

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

OREGON II CRUISE 89-02(180)  
6/16-7/17/89

### INTRODUCTION

The NOAA Ship OREGON II departed Pascagoula, Miss. on 16 June, 1989 to conduct a 32-day Southeast Area Monitoring and Assessment Program (SEAMAP) Survey in the northern and U.S. western Gulf of Mexico. This survey also included additional nearshore sampling by Florida, Alabama, Mississippi, Louisiana and Texas. Major objectives were to monitor size and distribution of penaeid shrimp and provide information on shrimp and groundfish stocks across the northern Gulf of Mexico in 5 to 60 fathoms (fm).

Four days were lost to gear problems (loss of an outrigger due to a broken pin) and adverse weather conditions. Only 165 of the 200 selected stations were completed.

The NOAA Ship OREGON II returned to Pascagoula, Miss. on 17 July 1989, terminating the cruise.

### OBJECTIVES

1. Determine size distribution of penaeid shrimp by depth across the U.S. northern and U.S. western Gulf of Mexico.
2. Obtain samples of brown, pink and white shrimp to determine length-weight relationships.
3. Collect finfish catch data.
4. Collect hydrographic and environmental data at each station.
5. Collect ichthyoplankton samples throughout the survey area.
6. Compare catch rates between a 65-foot (ft) fish trawl and a 40-ft shrimp trawl.
7. Survey and sample the Corps of Engineers berm site containing dredge spoil material from the Mobile ship channel.

### SURVEY METHODOLOGY

Ten sample sites were randomly selected for day and night replicate sampling around the berm site off Mobile Bay, Ala. Ten-minute tows were made at each site using a 40-ft shrimp trawl and a 65-ft fish trawl.

The SEAMAP shrimp assessment survey consisted of double rigged trawl samples taken with a 40-ft shrimp trawl with mud rollers and 8' x 40" wooden chain doors and a 65-ft 2-seam fish trawl with six 11-in floats and 8' x 40" wooden chain doors. Two hundred sample sites were randomly selected from Perdido Bay to the Texas-Mexico border in 5 to 60 fm (Fig. 1). Sample sites encompassed 1 or 3 fm depth strata between 5 and 25 fm and 5 fm depth strata between 30 and 60 fm. Tows were perpendicular to depth contours with tow duration from 10 to 60 minutes. Several stations required multiple tows to sample the entire depth strata.

Total weight of each catch was recorded, after which all Penaeus and other predefined invertebrates and finfish were separated. Weight and number of each species were then recorded from each sample. A random selection of 200 shrimp of each species (when available) was removed for data on sex, maturation, and length frequency.

All stations east of the Mississippi River and seven stations off the Texas coast were double rigged. All other stations were sampled with a single 40-ft shrimp trawl due to the broken outrigger.

#### HYDROGRAPHIC AND ENVIRONMENTAL DATA

Selected hydrographic data were taken before the start of each station. A conductivity, temperature and depth (CTD) unit was used to collect salinity, temperature, depth, dissolved oxygen and turbidity. Daily samples were saved to validate CTD readings. Whenever the CTD unit was inoperable a STD unit was used to collect temperature and salinity. Dissolved oxygen samples were run on a ysi meter. Chlorophyll samples (3 replicates) were taken at each station and filtered with a GF/C filter. All samples were taken from the surface except those stations less than 20 fm off Louisiana, which included bottom samples. Chlorophyll samples were fixed with magnesium carbonate, frozen in petri dishes for analysis at the Pascagoula Laboratory.

#### ICHTHYOPLANKTON

Bongo and neuston samples were taken at preselected stations integrated into the cruise track. Samples were initially held in buffered formalin for 24 hours. Formalin was then removed and samples were preserved in 95% ethanol.

#### SARGASSUM

An unusual amount of sargassum was observed floating on the surface off the Texas and Louisiana coast. One patch or mat was estimated to be 4 nautical miles long and a tenth of a mile wide, these and other patches were almost always associated with a tidal-rip.

Trawl tows made in the vicinity of the sargassum patches were not affected by the seaweed, due in part to trawls being on the bottom and the sea weed on the surface. During haul back, if you so choose to pick up in the middle of a sargassum patch, you would get some of the seaweed in the

wings of the net when it reached the surface. Occasionally we caught small amounts (avg. wt. .1 kg) of dead sargassum on the bottom. Sargassum caught on the surface in a neuston net is not uncommon since the neuston is towed just below the surface.

