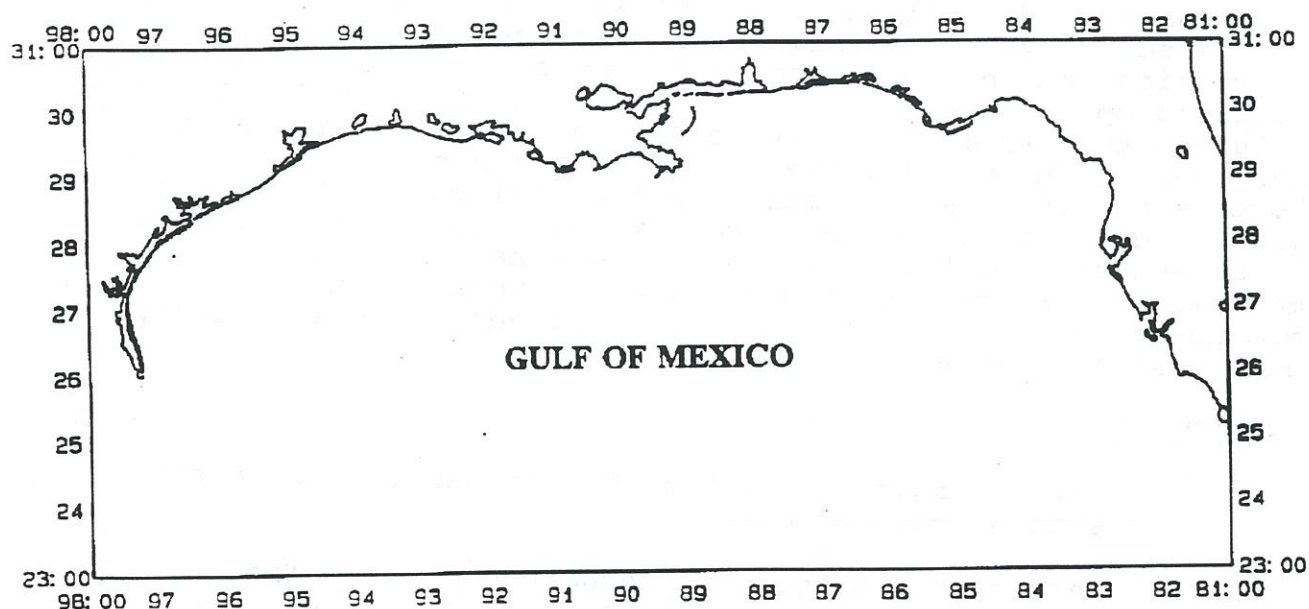


CRUISE RESULTS

DEC 01 1995

Reef Fish Survey

NOAA Ship CHAPMAN Cruise CH-95-04 (68)
06/19-08/01/95



U.S. Department of Commerce
National Oceanic and Atmospheric Administration
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Pascagoula Facility
P.O. Drawer 1207
Pascagoula, MS 39568-1207

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INTRODUCTION

The NOAA Ship CHAPMAN departed Pascagoula, Mississippi on June 19, 1995 to conduct the fourth annual SEAMAP trap/video reef fish survey. A total of 40 out of 45 scheduled sea-days were completed. Adverse weather conditions due to a tropical depression and the immediate following of a hurricane prevented sampling operations from July 28 thru August 1, 1995. The ship returned to Pascagoula 4 days early due to the approaching hurricane. On June 25, the sewage system overflowed into the lower staterooms, so the ship ran into Galveston to clean up the mess. The ship sailed the same day. The second leg was delayed from departing on July 6 to July 7 to repair one of the generators. A total of 1 sea-day and 2 working-days were lost to mechanical problems with the ship, 4 sea-days and 9 work-days were lost to weather.

