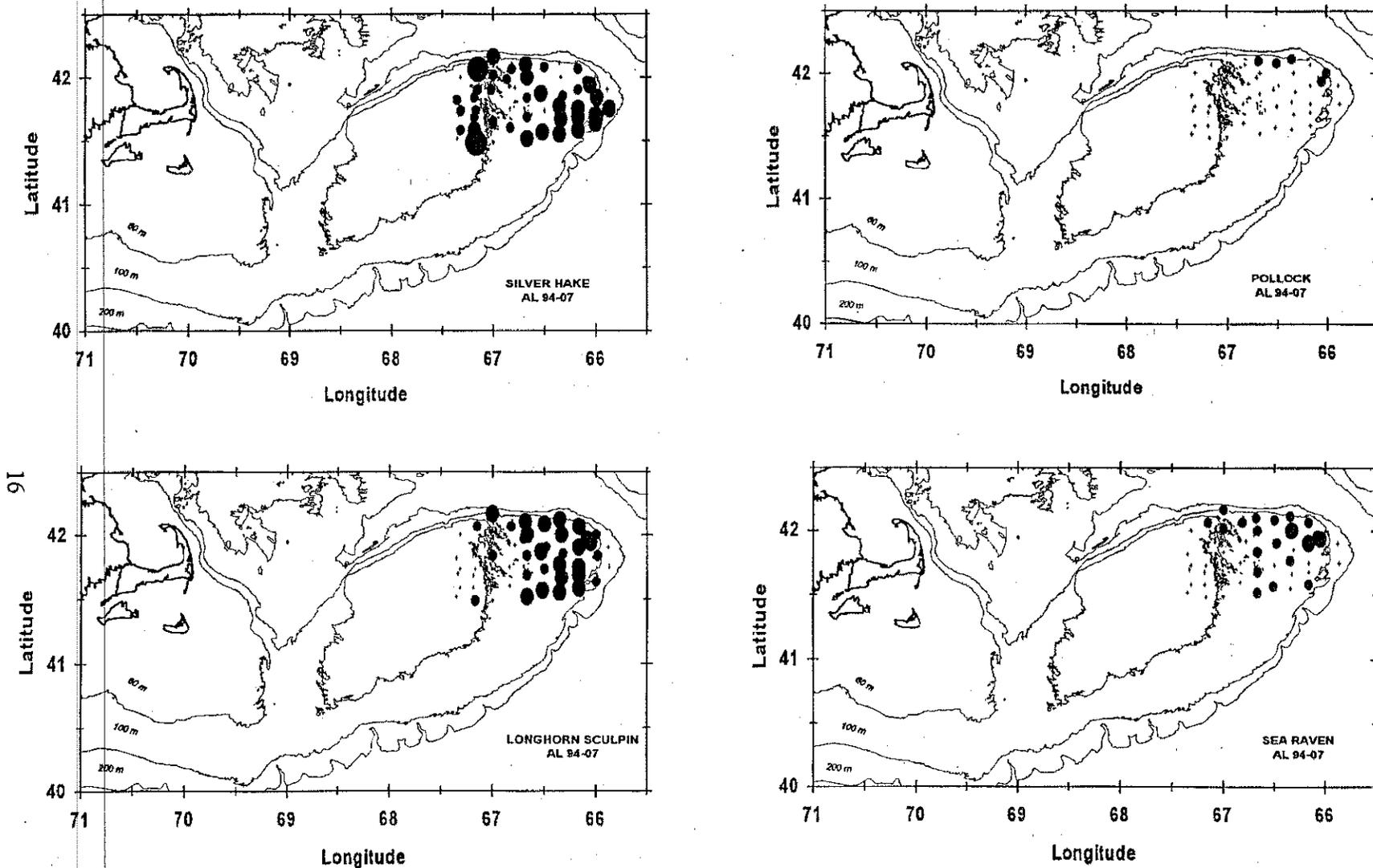


Figure 8. Distribution of silver hake, *Merluccius bilinearis*, pollock, *Pollachius virens*, longhorn sculpin, *Myoxocephalus octodecemspinosus*, and sea raven, *Hemirhamphus americanus*, from the systematic grid survey during cruise AL 94-07.

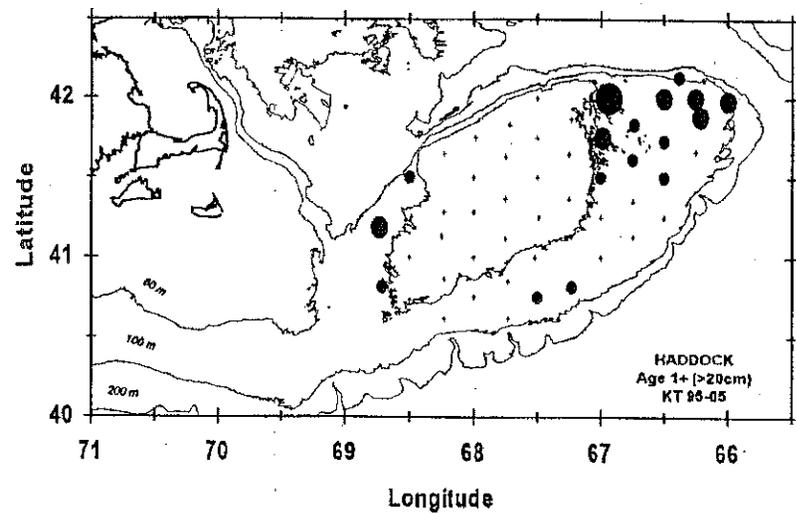
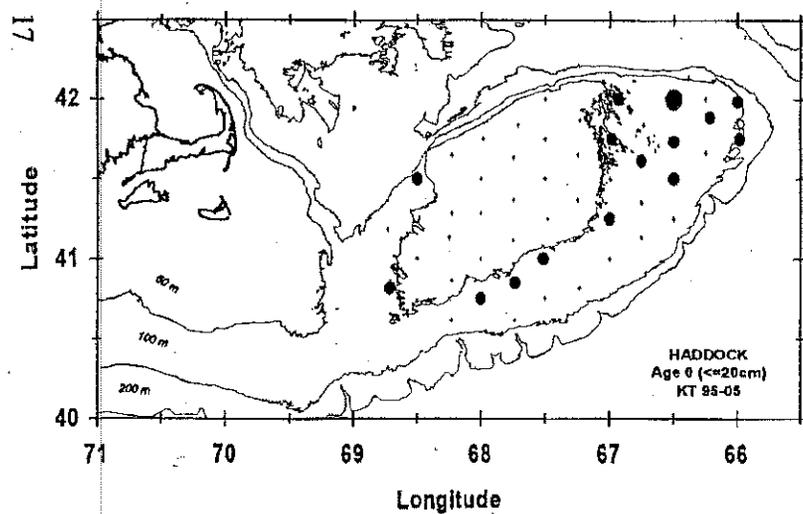
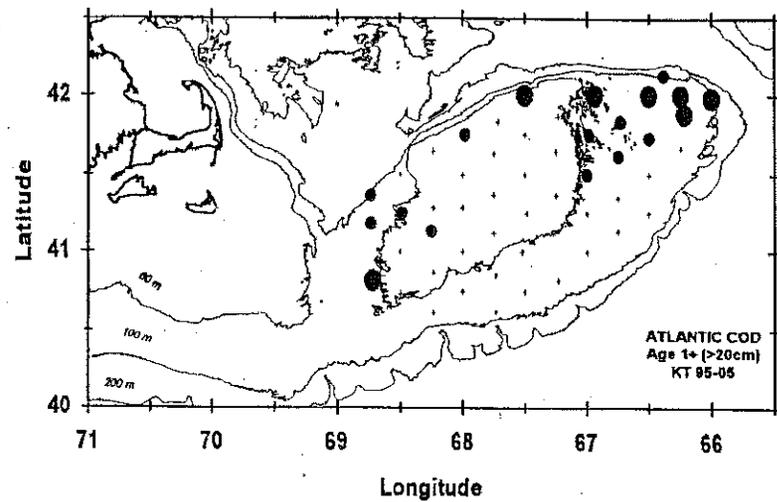
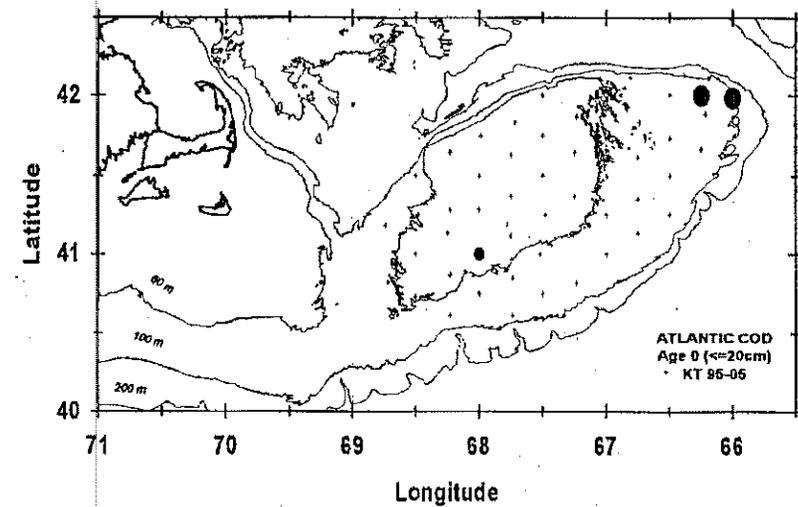


Figure 9. Distribution of Age 0 and 1+ Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, from the systematic grid survey during cruise KT 95-05.

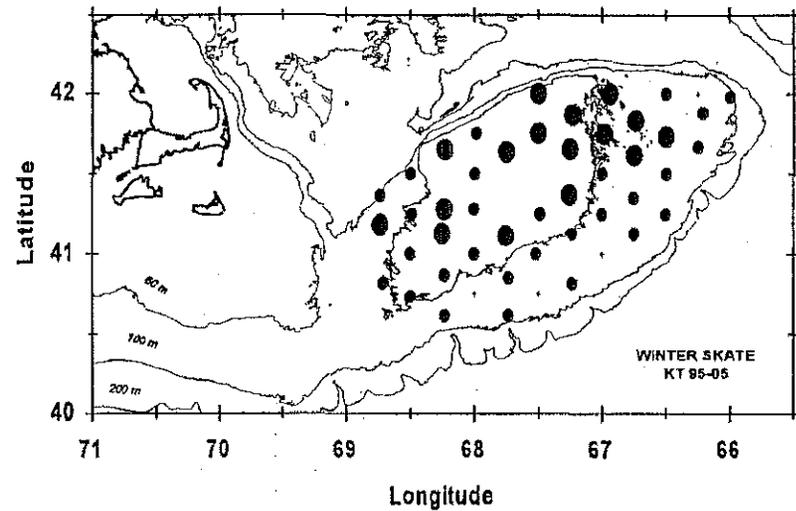
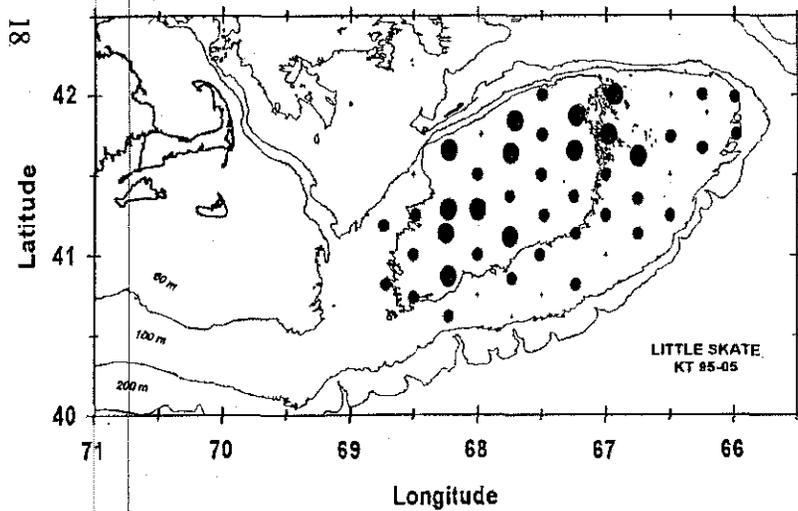
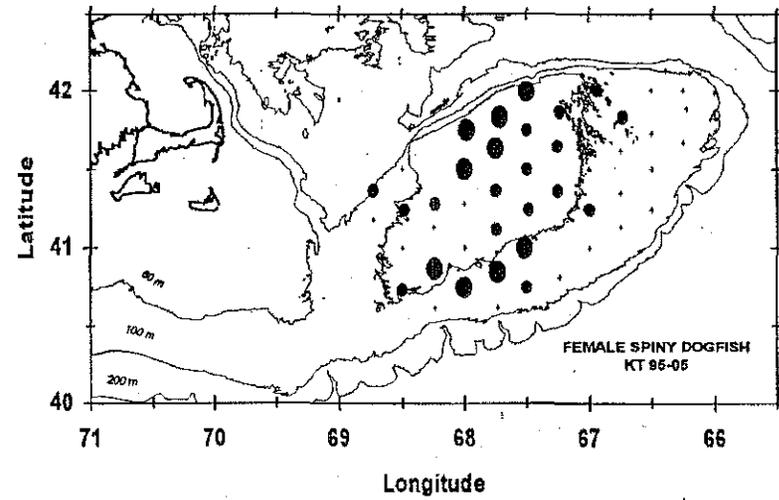
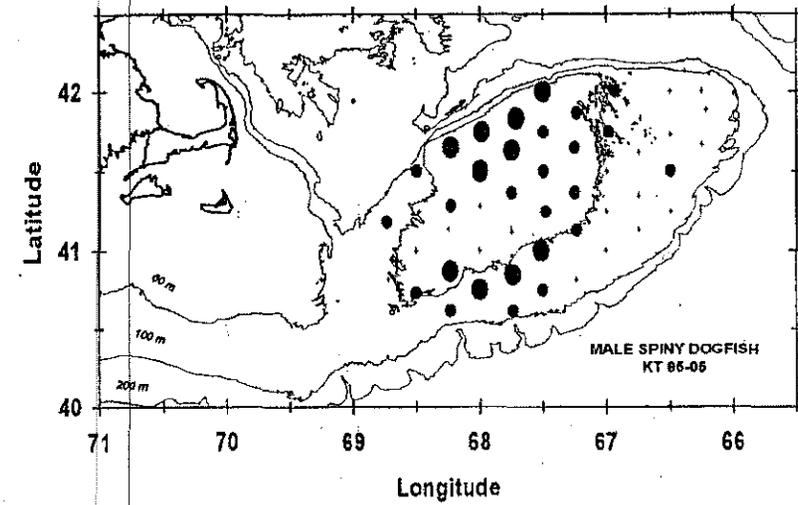


Figure 10. Distribution of spiny dogfish, *Squalus acanthias*, little skate, *Raja erinacea*, and winter skate, *Raja ocellata*, from the systematic grid survey during cruise KT 95-05.

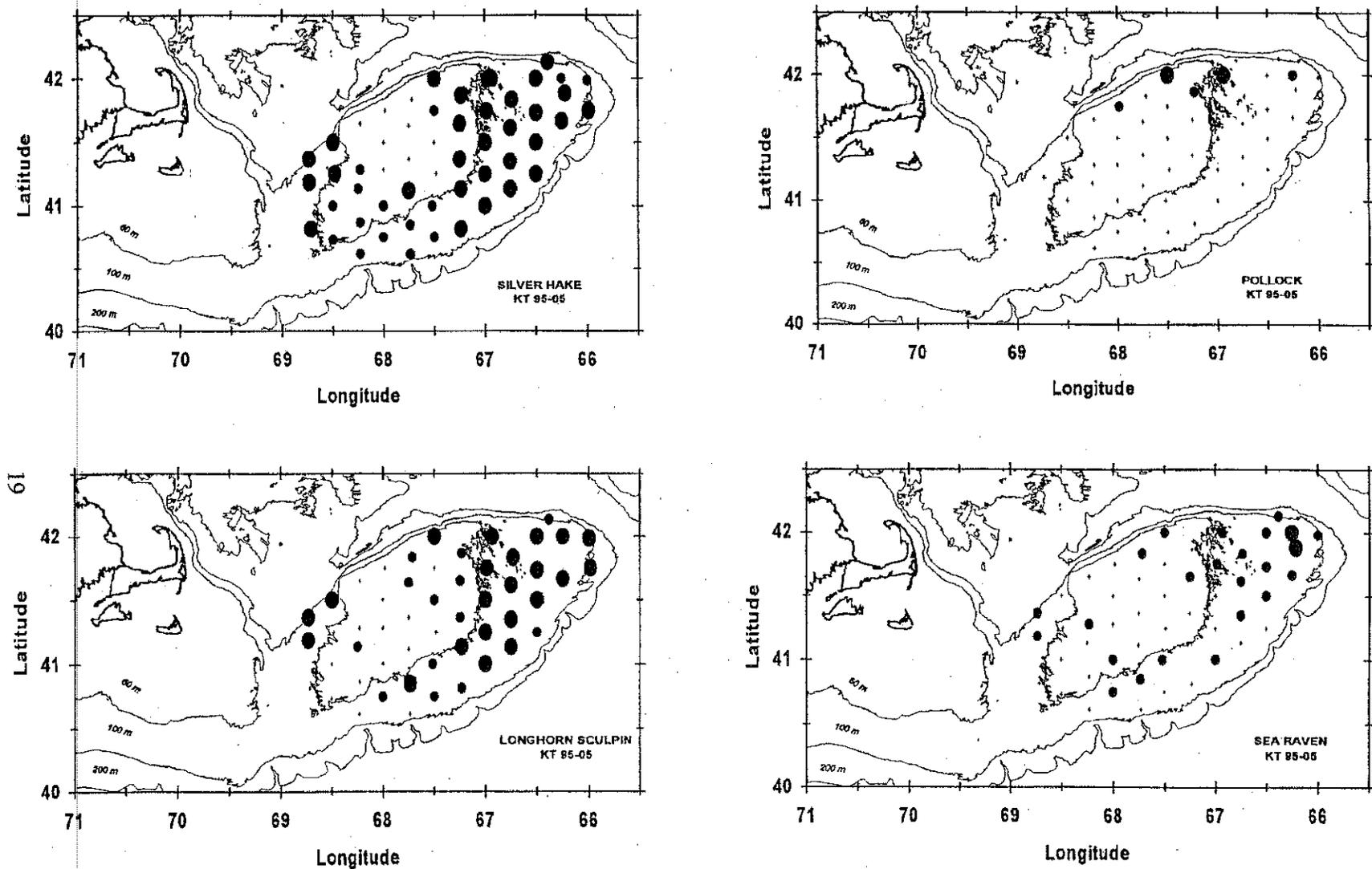


Figure 11. Distribution of silver hake, *Merluccius bilinearis*, pollock, *Pollachius virens*, longhorn sculpin, *Myxocephalus octodecemspinosus*, and sea raven, *Hemitripterus americanus*, from the systematic grid survey during cruise KT 95-05.

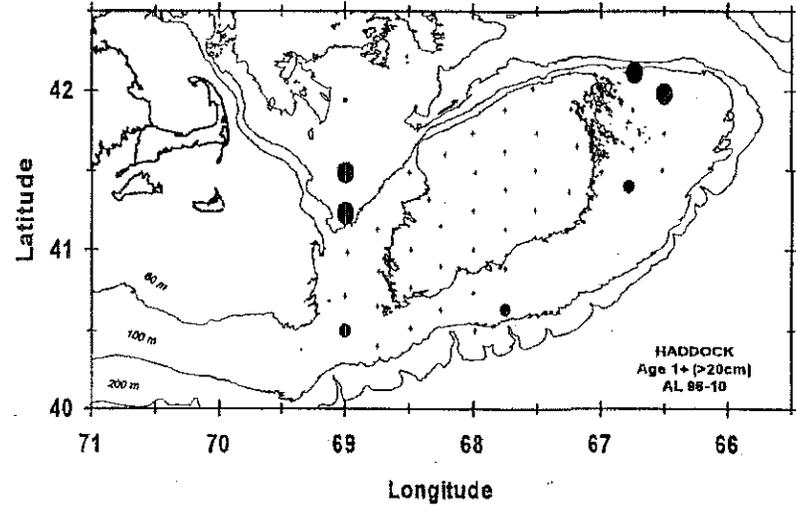
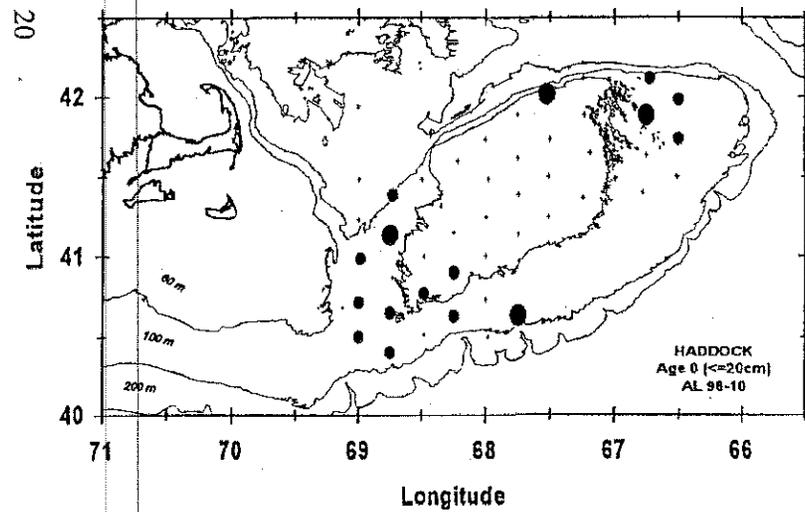
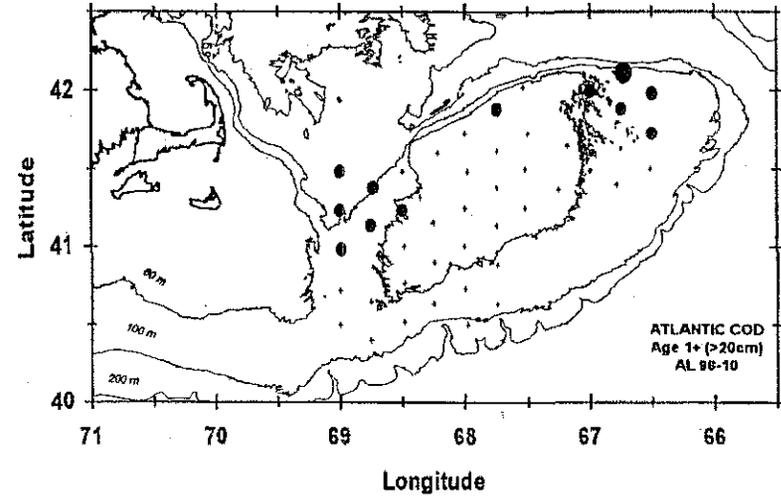
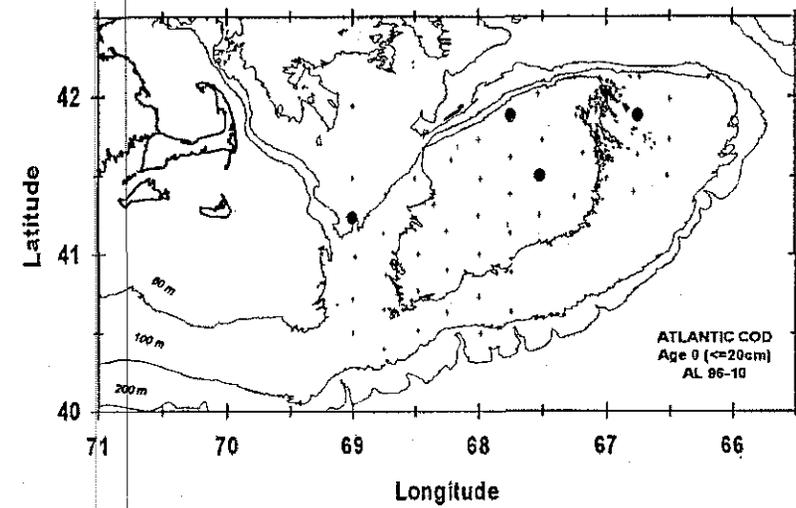


Figure 12. Distribution of Age 0 and 1+ Atlantic cod, *Gadus morhua*, and haddock, *Melanogrammus aeglefinus*, from the systematic grid survey during cruise AL 96-10.

