U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Center
P. O. Drawer 1207
Pascagoula, Miss. 39568-1207

CHAPMAN Cruise 92-02 (47)
4/30-5/13/92

INTRODUCTION

The NOAA Ship CHAPMAN departed Pascagoula, Miss. on April 30, 1992 to conduct four days of neuston net evaluation and ten days of Nutrient Enhanced Coastal Ocean Productivity (NECOP) survey in the northern Gulf of Mexico. The primary and secondary objectives for the second leg were completed ahead of schedule; the cruise terminated in Pascagoula on May 13, instead of May 15, 1992.

OBJECTIVES

1. Comparison of double and single rigged neuston gear.

2. Support the NECOP by coordination with the R/V LONGHORN and R/V PELICAN which are supporting other NECOP research objectives.

3. Collect samples of larval fish, zooplankton and chlorophyll, and associated hydrographic data to determine if any trophic advantage is conferred to larvae associated with the Mississippi river discharge plume.

4. Associate satellite imagery data to the Mississippi river discharge plume.

5. Observe marine mammals.

6. Collect larval fish in coordination with the Gulf Coast Research Laboratory (GCRL) MARFIN snapper project.

METHODS AND MATERIALS

Leg 1 (April 30 to May 3)

A four day plankton cruise was designed to determine the differences, if any, between the sampling efficiencies of single and double neuston nets as well as between inboard and outboard components of the double net and their affect on bluefin larvae as a target species. The CHAPMAN or OREGON II, when towing a double

or single neuston frame, must turn 5 degrees to starboard to keep the frame from hitting the side of the ship and the net out of the propeller. Because of the 5 degree turn the inboard neuston net may catch more or less due to the vessels bow wave influence.

A single and double neuston frame (two 1 x 2 meter frames welded end to end) were towed off the starboard side of the CHAPMAN. Double neuston nets were designed in order to expedite sampling and to allow more than one researcher to obtain and preserve separate neuston samples without conducting additional tows. A 0.950 mm net was attached to each neuston frame. A flowmeter was attached diagonally on the lower corner of the out board side of each neuston frame. Readings were recorded for each tow.

Satellite sea surface temperature data was obtained from the Mississippi Laboratories, Stennis Space Center, in order to identify temperature divergence associated with an eddy located south of 29°00 N. and west of 87°30 W., Figure 1. Three sample sites, 20 miles apart, were selected along 29°00 N on the northern edge of the eddy. Expendable baththerographs (XBT's) and a sea surface temperature gauge aboard the CHAPMAN were used to locate the sampling sites.

Once the sampling site was located, three ten-minute single and three double neuston tows were made north of the eddy which constituted a single collection set. The CHAPMAN would return to the start position for each tow within a site. A total of five sets or 30 tows were planned for at each site.

Leg 2 (May 4 to 13)

The CHAPMAN proceed to the vicinity of Southwest Pass off of the Mississippi River delta to rendezvous with the R/V LONGHORN. Five, one kilometer (km) sampling transects that cross strong turbidity fronts, Figure 2, were established; sampling was conducted at the turbidity front itself, and on the plume and shelf water sides of each transect. At each site, a 1 m^2 (mouth opening dimension) Tucker trawl, fitted with three .335 mm mesh nets, sampled the water column in the following manner: net #1 was fished in an oblique path from surface to near-bottom; net #2 was opened at the near-bottom level and was fished to mid-depth; net #3 was fished from mid-depth back to the surface. Zooplankton samples were filtered from Niskin bottle water samples. Chlorophyll a, phaeopigments and total pigments were determined from Niskin samples collected at the surface and various depths depending upon the total station depth.

Satellite imagery of turbidity (visible channel) was obtained to establish two 15-20 km north-south sampling transects that pass from Mississippi plume into Gulf of Mexico shelf water, crossing

the frontal region. Stations (4-6 km apart) were sampled using environmental and plankton gear as described for the 1 km transects.

Two east-west 100 km (up and down stream of the discharge plume) transects were established and stations 6-8 km apart were sampled as described for the 1 km transects.

In coordination with GCRL, a number of Tucker trawl stations were designated and sampled off the Alabama-NW Florida shelf to collect larval snapper. Surface chlorophyll a measurements, temperature and salinity profiles were taken at each of the Tucker trawl site.

RESULTS

Leg 1

Three sites were sampled on the first leg, which included thirty plankton stations per site. A total of ten XBT stations were made during the first leg.

Because of the 5 degree starboard turn and the movement of the eddy it was extremely difficult for the vessel to return to the same location for each tow within a site.

All plankton samples were preserved in 10% formaldehyde for 48 hours then changed to 95% ethanol. Data were entered into the computer system and samples were sent to the Miami Laboratory for sorting.

A group of Atlantic bottlenose dolphin Tursiops truncatus and Atlantic spotted dolphins Stenella plagiodon were sighted on the first leg.