OBJECTIVES

1. Verify locations of hard bottom habitat using the ship's echo sounder.
2. Determine the relative abundance of reef fish populations and habitat using a fish trap/video recording system (T/V).
3. Determine the relative abundance and vertical distribution of reef fish using a Fisheries Acoustic System (FAS).
4. Collect environmental data at each station.
5. Collect ichthyoplankton samples at selected reef sites.

METHODS

Natural reef fish habitat from Brownsville, Texas to the southern tip of Florida between 9 m and 110 m was inscribed on navigation charts. The area was then divided into east and west

Gulf and 10 by 10 nautical mile blocks (Primary Sample Units). Each block was subdivided into 100-m² sample units; with each sample unit characterized as "reef" or "nonreef". Blocks were stratified by size and area of the Gulf, and selected randomly. Four geographic areas of the Gulf were defined: Texas (west of 94°00'W longitude), Louisiana (94°00'W to 89°20' W longitude), Northeast (north of 27°30'N latitude and between 89°20'W and 83°00'W longitude), and Eastern Gulf (south of 27°30'N latitude and east of 85°00'W longitude). Size strata is based on the number of sample units within a block: Size 1 strata have 64 - 399 sample units; Size 2 have 400 - 899 sample units; Size 3 have 900 - 1599 sample units; Size 4 strata have 1600 - 2999 sample units; Size 5 contain 3000 - 9999 units; and Size 6 strata have 10000 - 26560 sample units. Primary and alternate blocks were selected using a proportional allocation of samples to each stratum. Alternate blocks were selected in case a primary block was not workable (ie. no "reef" sites found or occupied). The number of "reef" sample units within a block was the measure-of-size. Within each selected block, 100 sample sites were randomly selected, and their position placed into the ship's navigation plotter. Site positions were determined with GPS without P-codes or Differential GPS codes for the entire cruise.

Each selected block was occupied for one 24-hr period, where night hours were devoted to echo sounder surveys of selected sample sites and daytime hours to T/V and FAS sampling. Each sample site was classified as "reef" or "nonreef" using the ship's echo sounder. Up to 8 "reef" sites were then randomly selected for sampling that day. If less than 4 reef sites were located, the vessel proceeded to the next nearest block. Trap/video sampling began one hour after sunup and ended one hour before sunset. A Hi-8 mm video camera in an underwater housing was mounted outside a single funnel fish trap (2.13 m long by 0.76 m square) to record habitat and fish activity. The trap was baited with squid and remained on bottom for approximately one hour. A multi-camera gear consisting of a frame with 4 cameras mounted orthogonal to each other was also employed at some sites with the T/V unit. The FAS (Simrad EK500/BI500) was used to survey sample sites, and operated at 38 kHz. At sites < 30 m deep, both 38 kHz and 120 kHz frequencies were used. A total of four parallel passes over each site were made with the FAS.

Ichthyoplankton collections consisted of one Tucker trawl deployment and one 10-minute neuston net haul each morning prior to the start of the T/V surveys. Additional collections were made during the evening as time permitted with the Tucker, neuston and a Methot juvenile fish trawl. The 1-m Tucker trawl, fitted with one 0.335-mm mesh nets, sampled the water column in an oblique path from the surface to near-bottom, allowed to

settle for 30 seconds and then fished during retrieval from near-bottom to the surface. When time permitted in the evenings the Methot trawl was fished obliquely from the bottom to the surface for 20 min.

Associated environmental data collected at each site with a CTD included profiles of salinity, temperature, dissolved oxygen, light transmittance, irradiance (PAR), and fluorescence. Surface chlorophyll samples were also taken, once a day for CTD verification.

RESULTS

Thirty-five primary blocks were selected along with 23 alternate blocks. Twelve of the primary blocks were located in the western Gulf and 23 in the eastern Gulf. A total of 26 blocks (Table 1) and 125 sites (Figure 1, Table 2) were sampled using the T/V and/or the 4-camera gear during the survey. Nine blocks were surveyed with the ship's echosounder and not sampled because "reef habitat" was not found (Table 1). Ten of the blocks with 51 sites sampled were located in the western Gulf and 16 blocks with 74 sites in the eastern Gulf. Tucker trawl samples were collected at 29 sites, neuston samples at 32 sites and Methot trawl samples at 7 sites (Table 2, Figure 2). The FAS was employed at all 125 sites where the T/V and the 4-camera gear were deployed.