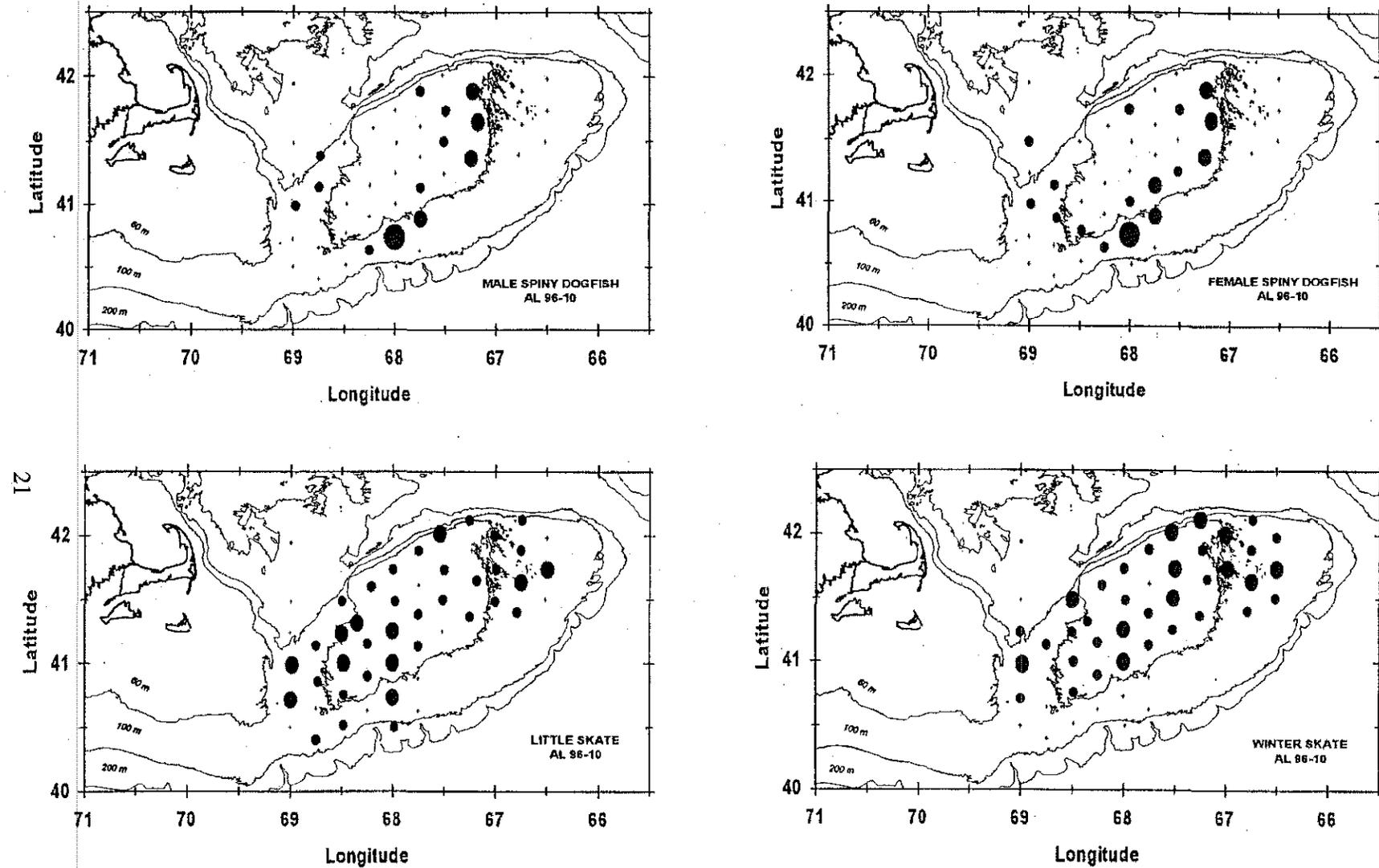


Figure 13. Distribution of spiny dogfish, *Squalus acanthias*, little skate, *Raja erinacea*, and winter skate, *Raja ocellata*, from the systematic grid survey during cruise AL 96-10.

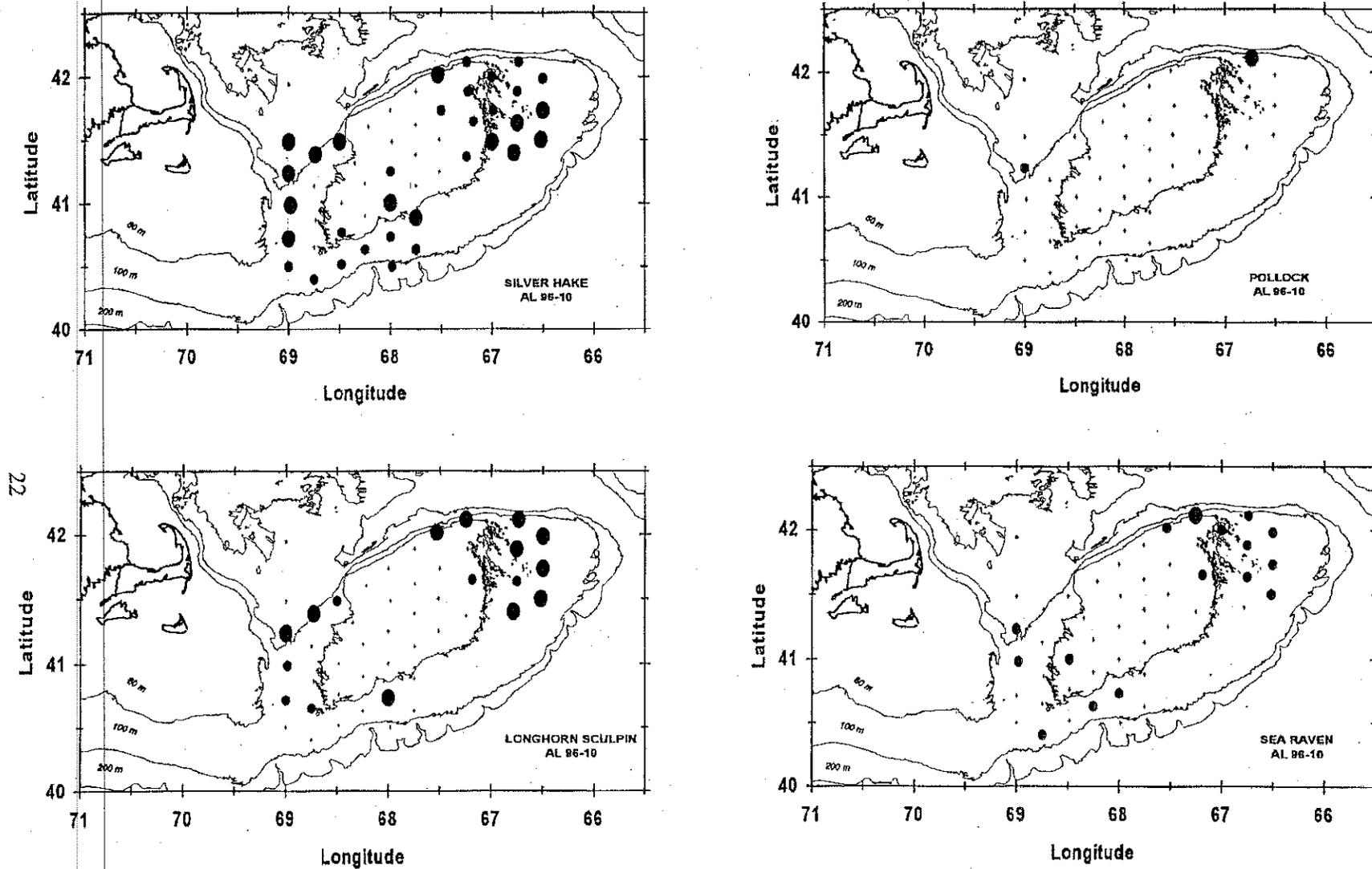
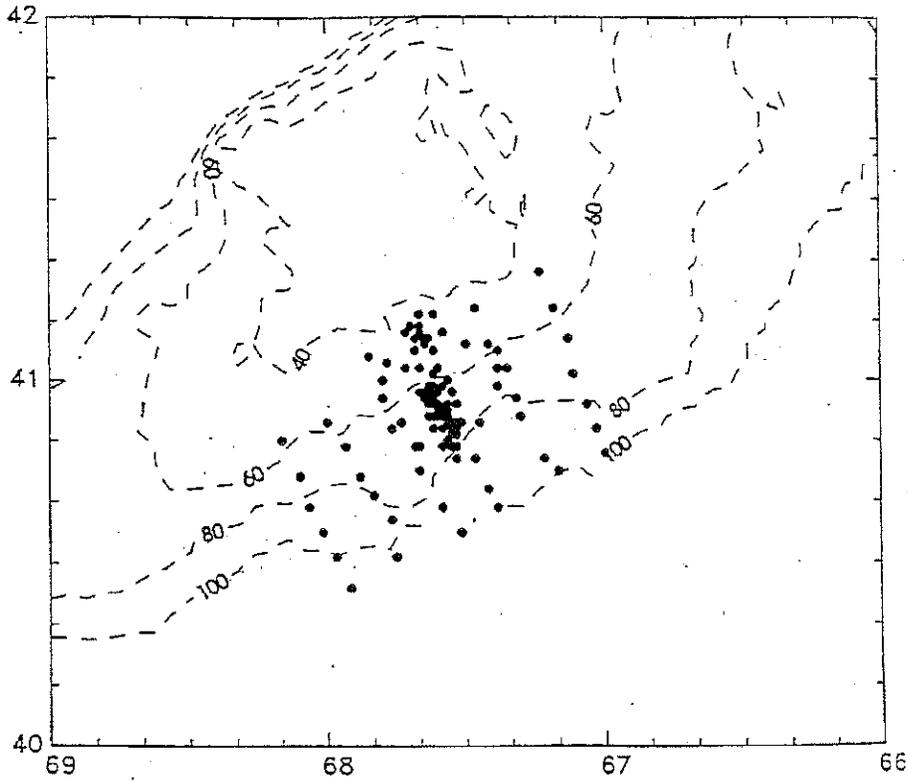


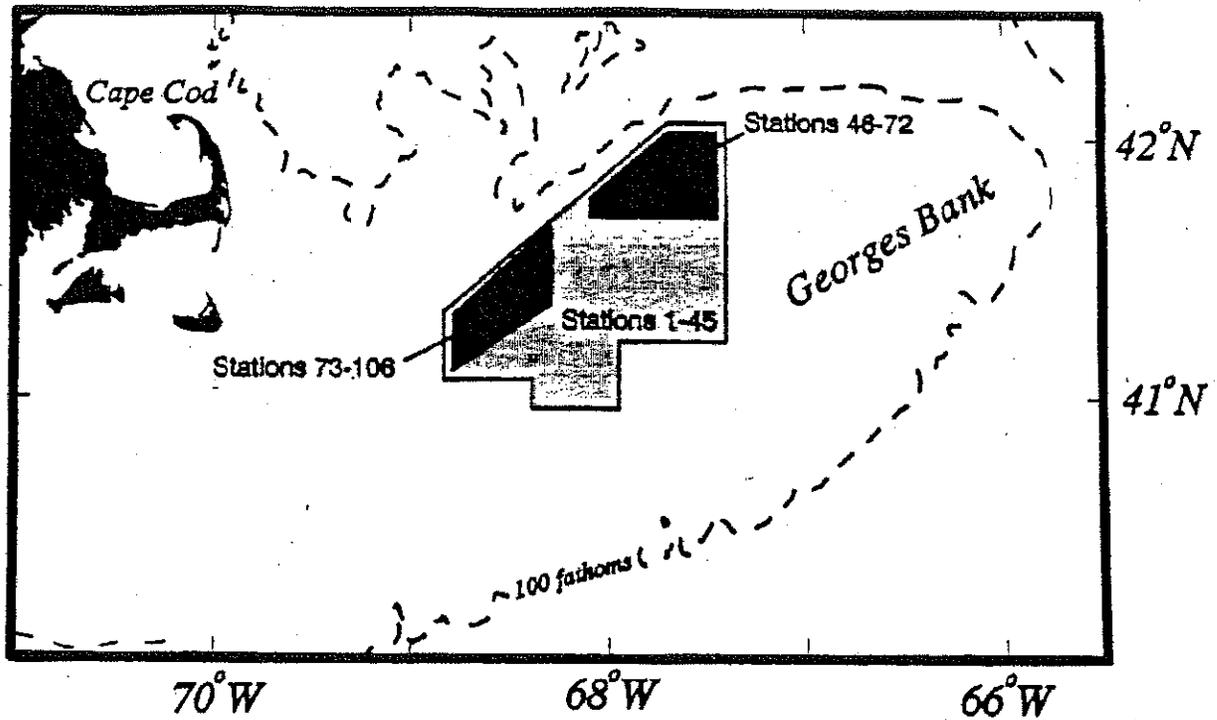
Figure 14. Distribution of silver hake, *Merluccius bilinearis*, pollock, *Pollachius virens*, longhorn sculpin, *Myxocephalus octodecemspinosus*, and sea raven, *Hemitripterus americanus*, from the systematic grid survey during cruise AL 96-10.

Appendix I

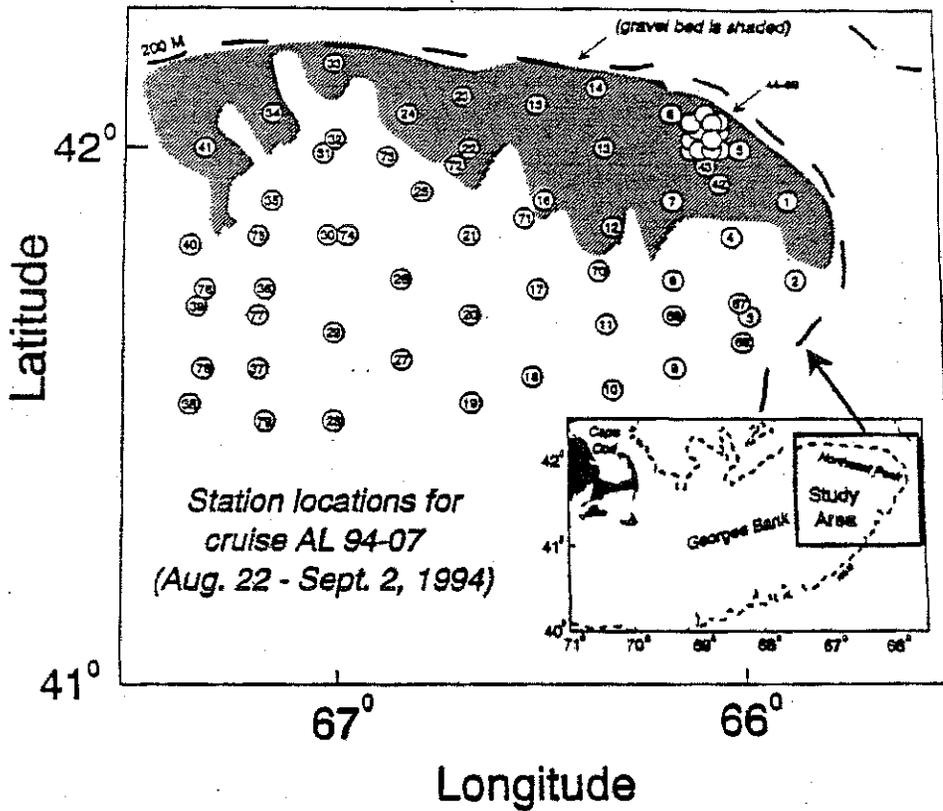
Station locations, sampling sites, and cruise tracks from COP funded process-oriented cruises during 1994-96



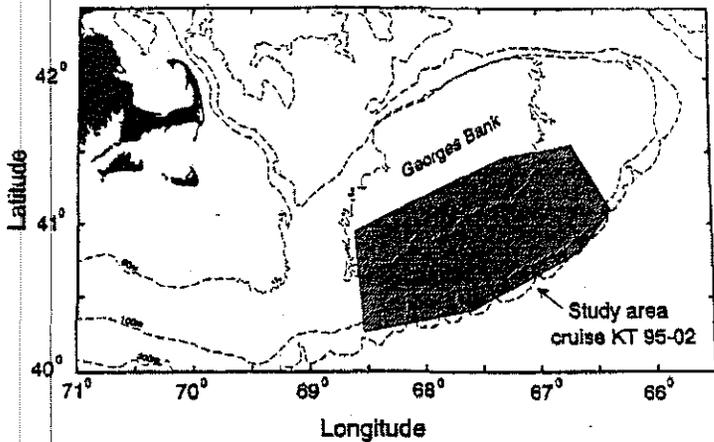
Station locations of systematic survey and site-specific sampling during Cruise DE 94-04.



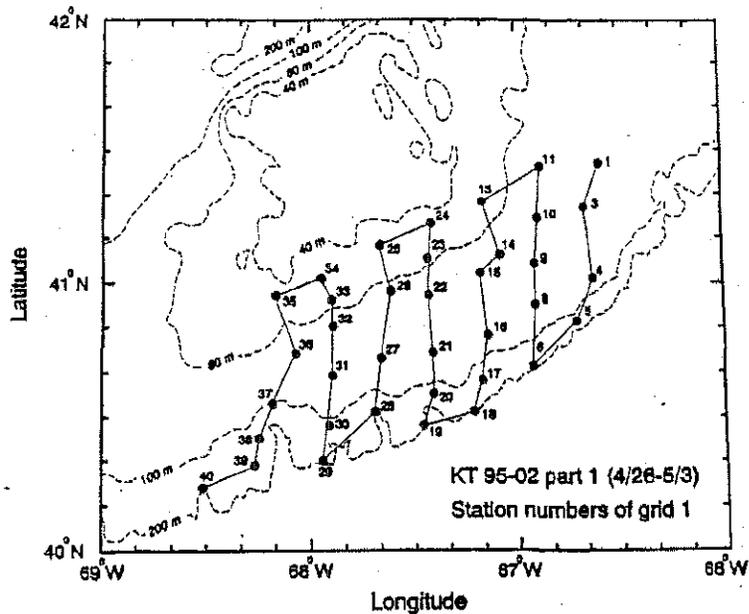
Study area of systematic survey and fine-scale grid sampled during Cruise DE 94-06.



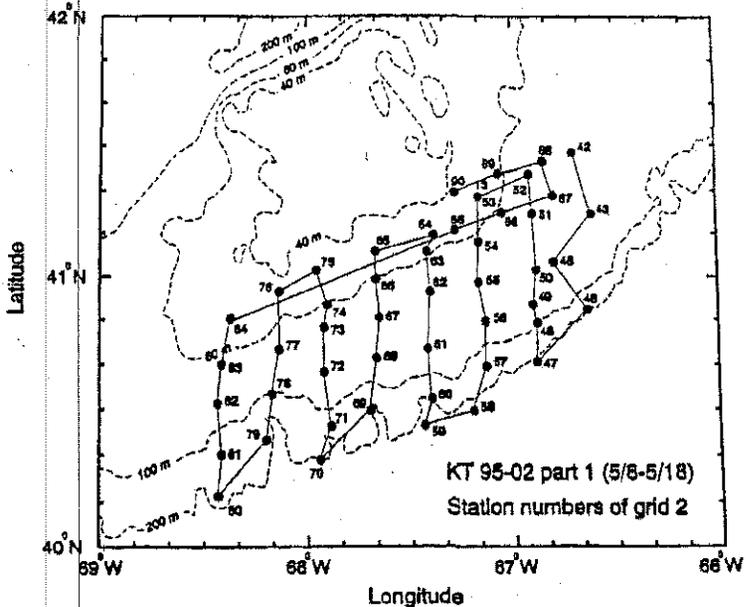
Station locations of systematic survey and site-specific sampling during Cruise AL 94-07.



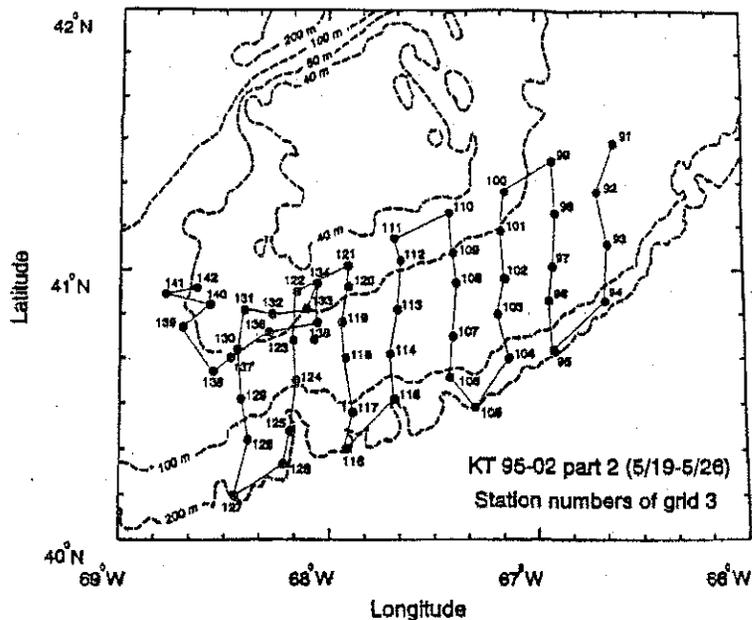
Study area and station locations of grid surveys during Cruise KT 95-02.