The cause of such large amounts of seaweed appearing in the Gulf of Mexico this year is unknown.

#### VESSEL SATELLITE COMMUNICATION SYSTEM

A data communication terminal aboard the NOAA Ship OREGON II was used to transmit environmental data and catch rates to the Mississippi Laboratories. Satellite transmission provided information for a weekly report on shrimp and finfish catch rates and location.

#### OBSERVATIONS AND RESULTS

A total of 46 tows were completed around the berm site off Mobile Bay, Ala.; results were not available for incorporation in this cruise report.

One hundred and eighty five tows (Fig. 1) were made on the SEAMAP portion of the cruise with dominant faunal components listed in Tables 1 and 2 for east Delta, Table 3 for west Delta and Tables 4 and 5 for Texas. Finfish concentrations were very light east of the Delta, with catfish (Arius felis) being most dominant in the 40-ft shrimp trawl, and round scad (Decapterus punctatus) in the 65-ft fish trawl. West Delta catch rates were slightly higher with croaker (Micropogonias undulatus) dominant. They were also most abundant off Texas in both the 40-ft shrimp trawl and the 65-ft fish trawl. There were no 65-ft fish trawls off the west Delta.

Density summaries expressed as kilograms per hour for total finfish and penaeid shrimp for the 40-ft shrimp and the 65-ft fish trawls are shown on Figures 2-5 east of the Delta, Figures 6 and 7 west of the Delta and Figures 8-11 along the northwestern Gulf of Mexico. The largest concentration of finfish (638 kg/hr) for a 40-ft trawl was off Louisiana, south of Trinity shoal in 18 fm of water. Butterfish (Peprilus burti) constituted 83% of that catch by weight with a average size of 95 mm.

Shrimp catches were higher this year than last year. The southern portion of Texas had the highest concentration of shrimp (53 kg/hr) in 18 fm.

#### ICHTHYOPLANKTON

Twenty-two bongo and neuston samples were obtained during the cruise (Fig. 12). Right bongo samples were sent to the NMFS, Miami Laboratory for processing, with left bongo and neuston samples sent to the Gulf Coast Research Laboratory for housing.

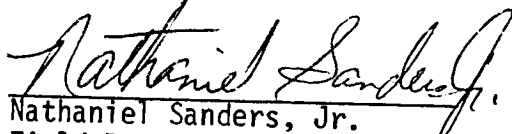
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- Karen Lecke-Mitchell, Fishery Biologist, Pascagoula, Miss., 6/16-7/04/89
- Mariam Hahn, Co-op Student, Pascagoula, Miss., 6/16-7/17/89
- Gilmore Pellegrin, Fishery Biologist, Pascagoula, Miss., 6/16-6/22/89
- Gladys Reese, Fishery Biologist, Pascagoula, Miss., 6/16-6/22 - 7/5-7/17/89
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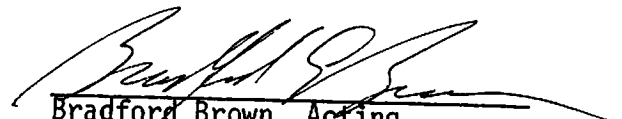
  
Bradford Brown, Acting  
Southeast Science & Research  
Director

Table 1. East Delta - dominant species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows:	1	12	1				14
Depth Range (Fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Arius felis</u>	1	1	-	-	-	-	1
<u>Aluterus schoepfi</u>	-	2	-	-	-	-	2
<u>Penaeus aztecus</u>	7	3	-	-	-	-	3
<u>Diplectrum formosum</u>	4	4	-	-	-	-	4
<u>Trachypeneus sp.</u>	-	5	-	-	-	-	5
<u>Stenotomus caprinus</u>	3	6	-	-	-	-	6
<u>Loligo pealei</u>	5	7	-	-	-	-	7
<u>Centropristis philadelphica</u>	-	8	-	-	-	-	8
<u>Doryteuthis plei</u>	6	9	-	-	-	-	9
<u>Synodus foetens</u>		-	10	-	-	-	- 10
<u>Diplectrum bivittatum</u>	-	11	-	-	-	-	11
<u>Sicyonia brevirostris</u>	-	12	-	-	-	-	12
<u>Haemulon aurolineatum</u>	-	13	-	-	-	-	13
<u>Callinectes similis</u>	2	-	-	-	-	-	14

Table 2. East Delta - dominant species ranked by weight within depth strata, using a 65-ft. fish trawl.