Temperature, salinity, depth, dissolved oxygen, light transmittance, irradiance (PAR), and fluorescence profiles were measured with a CTD at 126 sites. Surface chlorophyll samples were collected at 21 sites.

A total of 18 species were captured in the fish traps (Table 3). More fish were captured in the northeastern Gulf of Mexico (Mississippi River to Tampa Bay, Florida) than in the eastern Gulf (Tampa Bay, Florida to the Dry Tortugas) or in the western Gulf (west of the Mississippi River). Red porgy (Pagrus pagrus), vermilion snapper (Rhomboplites aurorubens) and the bank sea bass (Centropristis ocyurus) dominated the catch east of the Mississippi River, and vermilion snapper dominated the catch west of the Mississippi River.

CRUISE PARTICIPANTS (NOAA only):

Leg 1: (6/19/95 - 7/ 3/95): 15 sea-days

| | | |
|------------------|-------------------|----------------------|
| Kevin Rademacher | Field Party Chief | NMFS, Pascagoula, MS |
| Mark Grace | Fishery Biologist | NMFS, Pascagoula, MS |
| Eva Kargard | Fishery Biologist | NMFS, Pascagoula, MS |
| Cliff Harper | Electronics Tech. | NMFS, Stennis SC, MS |

CRUISE PARTICIPANTS (NOAA only): (Cont'd)

Leg 2: (7/ 7/95 - 7/20/95): 14 sea-days

| | | |
|------------------|-------------------|-----------------------|
| Kevin Rademacher | Field Party Chief | NMFS, Pascagoula, MS |
| Ken Wilkinson | Electronic Tech. | NMFS, Stennis SC, MS |
| Chris Gledhill | Fishery Biologist | NMFS, Pascagoula, MS |
| Doug DeVries | Fishery Biologist | NMFS, Panama City, FL |
| Robert Allman | Fishery Biologist | NMFS, Panama City, FL |
| Scott Baker | Fishery Biologist | NMFS, Panama City, FL |

Leg 3: (7/22/95 - 8/ 1/95): 11 sea-days

| | | |
|------------------|---------------------|-----------------------|
| Kevin Rademacher | Field Party Chief | NMFS, Pascagoula, MS |
| Chris Gledhill | Fishery Biologist | NMFS, Pascagoula, MS |
| Gary Fitzhugh | Fishery Biologist | NMFS, Panama City, FL |
| Nelson May | Remote Sensing Spc. | NMFS, Stennis SC, MS |
| Eva Kargard | Fishery Biologist | NMFS, Pascagoula, MS |
| Karen Reed | Biological Tech. | NMFS, Pascagoula, MS |


CRUISE PARTICIPANTS (Cooperators):


Leg 1: (6/19/95 - 7/ 3/95):

| | | |
|---------------|------------------|------------------------|
| Paul Choucair | Marine Biologist | Texas Parks & Wildlife |
| Doug Peter | Art. Reef Biol. | Texas Parks & Wildlife |

SUBMITTED BY:

Approved by:


Kevin R. Rademacher
Field Party Chief


Scott Nichols, Director
Mississippi Laboratories



Bradford E. Brown, Director
Southeast Fisheries Science
and Research Center

Table 1. List of reef fish survey blocks visited during CHAPMAN Cruise 95-04(68) east and west of the Mississippi River.

| BLOCKS SURVEYED AND WORKED | | | |
|----------------------------|------------|------------------|------------|
| <u>EAST GULF</u> | | <u>WEST GULF</u> | |
| <u>BK#</u> | <u>BK#</u> | <u>BK#</u> | <u>BK#</u> |
| 07 | 386 | 69 | 105 |
| 29 | 387 | 70 | 143 |
| 30 | 404 | 92 | |
| 45 | 425 | 94 | |
| 218 | 445 | 96 | |
| 334 | 553 | 101 | |
| 360 | 588 | 103 | |
| 371 | 633 | 104 | |