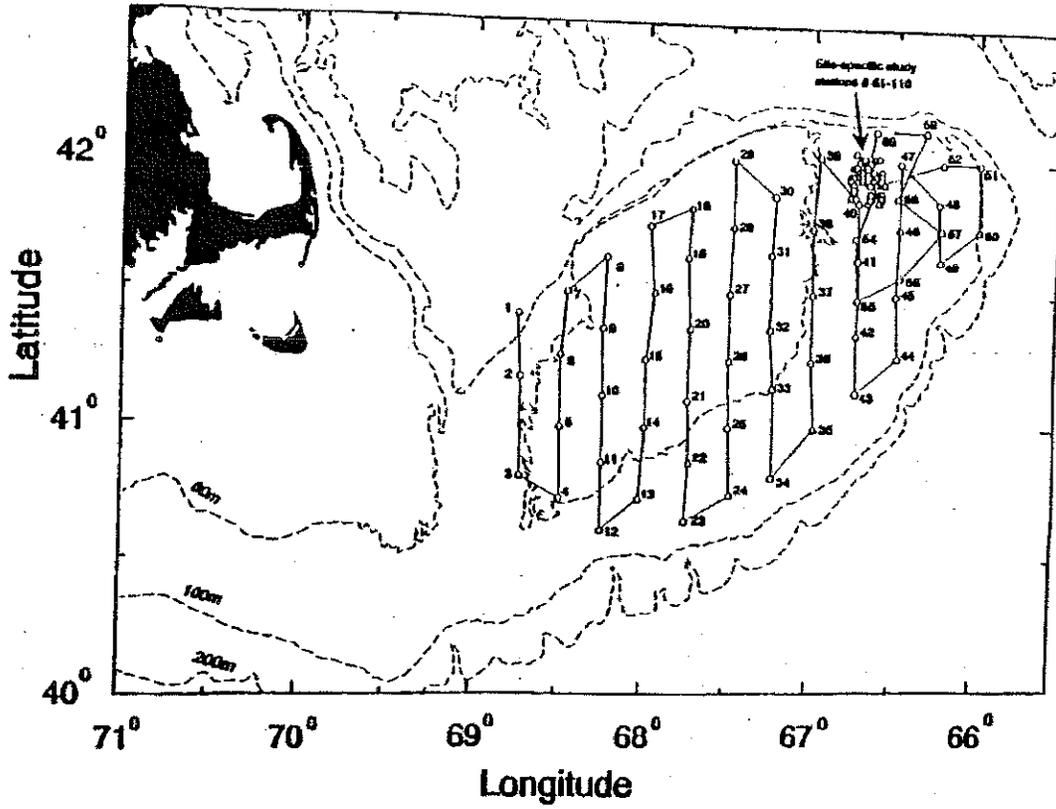
KT 95-02 part 1 (4/28-5/3)
Station numbers of grid 1



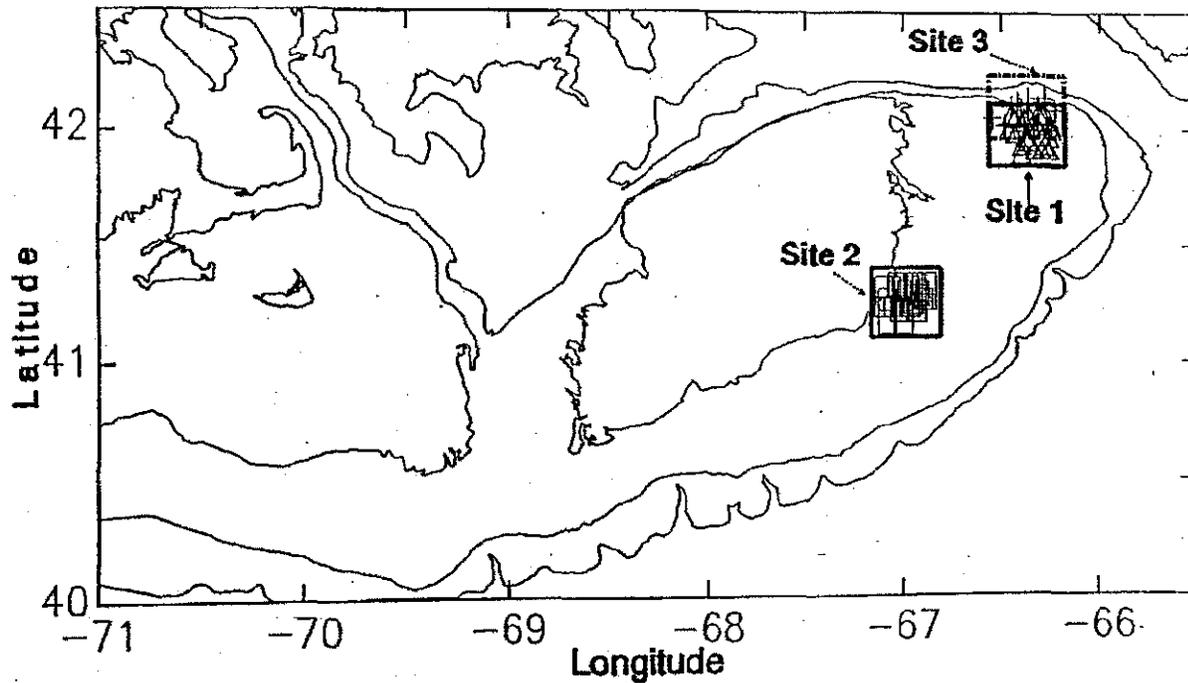
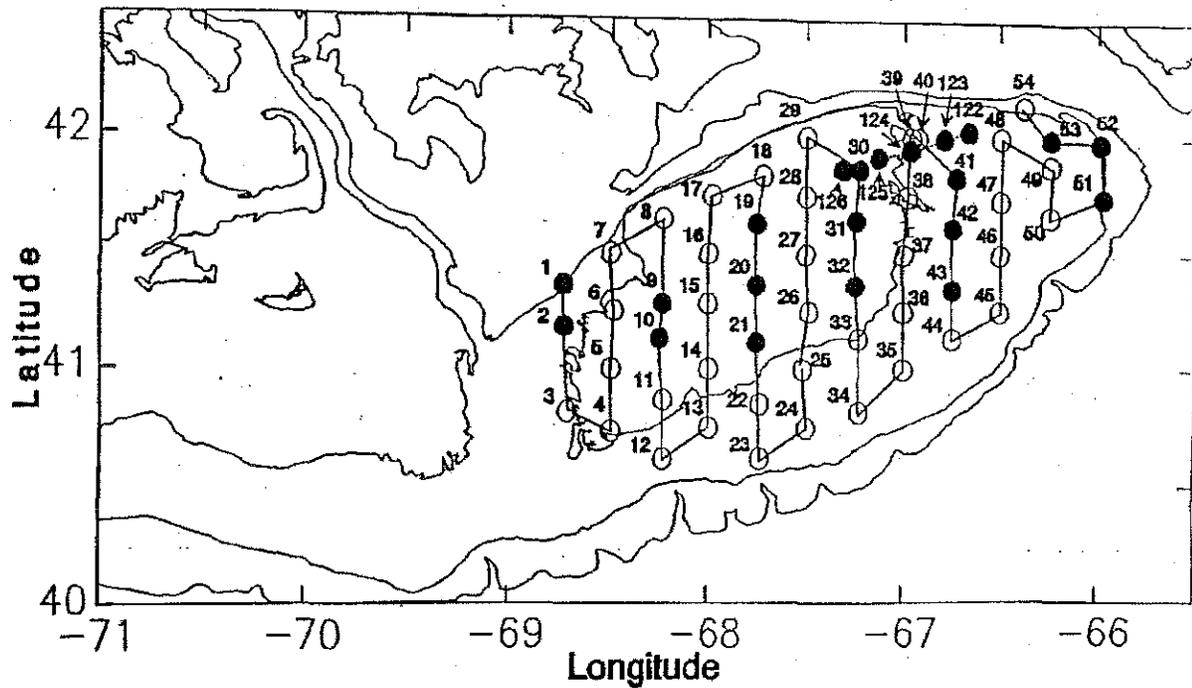
KT 95-02 part 1 (5/8-5/18)
Station numbers of grid 2



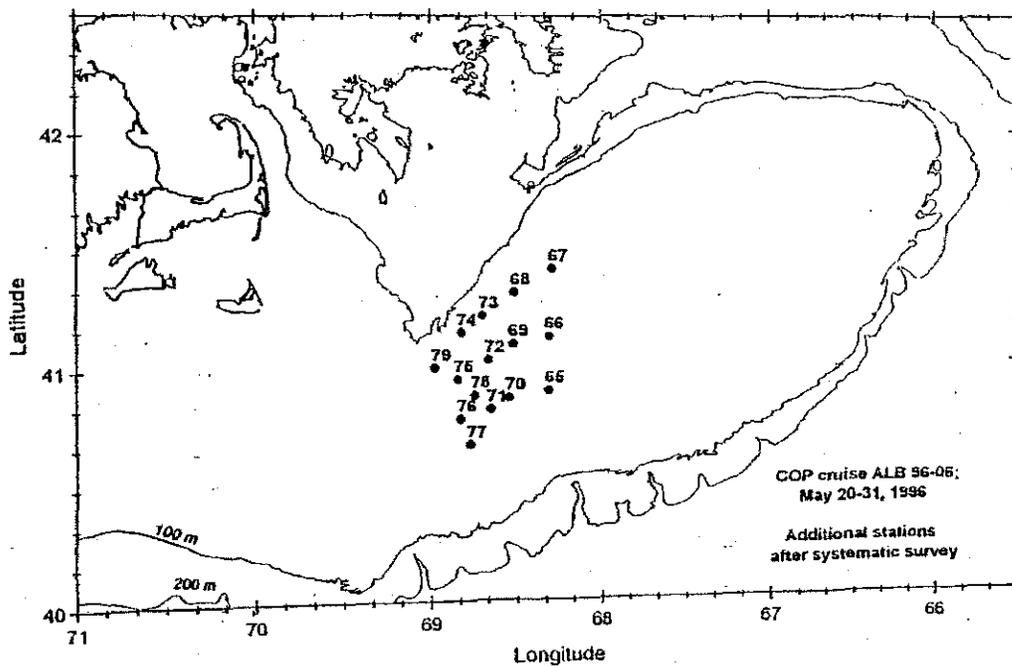
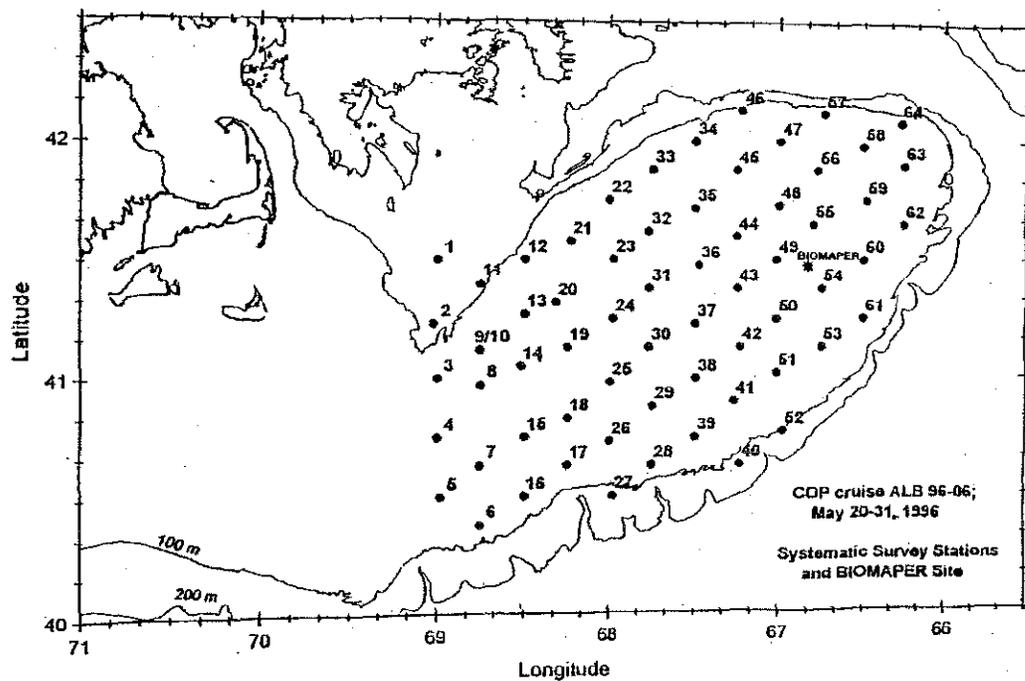
KT 95-02 part 2 (5/19-5/26)
Station numbers of grid 3



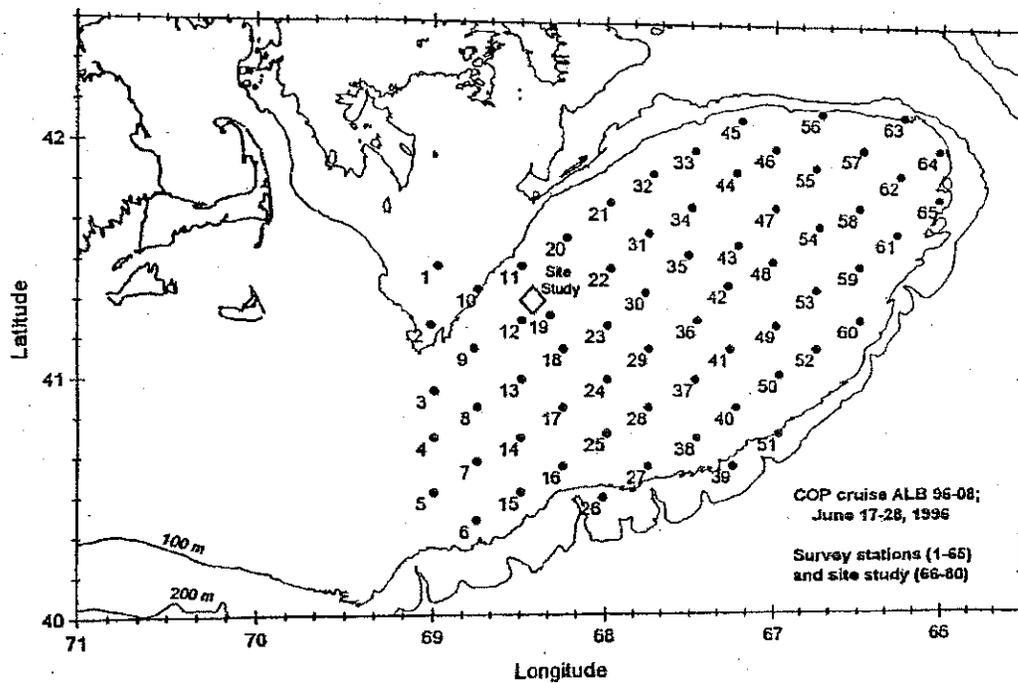
Station locations of systematic survey and site-specific sampling during Cruise KT 95-04.



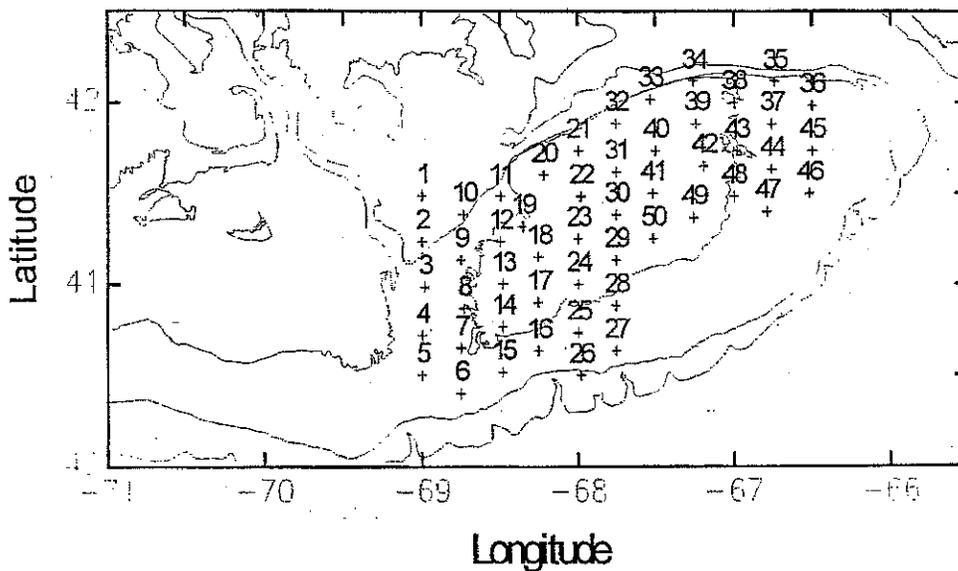
Station locations of systematic survey (top) and site-specific (bottom) sampling during Cruise KT 95-05. Open and solid symbols represent stations occupied during day and night, respectively.



Station locations of systematic survey (top) and site-specific (bottom) sampling during Cruise AL 96-06.



Station locations of systematic survey sampling during Cruise AL 96-08.



Station locations of systematic survey and site-specific sampling during Cruise AL 96-10.

Appendix II

**Summary of sample collections from COP funded process-oriented
cruises during 1994-96**

Table AII-1. Number of stomach content samples collected during R/V Delaware II cruise DE 94-04.

Species	Preserved ¹	Examined	Total	DNA
Alewife	38	30	68	27
Atlantic cod	0	3	3	0
Atlantic herring	260	289	549	215
Atlantic mackerel	2	25	247	203
Blueback herring	6	1	7	5
Butterfish	27	43	70	11
Fourspot flounder	0	28	28	0
<i>Illex</i> squid	105	297	402	33
<i>Loligo</i> squid	38	200	238	13
Monkfish	0	4	4	0
Pollock	0	1	1	0
Silver hake	0	37	637	0
Spiny dogfish	0	430	430	0
Windowpane flounder	6	19	25	0
Total	702	2007	2709	507

¹Column heading descriptions:

Preserved: Number of stomach samples preserved at sea for later laboratory processing.

Examined: Number of stomach samples processed at sea.

Total: Preserved+Examined

DNA: Number of samples collected to test for presence of cod or haddock in partially or well digested stomach content samples.

Table AII-2. Number of stomach content samples collected during R/V Delaware II cruise DE 94-06.

Species	Preserved	Examined	Total	DNA
Alewife	33	24	57	0
American sand lance	1	0	1	0
Atlantic herring	160	164	324	48
Atlantic cod	1	1059	1060	5
Atlantic mackerel	30	19	49	24
Bluefish	0	4	4	0
Butterfish	13	20	33	14
Cunner	0	1	1	0
Fourspot flounder	2	2	4	4
<i>Illex</i> squid	124	181	305	36
Little skate	1	81	82	0
<i>Loligo</i> squid	93	163	256	28
Longhorn sculpin	2	29	31	5
Pollock	5	23	28	5
Red hake	1	43	44	0
Sea raven	0	6	6	7
Silver hake	9	340	349	5
Spiny dogfish	0	575	575	0
White hake	0	30	30	0
Windowpane flounder	22	99	121	11
Winter skate	5	100	105	0
Total	502	1981	2483	192

Table AII-3. Number of stomach content samples collected during R/V Albatross IV cruise AL 94-07.

Species	Preserved	Examined	Total	DNA
American plaice	0	1	1	0
Atlantic mackerel	2	77	79	0
Atlantic halibut	0	2	2	0
Atlantic herring	0	13	13	0
Atlantic cod	167	3	170	2
Bluefish	0	6	6	0
Cunner	0	2	2	0
Fourspot flounder	80	2	82	0
<i>Illex</i> squid	85	65	150	1
Little skate	130	19	149	1
<i>Loligo</i> squid	33	37	70	2
Longhorn sculpin	0	220	220	1
Monkfish	0	4	4	0
Pollock	3	72	75	0
Red hake	0	59	59	1
Sea raven	7	115	122	3
Silver hake	103	78	181	0
Spiny dogfish	31	22	53	0
Thorny skate	33	44	77	1
White hake	0	11	11	1
Windowpane flounder	0	61	61	1
Winter skate	146	31	177	0
Total	820	964	1784	14

Table AII-4. Number of stomach content samples collected during NOAA Charter Vessel KATAHDIN cruise KT 95-02.

Species	Preserved	Examined	Total	DNA
Alewife	25	5	30	22
American shad	2	0	2	4
Atlantic herring	218	165	383	220
Atlantic mackerel	104	15	119	193
Blueback herring	12	4	16	10
Butterfish	98	55	153	92
Fourspot flounder	0	2	2	0
Haddock	5	4	9	0
<i>Illex</i> squid	223	256	479	236
Little skate	1	3	4	0
<i>Loligo</i> squid	137	273	410	178
Longhorn sculpin	8	9	17	2
Monkfish	31	38	69	46
Red hake	2	2	4	4
Silver hake	179	169	348	34
Spiny dogfish	109	51	160	60
Spotted hake	1	1	2	0
Windowpane flounder	0	13	13	0
Winter skate	2	1	3	0
Total	1065	1157	2222	1099

Table AII-5. Number of stomach content samples collected during NOAA Charter Vessel KATAHDIN cruise KT 95-04.

Species	Preserved	Examined	Total	DNA
Alewife	2	3	5	0
Atlantic cod	177	17	194	4
Atlantic herring	149	95	244	3
Atlantic mackerel	63	23	86	1
Fourspot flounder	7	8	15	1
Haddock	67	14	81	0
<i>Illex</i> squid	28	220	248	5
Little skate	185	20	205	2
<i>Loligo</i> squid	51	147	198	5
Longhorn sculpin	155	58	213	29
Monkfish	2	2	4	1
Pollock	32	4	36	9
Red hake	19	4	23	0
Sand lance	40	0	40	0
Sea raven	65	34	99	15
Silver hake	134	130	264	5
Spiny dogfish	172	150	322	1
Thorny skate	3	0	3	0
White hake	1	0	1	0
Windowpane flounder	1	0	1	1
Winter skate	218	39	257	10
Yellowtail flounder	0	1	1	0
Total	1571	969	2540	92

Table AII-6. Number of stomach content samples collected during NOAA Charter Vessel KATAHDIN cruise KT 95-05.