Leg 2

A total of 52 stations were occupied (Figure 2) which includes 52 neuston (1 x 2 m, 0.950 mm mesh), 150 Tucker trawl (1 x 1 m, 0.335 mm mesh) and 100 zooplankton (0.035 mm mesh) samples.

All NECOP neuston and Tucker trawl samples were preserved in accordance with SEAMAP protocol (10% formalin for 24 hrs then 95% ETOH). Duplicate or special samples were preserved in ETOH to ETOH for use in larval fish ageing, in particular those collected on one upstream-downstream transect. All samples were returned to NMFS Laboratory in Panama City, Fla. for sorting, identification, enumeration and analysis.

A single oblique Tucker trawl haul (same gear as used for NECOP collections) was made at 22 locations over the Alabama and NW Florida shelf (Figure 3). Surface chlorophyll a concentrations

were determined from Niskin samples. An STD cast was also made at each site. Ichthyoplankton samples were preserved in 95% ethanol. All samples were taken to GCRL for processing and analysis.

CRUISE PARTICIPANTS

(April 30 to May 3)

NAME	TITLE	ORGANIZATION
Perry A. Thompson, Jr.	Field Party Chief	NMFS Pascagoula, Miss.
Gilmore Pellegrin, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Rick Minkler, III.	Watch Leader	NMFS Pascagoula, Miss.
Rob Ford, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Lisa Daily	Cooperator	Univ. of South Alabama

(May 4 to 30)

NAME	TITLE	ORGANIZATION
Dr. Joanne Shultz	Field Party Chief	NMFS Pascagoula, Miss.
Dr. Churchill Grimes	Chief Scientist	NMFS Panama City, Fla.
Doug DeVries	Watch Leader	NMFS Panama City, Fla.
Bob Almond	Watch Stander	NMFS Panama City, Fla.
Andy David	Watch Leader	NMFS Panama City, Fla.
Steve Smith	Cooperator	Univ. of Miami (RSMAS)

Submitted By:

Perry A. Thompson, Jr.
Field Party Chief

Approved By:

Scott Nichols, Director
Mississippi Laboratories

Dr. Joanne L-Shultz
Field Party Chief

Bradford E. Brown, Acting
Southeast Science & Research
Director

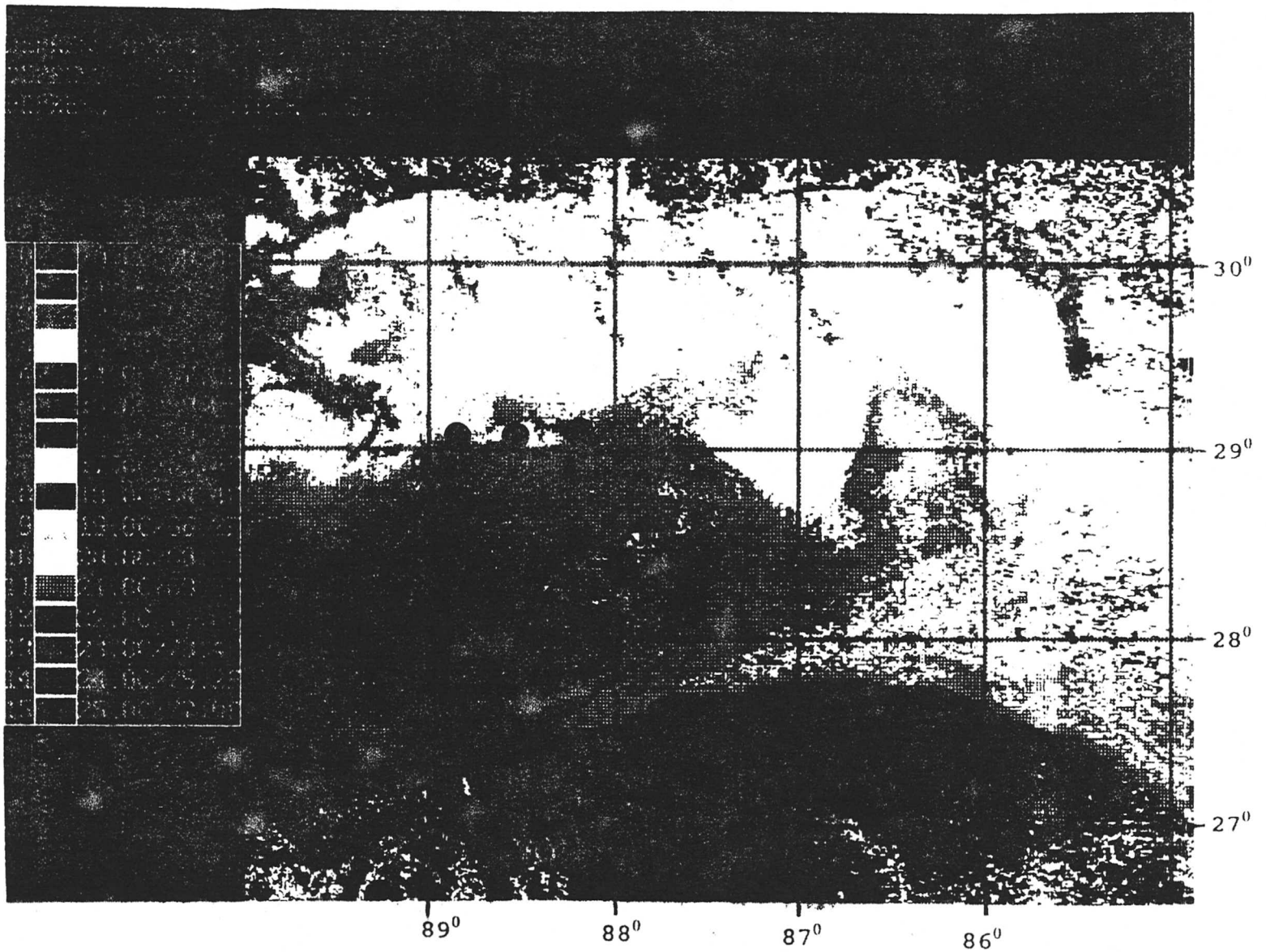

Figure 1. Northern Gulf of Mexico sample sites for the comparison of double and single neuston tows conducted by Chapman, cruise 47, April 30 to May 3, 1992.