Number of Tows:	1	12	1				14
Depth Range (Fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Decapterus punctatus</u>	-	1	-	-	-	-	1
<u>Stenotomus caprinus</u>	2	2	-	-	-	-	2
<u>Doryteuthis plei</u>	-	3	-	-	-	-	3
<u>Trachypeneus sp.</u>	-	4	-	-	-	-	4
<u>Loligo pealei</u>	-	5	1	-	-	-	5
<u>Arius felis</u>	-	6	-	-	-	-	6
<u>Scomber japonicus</u>	-	7	-	-	-	-	7
<u>Trachurus lathami</u>	-	8	-	-	-	-	8
<u>Myopsida</u>	3	10	-	-	-	-	9
<u>Penaeus aztecus</u>	-	9	-	-	-	-	10
<u>Rachycentron canadum</u>	-	11	-	-	-	-	11
<u>Centropristis philadelphica</u>	-	12	-	-	-	-	12
<u>Diplectrum bivittatum</u>	1	13	-	-	-	-	13
<u>Diplectrum formosum</u>	-	14	-	-	-	-	14

Table 3. West Delta - dominant species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows:	12	26	9	4	3	2	56	
Depth Range (Fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60	
<u>Micropogonias undulatus</u>	1	6	-	5	-	-	1	
<u>Peprilus burti</u>	-	1	1	3	2	2	2	
<u>Stenotomus caprinus</u>	-	4	2	2	1	3	3	
<u>Peprilus alepidotus</u>	-	2	-	-	-	-	4	
<u>Leiostomus xanthurus</u>	6	3	-	6	-	-	5	
<u>Trachurus lathamii</u>	-	5	5	7	4	1	6	
<u>Arius felis</u>	2	-	-	-	-	-	7	
<u>Chloroscombrus chrysurus</u>	4	8	4	-	-	-	8	
<u>Synodus foetens</u>		-	11	3	4	3	4	9
<u>Loligo pealei</u>	-	7	6	-	5	5	10	
<u>Lagodon rhomboides</u>	-	10	-	1	-	-	11	
<u>Polydactylus octonemus</u>	3	-	-	-	-	-	12	
<u>Cynoscion arenarius</u>	5	12	-	-	-	-	13	
<u>Callinectes similis</u>	7	9	-	-	-	-	14	

Table 4. Texas - dominant species ranked by weight within depth strata, using a 40-ft shrimp trawl.

Number of Tows:	15	41	16	11	5	7	95	
Depth Range (Fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60	
<u>Microgogonias undulatus</u>	1	3	-	-	-	-	1	
<u>Penaeus aztecus</u>	6	1	3	5	6	-	2	
<u>Chloroscombrus chrysurus</u>	4	2	-	-	-	-	3	
<u>Stenotomus caprinus</u>	-	10	1	1	1	1	4	
<u>Leiostomus xanthurus</u>	2	6	-	-	-	-	5	
<u>Loligo pealei</u>	5	4	4	3	4	4	6	
<u>Peprilus burti</u>	8	5	5	4	3	3	7	
<u>Trachurus lathamii</u>	-	-	2	2	2	2	8	
<u>Cynoscion nothus</u>	3	-	-	-	-	-	9	
<u>Synodus foetens</u>	-	-	-	6	6	5	5	10
<u>Penaeus duorarum</u>	-	7	-	-	-	-	11	
<u>Callinectes similis</u>	-	9	8	-	-	-	12	
<u>Lagodon rhomboides</u>	7	-	7	7	-	-	13	
<u>Cynoscion arenarius</u>	-	8	-	-	-	-	14	



Table 5. Texas - dominant species ranked by weight within depth strata, using a 65-ft shrimp trawl.