BLOCKS SURVEYED WITH ECHOSOUNDER ONLY

| <u>EAST GULF</u> | | | <u>WEST GULF</u> |
|------------------|------------|------------|------------------|
| <u>BK#</u> | <u>BK#</u> | <u>BK#</u> | <u>BK#</u> |
| 57 | 202 | 589 | 218 |
| 76 | 554 | 631 | 267 |
| 180 | | | |

Table 2. Data collected during CHAPMAN Cruise 95-04(68).

| Data | Number of Stations |
|---------------------|--------------------|
| Trap/Video drops | 125 |
| 4 camera drops | 41 |
| Fisheries Acoustic | 125 |
| CTD | 126 |
| Tucker Trawl | 29 |
| Neuston Net | 32 |
| Methot trawl | 7 |
| Surface chlorophyll | 21 |

Table 3. Average catch per hour from fish traps for the western, northeastern, and eastern Gulf of Mexico. (F=frequency of occurrence).

| <u>Western Gulf of Mexico</u> | | | | | |
|---------------------------------|--------------------|--------|----|-------|-------|
| SPECIES | COMMON NAME | NUMBER | | | |
| | | N | F | MEAN | SE |
| <u>Chaetodon sedentarius</u> | Reef butterflyfish | 56 | 1 | 0.013 | 0.013 |
| <u>Decodon peullarus</u> | Red hogfish | 56 | 3 | 0.083 | 0.057 |
| <u>Mycteroperca phenax</u> | Scamp | 56 | 2 | 0.047 | 0.035 |
| <u>Pagrus Pagrus</u> | Red porgy | 56 | 3 | 0.061 | 0.038 |
| <u>Rhomboplites aurorubens</u> | Vermilion snapper | 56 | 2 | 0.119 | 0.085 |
| <u>Serranus phoebe</u> | Tattler | 56 | 1 | 0.013 | 0.013 |
| <u>Northeast Gulf of Mexico</u> | | | | | |
| <u>Balistes capriscus</u> | Gray triggerfish | 48 | 2 | 0.031 | 0.022 |
| <u>Calamus nodosus</u> | Knobbed porgy | 48 | 1 | 0.019 | 0.019 |
| <u>Centropristis ocyurus</u> | Bank sea bass | 48 | 7 | 0.453 | 0.235 |
| <u>Chaetodon sedentarius</u> | Reef butterflyfish | 48 | 1 | 0.016 | 0.016 |
| <u>Epinephelus morio</u> | Red grouper | 48 | 2 | 0.035 | 0.025 |
| <u>Haemulon aurolineatum</u> | Tomtate | 48 | 2 | 0.070 | 0.057 |
| <u>Lutjanus campechanus</u> | Red snapper | 48 | 1 | 0.018 | 0.018 |
| <u>Mycteroperca phenax</u> | Scamp | 48 | 1 | 0.019 | 0.019 |
| <u>Pagrus pagrus</u> | Red porgy | 48 | 15 | 0.985 | 0.342 |
| <u>Psuedupeneus maculatus</u> | Spotted goatfish | 48 | 1 | 0.016 | 0.016 |
| <u>Rhomboplites aurorubens</u> | Vermilion snapper | 48 | 4 | 0.460 | 0.327 |
| <u>Serranus phoebe</u> | Tattler | 48 | 1 | 0.013 | 0.013 |
| <u>Stenotomus caprinus</u> | Longspine porgy | 48 | 2 | 0.035 | 0.025 |
| <u>Eastern Gulf of Mexico</u> | | | | | |
| <u>Chaetodon capistratus</u> | Foureye butterfly | 21 | 1 | 0.041 | 0.041 |
| <u>Epinephelus morio</u> | Red grouper | 21 | 1 | 0.071 | 0.071 |
| <u>Haemulon plumieri</u> | White grunt | 21 | 2 | 0.158 | 0.123 |
| <u>Holocanthus bermudensis</u> | Blue angelfish | 21 | 1 | 0.039 | 0.039 |
| <u>Ocyurus chrysurus</u> | Yellowtail snapper | 21 | 1 | 0.044 | 0.044 |