Species	Preserved	Examined	Total	DNA
American plaice	0	2	2	0
American shad	0	1	1	0
Atlantic halibut	1	0	1	0
Atlantic cod	212	36	248	26
Atlantic herring	50	180	230	0
Atlantic mackerel	20	27	47	2
Bluefish	0	1	1	0
Butterfish	26	2	28	0
Fourspot flounder	18	10	28	0
Haddock	149	25	174	0
<i>Illex</i> squid	34	79	113	0
Little skate	174	17	191	0
<i>Loligo</i> squid	40	92	132	0
Longhorn sculpin	201	40	241	0
Monkfish	9	2	11	0
Northern searobin	1	0	1	0
Pollock	47	6	53	3
Red hake	150	39	189	1
Sea raven	145	136	281	22
Silver hake	354	275	629	6
Spiny dogfish	211	40	252	10
Thorny skate	8	0	8	0
White hake	6	0	6	1
Windowpane flounder	10	5	15	0
Winter skate	367	28	395	10
Total	2233	1044	3277	81

Table AII-7. Number of stomach content samples collected during R/V Albatross IV cruise AL 96-06.

Species	Preserved	Examined	Total	DNA
American plaice	0	2	0	0
Atlantic wolffish	0	1	1	0
Atlantic cod	5	158	163	23
Atlantic mackerel	129	86	215	115
Atlantic herring	151	219	370	111
Butterfish	6	4	10	0
Fourspot flounder	0	33	33	0
Haddock	0	11	11	0
<i>Illex</i> squid	46	96	142	41
<i>Loligo</i> squid	31	87	118	23
Northern searobin	0	1	1	0
Pollock	0	12	12	3
Silver hake	1	165	166	10
Spiny dogfish	11	186	197	0
Windowpane flounder	0	55	55	1
Total	380	1077	1496	340

Table AII-8. Number of stomach content samples collected during R/V Albatross IV cruise AL 96-08.

Species	Preserved	Examined	Total	DNA
Atlantic cod	2	108	110	2
Fourspot flounder	1	97	97	1
Little skate	0	2	2	0
Longhorn sculpin	1	230	231	1
Monkfish	0	5	5	0
Sea raven	4	126	130	4
Silver hake	3	317	320	4
Spiny dogfish	2	284	286	2
Winter skate	1	226	227	1
Total	11	1395	1408	15

Table AII-9. Number of stomach content samples collected during R/V Albatross IV cruise AL 96-10.

Species	Preserved	Examined	Total	DNA
Atlantic cod	0	69	69	0
Bluefish	0	6	6	1
Fourspot flounder	2	83	85	2
<i>Illex</i> squid	0	173	173	0
Little skate	0	7	7	0
<i>Loligo</i> squid	1	128	129	1
Longhorn sculpin	0	101	101	1
Monkfish	0	4	4	0
Pollock	0	1	1	0
Red hake	5	112	117	2
Sea raven	0	42	42	1
Silver hake	0	145	145	1
Smooth dogfish	0	6	6	0
Spiny dogfish	11	130	141	5
Summer flounder	0	1	1	0
Thorny skate	0	15	15	0
White hake	0	1	1	0
Windowpane flounder	0	112	112	0
Winter skate	5	286	291	2
Wolffish	0	1	1	0
Total	24	1423	1447	16

Appendix III

Station specific information including cruise number (and code), station type, trawl and other gear used, date, time, and location for each sampling site occupied during COP funded process-oriented cruises during 1994-96. Descriptions of codes used in the following tables are provided below.

Station Type:

- 6 Site-specific
- 7 Systematic Grid

Trawl Gear:

- Y36 Standard NEFSC Yankee 36 Bottom Trawl
- SHU Shuman (Series 68x354 cm) Midwater Trawl

Other Gear:

- B Twin 61 cm Bongo sampler with .333 and .505 mm mesh nets (towed)
- VB Vertical (drift) Bongo
- CTD Conductivity-Temperature-Depth Profiler
- N Niskin Bottle
- PD Pipe Dredge for sediment analysis

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
DE9404 (9454)	1	7	-	VB/CTD	1	94	5	3	0450	4109.0	6747.0
DE9404 (9454)	2	7	-	VB/CTD	1	94	5	3	0555	4104.0	6744.0
DE9404 (9454)	3	7	-	VB/CTD	1	94	5	3	0710	4059.0	6741.0
DE9404 (9454)	4	7	-	VB/CTD	1	94	5	3	0740	4055.0	6739.0
DE9404 (9454)	5	7	-	VB/CTD	1	94	5	3	0825	4050.0	6736.0
DE9404 (9454)	6	7	-	VB/CTD	1	94	5	3	0920	4041.0	6731.0
DE9404 (9454)	7	7	-	VB/CTD	1	94	5	3	1010	4040.0	6730.0
DE9404 (9454)	8	7	-	VB/CTD	1	94	5	3	1114	4036.0	6728.0
DE9404 (9454)	9	7	-	VB/CTD	1	94	5	3	1320	4043.7	6717.7
DE9404 (9454)	10	7	-	VB/CTD	1	94	5	3	1425	4048.3	6719.5
DE9404 (9454)	11	7	-	VB/CTD	1	94	5	3	1510	4052.5	6721.2
DE9404 (9454)	12	7	-	VB/CTD	1	94	5	3	1609	4057.3	6725.2
DE9404 (9454)	13	7	-	VB/CTD	1	94	5	3	1658	4102.0	6727.0
DE9404 (9454)	14	7	-	VB/CTD	1	94	5	3	1754	4106.0	6730.0
DE9404 (9454)	15	7	-	VB/CTD	1	94	5	3	1901	4111.0	6733.0
DE9404 (9454)	16	7	-	VB/CTD	1	94	5	3	2023	4112.0	6723.0
DE9404 (9454)	17	7	-	VB/CTD	1	94	5	3	2112	4107.0	6717.0
DE9404 (9454)	18	7	-	VB/CTD	1	94	5	3	2215	4103.0	6715.0
DE9404 (9454)	19	7	-	VB/CTD	1	94	5	3	2315	4102.8	6714.5
DE9404 (9454)	20	7	-	VB/CTD	1	94	5	4	0005	4058.2	6711.8
DE9404 (9454)	21	7	-	VB/CTD	1	94	5	4	0055	4053.9	6708.7
DE9404 (9454)	22	7	-	VB/CTD	1	94	5	4	0155	4049.4	6705.8
DE9404 (9454)	23	7	-	VB/CTD	1	94	5	4	0330	4044.4	6702.9
DE9404 (9454)	24	7	-	VB/CTD	1	94	5	4	0501	4051.0	6653.0
DE9404 (9454)	25	7	-	VB/CTD	1	94	5	4	0557	4056.0	6656.0
DE9404 (9454)	26	7	-	VB/CTD	1	94	5	4	0653	4101.0	6658.0
DE9404 (9454)	27	7	-	VB/CTD	1	94	5	4	0744	4105.0	6701.0
DE9404 (9454)	28	7	-	VB/CTD	1	94	5	4	0846	4110.0	6704.0
DE9404 (9454)	29	7	-	VB/CTD	1	94	5	4	0946	4114.0	6707.0
DE9404 (9454)	30	7	-	VB/CTD	1	94	5	4	1048	4118.5	6709.4
DE9404 (9454)	31	7	-	VB/CTD	1	94	5	4	1150	4123.2	6712.1
DE9404 (9454)	32	7	-	VB/CTD	1	94	5	4	1320	4128.0	6700.3
DE9404 (9454)	33	7	-	VB/CTD	1	94	5	4	1430	4123.3	6657.2
DE9404 (9454)	34	7	-	VB/CTD	1	94	5	4	1532	4119.2	6654.9
DE9404 (9454)	35	7	-	VB/CTD	1	94	5	4	1640	4114.3	6651.5
DE9404 (9454)	36	7	-	VB/CTD	1	94	5	4	1742	4110.0	6647.0
DE9404 (9454)	37	7	-	VB/CTD	1	94	5	5	0111	4106.4	6738.6
DE9404 (9454)	38	6	Y36	VB/CTD	-	94	5	6	0505	4108.0	6746.0
DE9404 (9454)	39	6	Y36	VB/CTD	-	94	5	6	0620	4106.0	6737.0
DE9404 (9454)	40	6	Y36	VB/CTD	-	94	5	6	0803	4103.0	6734.0
DE9404 (9454)	41	6	Y36	VB/CTD	-	94	5	6	0948	4107.0	6735.0
DE9404 (9454)	42	6	Y36	VB/CTD	-	94	5	6	1145	4106.4	6731.7
DE9404 (9454)	43	6	Y36	VB/CTD	-	94	5	6	1345	4108.9	6728.4
DE9404 (9454)	44	6	Y36	VB/CTD	-	94	5	6	1546	4108.8	6731.9
DE9404 (9454)	45	6	Y36	VB/CTD	-	94	5	6	1749	4113.0	6731.0
DE9404 (9454)	46	6	Y36	VB/CTD	-	94	5	6	1949	4114.0	6735.0
DE9404 (9454)	47	6	Y36	VB/CTD	-	94	5	6	2159	4112.0	6735.0
DE9404 (9454)	48	6	Y36	VB/CTD	-	94	5	6	2345	4111.2	6738.3
DE9404 (9454)	49	6	Y36	VB/CTD	-	94	5	7	0145	4109.0	6738.5
DE9404 (9454)	50	6	Y36	VB/CTD	-	94	5	7	0350	4108.3	6742.6
DE9404 (9454)	51	6	Y36	VB/CTD	-	94	5	7	0554	4106.0	6739.0
DE9404 (9454)	52	6	Y36	VB/CTD	-	94	5	7	0750	4104.0	6735.0
DE9404 (9454)	53	6	Y36	VB/CTD	-	94	5	7	0952	4107.0	6735.0
DE9404 (9454)	54	6	Y36	VB/CTD	-	94	5	7	1225	4106.2	6731.6
DE9404 (9454)	55	6	Y36	VB/CTD	-	94	5	7	1549	4109.0	6728.8
DE9404 (9454)	56	6	Y36	VB/CTD	-	94	5	7	1723	4109.0	6732.0
DE9404 (9454)	57	6	Y36	VB/CTD	-	94	5	10	0240	4042.0	6750.8
DE9404 (9454)	58	6	Y36	VB/CTD	-	94	5	10	0447	4040.0	6747.2
DE9404 (9454)	59	6	Y36	VB/CTD	-	94	5	10	0640	4042.0	6747.0
DE9404 (9454)	60	6	Y36	VB/CTD	-	94	5	10	0848	4042.0	6743.0
DE9404 (9454)	61	6	Y36	VB/CTD	-	94	5	10	1055	4055.1	6738.7
DE9404 (9454)	62	6	Y36	VB/CTD	-	94	5	10	1443	4054.5	6752.4

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
DE9404 (9454)	63	6	Y36	VB/CTD	-	94	5	10	1526	4049.7	6752.2
DE9404 (9454)	64	6	Y36	VB/CTD	-	94	5	10	1610	4044.9	6752.1
DE9404 (9454)	65	6	Y36	VB/CTD	-	94	5	10	1741	4053.0	6757.0
DE9404 (9454)	66	6	Y36	VB/CTD	-	94	5	10	1926	4041.0	6744.0
DE9404 (9454)	67	6	Y36	VB/CTD	-	94	5	10	2145	4045.0	6733.0
DE9404 (9454)	68	6	Y36	VB/CTD	-	94	5	10	2355	4049.6	6720.8
DE9404 (9454)	69	6	Y36	VB/CTD	-	94	5	11	0223	4053.7	6708.7
DE9404 (9454)	70	6	Y36	VB/CTD	-	94	5	11	0446	4057.7	6656.9
DE9404 (9454)	71	6	Y36	VB/CTD	-	94	5	11	0651	4102.0	6700.0
DE9404 (9454)	72	6	Y36	VB/CTD	-	94	5	11	0830	4108.0	6703.0
DE9404 (9454)	73	6	Y36	VB/CTD	-	94	5	11	1010	4113.0	6705.0
DE9404 (9454)	74	6	Y36	VB/CTD	-	94	5	11	1215	4117.0	6707.7
DE9404 (9454)	75	6	Y36	VB/CTD	-	94	5	11	1421	4112.3	6720.2
DE9404 (9454)	76	6	Y36	VB/CTD	-	94	5	11	1613	4107.4	6718.3
DE9404 (9454)	77	6	Y36	VB/CTD	-	94	5	11	1722	4103.0	6716.0
DE9404 (9454)	78	6	Y36	VB/CTD	-	94	5	11	2014	4058.0	6712.0
DE9404 (9454)	79	6	Y36	VB/CTD	-	94	5	11	2231	4054.0	6723.0
DE9404 (9454)	80	6	Y36	VB/CTD	-	94	5	12	0040	4059.3	6725.4
DE9404 (9454)	81	6	Y36	VB/CTD	-	94	5	12	0300	4103.7	6729.1
DE9404 (9454)	82	6	Y36	VB/CTD	-	94	5	12	0450	4109.0	6732.0
DE9404 (9454)	83	6	Y36	VB/CTD	-	94	5	12	0634	4105.0	6744.0
DE9404 (9454)	84	6	Y36	VB/CTD	-	94	5	12	0822	4100.0	6742.0
DE9404 (9454)	85	6	Y36	VB/CTD	-	94	5	12	0948	4055.0	6739.0
DE9404 (9454)	86	6	Y36	VB/CTD	-	94	5	12	1152	4050.4	6736.0
DE9404 (9454)	87	6	Y36	VB/CTD	-	94	5	12	1345	4046.6	6746.5
DE9404 (9454)	88	7	Y36	VB/CTD	2	94	5	17	0056	4050.7	6810.4
DE9404 (9454)	89	7	Y36	VB/CTD	2	94	5	17	0235	4045.7	6807.3
DE9404 (9454)	90	7	Y36	VB/CTD	2	94	5	17	0432	4040.7	6804.9
DE9404 (9454)	91	7	Y36	VB/CTD	2	94	5	17	0705	4036.2	6801.3
DE9404 (9454)	92	7	Y36	VB/CTD	2	94	5	17	0845	4031.5	6758.9
DE9404 (9454)	93	7	Y36	VB/CTD	2	94	5	17	1045	4026.5	6756.5
DE9404 (9454)	94	7	Y36	VB/CTD	2	94	5	17	1255	4031.0	6744.0
DE9404 (9454)	95	7	Y36	VB/CTD	2	94	5	17	1511	4036.0	6746.0
DE9404 (9454)	96	7	Y36	VB/CTD	2	94	5	17	1700	4040.7	6749.0
DE9404 (9454)	97	7	Y36	VB/CTD	2	94	5	17	1850	4044.1	6753.1
DE9404 (9454)	98	7	Y36	VB/CTD	2	94	5	17	2050	4048.6	6755.9
DE9404 (9454)	99	7	Y36	VB/CTD	2	94	5	17	2255	4053.0	6759.0
DE9404 (9454)	100	7	Y36	VB/CTD	2	94	5	18	0148	4103.3	6750.7
DE9404 (9454)	101	7	Y36	VB/CTD	2	94	5	18	0424	4059.2	6747.8
DE9404 (9454)	102	7	Y36	VB/CTD	2	94	5	18	0745	4050.5	6748.1
DE9404 (9454)	103	7	Y36	VB/CTD	2	94	5	18	0900	4050.2	6741.8
DE9404 (9454)	104	7	Y36	VB/CTD	2	94	5	18	1156	4045.1	6740.9
DE9404 (9454)	105	7	Y36	VB/CTD	2	94	5	18	1412	4040.1	6735.8
DE9404 (9454)	106	7	Y36	VB/CTD	2	94	5	18	1615	4033.8	6730.8
DE9404 (9454)	107	7	Y36	VB/CTD	2	94	5	18	1820	4038.5	6722.7
DE9404 (9454)	108	7	Y36	VB/CTD	2	94	5	18	2000	4042.3	6724.6
DE9404 (9454)	109	7	Y36	VB/CTD	2	94	5	18	2150	4046.8	6728.0
DE9404 (9454)	110	7	Y36	VB/CTD	2	94	5	19	0010	4052.2	6732.0
DE9404 (9454)	111	7	Y36	VB/CTD	2	94	5	19	0206	4057.4	6735.5
DE9404 (9454)	112	7	Y36	VB/CTD	2	94	5	19	0352	4101.8	6736.8
DE9404 (9454)	113	7	Y36	VB/CTD	2	94	5	19	0550	4106.6	6724.3
DE9404 (9454)	114	7	Y36	VB/CTD	2	94	5	19	0730	4103.3	6721.0
DE9404 (9454)	115	7	Y36	VB/CTD	2	94	5	19	0910	4056.9	6719.8
DE9404 (9454)	116	7	Y36	VB/CTD	2	94	5	19	1115	4052.7	6717.5
DE9404 (9454)	117	7	Y36	VB/CTD	2	94	5	19	1324	4047.9	6713.2
DE9404 (9454)	118	7	Y36	VB/CTD	2	94	5	19	1517	4044.1	6710.8
DE9404 (9454)	119	7	Y36	VB/CTD	2	94	5	19	1712	4047.1	6659.9
DE9404 (9454)	120	7	Y36	VB/CTD	2	94	5	19	1908	4051.1	6702.4
DE9404 (9454)	121	7	Y36	VB/CTD	2	94	5	19	2100	4053.9	6704.3
DE9404 (9454)	122	7	Y36	VB/CTD	2	94	5	19	2245	4100.8	6706.5
DE9404 (9454)	123	7	Y36	VB/CTD	2	94	5	20	0024	4106.0	6708.0
DE9404 (9454)	124	7	Y36	VB/CTD	2	94	5	20	0314	4115.2	6713.7

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
DE9404 (9454)	125	7	Y36	VB/CTD	2	94	5	20	0412	4118.7	6713.0
DE9404 (9454)	126	7	Y36	VB/CTD	2	94	5	20	0620	4111.7	6726.4
DE9404 (9454)	127	6	Y36	VB/CTD	-	94	5	20	0807	4106.6	6738.5
DE9404 (9454)	128	6	Y36	VB/CTD	-	94	5	20	1028	4053.5	6744.8
DE9404 (9454)	129	6	Y36	VB/CTD	-	94	5	20	1256	4057.1	6733.4
DE9404 (9454)	130	6	Y36	VB/CTD	-	94	5	20	1525	4102.5	6721.8
DE9404 (9454)	131	6	Y36	VB/CTD	-	94	5	20	1730	4057.3	6717.0
DE9404 (9454)	132	6	Y36	VB/CTD	-	94	5	20	1934	4052.9	6726.6
DE9404 (9454)	133	6	Y36	VB/CTD	-	94	5	20	2142	4048.9	6741.2
DE9404 (9454)	134	6	Y36	VB/CTD	-	94	5	21	0045	4101.1	6733.4
DE9404 (9454)	135	6	Y36	VB/CTD	-	94	5	21	0245	4056.3	6748.4
DE9404 (9454)	136	6	Y36	VB/CTD	-	94	5	21	0316	4055.3	6733.2
DE9404 (9454)	137	6	Y36	VB/CTD	-	94	5	21	0738	4105.5	6722.4
DE9404 (9454)	138	6	Y36	VB/CTD	-	94	5	21	1000	4057.0	6738.2
DE9404 (9454)	139	6	Y36	VB/CTD	-	94	5	21	1215	4058.2	6723.5
DE9404 (9454)	140	6	Y36	VB/CTD	-	94	5	21	1509	4105.0	6728.8
DE9404 (9454)	141	6	Y36	VB/CTD	-	94	5	21	1845	4052.6	6735.2
DE9404 (9454)	142	6	Y36	VB/CTD	-	94	5	21	2050	4053.8	6731.7
DE9404 (9454)	143	6	Y36	VB/CTD	-	94	5	21	2255	4050.3	6733.2
DE9404 (9454)	144	6	Y36	VB/CTD	-	94	5	22	0100	4046.7	6732.7
DE9404 (9454)	145	6	Y36	VB/CTD	-	94	5	22	0246	4048.8	6733.1
DE9404 (9454)	146	6	Y36	VB/CTD	-	94	5	22	0500	4048.7	6735.8
DE9404 (9454)	147	6	Y36	VB/CTD	-	94	5	22	0650	4051.4	6735.8
DE9404 (9454)	148	6	Y36	VB/CTD	-	94	5	22	0850	4052.5	6732.2
DE9404 (9454)	149	6	Y36	VB/CTD	-	94	5	22	1055	4050.6	6734.8
DE9404 (9454)	150	6	Y36	VB/CTD	-	94	5	22	1250	4051.2	6735.1
DE9404 (9454)	151	6	Y36	VB/CTD	-	94	5	22	1452	4054.7	6736.9
DE9404 (9454)	152	6	Y36	VB/CTD	-	94	5	22	1645	4057.0	6738.8
DE9404 (9454)	153	6	Y36	VB/CTD	-	94	5	22	1845	4057.9	6739.3
DE9404 (9454)	154	6	Y36	VB/CTD	-	94	5	22	2050	4059.6	6739.6
DE9404 (9454)	155	6	Y36	VB/CTD	-	94	5	22	2302	4056.7	6734.1
DE9404 (9454)	156	6	Y36	VB/CTD	-	94	5	23	0055	4053.6	6733.7
DE9404 (9454)	157	6	Y36	VB/CTD	-	94	5	23	0246	4055.5	6736.6
DE9404 (9454)	158	6	Y36	VB/CTD	-	94	5	23	0455	4056.8	6739.4
DE9404 (9454)	159	6	Y36	VB/CTD	-	94	5	23	0650	4057.6	6739.1
DE9404 (9454)	160	6	Y36	VB/CTD	-	94	5	23	0952	4058.7	6738.7
DE9404 (9454)	161	6	Y36	VB/CTD	-	94	5	23	1050	4059.0	6735.0
DE9404 (9454)	162	6	Y36	VB/CTD	-	94	5	23	1250	4057.1	6734.0
DE9404 (9454)	163	6	Y36	VB/CTD	-	94	5	23	1447	4056.4	6734.5
DE9404 (9454)	164	6	Y36	VB/CTD	-	94	5	23	1645	4056.5	6737.9
DE9404 (9454)	165	6	Y36	VB/CTD	-	94	5	23	1846	4058.2	6738.5
DE9404 (9454)	166	6	Y36	VB/CTD	-	94	5	23	2049	4056.6	6737.9
DE9404 (9454)	167	6	Y36	VB/CTD	-	94	5	23	2243	4054.3	6736.5
DE9404 (9454)	168	6	Y36	VB/CTD	-	94	5	24	0105	4106.6	6738.7
DE9404 (9454)	169	6	Y36	VB/CTD	-	94	5	24	0248	4108.0	6739.3
DE9404 (9454)	170	6	Y36	VB/CTD	-	94	5	24	0553	4107.4	6741.0
DE9404 (9454)	171	6	Y36	VB/CTD	-	94	5	24	0651	4109.1	6740.8
DE9404 (9454)	172	6	Y36	VB/CTD	-	94	5	24	0847	4109.9	6740.7
DE9404 (9454)	173	6	Y36	VB/CTD	-	94	5	24	1055	4110.8	6738.2
DE9404 (9454)	174	6	Y36	VB/CTD	-	94	5	24	1252	4108.2	6735.4
DE9404 (9454)	175	6	Y36	VB/CTD	-	94	5	24	1445	4105.1	6735.4
DE9404 (9454)	176	6	Y36	VB/CTD	-	94	5	24	1648	4103.8	6741.4
DE9404 (9454)	177	6	Y36	VB/CTD	-	94	5	24	1845	4107.6	6743.5
DE9404 (9454)	178	6	Y36	VB/CTD	-	94	5	24	2047	4108.8	6741.9
DE9404 (9454)	179	6	Y36	VB/CTD	-	94	5	24	2245	4106.2	6739.3
DE9404 (9454)	180	6	Y36	VB/CTD	-	94	5	25	0050	4106.2	6737.4
DE9404 (9454)	181	6	Y36	VB/CTD	-	94	5	25	0245	4100.8	6736.9
DE9404 (9454)	182	6	Y36	VB/CTD	-	94	5	25	0458	4101.1	6740.1
DE9404 (9454)	183	6	Y36	VB/CTD	-	94	5	25	0745	4102.5	6742.3
DE9404 (9454)	184	6	Y36	VB/CTD	-	94	5	25	0844	4103.2	6746.9
DE9404 (9454)	185	6	Y36	VB/CTD	-	94	5	25	1048	4054.9	6735.0
DE9404 (9454)	186	6	Y36	VB/CTD	-	94	5	25	1250	4053.3	6730.4