Number of Tows:	1	2	3				6
Depth Range (Fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Micropogonias undulatus</u>	1	-	-	-	-	-	1
<u>Stenotomus caprinus</u>	-	7	1	-	-	-	2
<u>Chloroscombrus chrysurus</u>	-	1	-	-	-	-	3
<u>Trachurus lathami</u>	-	2	-	-	-	-	4
<u>Penaeus aztecus</u>	-	-	2	-	-	-	5
<u>Cynoscion sp.</u>	2	-	-	-	-	-	6
<u>Synodus foetens</u>		-	5	4	-	-	- 7
<u>Syacium sp.</u>	-	-	3	-	-	-	8
<u>Doryteuthis plei</u>	-	3	-	-	-	-	9
<u>Peprilus burti</u>	-	4	-	-	-	-	10
<u>Lutjanus campechanus</u>	-	8	5	-	-	-	11
<u>Upeneus parvus</u>	-	6	6	-	-	-	12
<u>Leiostomus xanthurus</u>	3	-	-	-	-	-	13
<u>Brevoortia patronus</u>	4	-	-	-	-	-	14

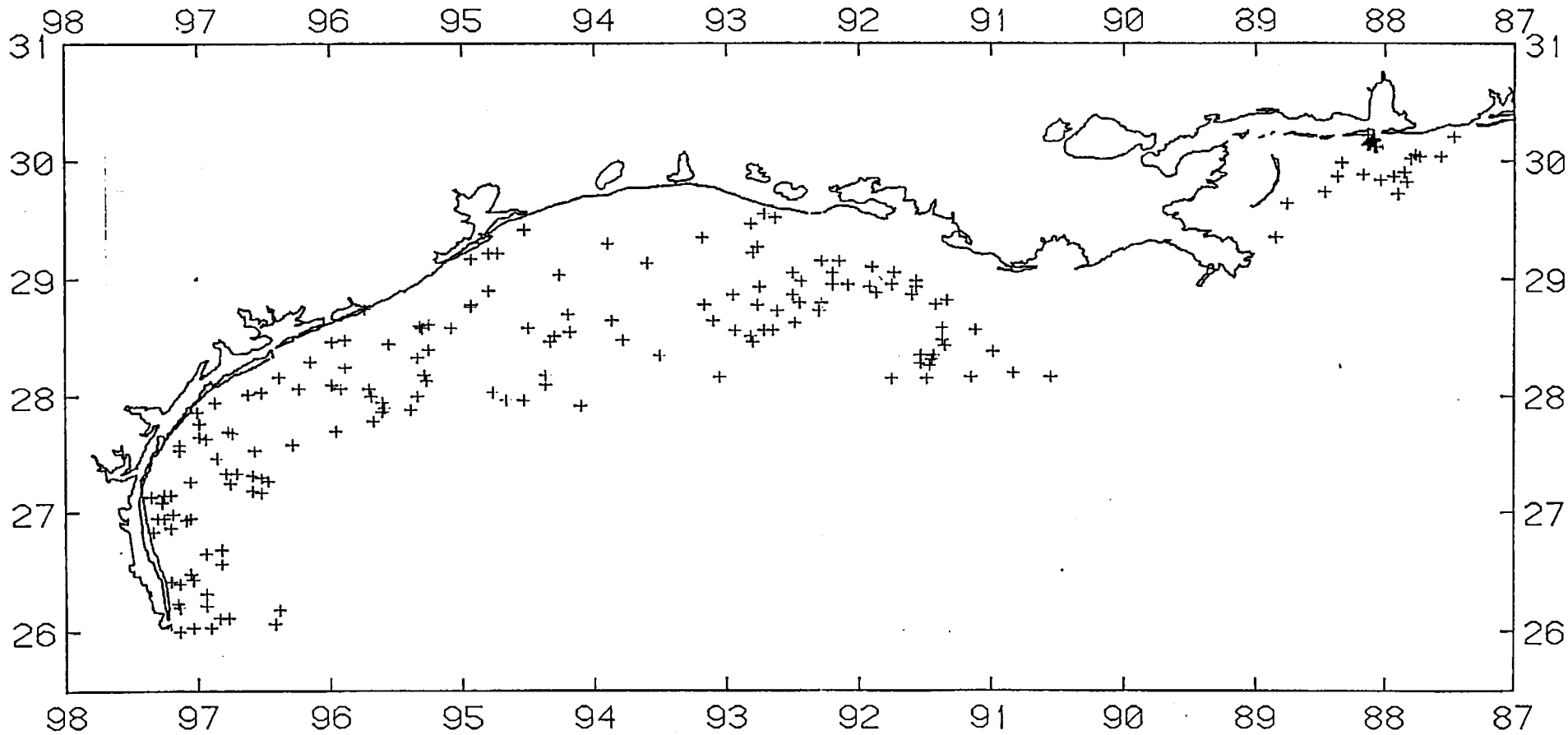


Figure 1: Trawl sample sites.