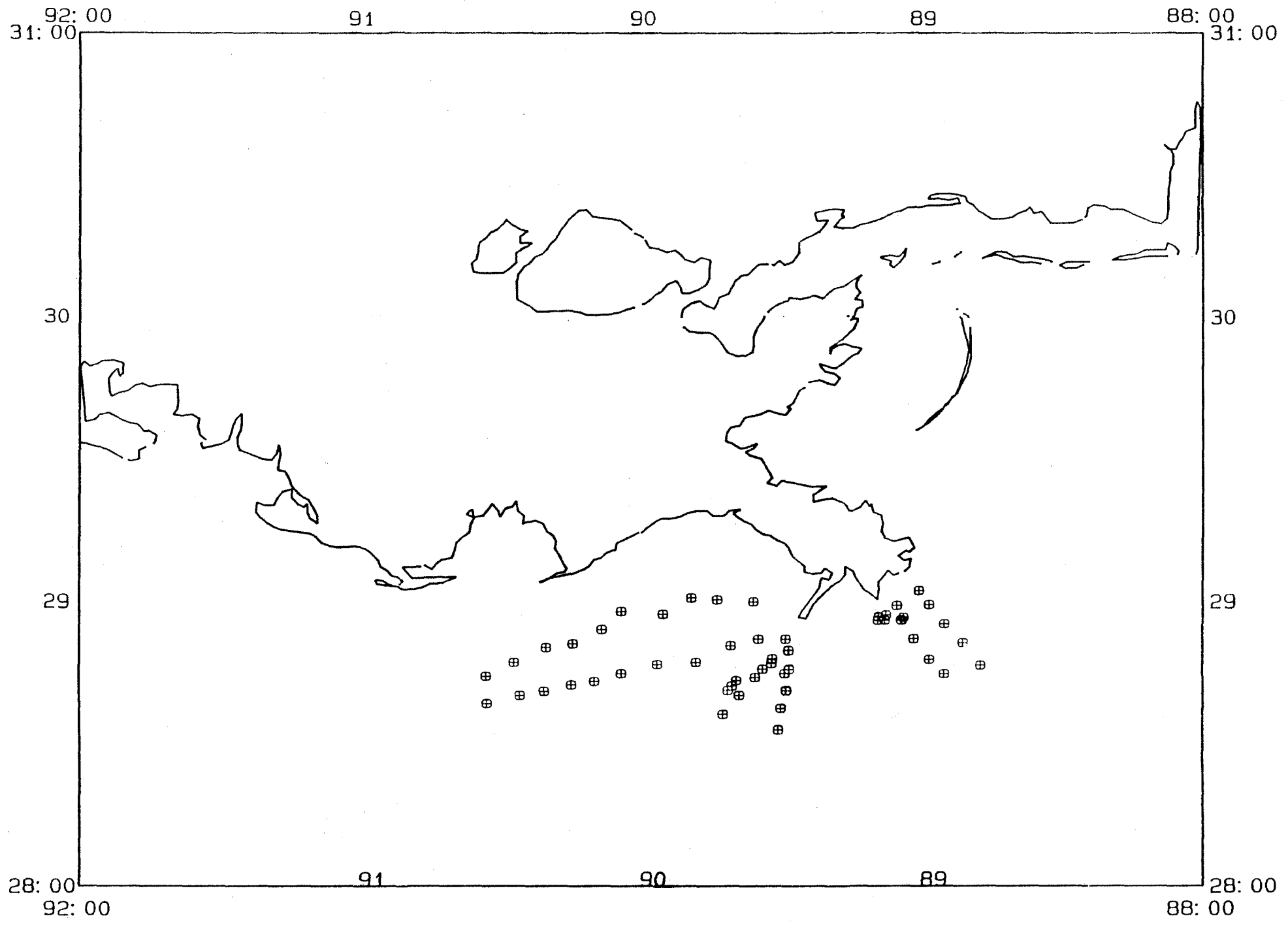

Figure 2. Sites of biological and hydrographic data collection in the vicinity of the Mississippi River discharge plume.

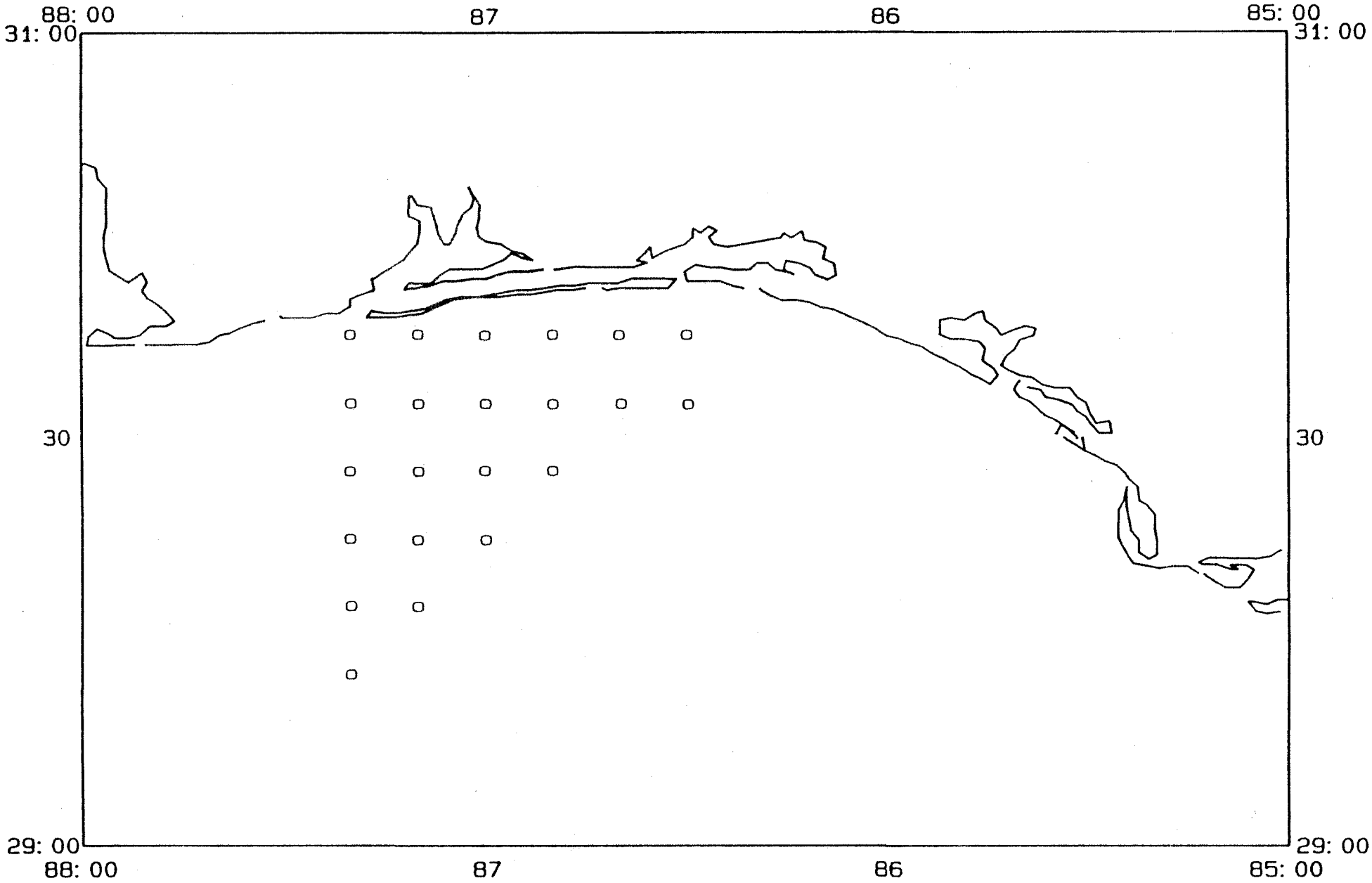

Figure 3. Sites of biological and hydrographic data collection in support of the GCRL/MARFIN snapper project.