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
DE9404 (9454)	187	6	Y36	VB/CTD	-	94	5	25	1447	4052.4	6733.3
DE9404 (9454)	188	6	Y36	VB/CTD	-	94	5	25	1645	4053.7	6734.7
DE9404 (9454)	189	6	Y36	VB/CTD	-	94	5	25	1846	4055.5	6735.3
DE9404 (9454)	190	6	Y36	VB/CTD	-	94	5	25	2047	4055.0	6734.1
DE9404 (9454)	191	6	Y36	VB/CTD	-	94	5	25	2246	4055.1	6735.7
DE9404 (9454)	192	6	Y36	VB/CTD	-	94	5	26	0102	4052.2	6731.8
DE9404 (9454)	193	6	Y36	VB/CTD	-	94	5	26	0252	4050.4	6733.0
DE9404 (9454)	194	6	Y36	VB/CTD	-	94	5	26	0450	4052.0	6737.0
DE9404 (9454)	195	6	Y36	VB/CTD	-	94	5	26	0702	4053.8	6738.9
DE9404 (9454)	196	6	Y36	VB/CTD	-	94	5	26	0850	4056.0	6736.4
DE9404 (9454)	197	6	Y36	VB/CTD	-	94	5	26	1052	4057.5	6736.9
DE9404 (9454)	198	6	Y36	VB/CTD	-	94	5	26	1248	4055.0	6734.7
DE9406 (9456)	1	7	Y36	VB/CTD	1	94	6	21	2247	4110.2	6850.2
DE9406 (9456)	2	7	Y36	VB/CTD	1	94	6	21	0611	4057.7	6851.5
DE9406 (9456)	3	7	Y36	VB/CTD	1	94	6	21	0506	4050.0	6850.3
DE9406 (9456)	4	7	Y36	VB/CTD	1	94	6	21	0803	4052.9	6819.4
DE9406 (9456)	5	7	Y36	VB/CTD	1	94	6	21	1457	4059.7	6839.6
DE9406 (9456)	6	7	Y36	VB/CTD	1	94	6	21	1850	4109.1	6840.3
DE9406 (9456)	7	7	Y36	VB/CTD	1	94	6	21	1858	4120.1	6839.7
DE9406 (9456)	8	7	Y36	VB/CTD	1	94	6	21	2002	4130.2	6829.7
DE9406 (9456)	9	7	Y36	VB/CTD	1	94	6	21	2201	4120.4	6829.6
DE9406 (9456)	10	7	Y36	VB/CTD	1	94	6	22	0002	4109.8	6829.7
DE9406 (9456)	11	7	Y36	VB/CTD	1	94	6	22	0142	4100.2	6830.7
DE9406 (9456)	12	7	Y36	VB/CTD	1	94	6	22	0320	4050.1	6830.0
DE9406 (9456)	13	7	Y36	VB/CTD	1	94	6	22	0535	4040.1	6820.1
DE9406 (9456)	14	7	Y36	VB/CTD	1	94	6	22	0715	4050.2	6820.1
DE9406 (9456)	15	7	Y36	VB/CTD	1	94	6	22	0900	4100.2	6819.9
DE9406 (9456)	16	7	Y36	VB/CTD	1	94	6	22	1104	4109.2	6820.7
DE9406 (9456)	17	7	Y36	VB/CTD	1	94	6	22	1304	4119.8	6819.9
DE9406 (9456)	18	7	Y36	VB/CTD	1	94	6	22	1454	4129.4	6820.1
DE9406 (9456)	19	7	Y36	VB/CTD	1	94	6	22	1700	4140.2	6820.2
DE9406 (9456)	20	7	Y36	VB/CTD	1	94	6	22	1911	4130.1	6809.9
DE9406 (9456)	21	7	Y36	VB/CTD	1	94	6	22	2106	4119.5	6809.8
DE9406 (9456)	22	7	Y36	VB/CTD	1	94	6	22	2306	4107.1	6809.7
DE9406 (9456)	23	7	Y36	VB/CTD	1	94	6	23	0106	4055.5	6810.2
DE9406 (9456)	24	7	Y36	VB/CTD	1	94	6	23	0308	4049.9	6810.1
DE9406 (9456)	25	7	Y36	VB/CTD	1	94	6	23	0507	4040.2	6810.1
DE9406 (9456)	26	7	Y36	VB/CTD	1	94	6	23	0655	4039.9	6759.9
DE9406 (9456)	27	7	Y36	VB/CTD	1	94	6	23	0900	4050.0	6800.2
DE9406 (9456)	28	7	Y36	VB/CTD	1	94	6	23	1102	4100.0	6759.5
DE9406 (9456)	29	7	Y36	VB/CTD	1	94	6	23	1303	4109.4	6801.8
DE9406 (9456)	30	7	Y36	VB/CTD	1	94	6	23	1508	4119.9	6759.9
DE9406 (9456)	31	7	Y36	VB/CTD	1	94	6	23	1656	4127.3	6801.1
DE9406 (9456)	32	7	Y36	VB/CTD	1	94	6	23	1853	4140.3	6800.0
DE9406 (9456)	33	7	Y36	VB/CTD	1	94	6	23	2054	4146.2	6809.7
DE9406 (9456)	34	7	Y36	VB/CTD	1	94	6	23	2308	4149.7	6759.1
DE9406 (9456)	35	7	Y36	VB/CTD	1	94	6	24	0056	4141.2	6749.8
DE9406 (9456)	36	7	Y36	VB/CTD	1	94	6	24	0004	4129.2	6750.7
DE9406 (9456)	37	7	Y36	VB/CTD	1	94	6	24	0504	4119.9	6750.1
DE9406 (9456)	38	7	Y36	VB/CTD	1	94	6	24	0714	4110.3	6750.5
DE9406 (9456)	39	7	Y36	VB/CTD	1	94	6	24	0904	4100.0	6750.3
DE9406 (9456)	40	7	Y36	VB/CTD	1	94	6	24	1100	4100.3	6739.9
DE9406 (9456)	41	7	Y36	VB/CTD	1	94	6	24	1255	4109.9	6739.6
DE9406 (9456)	42	7	Y36	VB/CTD	1	94	6	24	1457	4120.0	6740.0
DE9406 (9456)	43	7	Y36	VB/CTD	1	94	6	24	1700	4129.7	6740.5
DE9406 (9456)	44	7	Y36	VB/CTD	1	94	6	24	1909	4139.9	6740.2
DE9406 (9456)	45	7	Y36	VB/CTD	1	94	6	24	2105	4150.1	6744.1
DE9406 (9456)	46	6	Y36	VB/CTD	2	94	6	24	2307	4155.3	6739.4
DE9406 (9456)	47	6	Y36	VB/CTD	2	94	6	25	0057	4159.8	6739.9
DE9406 (9456)	48	6	Y36	VB/CTD	2	94	6	25	0256	4145.1	6740.0
DE9406 (9456)	49	6	Y36	VB/CTD	2	94	6	25	0509	4140.1	6739.9

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
DE9406 (9456)	50	6	Y36	VB/CTD	2	94	6	25	0714	4130.1	6740.5
DE9406 (9456)	51	6	Y36	VB/CTD	2	94	6	25	0909	4130.9	6747.6
DE9406 (9456)	52	6	Y36	VB/CTD	2	94	6	25	1103	4137.6	6746.8
DE9406 (9456)	53	6	Y36	VB/CTD	2	94	6	25	1309	4147.7	6747.5
DE9406 (9456)	54	6	Y36	VB/CTD	2	94	6	25	1450	4154.5	6747.0
DE9406 (9456)	55	6	Y36	VB/CTD	2	94	6	25	1700	4155.0	6753.6
DE9406 (9456)	56	6	Y36	VB/CTD	2	94	6	25	1902	4150.1	6753.7
DE9406 (9456)	57	6	Y36	VB/CTD	2	94	6	25	2104	4146.0	6753.8
DE9406 (9456)	58	6	Y36	VB/CTD	2	94	6	25	2300	4140.9	6752.8
DE9406 (9456)	59	6	Y36	VB/CTD	2	94	6	26	0051	4135.2	6752.7
DE9406 (9456)	60	6	Y36	VB/CTD	2	94	6	26	0255	4129.9	6753.5
DE9406 (9456)	61	6	Y36	VB/CTD	2	94	6	26	0506	4131.0	6800.1
DE9406 (9456)	62	6	Y36	VB/CTD	2	94	6	26	0701	4137.3	6800.3
DE9406 (9456)	63	6	Y36	VB/CTD	2	94	6	26	0901	4144.6	6759.9
DE9406 (9456)	64	6	Y36	VB/CTD	2	94	6	26	9999	4152.9	6759.2
DE9406 (9456)	65	6	Y36	VB/CTD	2	94	6	26	1252	4150.8	6804.5
DE9406 (9456)	66	6	Y36	VB/CTD	2	94	6	26	1457	4144.1	6804.9
DE9406 (9456)	67	6	Y36	VB/CTD	2	94	6	26	1658	4136.5	6804.8
DE9406 (9456)	68	6	Y36	VB/CTD	2	94	6	26	1911	4130.7	6805.2
DE9406 (9456)	69	6	Y36	VB/CTD	2	94	6	26	2103	4132.5	6810.1
DE9406 (9456)	70	6	Y36	VB/CTD	2	94	6	26	2302	4141.6	6809.7
DE9406 (9456)	71	6	Y36	VB/CTD	2	94	6	27	0052	4143.9	6809.0
DE9406 (9456)	72	6	Y36	VB/CTD	2	94	6	27	0255	4149.1	6809.9
DE9406 (9456)	73	6	Y36	VB/CTD	3	94	6	27	0513	4140.0	6825.0
DE9406 (9456)	74	6	Y36	VB/CTD	3	94	6	27	0720	4134.9	6825.4
DE9406 (9456)	75	6	Y36	VB/CTD	3	94	6	27	0908	4130.7	6825.5
DE9406 (9456)	76	6	Y36	VB/CTD	3	94	6	27	1102	4125.2	6825.0
DE9406 (9456)	77	6	Y36	VB/CTD	3	94	6	27	1256	4120.6	6825.0
DE9406 (9456)	78	6	Y36	VB/CTD	3	94	6	27	1449	4114.9	6824.2
DE9406 (9456)	79	6	Y36	VB/CTD	3	94	6	27	1703	4110.0	6824.7
DE9406 (9456)	80	6	Y36	VB/CTD	3	94	6	27	1901	4109.8	6830.5
DE9406 (9456)	81	6	Y36	VB/CTD	3	94	6	27	2104	4115.0	6830.2
DE9406 (9456)	82	6	Y36	VB/CTD	3	94	6	28	0001	4120.1	6830.3
DE9406 (9456)	83	6	Y36	VB/CTD	3	94	6	28	0056	4125.2	6829.9
DE9406 (9456)	84	6	Y36	VB/CTD	3	94	6	28	0255	4130.3	6829.6
DE9406 (9456)	85	6	Y36	VB/CTD	3	94	6	28	0515	4126.1	6834.9
DE9406 (9456)	86	6	Y36	VB/CTD	3	94	6	28	0722	4120.5	6834.8
DE9406 (9456)	87	6	Y36	VB/CTD	3	94	6	28	0915	4115.9	6835.3
DE9406 (9456)	88	6	Y36	VB/CTD	3	94	6	28	1102	4110.6	6835.1
DE9406 (9456)	89	6	Y36	VB/CTD	3	94	6	28	1300	4105.4	6835.0
DE9406 (9456)	90	6	Y36	VB/CTD	3	94	6	28	1455	4059.9	6839.8
DE9406 (9456)	91	6	Y36	VB/CTD	3	94	6	28	1701	4104.4	6839.7
DE9406 (9456)	92	6	Y36	VB/CTD	3	94	6	28	1900	4109.6	6840.2
DE9406 (9456)	93	6	Y36	VB/CTD	3	94	6	28	2103	4115.5	6840.5
DE9406 (9456)	94	6	Y36	VB/CTD	3	94	6	28	2302	4120.3	6839.9
DE9406 (9456)	95	6	Y36	VB/CTD	3	94	6	29	0058	4117.8	6844.7
DE9406 (9456)	96	6	Y36	VB/CTD	3	94	6	29	0257	4110.1	6844.6
DE9406 (9456)	97	6	Y36	VB/CTD	3	94	6	29	0718	4104.4	6844.8
DE9406 (9456)	98	6	Y36	VB/CTD	3	94	6	29	0933	4100.0	6845.2
DE9406 (9456)	99	6	Y36	VB/CTD	3	94	6	29	1132	4055.3	6845.1
DE9406 (9456)	100	6	Y36	VB/CTD	3	94	6	29	1304	4050.4	6849.7
DE9406 (9456)	101	6	Y36	VB/CTD	3	94	6	29	1457	4055.3	6849.4
DE9406 (9456)	102	6	Y36	VB/CTD	3	94	6	29	1710	4059.7	6849.9
DE9406 (9456)	103	6	Y36	VB/CTD	3	94	6	29	1905	4105.1	6849.8
DE9406 (9456)	104	6	Y36	VB/CTD	3	94	6	29	2216	4109.6	6850.4
DE9406 (9456)	105	6	Y36	VB/CTD	3	94	6	29	2354	4114.0	6850.4
DE9406 (9456)	106	-	-	VB/CTD	3	94	6	30	510	4124.8	6939.3
AL9407 (9457)	1	7	Y36	CTD	1	94	8	24	1021	4154.0	6553.0
AL9407 (9457)	2	7	Y36	CTD	1	94	8	24	1228	4145.0	6552.0
AL9407 (9457)	3	7	Y36	CTD	1	94	8	24	1423	4141.0	6559.0
AL9407 (9457)	4	7	Y36	CTD	1	94	8	24	1622	4150.0	6559.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
AL9407 (9457)	5	7	Y36	CTD	1	94	8	24	1818	4200.0	6600.0
AL9407 (9457)	6	7	Y36	CTD	1	94	8	24	2020	4204.0	6610.0
AL9407 (9457)	7	7	Y36	CTD	1	94	8	24	2223	4154.0	6610.0
AL9407 (9457)	8	7	Y36	CTD	1	94	8	25	0014	4145.0	6610.0
AL9407 (9457)	9	7	Y36	CTD	1	94	8	25	0218	4135.0	6610.0
AL9407 (9457)	10	7	Y36	CTD	1	94	8	25	0420	4133.0	6621.0
AL9407 (9457)	11	7	Y36	CTD	1	94	8	25	0617	4140.0	6620.0
AL9407 (9457)	12	7	Y36	CTD	1	94	8	25	0830	4151.0	6619.0
AL9407 (9457)	13	7	Y36	CTD	1	94	8	25	1019	4200.0	6620.0
AL9407 (9457)	14	7	Y36	CTD	1	94	8	25	1215	4207.0	6621.0
AL9407 (9457)	15	7	Y36	CTD	1	94	8	25	1417	4205.0	6630.0
AL9407 (9457)	16	7	Y36	CTD	1	94	8	25	1615	4154.0	6629.0
AL9407 (9457)	17	7	Y36	CTD	1	94	8	25	1813	4144.0	6630.0
AL9407 (9457)	18	7	Y36	CTD	1	94	8	25	2015	4134.0	6631.0
AL9407 (9457)	19	7	Y36	CTD	1	94	8	25	2231	4131.0	6640.0
AL9407 (9457)	20	7	Y36	CTD	1	94	8	26	0018	4141.0	6640.0
AL9407 (9457)	21	7	Y36	CTD	1	94	8	26	0215	4150.0	6640.0
AL9407 (9457)	22	7	Y36	CTD	1	94	8	26	0418	4200.0	6640.0
AL9407 (9457)	23	7	Y36	CTD	1	94	8	26	0623	4206.0	6641.0
AL9407 (9457)	24	7	Y36	CTD	1	94	8	26	0813	4204.0	6649.0
AL9407 (9457)	25	7	Y36	CTD	1	94	8	26	1013	4155.0	6647.0
AL9407 (9457)	26	7	Y36	CTD	1	94	8	26	1217	4145.0	6650.0
AL9407 (9457)	27	7	Y36	CTD	1	94	8	26	1433	4136.0	6650.0
AL9407 (9457)	28	7	Y36	CTD	1	94	8	26	1617	4129.0	6700.0
AL9407 (9457)	29	7	Y36	CTD	1	94	8	26	1814	4139.0	6700.0
AL9407 (9457)	30	7	Y36	CTD	1	94	8	26	2016	4150.0	6700.0
AL9407 (9457)	31	7	Y36	CTD	1	94	8	26	2213	4201.0	6700.0
AL9407 (9457)	32	7	Y36	CTD	1	94	8	27	0019	4201.0	6700.0
AL9407 (9457)	33	7	Y36	CTD	1	94	8	27	0218	4210.0	6700.0
AL9407 (9457)	34	7	Y36	CTD	1	94	8	27	0414	4204.0	6709.0
AL9407 (9457)	35	7	Y36	CTD	1	94	8	27	0617	4154.0	6709.0
AL9407 (9457)	36	7	Y36	CTD	1	94	8	27	0814	4144.0	6710.0
AL9407 (9457)	37	7	Y36	CTD	1	94	8	27	1008	4135.0	6711.0
AL9407 (9457)	38	7	Y36	CTD	1	94	8	27	1218	4131.0	6721.0
AL9407 (9457)	39	7	Y36	CTD	1	94	8	27	1409	4142.0	6720.0
AL9407 (9457)	40	7	Y36	CTD	1	94	8	27	1608	4149.0	6721.0
AL9407 (9457)	41	7	Y36	CTD	1	94	8	27	1816	4200.0	6719.0
AL9407 (9457)	42	7	Y36	CTD	1	94	8	28	0624	4156.0	6603.0
AL9407 (9457)	43	7	Y36	B	1	94	8	28	0851	4158.0	6605.0
AL9407 (9457)	44	6	Y36	CTD	-	94	8	28	2025	4202.0	6603.0
AL9407 (9457)	45	6	Y36	CTD	-	94	8	28	2211	4200.0	6604.0
AL9407 (9457)	46	6	Y36	CTD	-	94	8	29	0024	4204.0	6605.0
AL9407 (9457)	47	6	Y36	CTD	-	94	8	29	0218	4201.0	6607.0
AL9407 (9457)	48	6	Y36	CTD	-	94	8	29	0420	4204.0	6605.0
AL9407 (9457)	49	6	Y36	CTD	-	94	8	29	0619	4200.0	6604.0
AL9407 (9457)	50	6	Y36	CTD	-	94	8	29	0814	4200.0	6606.0
AL9407 (9457)	51	6	Y36	CTD	-	94	8	29	1019	4203.0	6607.0
AL9407 (9457)	52	6	Y36	CTD	-	94	8	29	1223	4201.0	6605.0
AL9407 (9457)	53	6	Y36	CTD	-	94	8	29	1419	4201.0	6607.0
AL9407 (9457)	54	6	Y36	CTD	-	94	8	29	1612	4204.0	6605.0
AL9407 (9457)	55	6	Y36	CTD	-	94	8	29	1815	4204.0	6605.0
AL9407 (9457)	56	6	Y36	CTD	-	94	8	29	2011	4203.0	6604.0
AL9407 (9457)	57	6	Y36	CTD	-	94	8	29	2205	4200.0	6607.0
AL9407 (9457)	58	6	Y36	CTD	-	94	8	30	0023	4200.0	6603.0
AL9407 (9457)	59	6	Y36	CTD	-	94	8	30	0220	4200.0	6607.0
AL9407 (9457)	60	6	Y36	CTD	-	94	8	30	0423	4201.0	6604.0
AL9407 (9457)	61	6	Y36	CTD	-	94	8	30	0618	4202.0	6606.0
AL9407 (9457)	62	6	Y36	CTD	-	94	8	30	0811	4202.0	6603.0
AL9407 (9457)	63	6	Y36	CTD	-	94	8	30	1011	4203.0	6603.0
AL9407 (9457)	64	6	Y36	CTD	-	94	8	30	1220	4203.0	6607.0
AL9407 (9457)	65	6	Y36	CTD	-	94	8	30	1418	4202.0	6603.0
AL9407 (9457)	66	6	Y36	CTD	-	94	8	30	1616	4203.0	6604.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
AL9407 (9457)	67	7	Y36	CTD	-	94	8	30	2015	4142.0	6600.0
AL9407 (9457)	68	7	Y36	CTD	-	94	8	30	2218	4138.0	6600.0
AL9407 (9457)	69	7	Y36	B	-	94	8	31	0038	4141.0	6610.0
AL9407 (9457)	70	7	Y36	B	-	94	8	31	0219	4146.0	6621.0
AL9407 (9457)	71	7	Y36	B	-	94	8	31	0423	4152.0	6632.0
AL9407 (9457)	72	7	Y36	B	-	94	8	31	0620	4158.0	6642.0
AL9407 (9457)	73	7	Y36	B	-	94	8	31	0820	4159.0	6652.0
AL9407 (9457)	74	7	Y36	B	-	94	8	31	1010	4154.0	6701.0
AL9407 (9457)	75	7	Y36	B	-	94	8	31	1217	4150.0	6711.0
AL9407 (9457)	76	7	Y36	B	-	94	8	31	1432	4144.0	6719.0
AL9407 (9457)	77	7	Y36	B	-	94	8	31	1637	4141.0	6711.0
AL9407 (9457)	78	7	Y36	B	-	94	8	31	1841	4135.0	6719.0
AL9407 (9457)	79	7	Y36	B	-	94	8	31	2032	4129.0	6710.0
KT9502 (9552)	1	7	SHU	B/CTD	1	95	4	26	1410	4123.9	6634.2
KT9502 (9552)	2	7	SHU	B/CTD	1	95	4	26	1630	4117.3	6640.1
KT9502 (9552)	4	7	SHU	B/CTD	1	95	4	26	2320	4106.6	6637.9
KT9502 (9552)	5	7	SHU	B/CTD	1	95	4	27	0238	4053.6	6641.2
KT9502 (9552)	6	7	SHU	B/CTD	1	95	4	27	0616	4041.9	6655.4
KT9502 (9552)	7	7	SHU	B/CTD	1	95	4	27	0954	4053.5	6654.7
KT9502 (9552)	9	7	SHU	B/CTD	1	95	4	27	1439	4104.3	6654.7
KT9502 (9552)	10	7	SHU	B/CTD	1	95	4	27	1731	4113.1	6654.9
KT9502 (9552)	11	7	SHU	B/CTD	1	95	4	27	2036	4124.6	6653.0
KT9502 (9552)	12	7	SHU	B/CTD	1	95	4	28	0133	4118.4	6710.3
KT9502 (9552)	14	7	SHU	B	1	95	4	28	0416	4106.0	6705.0
KT9502 (9552)	15	7	SHU	B/CTD	1	95	4	28	0749	4101.6	6710.6
KT9502 (9552)	16	7	SHU	B/CTD	1	95	4	28	1123	4049.9	6709.9
KT9502 (9552)	17	7	SHU	B/CTD/N	1	95	4	28	1415	4039.4	6710.3
KT9502 (9552)	18	7	SHU	B/CTD	1	95	4	28	1750	4031.5	6711.5
KT9502 (9552)	19	7	SHU	B/CTD	1	95	4	28	2356	4027.7	6728.3
KT9502 (9552)	20	7	SHU	B/CTD	1	95	4	29	0216	4035.5	6725.1
KT9502 (9552)	21	7	SHU	B/CTD/N	1	95	4	29	0515	4044.2	6725.1
KT9502 (9552)	22	7	SHU	B/CTD	1	95	4	29	0930	4057.7	6725.4
KT9502 (9552)	23	7	SHU	B/CTD	1	95	4	29	1335	4105.5	6726.3
KT9502 (9552)	24	7	SHU	B/CTD	1	95	4	29	1639	4113.6	6725.0
KT9502 (9552)	25	7	SHU	B/CTD	1	95	4	29	2052	4107.9	6740.0
KT9502 (9552)	26	7	SHU	B/CTD/N	1	95	4	29	2327	4059.3	6739.6
KT9502 (9552)	27	7	SHU	B	1	95	4	30	0339	4043.0	6740.2
KT9502 (9552)	28	7	SHU	B/CTD	1	95	4	30	0745	4030.7	6740.4
KT9502 (9552)	29	7	SHU	B/CTD/N	1	95	4	30	1235	4020.2	6756.4
KT9502 (9552)	30	7	SHU	B/CTD	1	95	4	30	1550	4028.4	6754.9
KT9502 (9552)	31	7	SHU	B/CTD	1	95	4	30	1848	4039.6	6754.5
KT9502 (9552)	32	7	SHU	B/CTD	1	95	4	30	2134	4049.2	6755.1
KT9502 (9552)	33	7	SHU	B/CTD	1	95	4	30	2347	4055.2	6755.1
KT9502 (9552)	34	7	SHU	B/CTD	1	95	5	1	0250	4102.8	6756.6
KT9502 (9552)	35	7	SHU	B/CTD	1	95	5	1	0816	4056.7	6809.3
KT9502 (9552)	36	7	SHU	B/CTD	1	95	5	2	0039	4044.9	6807.9
KT9502 (9552)	37	7	SHU	B/CTD	1	95	5	2	0515	4033.8	6810.2
KT9502 (9552)	38	7	SHU	B/CTD	1	95	5	2	0914	4024.3	6811.5
KT9502 (9552)	39	7	SHU	VB/CTD/N	1	95	5	2	1322	4019.4	6813.9
KT9502 (9552)	40	7	SHU	B/CTD	1	95	5	2	1727	4012.7	6826.1
KT9502 (9552)	41	7	SHU	B/CTD	1	95	5	2	2257	4022.1	6825.2
KT9502 (9552)	42	7	SHU	B/CTD	2	95	5	10	0128	4130.1	6641.6
KT9502 (9552)	43	7	SHU	B	2	95	5	10	0546	4117.2	6640.2
KT9502 (9552)	44	7	SHU	B/CTD/N	2	95	5	10	0954	4106.5	6640.5
KT9502 (9552)	45	7	SHU	B/CTD	2	95	5	10	1350	4104.0	6648.0
KT9502 (9552)	46	7	SHU	B/CTD	2	95	5	10	1648	4052.9	6639.5
KT9502 (9552)	47	7	SHU	B/CTD	2	95	5	10	2245	4041.6	6654.9
KT9502 (9552)	48	7	SHU	B/CTD	2	95	5	11	0144	4050.2	6653.9
KT9502 (9552)	49	7	SHU	B/CTD/N	2	95	5	11	0635	4053.6	6655.3
KT9502 (9552)	50	7	SHU	B/CTD	2	95	5	11	1000	4104.3	6655.1
KT9502 (9552)	51	7	SHU	B/CTD	2	95	5	11	1511	4113.6	6655.1