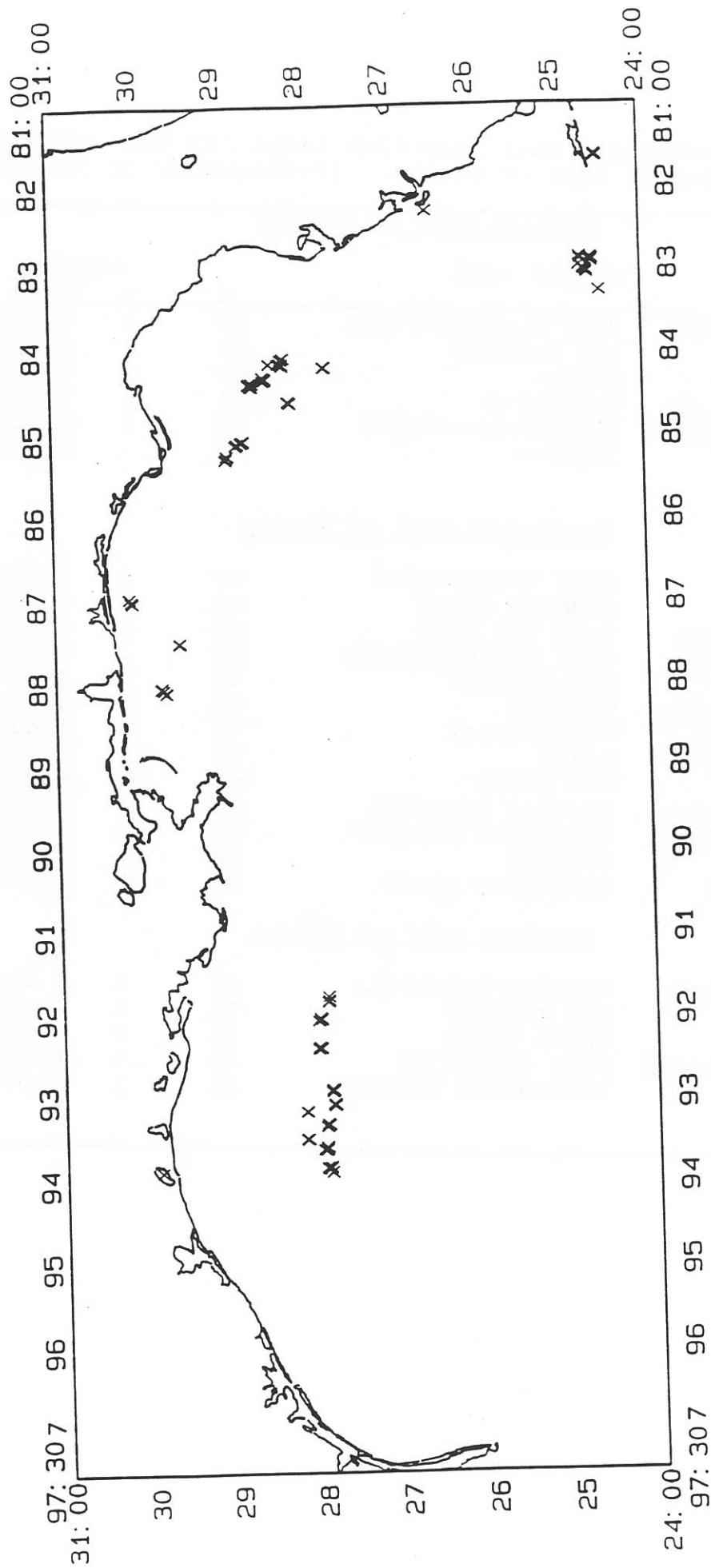


Figure 1. Trap/video stations sampled during CHAPMAN Cruise 95-04 (68).