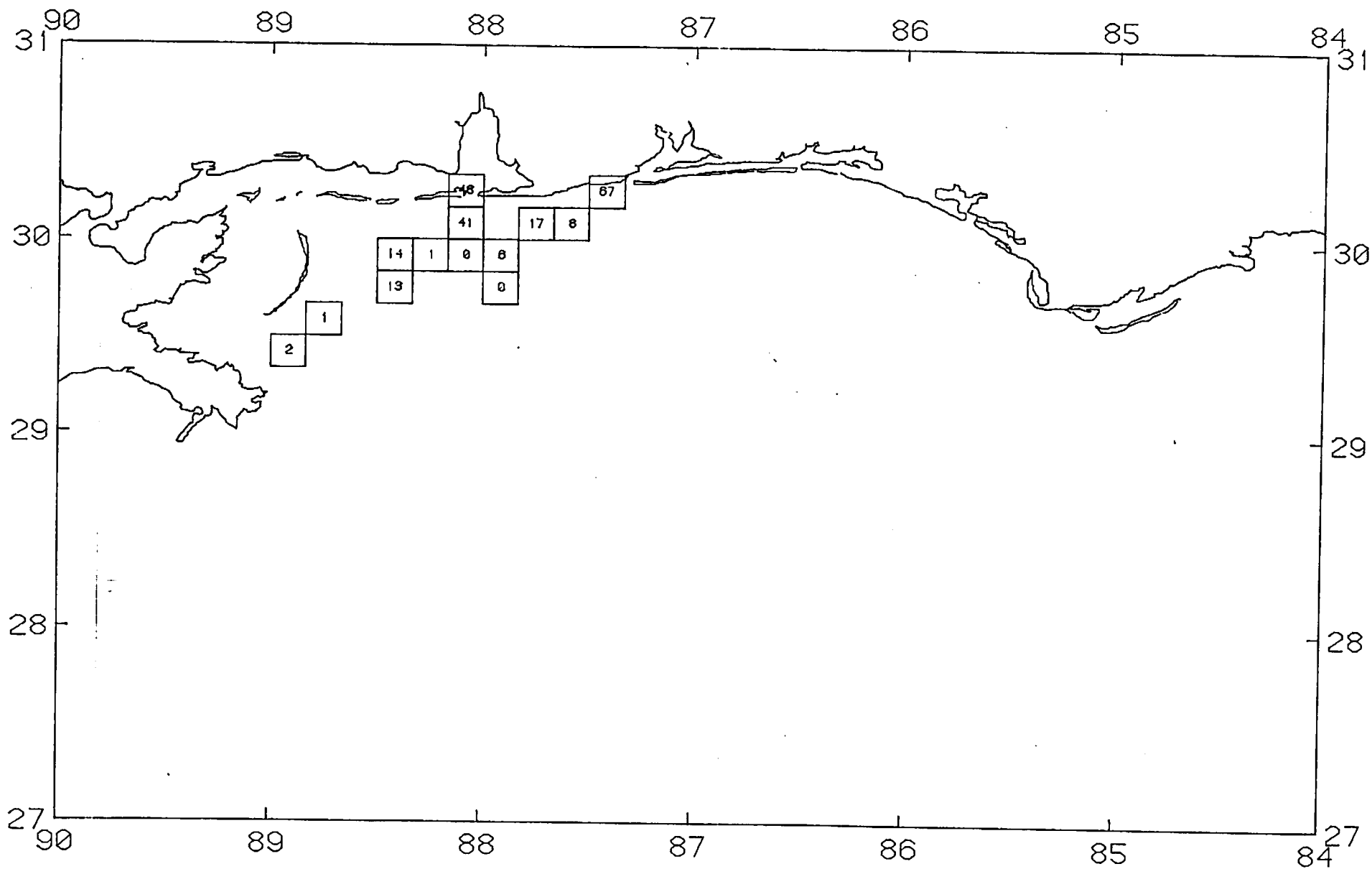


Figure 2. Finfish total weights in the Gulf of Mexico east of the Mississippi River. Numbers are expressed in kilograms per hour for a 40-ft shrimp trawl.