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
KT9502 (9552)	52	7	SHU	B/CTD	2	95	5	11	1749	4124.6	6654.9
KT9502 (9552)	53	7	SHU	B/CTD	2	95	5	11	2058	4118.4	6709.9
KT9502 (9552)	54	7	SHU	B/CTD	2	95	5	11	2347	4109.2	6710.5
KT9502 (9552)	55	7	SHU	B/CTD	2	95	5	12	0224	4059.9	6710.5
KT9502 (9552)	56	7	SHU	B/CTD	2	95	5	12	0524	4049.6	6709.9
KT9502 (9552)	57	7	SHU	B/CTD	2	95	5	12	0929	4039.6	6709.7
KT9502 (9552)	58	7	SHU	B	2	95	5	12	1333	4030.0	6709.9
KT9502 (9552)	59	7	SHU	B/CTD/N	2	95	5	12	1721	4026.7	6727.2
KT9502 (9552)	60	7	SHU	B/CTD	2	95	5	12	2134	4033.9	6723.4
KT9502 (9552)	61	7	SHU	B/CTD	2	95	5	12	2356	4044.9	6724.8
KT9502 (9552)	62	7	SHU	B/CTD	2	95	5	13	0418	4057.2	6724.9
KT9502 (9552)	63	7	SHU	B/CTD/N	2	95	5	13	0804	4105.6	6725.2
KT9502 (9552)	64	7	SHU	B/CTD	2	95	5	13	1158	4112.2	6724.3
KT9502 (9552)	65	7	SHU	B/CTD	2	95	5	13	1537	4106.9	6740.1
KT9502 (9552)	66	7	SHU	B/CTD	2	95	5	13	1830	4059.6	6739.9
KT9502 (9552)	67	7	SHU	B/CTD	2	95	5	13	2155	4051.9	6740.4
KT9502 (9552)	68	7	SHU	B/CTD	2	95	5	14	0126	4042.6	6740.2
KT9502 (9552)	69	7	SHU	B/CTD	2	95	5	14	0455	4030.7	6740.3
KT9502 (9552)	70	7	SHU	B/CTD	2	95	5	14	1139	4019.9	6755.2
KT9502 (9552)	71	7	SHU	B/CTD	2	95	5	14	1542	4028.2	6754.8
KT9502 (9552)	72	7	SHU	B/CTD	2	95	5	14	1924	4039.2	6755.0
KT9502 (9552)	73	7	SHU	B/CTD/N	2	95	5	14	2220	4049.1	6754.8
KT9502 (9552)	74	7	SHU	B/CTD	2	95	5	15	0148	4056.3	6754.8
KT9502 (9552)	75	7	SHU	B/CTD	2	95	5	15	0532	4103.1	6755.1
KT9502 (9552)	76	7	SHU	B/CTD/N	2	95	5	15	0855	4056.4	6809.5
KT9502 (9552)	77	7	SHU	B/CTD	2	95	5	15	1240	4045.0	6809.9
KT9502 (9552)	78	7	SHU	B/CTD	2	95	5	15	1535	4034.9	6810.0
KT9502 (9552)	79	7	SHU	B/CTD	2	95	5	15	1814	4024.9	6809.9
KT9502 (9552)	80	7	SHU	B/CTD	2	95	5	15	2332	4013.3	6825.2
KT9502 (9552)	81	7	SHU	B/CTD	2	95	5	16	0242	4021.9	6824.9
KT9502 (9552)	82	7	SHU	B/CTD/N	2	95	5	16	0700	4032.1	6824.9
KT9502 (9552)	83	7	SHU	B/CTD	2	95	5	16	0954	4041.7	6825.0
KT9502 (9552)	84	7	SHU	B/CTD	2	95	5	16	1219	4051.2	6824.7
KT9502 (9552)	85	7	SHU	B/CTD	2	95	5	16	1825	4112.0	6716.9
KT9502 (9552)	86	7	SHU	B/CTD	2	95	5	16	2115	4115.6	6702.5
KT9502 (9552)	87	7	SHU	B/CTD	2	95	5	17	0321	4120.0	6648.6
KT9502 (9552)	88	7	SHU	B/CTD	2	95	5	17	0432	4129.0	6650.0
KT9502 (9552)	89	7	SHU	B/CTD	2	95	5	17	0723	4125.1	6704.5
KT9502 (9552)	90	7	SHU	B/CTD	2	95	5	17	1022	4118.4	6716.8
KT9502 (9552)	91	7	SHU	B/CTD/N	3	95	5	20	0541	4130.0	6639.4
KT9502 (9552)	92	7	SHU	B/CTD	3	95	5	20	1059	4117.7	6642.0
KT9502 (9552)	93	7	SHU	B/CTD	3	95	5	20	1439	4106.9	6639.9
KT9502 (9552)	94	7	SHU	B/CTD	3	95	5	20	1748	4053.8	6640.0
KT9502 (9552)	95	7	SHU	B/CTD	3	95	5	20	2159	4041.7	6655.2
KT9502 (9552)	96	7	SHU	B/CTD	3	95	5	21	0107	4053.1	6655.0
KT9502 (9552)	96	7	SHU	B/CTD	3	95	5	21	0124	4052.9	6654.9
KT9502 (9552)	97	7	SHU	B/CTD	3	95	5	21	0437	4104.2	6654.7
KT9502 (9552)	98	7	SHU	B/CTD	3	95	5	21	0930	4113.5	6654.8
KT9502 (9552)	99	7	SHU	B/CTD	3	95	5	21	1215	4124.2	6655.2
KT9502 (9552)	100	7	SHU	B/CTD	3	95	5	21	1609	4118.5	6709.9
KT9502 (9552)	101	7	SHU	B/CTD	3	95	5	21	1827	4109.8	6710.1
KT9502 (9552)	102	7	SHU	B/CTD	3	95	5	21	2100	4059.7	6710.0
KT9502 (9552)	103	7	SHU	B/CTD	3	95	5	22	0013	4049.9	6710.0
KT9502 (9552)	104	7	SHU	B/CTD	3	95	5	22	0423	4040.0	6709.9
KT9502 (9552)	105	7	SHU	B/CTD	3	95	5	22	0838	4030.0	6717.4
KT9502 (9552)	106	7	SHU	B/CTD	3	95	5	22	1131	4034.9	6724.8
KT9502 (9552)	107	7	SHU	B	3	95	5	22	1427	4045.0	6724.0
KT9502 (9552)	108	7	SHU	B/CTD	3	95	5	22	1732	4057.2	6724.9
KT9502 (9552)	109	7	SHU	B/CTD	3	95	5	22	2018	4104.9	6725.0
KT9502 (9552)	110	7	SHU	B/CTD	3	95	5	22	2303	4113.0	6725.0
KT9502 (9552)	111	7	SHU	B/CTD	3	95	5	23	0220	4107.0	6741.0
KT9502 (9552)	112	7	SHU	B/CTD	3	95	5	23	0435	4059.9	6739.9