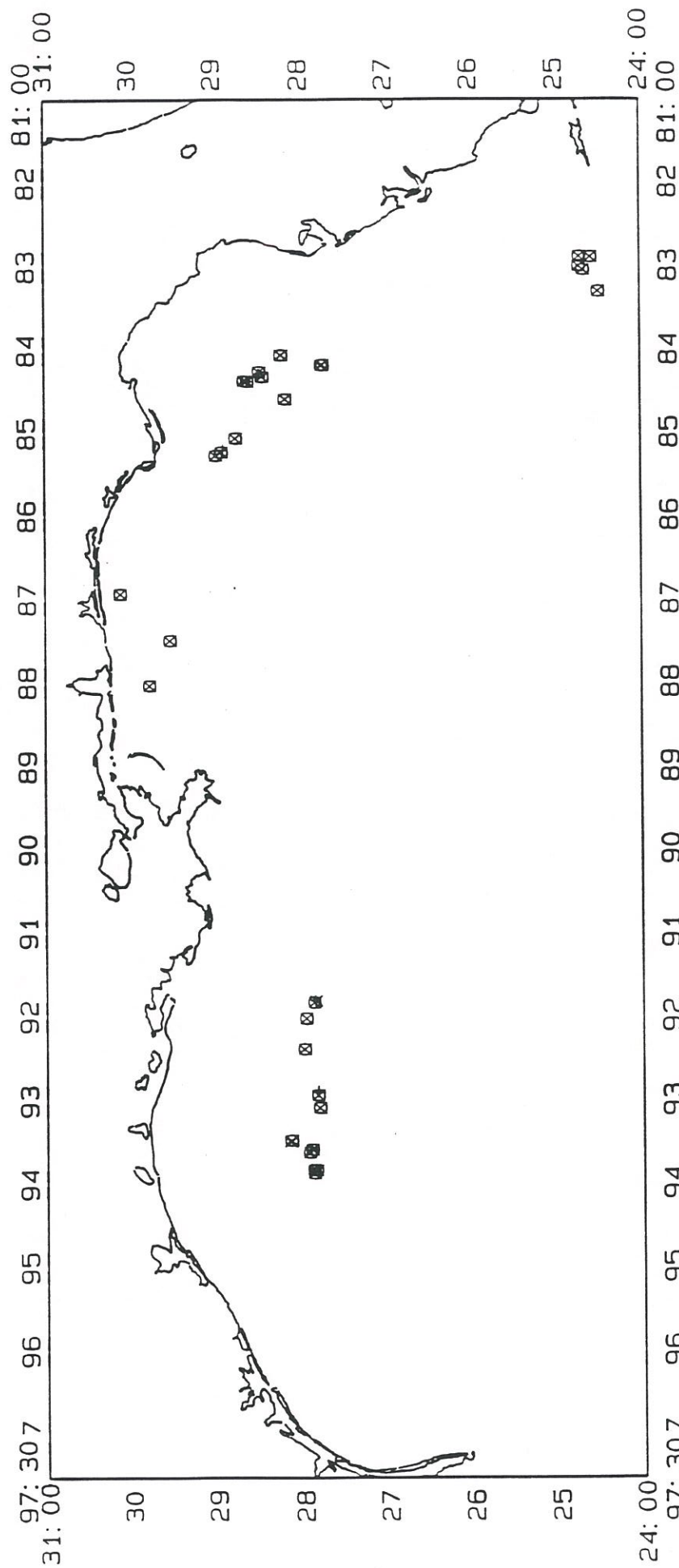


Figure 2. Ichthyoplankton stations sampled during CHAPMAN Cruise 95-04 (68).