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
KT9502 (9552)	113	7	SHU	B/CTD	3	95	5	23	0830	4051.8	6739.9
KT9502 (9552)	114	7	SHU	B/CTD	3	95	5	23	1044	4042.4	6740.5
KT9502 (9552)	115	7	SHU	B/CTD	3	95	5	23	1339	4031.0	6740.0
KT9502 (9552)	116	7	SHU	B/CTD	3	95	5	23	1735	4020.0	6755.0
KT9502 (9552)	117	7	SHU	B/CTD	3	95	5	23	2021	4028.0	6753.0
KT9502 (9552)	118	7	SHU	B/CTD	3	95	5	23	2337	4040.0	6755.0
KT9502 (9552)	119	7	SHU	B/CTD	3	95	5	24	0237	4048.0	6756.0
KT9502 (9552)	120	7	SHU	B/CTD	3	95	5	24	0514	4056.0	6754.0
KT9502 (9552)	121	7	SHU	B/CTD	3	95	5	24	0732	4102.5	6755.1
KT9502 (9552)	122	7	SHU	B/CTD	3	95	5	24	1103	4057.0	6810.1
KT9502 (9552)	123	7	SHU	B/CTD	3	95	5	24	1426	4045.0	6810.0
KT9502 (9552)	124	7	SHU	B/CTD	3	95	5	24	1728	4035.1	6809.3
KT9502 (9552)	125	7	SHU	B/CTD	3	95	5	24	2045	4024.9	6809.9
KT9502 (9552)	126	7	SHU	B/CTD	3	95	5	25	0025	4018.4	6813.3
KT9502 (9552)	128	7	SHU	B/CTD	3	95	5	25	0815	4022.1	6824.5
KT9502 (9552)	129	7	SHU	B/CTD	3	95	5	25	1149	4031.8	6824.9
KT9502 (9552)	130	7	SHU	B/CTD	3	95	5	25	1527	4042.0	6826.0
KT9502 (9552)	131	7	SHU	B/CTD	3	95	5	25	1805	4051.0	6824.0
KT9502 (9552)	132	7	SHU	B/CTD	3	95	5	25	2022	4051.0	6816.4
KT9502 (9552)	133	7	SHU	B/CTD	3	95	5	25	2323	4051.9	6805.9
KT9502 (9552)	134	7	SHU	B/CTD	3	95	5	26	0230	4057.9	6802.2
KT9502 (9552)	135	7	SHU	B/CTD/N	3	95	5	26	0539	4049.0	6802.0
KT9502 (9552)	136	7	SHU	B/CTD	3	95	5	26	0841	4046.0	6817.0
KT9502 (9552)	137	7	SHU	B/CTD	3	95	5	26	1134	4041.6	6829.2
KT9502 (9552)	138	7	SHU	B/CTD	3	95	5	26	1342	4037.7	6832.2
KT9502 (9552)	139	7	SHU	B/CTD	3	95	5	26	1652	4047.1	6843.1
KT9502 (9552)	140	7	SHU	B/CTD	3	95	5	26	1918	4052.5	6834.1
KT9502 (9552)	141	7	SHU	B/CTD	3	95	5	26	2118	4056.7	6845.0
KT9502 (9552)	142	7	SHU	B/CTD	3	95	5	26	2346	4056.0	6837.4
KT9504 (9554)	1	7	Y36	-	1	95	6	20	0000	4125.0	6845.0
KT9504 (9554)	2	7	Y36	-	1	95	6	20	0445	4111.0	6844.0
KT9504 (9554)	3	7	Y36	-	1	95	6	20	0840	4049.0	6844.0
KT9504 (9554)	4	7	Y36	-	1	95	6	20	1120	4044.0	6830.0
KT9504 (9554)	5	7	Y36	-	1	95	6	20	1400	4100.0	6830.0
KT9504 (9554)	6	7	Y36	-	1	95	6	20	1600	4116.0	6830.0
KT9504 (9554)	7	7	Y36	-	1	95	6	20	1840	4130.0	6828.0
KT9504 (9554)	8	7	Y36	CTD	1	95	6	20	2125	4138.0	6814.0
KT9504 (9554)	9	7	Y36	-	1	95	6	21	0000	4122.0	6815.0
KT9504 (9554)	10	7	Y36	-	1	95	6	21	0245	4107.0	6815.0
KT9504 (9554)	11	7	Y36	-	1	95	6	21	0520	4052.0	6815.0
KT9504 (9554)	12	7	Y36	CTD	1	95	6	21	0750	4037.0	6815.0
KT9504 (9554)	13	7	Y36	-	1	95	6	21	1145	4044.0	6802.0
KT9504 (9554)	14	7	Y36	-	1	95	6	21	1400	4100.0	6800.0
KT9504 (9554)	15	7	Y36	-	1	95	6	21	1550	4115.0	6800.0
KT9504 (9554)	16	7	Y36	-	1	95	6	21	1745	4130.0	6757.0
KT9504 (9554)	17	7	Y36	CTD	1	95	6	21	1955	4145.0	6759.0
KT9504 (9554)	18	7	Y36	-	1	95	6	21	2220	4149.0	6744.0
KT9504 (9554)	19	7	Y36	-	1	95	6	22	0010	4138.0	6745.0
KT9504 (9554)	20	7	Y36	-	1	95	6	22	0221	4122.0	6744.0
KT9504 (9554)	21	7	Y36	-	1	95	6	22	0455	4106.0	6745.0
KT9504 (9554)	22	7	Y36	-	1	95	6	22	0750	4052.0	6744.0
KT9504 (9554)	23	7	Y36	CTD	1	95	6	22	1000	4039.0	6745.0
KT9504 (9554)	24	7	Y36	-	1	95	6	22	1203	4045.0	6729.0
KT9504 (9554)	25	7	Y36	-	1	95	6	22	1405	4100.0	6730.0
KT9504 (9554)	26	7	Y36	-	1	95	6	22	1555	4115.0	6730.0
KT9504 (9554)	27	7	Y36	-	1	95	6	22	1740	4130.0	6730.0
KT9504 (9554)	28	7	Y36	-	1	95	6	22	1932	4145.0	6729.0
KT9504 (9554)	29	7	Y36	-	1	95	6	22	2150	4200.0	6729.0
KT9504 (9554)	30	7	Y36	-	1	95	6	22	2345	4152.0	6714.0
KT9504 (9554)	31	7	Y36	-	1	95	6	23	0130	4139.0	6715.0
KT9504 (9554)	32	7	Y36	CTD	1	95	6	23	0345	4122.0	6715.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
KT9504 (9554)	33	7	Y36	CTD	1	95	6	23	0540	4109.0	6714.0
KT9504 (9554)	34	7	Y36	-	1	95	6	23	0820	4049.0	6714.0
KT9504 (9554)	35	7	Y36	-	1	95	6	23	1035	4100.0	6659.0
KT9504 (9554)	36	7	Y36	-	1	95	6	23	1240	4115.0	6700.0
KT9504 (9554)	37	7	Y36	-	1	95	6	23	1440	4130.0	6700.0
KT9504 (9554)	38	7	Y36	-	1	95	6	23	1630	4145.0	6700.0
KT9504 (9554)	39	7	Y36	CTD	1	95	6	23	1850	4201.0	6658.0
KT9504 (9554)	40	7	Y36	-	1	95	6	23	2045	4151.0	6644.0
KT9504 (9554)	41	7	Y36	-	1	95	6	23	2237	4138.0	6644.0
KT9504 (9554)	42	7	Y36	-	1	95	6	24	0045	4121.0	6644.0
KT9504 (9554)	43	7	Y36	-	1	95	6	24	0235	4108.0	6644.0
KT9504 (9554)	44	7	Y36	-	1	95	6	24	0432	4116.0	6629.0
KT9504 (9554)	45	7	Y36	CTD	1	95	6	24	0635	4130.0	6630.0
KT9504 (9554)	46	7	Y36	-	1	95	6	24	0825	4145.0	6629.0
KT9504 (9554)	47	7	Y36	-	1	95	6	24	1028	4200.0	6629.0
KT9504 (9554)	48	7	Y36	-	1	95	6	24	1223	4151.0	6615.0
KT9504 (9554)	49	7	Y36	-	1	95	6	24	1402	4138.0	6614.0
KT9504 (9554)	50	7	Y36	-	1	95	6	24	1613	4145.0	6600.0
KT9504 (9554)	51	7	Y36	CTD	1	95	6	24	1824	4200.0	6600.0
KT9504 (9554)	52	7	Y36	-	1	95	6	24	2000	4200.0	6614.0
KT9504 (9554)	53	7	Y36	-	1	95	6	24	2325	4159.0	6645.0
KT9504 (9554)	54	7	Y36	-	1	95	6	25	0139	4143.0	6645.0
KT9504 (9554)	55	7	Y36	-	1	95	6	25	0330	4129.0	6644.0
KT9504 (9554)	56	7	Y36	-	1	95	6	25	0535	4134.0	6629.0
KT9504 (9554)	57	7	Y36	-	1	95	6	25	0745	4145.0	6614.0
KT9504 (9554)	58	7	Y36	-	1	95	6	25	0957	4152.0	6630.0
KT9504 (9554)	59	7	Y36	-	1	95	6	25	1328	4207.0	6620.0
KT9504 (9554)	60	7	Y36	-	1	95	6	25	1548	4207.0	6638.0
KT9504 (9554)	61	6	Y36	-	1	95	6	25	1715	4201.0	6638.0
KT9504 (9554)	62	6	Y36	-	-	95	6	25	1915	4201.0	6642.0
KT9504 (9554)	63	6	Y36	-	-	95	6	25	2114	4157.0	6643.0
KT9504 (9554)	64	6	Y36	-	-	95	6	25	2310	4156.0	6641.0
KT9504 (9554)	65	6	Y36	-	-	95	6	26	0105	4153.0	6637.0
KT9504 (9554)	66	6	Y36	-	-	95	6	26	0310	4152.0	6636.0
KT9504 (9554)	67	6	Y36	-	-	95	6	26	0505	4153.0	6640.0
KT9504 (9554)	68	6	Y36	-	-	95	6	26	0716	4152.0	6647.0
KT9504 (9554)	69	6	Y36	-	-	95	6	26	0905	4157.0	6647.0
KT9504 (9554)	70	6	Y36	-	-	95	6	26	1105	4202.0	6645.0
KT9504 (9554)	71	6	Y36	-	-	95	6	26	1307	4200.0	6641.0
KT9504 (9554)	72	6	Y36	-	-	95	6	26	1510	4156.0	6636.0
KT9504 (9554)	73	6	Y36	-	-	95	6	26	1712	4152.0	6636.0
KT9504 (9554)	74	6	Y36	-	-	95	6	26	1910	4155.0	6640.0
KT9504 (9554)	75	6	Y36	-	-	95	6	26	2108	4158.0	6644.0
KT9504 (9554)	76	6	Y36	-	-	95	6	26	2310	4200.0	6644.0
KT9504 (9554)	77	6	Y36	-	-	95	6	27	0345	4155.0	6638.0
KT9504 (9554)	78	6	Y36	-	-	95	6	27	0510	4156.0	6636.0
KT9504 (9554)	79	6	Y36	-	-	95	6	27	0710	4158.0	6636.0
KT9504 (9554)	80	6	Y36	-	-	95	6	27	0910	4201.0	6637.0
KT9504 (9554)	81	6	Y36	-	-	95	6	27	1112	4201.0	6640.0
KT9504 (9554)	82	6	Y36	-	-	95	6	27	1310	4158.0	6639.0
KT9504 (9554)	83	6	Y36	-	-	95	6	27	1510	4155.0	6646.0
KT9504 (9554)	84	6	SHU	-	-	95	6	27	2128	4158.0	6643.0
KT9504 (9554)	85	6	SHU	-	-	95	6	27	2249	4200.0	6640.0
KT9504 (9554)	86	6	SHU	-	-	95	6	28	0105	4201.0	6643.0
KT9504 (9554)	87	6	SHU	-	-	95	6	28	0315	4158.0	6643.0
KT9504 (9554)	88	6	SHU	-	-	95	6	28	0505	4157.0	6644.0
KT9504 (9554)	89	6	SHU	-	-	95	6	28	0753	4159.0	6643.0
KT9504 (9554)	90	6	SHU	-	-	95	6	28	0915	4159.0	6641.0
KT9504 (9554)	91	6	SHU	-	-	95	6	28	1138	4157.0	6638.0
KT9504 (9554)	92	6	SHU	-	-	95	6	28	1310	4155.0	6635.0
KT9504 (9554)	93	6	SHU	-	-	95	6	28	1516	4151.0	6637.0
KT9504 (9554)	94	6	SHU	-	-	95	6	28	1700	4152.0	6640.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
KT9504 (9554)	95	6	SHU	-	-	95	6	29	0047	4158.0	6644.0
KT9504 (9554)	96	6	SHU	-	-	95	6	29	0315	4156.0	6639.0
KT9504 (9554)	97	6	SHU	-	-	95	6	29	0537	4152.0	6640.0
KT9504 (9554)	98	6	SHU	-	-	95	6	29	0717	4152.0	6645.0
KT9504 (9554)	99	6	SHU	-	-	95	6	29	0928	4156.0	6647.0
KT9504 (9554)	100	6	SHU	-	-	95	6	29	1120	4202.0	6645.0
KT9504 (9554)	101	6	SHU	-	-	95	6	29	1335	4201.0	6640.0
KT9504 (9554)	102	6	SHU	-	-	95	6	29	1608	4157.0	6636.0
KT9504 (9554)	103	6	SHU	-	-	95	6	29	1720	4153.0	6636.0
KT9504 (9554)	104	6	SHU	-	-	95	6	29	1922	4151.0	6641.0
KT9504 (9554)	105	6	SHU	-	-	95	6	29	2107	4154.0	6646.0
KT9504 (9554)	106	6	SHU	-	-	95	6	29	2305	4159.0	6646.0
KT9504 (9554)	107	6	SHU	-	-	95	6	30	0410	4155.0	6638.0
KT9504 (9554)	108	6	SHU	-	-	95	6	30	0722	4153.0	6640.0
KT9504 (9554)	109	6	SHU	-	-	95	6	30	0910	4156.0	6643.0
KT9504 (9554)	110	6	SHU	-	-	95	6	30	0950	4157.0	6646.0
KT9505 (9555)	1	7	Y36	PD	1	95	7	17	2345	4122.0	6844.0
KT9505 (9555)	2	7	Y36	CTD/PD	1	95	7	18	0245	4111.0	6844.0
KT9505 (9555)	3	7	Y36	PD	1	95	7	18	0610	4049.0	6843.0
KT9505 (9555)	4	7	Y36	PD	1	95	7	18	0849	4044.0	6830.0
KT9505 (9555)	5	7	Y36	CTD/PD	1	95	7	18	1122	4100.0	6830.0
KT9505 (9555)	6	7	Y36	PD	1	95	7	18	1329	4115.0	6829.0
KT9505 (9555)	7	7	Y36	PD	1	95	7	18	1602	4130.0	6830.0
KT9505 (9555)	8	7	Y36	PD	1	95	7	18	1850	4139.0	6814.0
KT9505 (9555)	9	7	Y36	PD	1	95	7	18	2205	4117.0	6814.0
KT9505 (9555)	10	7	Y36	CTD/PD	1	95	7	19	0040	4108.0	6815.0
KT9505 (9555)	11	7	Y36	PD	1	95	7	19	0345	4052.0	6814.0
KT9505 (9555)	12	7	Y36	PD	1	95	7	19	0620	4037.0	6814.0
KT9505 (9555)	13	7	Y36	PD	1	95	7	19	0855	4045.0	6800.0
KT9505 (9555)	14	7	Y36	CTD/PD	1	95	7	19	1117	4100.0	6800.0
KT9505 (9555)	15	7	Y36	PD	1	95	7	19	1318	4117.0	6800.0
KT9505 (9555)	16	7	Y36	PD	1	95	7	19	1500	4130.0	6800.0
KT9505 (9555)	17	7	Y36	PD	1	95	7	19	1655	4145.0	6759.0
KT9505 (9555)	18	7	Y36	PD	1	95	7	19	1915	4150.0	6743.0
KT9505 (9555)	19	7	Y36	PD	1	95	7	19	2120	4138.0	6745.0
KT9505 (9555)	20	7	Y36	PD	1	95	7	19	2347	4122.0	6745.0
KT9505 (9555)	21	7	Y36	PDCTD	1	95	7	20	0225	4107.0	6745.0
KT9505 (9555)	22	7	Y36	PD	1	95	7	20	0448	4051.0	6744.0
KT9505 (9555)	23	7	Y36	PD	1	95	7	20	0702	4037.0	6744.0
KT9505 (9555)	24	7	Y36	PD	1	95	7	20	0900	4045.0	6730.0
KT9505 (9555)	25	7	Y36	CTD/PD	1	95	7	20	1118	4100.0	6731.0
KT9505 (9555)	26	7	Y36	PD	1	95	7	20	1325	4115.0	6729.0
KT9505 (9555)	27	7	Y36	PD	1	95	7	20	1516	4130.0	6730.0
KT9505 (9555)	28	7	Y36	PD	1	95	7	20	1710	4145.0	6730.0
KT9505 (9555)	29	7	Y36	PD	1	95	7	20	1922	4200.0	6730.0
KT9505 (9555)	30	7	Y36	PD	1	95	7	20	2145	4152.0	6714.0
KT9505 (9555)	31	7	Y36	CTD/PD	1	95	7	21	0000	4139.0	6715.0
KT9505 (9555)	32	7	Y36	PD	1	95	7	21	0245	4122.0	6715.0
KT9505 (9555)	33	7	Y36	PD	1	95	7	21	0450	4108.0	6714.0
KT9505 (9555)	34	7	Y36	PD	1	95	7	21	0735	4049.0	6714.0
KT9505 (9555)	35	7	Y36	PD	1	95	7	21	0946	4100.0	6700.0
KT9505 (9555)	36	7	Y36	CTD/PD	1	95	7	21	1207	4115.0	6700.0
KT9505 (9555)	37	7	Y36	PD	1	95	7	21	1421	4130.0	6700.0
KT9505 (9555)	38	7	Y36	PD	1	95	7	21	1622	4145.0	6659.0
KT9505 (9555)	39	7	Y36	PD	1	95	7	21	1838	4200.0	6658.0
KT9505 (9555)	40	7	Y36	PD	1	95	7	21	1923	4200.0	6656.0
KT9505 (9555)	41	7	Y36	PD	1	95	7	21	2200	4150.0	6644.0
KT9505 (9555)	42	7	Y36	CTD/PD	1	95	7	22	0018	4137.0	6645.0
KT9505 (9555)	43	7	Y36	PD	1	95	7	22	0248	4121.0	6645.0
KT9505 (9555)	44	7	Y36	PD	1	95	7	22	0450	4108.0	6645.0
KT9505 (9555)	45	7	Y36	PD	1	95	7	22	0700	4115.0	6630.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
KT9505 (9555)	46	7	Y36	PD	1	95	7	22	0907	4130.0	6630.0
KT9505 (9555)	47	7	Y36	CTD/PD	1	95	7	22	1120	4144.0	6630.0
KT9505 (9555)	48	7	Y36	PD	1	95	7	22	1341	4200.0	6630.0
KT9505 (9555)	49	7	Y36	PD	1	95	7	22	1612	4153.0	6613.0
KT9505 (9555)	50	7	Y36	PD	1	95	7	22	1844	4140.0	6615.0
KT9505 (9555)	51	7	Y36	PD	1	95	7	22	2057	4145.0	6559.0
KT9505 (9555)	52	7	Y36	CTD/PD	1	95	7	22	2330	4159.0	6600.0
KT9505 (9555)	53	7	Y36	PD	1	95	7	23	0145	4200.0	6615.0
KT9505 (9555)	54	7	Y36	PD	-	95	7	23	0345	4208.0	6623.0
KT9505 (9555)	55	6	Y36	PD	-	95	7	23	0707	4204.0	6622.0
KT9505 (9555)	56	6	Y36	PD	-	95	7	23	0909	4204.0	6617.0
KT9505 (9555)	57	6	Y36	PD	-	95	7	23	1114	4201.0	6616.0
KT9505 (9555)	58	6	Y36	PD	-	95	7	23	1308	4156.0	6617.0
KT9505 (9555)	59	6	Y36	CTD/PD	-	95	7	23	1511	4155.0	6620.0
KT9505 (9555)	60	6	Y36	PD	-	95	7	23	1706	4156.0	6624.0
KT9505 (9555)	61	6	Y36	PD	-	95	7	23	1905	4200.0	6628.0
KT9505 (9555)	62	6	Y36	PD	-	95	7	23	2120	4203.0	6626.0
KT9505 (9555)	63	6	Y36	PD	-	95	7	23	2305	4202.0	6620.0
KT9505 (9555)	64	6	Y36	CTD/PD	-	95	7	24	0110	4158.0	6616.0
KT9505 (9555)	65	6	Y36	PD	-	95	7	24	0310	4154.0	6624.0
KT9505 (9555)	66	6	Y36	PD	-	95	7	24	0500	4159.0	6626.0
KT9505 (9555)	67	6	Y36	PD	-	95	7	24	0705	4203.0	6623.0
KT9505 (9555)	68	6	Y36	PD	-	95	7	24	0905	4201.0	6621.0
KT9505 (9555)	69	6	Y36	PD	-	95	7	24	1103	4157.0	6622.0
KT9505 (9555)	70	6	Y36	CTD/PD	-	95	7	24	1314	4155.0	6618.0
KT9505 (9555)	71	6	Y36	PD	-	95	7	24	1504	4155.0	6616.0
KT9505 (9555)	72	6	Y36	PD	-	95	7	24	1703	4201.0	6619.0
KT9505 (9555)	73	6	Y36	PD	-	95	7	24	1910	4204.0	6619.0
KT9505 (9555)	74	6	Y36	PD	-	95	7	24	2110	4204.0	6618.0
KT9505 (9555)	75	6	Y36	PD	-	95	7	24	2310	4201.0	6615.0
KT9505 (9555)	76	6	Y36	CTD/PD	-	95	7	25	0110	4158.0	6618.0
KT9505 (9555)	77	6	Y36	PD	-	95	7	25	0305	4158.0	6622.0
KT9505 (9555)	78	6	Y36	PD	-	95	7	25	0508	4202.0	6624.0
KT9505 (9555)	79	6	Y36	PD	-	95	7	25	0715	4204.0	6627.0
KT9505 (9555)	80	6	Y36	CTD/PD	-	95	7	25	1302	4120.0	6653.0
KT9505 (9555)	81	6	Y36	PD	-	95	7	25	1510	4116.0	6654.0
KT9505 (9555)	82	6	Y36	PD	-	95	7	25	1704	4113.0	6656.0
KT9505 (9555)	83	6	Y36	PD	-	95	7	25	1915	4113.0	6700.0
KT9505 (9555)	84	6	Y36	PD	-	95	7	25	2105	4110.0	6700.0
KT9505 (9555)	85	6	Y36	PD	-	95	7	25	2305	4110.0	6705.0
KT9505 (9555)	86	6	Y36	CTD/PD	-	95	7	26	0110	4114.0	6706.0
KT9505 (9555)	87	6	Y36	PD	-	95	7	26	0305	4119.0	6706.0
KT9505 (9555)	88	6	Y36	PD	-	95	7	26	0511	4120.0	6702.0
KT9505 (9555)	89	6	Y36	PD	-	95	7	26	0706	4120.0	6700.0
KT9505 (9555)	90	6	Y36	PD	-	95	7	26	0906	4120.0	6656.0
KT9505 (9555)	91	6	Y36	PD	-	95	7	26	1102	4118.0	6655.0
KT9505 (9555)	92	6	Y36	CTD/PD	-	95	7	26	1312	4115.0	6657.0
KT9505 (9555)	93	6	Y36	PD	-	95	7	26	1512	4114.0	6658.0
KT9505 (9555)	94	6	Y36	PD	-	95	7	26	1707	4114.0	6701.0
KT9505 (9555)	95	6	Y36	PD	-	95	7	26	1907	4116.0	6705.0
KT9505 (9555)	96	6	Y36	PD	-	95	7	26	2103	4119.0	6702.0
KT9505 (9555)	97	6	Y36	PD	-	95	7	26	2305	4119.0	6658.0
KT9505 (9555)	98	6	Y36	CTD/PD	-	95	7	27	0115	4116.0	6653.0
KT9505 (9555)	99	6	Y36	PD	-	95	7	27	0310	4117.0	6656.0
KT9505 (9555)	100	6	Y36	PD	-	95	7	27	0515	4118.0	6659.0
KT9505 (9555)	101	6	Y36	PD	-	95	7	27	0703	4114.0	6703.0
KT9505 (9555)	102	6	Y36	PD	-	95	7	27	0908	4113.0	6701.0
KT9505 (9555)	103	6	Y36	PD	-	95	7	27	1106	4117.0	6655.0
KT9505 (9555)	104	6	Y36	CTD/PD	-	95	7	27	1311	4120.0	6657.0
KT9505 (9555)	105	6	Y36	PD	-	95	7	27	1906	4201.0	6629.0
KT9505 (9555)	106	6	Y36	-	-	95	7	27	2007	4204.0	6629.0
KT9505 (9555)	107	6	Y36	PD	-	95	7	27	2107	4206.0	6627.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
KT9505 (9555)	108	6	Y36	-	-	95	7	27	2210	4207.0	6625.0
KT9505 (9555)	109	6	Y36	PD	-	95	7	27	2313	4208.0	6622.0
KT9505 (9555)	110	6	Y36	CTD/PD	-	95	7	28	0023	4208.0	6617.0
KT9505 (9555)	111	6	Y36	PD	-	95	7	28	0108	4205.0	6614.0
KT9505 (9555)	112	6	Y36	-	-	95	7	28	0207	4201.0	6615.0
KT9505 (9555)	113	6	Y36	PD	-	95	7	28	0305	4200.0	6616.0
KT9505 (9555)	114	6	Y36	-	-	95	7	28	0410	4201.0	6619.0
KT9505 (9555)	115	6	Y36	PD	-	95	7	28	0505	4200.0	6620.0
KT9505 (9555)	116	6	Y36	PD	-	95	7	28	0612	4201.0	6623.0
KT9505 (9555)	117	6	Y36	PD	-	95	7	28	0713	4203.0	6623.0
KT9505 (9555)	118	6	Y36	PD	-	95	7	28	0808	4205.0	6622.0
KT9505 (9555)	119	6	Y36	PD	-	95	7	28	0906	4206.0	6619.0
KT9505 (9555)	120	6	Y36	PD	-	95	7	28	1008	4205.0	6624.0
KT9505 (9555)	121	7	Y36	PD	-	95	7	28	1110	4203.0	6633.0
KT9505 (9555)	122	7	Y36	CTD/PD	-	95	7	28	1214	4202.0	6640.0
KT9505 (9555)	123	7	Y36	PD	-	95	7	28	1306	4200.0	6648.0
KT9505 (9555)	124	7	Y36	PD	-	95	7	28	1405	4157.0	6658.0
KT9505 (9555)	125	7	Y36	PD	-	95	7	28	1506	4155.0	6708.0
KT9505 (9555)	126	7	Y36	PD	-	95	7	28	1606	4152.0	6719.0
DE9606 (9656)	1	7	Y36	B/CTD	1	96	5	21	0603	4047.4	6911.9
DE9606 (9656)	2	7	Y36	B/CTD/N	1	96	5	21	0759	4115.0	6859.9
DE9606 (9656)	3	7	Y36	B/CTD	1	96	5	21	1359	4100.8	6859.1
DE9606 (9656)	4	7	Y36	B/CTD	1	96	5	21	1654	4044.1	6900.1
DE9606 (9656)	5	7	Y36	B/CTD/N	1	96	5	21	1955	4030.0	6859.8
DE9606 (9656)	6	7	Y36	B/CTD	1	96	5	21	2228	4022.7	6845.4
DE9606 (9656)	7	7	Y36	B/CTD	1	96	5	22	0055	4037.4	6844.6
DE9606 (9656)	8	7	Y36	B/CTD	1	96	5	22	0259	4052.5	6845.0
DE9606 (9656)	9	7	Y36	B/CTD/N	1	96	5	22	0517	4106.4	6845.0
DE9606 (9656)	11	7	Y36	B/CTD	1	96	5	22	0903	4122.4	6845.0
DE9606 (9656)	12	7	Y36	B/CTD	1	96	5	22	1114	4130.3	6830.2
DE9606 (9656)	13	7	Y36	B/CTD	1	96	5	22	1338	4116.5	6830.7
DE9606 (9656)	14	7	Y36	B/CTD	1	96	5	22	1611	4103.2	6832.0
DE9606 (9656)	15	7	Y36	B/CTD/N	1	96	5	22	1832	4046.0	6828.7
DE9606 (9656)	16	7	Y36	B/CTD	1	96	5	22	2101	4029.3	6830.9
DE9606 (9656)	17	7	Y36	B/CTD	1	96	5	22	2311	4037.6	6816.5
DE9606 (9656)	18	7	Y36	B/CTD	1	96	5	23	0121	4049.9	6813.5
DE9606 (9656)	19	7	Y36	B/CTD	1	96	5	23	0347	4107.4	6814.9
DE9606 (9656)	20	7	Y36	B/CTD/N	1	96	5	23	0554	4118.7	6818.0
DE9606 (9656)	21	7	Y36	B/CTD	1	96	5	23	0844	4134.7	6813.5
DE9606 (9656)	22	7	Y36	B/CTD	1	96	5	23	1054	4145.2	6801.1
DE9606 (9656)	23	7	Y36	B/CTD	1	96	5	23	1318	4130.6	6758.8
DE9606 (9656)	24	7	Y36	B/CTD	1	96	5	23	1538	4115.0	6758.5
DE9606 (9656)	25	7	Y36	B/CTD	1	96	5	23	1747	4100.4	6759.7
DE9606 (9656)	26	7	Y36	B/CTD/N	1	96	5	23	1950	4045.2	6800.1
DE9606 (9656)	27	7	Y36	B/CTD	1	96	5	23	2204	4030.1	6800.2
DE9606 (9656)	28	7	Y36	B/CTD	1	96	5	24	0009	4037.1	6746.0
DE9606 (9656)	29	7	Y36	B/CTD	1	96	5	24	0207	4051.8	6745.4
DE9606 (9656)	30	7	Y36	B/CTD	1	96	5	24	0417	4107.5	6745.2
DE9606 (9656)	31	7	Y36	B/CTD	1	96	5	24	0623	4122.4	6745.1
DE9606 (9656)	32	7	Y36	B/CTD/N	1	96	5	24	0828	4136.7	6745.9
DE9606 (9656)	33	7	Y36	B/CTD	1	96	5	24	1042	4152.6	6745.2
DE9606 (9656)	34	7	Y36	B/CTD	1	96	5	24	1244	4200.3	6730.2
DE9606 (9656)	35	7	Y36	B/CTD	1	96	5	24	1519	4143.6	6730.8
DE9606 (9656)	36	7	Y36	B/CTD/N	1	96	5	24	1726	4130.3	6729.8
DE9606 (9656)	37	7	Y36	B/CTD	1	96	5	24	1925	4115.5	6729.6
DE9606 (9656)	38	7	Y36	B/CTD	1	96	5	24	2118	4101.0	6730.2
DE9606 (9656)	39	7	Y36	B/CTD	1	96	5	24	2324	4046.6	6729.7
DE9606 (9656)	40	7	Y36	B/CTD	1	96	5	25	0135	4037.9	6715.5
DE9606 (9656)	41	7	Y36	B/CTD	1	96	5	25	0358	4053.1	6714.9
DE9606 (9656)	42	7	Y36	B/CTD/N	1	96	5	25	0628	4107.7	6714.4
DE9606 (9656)	43	7	Y36	B/CTD/N	1	96	5	25	0845	4122.4	6715.2

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
DE9606 (9656)	44	7	Y36	B/CTD	1	96	5	25	1051	4135.6	6715.0
DE9606 (9656)	45	7	Y36	B/CTD	1	96	5	25	1257	4152.3	6714.7
DE9606 (9656)	46	7	Y36	B/CTD	1	96	5	25	1452	4207.3	6715.2
DE9606 (9656)	47	7	Y36	B/CTD/N	1	96	5	25	1701	4200.4	6700.3
DE9606 (9656)	48	7	Y36	B/CTD	1	96	5	25	1923	4145.1	6700.9
DE9606 (9656)	49	7	Y36	B/CTD	1	96	5	25	2128	4130.7	6701.7
DE9606 (9656)	50	7	Y36	B/CTD	1	96	5	25	2337	4116.4	6700.2
DE9606 (9656)	51	7	Y36	B/CTD	1	96	5	26	0139	4101.3	6700.3
DE9606 (9656)	52	7	Y36	B/CTD	1	96	5	26	0354	4045.2	6659.7
DE9606 (9656)	53	7	Y36	B/CTD/N	1	96	5	26	0704	4107.4	6645.1
DE9606 (9656)	54	7	Y36	B/CTD	1	96	5	26	0934	4122.2	6645.1
DE9606 (9656)	55	7	Y36	B/CTD	1	96	5	27	0321	4138.1	6646.9
DE9606 (9656)	56	7	Y36	B/CTD/N	1	96	5	27	0528	4154.0	6645.5
DE9606 (9656)	57	7	Y36	B/CTD	1	96	5	27	0808	4207.6	6645.0
DE9606 (9656)	58	7	Y36	B/CTD	1	96	5	27	1001	4159.9	6630.0
DE9606 (9656)	59	7	Y36	B/CTD	1	96	5	27	1200	4145.9	6629.4
DE9606 (9656)	60	7	Y36	B/CTD	1	96	5	27	1402	4131.4	6630.0
DE9606 (9656)	61	7	Y36	B/CTD	1	96	5	27	1619	4115.5	6629.9
DE9606 (9656)	62	7	Y36	B/CTD/N	1	96	5	27	1946	4137.2	6615.5
DE9606 (9656)	63	7	Y36	B/CTD	1	96	5	27	2214	4152.6	6615.0
DE9606 (9656)	64	7	Y36	B/CTD	1	96	5	28	0027	4205.4	6614.4
DE9606 (9656)	65	7	Y36	B/CTD	1	96	5	29	0018	4054.0	6819.2
DE9606 (9656)	66	6	Y36	B/CTD	-	96	5	29	0245	4108.3	6818.7
DE9606 (9656)	67	6	Y36	B/CTD/N	-	96	5	29	0615	4124.5	6819.8
DE9606 (9656)	68	6	Y36	B/CTD	-	96	5	29	0902	4118.9	6830.3
DE9606 (9656)	69	6	Y36	B/CTD	-	96	5	29	1118	4107.3	6831.8
DE9606 (9656)	70	6	Y36	B/CTD	-	96	5	29	1403	4051.8	6834.1
DE9606 (9656)	71	6	Y36	B/CTD	-	96	5	29	1621	4049.9	6840.8
DE9606 (9656)	72	6	Y36	B/CTD/N	-	96	5	29	1910	4101.6	6840.6
DE9606 (9656)	73	6	Y36	B/CTD	-	96	5	29	2121	4113.5	6840.8
DE9606 (9656)	74	6	Y36	B/CTD	-	96	5	29	2320	4109.0	6849.2
DE9606 (9656)	75	6	Y36	B/CTD	-	96	5	30	0123	4058.3	6851.0
DE9606 (9656)	76	6	Y36	B/CTD	-	96	5	30	0332	4046.9	6851.8
DE9606 (9656)	77	6	Y36	B/CTD/N	-	96	5	30	0537	4040.4	6846.2
DE9606 (9656)	78	6	Y36	B/CTD	-	96	5	30	0841	4052.3	6844.1
DE9606 (9656)	79	6	Y36	B/CTD	-	96	5	30	1110	4059.7	6859.6
AL9608 (9658)	1	7	Y36	B/CTD	1	96	6	18	1216	4130.6	6859.7
AL9608 (9658)	2	7	Y36	B/CTD	1	96	6	18	1503	4115.2	6859.2
AL9608 (9658)	3	7	Y36	B/CTD	1	96	6	18	1745	4059.8	6859.9
AL9608 (9658)	4	7	Y36	B/CTD/N	1	96	6	18	1957	4046.2	6859.9
AL9608 (9658)	5	7	Y36	B/CTD	1	96	6	18	2210	4031.9	6900.1
AL9608 (9658)	6	7	Y36	B/CTD	1	96	6	19	0036	4023.3	6845.0
AL9608 (9658)	7	7	Y36	B/CTD	1	96	6	19	0258	4037.7	6844.6
AL9608 (9658)	8	7	Y36	B/CTD	1	96	6	19	0515	4052.4	6845.2
AL9608 (9658)	9	7	Y36	B/CTD/N	1	96	6	19	0731	4107.0	6845.2
AL9608 (9658)	10	7	Y36	B/CTD	1	96	6	19	0955	4122.9	6845.8
AL9608 (9658)	11	7	Y36	B/CTD	1	96	6	19	1205	4129.9	6830.2
AL9608 (9658)	12	7	Y36	B/CTD/N	1	96	6	19	1431	4116.2	6829.3
AL9608 (9658)	13	7	Y36	B/CTD	1	96	6	19	1706	4059.9	6829.7
AL9608 (9658)	14	7	Y36	B/CTD	1	96	6	19	1942	4046.8	6830.3
AL9608 (9658)	15	7	Y36	B/CTD	1	96	6	19	2259	4031.7	6828.8
AL9608 (9658)	16	7	Y36	B/CTD	1	96	6	20	0029	4037.1	6816.5
AL9608 (9658)	17	7	Y36	B/CTD	1	96	6	20	0254	4052.3	6815.0
AL9608 (9658)	18	7	Y36	B/CTD	1	96	6	20	0515	4107.9	6815.1
AL9608 (9658)	19	7	Y36	B/CTD/N	1	96	6	20	0732	4115.3	6819.7
AL9608 (9658)	20	7	Y36	B/CTD	1	96	6	20	1117	4135.1	6814.3
AL9608 (9658)	21	7	Y36	B/CTD	1	96	6	20	1341	4145.0	6759.0
AL9608 (9658)	22	7	Y36	B/CTD	1	96	6	20	1625	4127.7	6758.6
AL9608 (9658)	23	7	Y36	B/CTD	1	96	6	20	1904	4114.9	6759.8
AL9608 (9658)	24	7	Y36	B/CTD	1	96	6	20	2114	4100.3	6800.1
AL9608 (9658)	25	7	Y36	B/CTD/N	1	96	6	20	2319	4046.9	6759.8

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
AL9608 (9658)	26	7	Y36	B/CTD	1	96	6	21	0151	4030.4	6802.0
AL9608 (9658)	27	7	Y36	B/CTD	1	96	6	21	0412	4037.5	6745.3
AL9608 (9658)	28	7	Y36	B/CTD/N	1	96	6	21	0628	4052.4	6745.1
AL9608 (9658)	29	7	Y36	B/CTD	1	96	6	21	0853	4107.5	6745.1
AL9608 (9658)	30	7	Y36	B/CTD	1	96	6	21	1056	4121.8	6744.9
AL9608 (9658)	31	7	Y36	B/CTD	1	96	6	21	1303	4136.6	6745.0
AL9608 (9658)	32	7	Y36	B/CTD	1	96	6	21	1612	4151.8	6743.0
AL9608 (9658)	33	7	Y36	B/CTD	1	96	6	21	1839	4159.6	6729.7
AL9608 (9658)	34	7	Y36	B/CTD	1	96	6	21	2153	4145.1	6730.0
AL9608 (9658)	35	7	Y36	B/CTD	1	96	6	21	2318	4132.4	6731.2
AL9608 (9658)	36	7	Y36	B/CTD/N	1	96	6	22	0329	4115.1	6729.8
AL9608 (9658)	37	7	Y36	B/CTD/N	1	96	6	22	0554	4100.8	6730.5
AL9608 (9658)	38	7	Y36	B/CTD	1	96	6	22	1334	4045.0	6729.8
AL9608 (9658)	39	7	Y36	B/CTD	1	96	6	22	1531	4038.3	6716.7
AL9608 (9658)	40	7	Y36	B/CTD	1	96	6	22	1758	4052.0	6714.9
AL9608 (9658)	41	7	Y36	B/CTD	1	96	6	22	2118	4107.2	6715.0
AL9608 (9658)	42	7	Y36	B/CTD	1	96	6	22	2242	4122.8	6715.7
AL9608 (9658)	43	7	Y36	B/CTD/N	1	96	6	23	0050	4133.6	6712.7
AL9608 (9658)	44	7	Y36	B/CTD	1	96	6	23	0325	4152.3	6714.2
AL9608 (9658)	45	7	Y36	B/CTD/N	1	96	6	23	0556	4207.3	6714.1
AL9608 (9658)	46	7	Y36	B/CTD	1	96	6	23	0754	4200.6	6700.4
AL9608 (9658)	47	7	Y36	B/CTD	1	96	6	23	1007	4145.2	6700.0
AL9608 (9658)	48	7	Y36	B/CTD	1	96	6	23	1221	4130.4	6701.1
AL9608 (9658)	49	7	Y36	B/CTD	1	96	6	23	1436	4115.0	6659.8
AL9608 (9658)	50	7	Y36	B/CTD	1	96	6	23	1633	4102.0	6659.3
AL9608 (9658)	51	7	Y36	B/CTD	1	96	6	23	1859	4045.1	6659.8
AL9608 (9658)	52	7	Y36	B/CTD	1	96	6	23	2223	4107.2	6645.7
AL9608 (9658)	53	7	Y36	B/CTD/N	1	96	6	24	0047	4121.8	6644.6
AL9608 (9658)	54	7	Y36	B/CTD	1	96	6	24	0259	4137.5	6644.8
AL9608 (9658)	55	7	Y36	B/CTD/N	1	96	6	24	0506	4152.6	6644.6
AL9608 (9658)	56	7	Y36	B/CTD	1	96	6	24	0735	4207.8	6645.2
AL9608 (9658)	57	7	Y36	B/CTD	1	96	6	24	0943	4200.3	6629.3
AL9608 (9658)	58	7	Y36	B/CTD	1	96	6	24	1145	4145.5	6630.3
AL9608 (9658)	59	7	Y36	B/CTD	1	96	6	24	1743	4130.4	6629.9
AL9608 (9658)	60	7	Y36	B/CTD	1	96	6	24	1958	4114.9	6630.2
AL9608 (9658)	61	7	Y36	B/CTD/N	1	96	6	24	2312	4136.0	6616.6
AL9608 (9658)	62	7	Y36	B/CTD	1	96	6	25	0139	4150.7	6615.0
AL9608 (9658)	63	7	Y36	B/CTD	1	96	6	25	0359	4207.7	6615.3
AL9608 (9658)	64	7	Y36	B/CTD/N	1	96	6	25	0600	4159.8	6600.8
AL9608 (9658)	65	7	Y36	B/CTD	1	96	6	25	0826	4145.4	6559.9
AL9610 (9650)	1	7	Y36	-	1	96	8	28	2109	4129.0	6900.0
AL9610 (9650)	2	7	Y36	-	1	96	8	29	0002	4114.0	6900.0
AL9610 (9650)	3	7	Y36	-	1	96	8	29	0207	4059.0	6859.0
AL9610 (9650)	4	7	Y36	-	1	96	8	29	0406	4043.0	6900.0
AL9610 (9650)	5	7	Y36	-	1	96	8	29	0654	4030.0	6900.0
AL9610 (9650)	6	7	Y36	-	1	96	8	29	0900	4024.0	6845.0
AL9610 (9650)	7	7	Y36	-	1	96	8	29	1054	4039.0	6845.0
AL9610 (9650)	8	7	Y36	-	1	96	8	29	1251	4052.0	6844.0
AL9610 (9650)	9	7	Y36	-	1	96	8	29	1514	4108.0	6845.0
AL9610 (9650)	10	7	Y36	-	1	96	8	29	1726	4123.0	6844.0
AL9610 (9650)	11	7	Y36	-	1	96	8	29	1942	4129.0	6830.0
AL9610 (9650)	12	7	Y36	-	1	96	8	29	2209	4114.0	6830.0
AL9610 (9650)	13	7	Y36	CTD	1	96	8	29	2312	4100.0	6829.0
AL9610 (9650)	14	7	Y36	-	1	96	8	30	0212	4046.0	6829.0
AL9610 (9650)	15	7	Y36	-	1	96	8	30	0418	4031.0	6829.0
AL9610 (9650)	16	7	Y36	-	1	96	8	30	0618	4038.0	6815.0
AL9610 (9650)	17	7	Y36	-	1	96	8	30	0819	4054.0	6815.0
AL9610 (9650)	18	7	Y36	-	1	96	8	30	0959	4109.0	6815.0
AL9610 (9650)	19	7	Y36	CTD	1	96	8	30	1133	4119.0	6821.0
AL9610 (9650)	20	7	Y36	-	1	96	8	30	1417	4136.0	6813.0
AL9610 (9650)	21	7	Y36	-	1	96	8	30	1634	4144.0	6800.0

Cruise Number (Code)	Station Number	Station Type	Trawl Gear	Other Gear	Grid Number	Yr	Mon	Day	Tow Time	LAT	LON
AL9610 (9650)	22	7	Y36	-	1	96	8	30	1828	4129.0	6759.0
AL9610 (9650)	23	7	Y36	-	1	96	8	30	2048	4115.0	6800.0
AL9610 (9650)	24	7	Y36	-	1	96	8	30	2258	4100.0	6800.0
AL9610 (9650)	25	7	Y36	CTD	1	96	8	31	0105	4044.0	6800.0
AL9610 (9650)	26	7	Y36	CTD	1	96	8	31	0304	4030.0	6759.0
AL9610 (9650)	27	7	Y36	-	1	96	8	31	0519	4038.0	6745.0
AL9610 (9650)	28	7	Y36	-	1	96	8	31	0722	4053.0	6745.0
AL9610 (9650)	29	7	Y36	-	1	96	8	31	0913	4108.0	6745.0
AL9610 (9650)	30	7	Y36	-	1	96	8	31	1056	4123.0	6745.0
AL9610 (9650)	31	7	Y36	CTD	1	96	8	31	1247	4137.0	6745.0
AL9610 (9650)	32	7	Y36	-	1	96	8	31	1517	4153.0	6745.0
AL9610 (9650)	33	7	Y36	-	1	96	9	04	0012	4201.0	6732.0
AL9610 (9650)	34	7	Y36	CTD	1	96	9	04	0223	4207.0	6715.0
AL9610 (9650)	35	7	Y36	-	1	96	9	04	0514	4207.0	6644.0
AL9610 (9650)	36	7	Y36	-	1	96	9	04	0700	4159.0	6630.0
AL9610 (9650)	37	7	Y36	-	1	96	9	04	0904	4153.0	6645.0
AL9610 (9650)	38	7	Y36	-	1	96	9	04	1101	4200.0	6700.0
AL9610 (9650)	39	7	Y36	CTD	1	96	9	04	1308	4153.0	6714.0
AL9610 (9650)	40	7	Y36	-	1	96	9	04	1523	4144.0	6730.0
AL9610 (9650)	41	7	Y36	-	1	96	9	04	1734	4130.0	6731.0
AL9610 (9650)	42	7	Y36	-	1	96	9	04	2029	4139.0	6711.0
AL9610 (9650)	43	7	Y36	-	1	96	9	04	2220	4144.0	6659.0
AL9610 (9650)	44	7	Y36	CTD	1	96	9	05	0019	4138.0	6645.0
AL9610 (9650)	45	7	Y36	-	1	96	9	05	0220	4144.0	6630.0
AL9610 (9650)	46	7	Y36	-	1	96	9	05	0432	4130.0	6631.0
AL9610 (9650)	47	7	Y36	-	1	96	9	05	0648	4124.0	6647.0
AL9610 (9650)	48	7	Y36	-	1	96	9	05	0842	4129.0	6700.0
AL9610 (9650)	49	7	Y36	-	1	96	9	05	1043	4122.0	6715.0
AL9610 (9650)	50	7	Y36	CTD	1	96	9	05	1235	4115.0	6731.0

Appendix IV

Scientific personnel (listed alphabetically) during COP Process-oriented cruises 1994-96

Amico, Alyssa	Boston University, Boston, MA
Armstrong, Robert	University of Rhode Island, Kingston, RI
Ashkouri, Michael	New England Aquarium, Boston, MA
Barrera, Noe	Texas A&M University, Corpus Christi, TX
Berube, Jesse	University of Maine, Machias, ME
Beverly, Lyne	Eastern Nazarene College, Weston, MA
Bolles, Karen	Westfield State College, Westfield, MA
Bosley, Keith	Rutgers University, New Brunswick, NJ
Bowman, Raymond	NMFS, NEFSC, Woods Hole, MA
Brodziak, John	NMFS, NEFSC, Woods Hole, MA
Broughton, Elizabeth	NMFS, NEFSC, Woods Hole, MA
Bryant, Mary	Northeastern Missouri State University, Kirksville, MO
Bullough, Luke	University Aberdeen, Scotland
Burns, Bruce	NMFS, NEFSC, Woods Hole, MA
Burrell, Mondle Tim	Atlantic Marine Center, ONCO, Norfolk, VA
Burt, Ryan	Bemidji State University, Bemidji, MN
Callahan, Michael	New England Aquarium, Boston, MA
Chadwick, Alex	National Public Radio, Washington, D.C.
Chapman, Ginger	University of the Virgin Islands, ST. Thomas, VI
Chizich, Jenee	Cornell University, Ithaca, NY
Ciesla, Mary	University of South Carolina, Columbia, SC
Collins, Julia	NMFS, NEFSC, Woods Hole, MA
Colvin, Joseph	Atlantic Marine Center, ONCO, Norfolk, VA
Constantino, Jason	University of Maine, Machias, ME
Crossin, Glenn	Marine Biological Laboratory, Woods Hole, MA
DeConinck, Michael	New Bedford, MA
Demer, David	NMFS, SWFSC, LaJolla, CA
Doornbosch, Frederike	Colgate University, NY
Drouin, Ann	Waterton, MA
Elder, Layla	Texas A&M University, Corpus Christi, TX
Farham, Debra	NMFS, NEFSC, Woods Hole, MA
Flanagan, Joseph	Salve Regina University, MA
Fogarty, Michael	NMFS, NEFSC, Woods Hole, MA
Gallant, Elizabeth	NMFS, NEFSC, Woods Hole, MA
Gerstner, Cynthia	University of Michigan, Ann Arbor, MI
Goncalves, Kimberly	University of Massachusetts, Amherst, MA
Green, Allison	State University of New York, Stony Brook, NY
Grillo, William	State University of New York, Stony Brook, NY
Hanley, Joseph	University of Washington, Seattle, WA
Helser, Thomas	NMFS, NEFSC, Woods Hole, MA
Hieskell, Mary Beth	NMFS, NEFSC, Woods Hole, MA
Hopkins, Nicolas	University of Maine, Machias, ME

Kaminer, Brian	NMFS, NEFSC, Woods Hole, MA
Kelsey, Jonathan	Duke University, Durham, NC
Kiladis, Marie	NMFS, NEFSC, Woods Hole, MA
Knight, Terrence	National Public Radio, Washington, D.C.
Lankau, Lauren	University of Rhode Island, Kingston, RI
Lavoie, Diane	University of Richmond, Richmond, VA
Lin, Hsing-Juh	University of Rhode Island, Kingston, RI
Loi, Than	Atlantic Marine Center, ONCO, Norfolk, VA
Maekawa, Kurt	University of Washington, Seattle, WA
Malcolm, Hank	ONCO, AMC, Norfolk, Va
Matiskella, Keith	University of Massachusetts, Amherst, MA
McHugh, Nancy	NMFS, NEFSC, Woods Hole, MA
Michaels, William	NMFS, NEFSC, Woods Hole, MA
Mooney, Kevin	University of Michigan, Ann Arbor, MI
Moore, Timothy	University of Rhode Island, Kingston, RI
Mousel, David	University of Massachusetts, Amherst, MA
Nelson, Erik	University of Maine, Machias, ME
Nelson, John	NMFS, NEFSC, Woods Hole, MA
Newick, Sarah	York, ME
Olszewski, Scott	Rhode Island Fish & Wildlife Service, Cranston, RI
Parkhurst, Jennifer	University of Maine, Machias, ME
Pickle, Kathleen	Maine Maritime Academy, Castine, ME
Potthoff, Thomas	NMFS, NEFSC, Narragansett, RI
Repucci, Gina	NMFS, NEFSC, Woods Hole, MA
Robinson, Mark	University of Massachusetts, Amherst, MA
Rountree, Rodney	NMFS, NEFSC, Woods Hole, MA
Scharf, Frederick	University of Massachusetts, Amherst, MA
Shepherd, Nina	NMFS, NEFSC, Woods Hole, MA
Silva, Vaughn	NMFS, NEFSC, Woods Hole, MA
Smith, Brandon	New England Aquarium, Boston, MA
Smith, Kelly	Rutgers University, New Brunswick, NJ
Spencer, Paul	University of Rhode Island, Kingston, RI
Spivey, Thom	Atlantic Marine Center, ONCO, Norfolk, VA
Stehlik, Linda	NMFS, NEFSC, Highlands, NJ
Stevens, Shannon	University of South Carolina, Columbia, SC
Sutherland, Sandra	University of Rhode Island, Kingston, RI
Terra, Maria	Buffalo State College, Buffalo, NY
Tomasky, Gabrielle	Boston University Marine Program, Woods Hole, MA
Tugend, Kimberly	University of South Carolina, Columbia, SC
Vigness, Kathleen	University of Rhode Island, Kingston, RI
Wagner, Melissa	University of Rhode Island, Kingston, RI
Wakeman, Marc	Maine Maritime Academy, Castine, ME
Walden, John	NMFS, NEFSC, Woods Hole, MA
Weimer, Michael	Buffalo State College, Buffalo, NY
White, Geoffrey	VIMS, Gloucester Point, VA
Williams, David	Eastern Nazarene College, Weston, MA
Yetter, Richard	University of Massachusetts, Amherst, MA