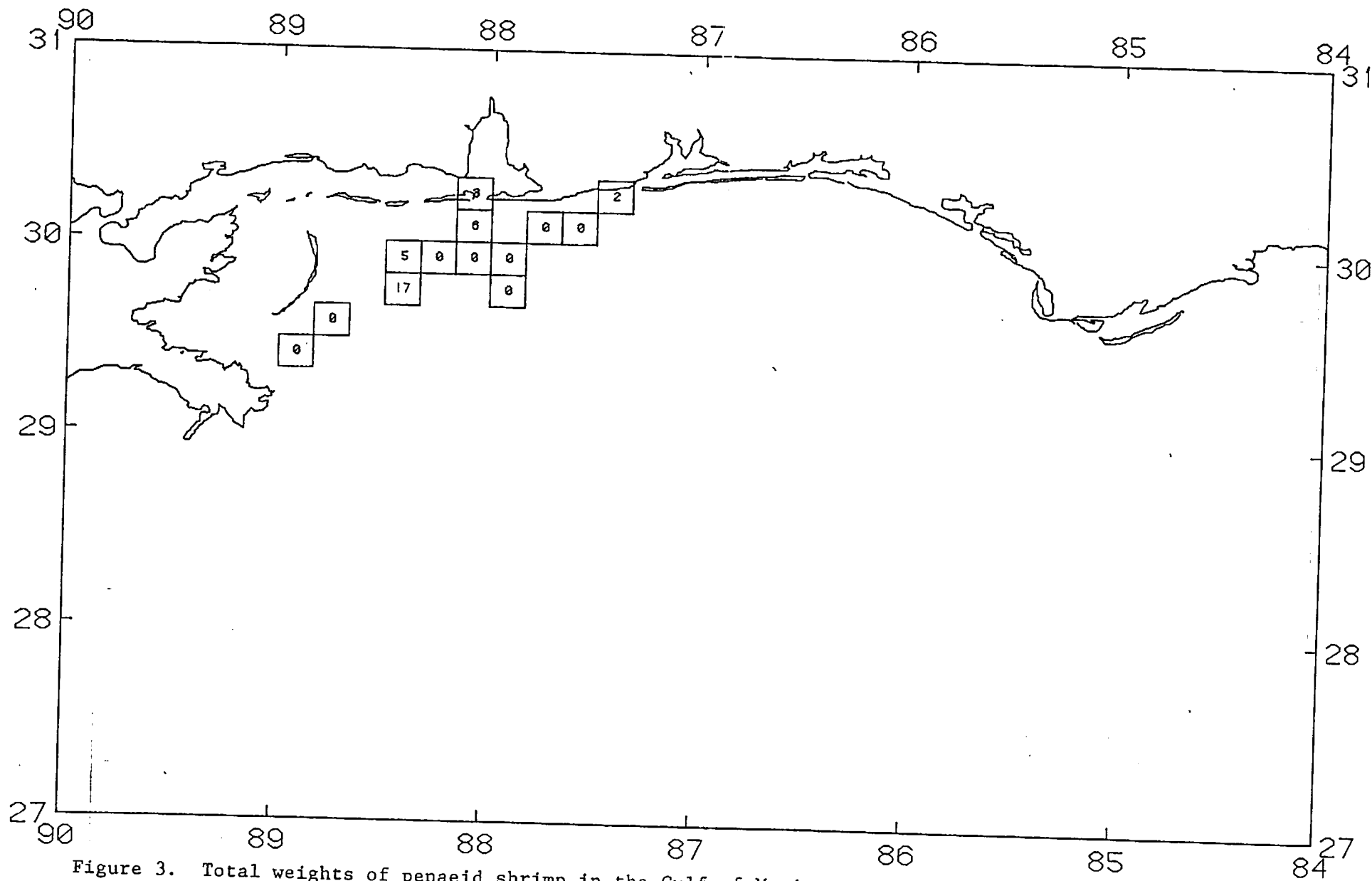


Figure 3. Total weights of penaeid shrimp in the Gulf of Mexico east of the Mississippi River. Numbers are expressed in kilograms per hour for a 40-ft shrimp trawl.

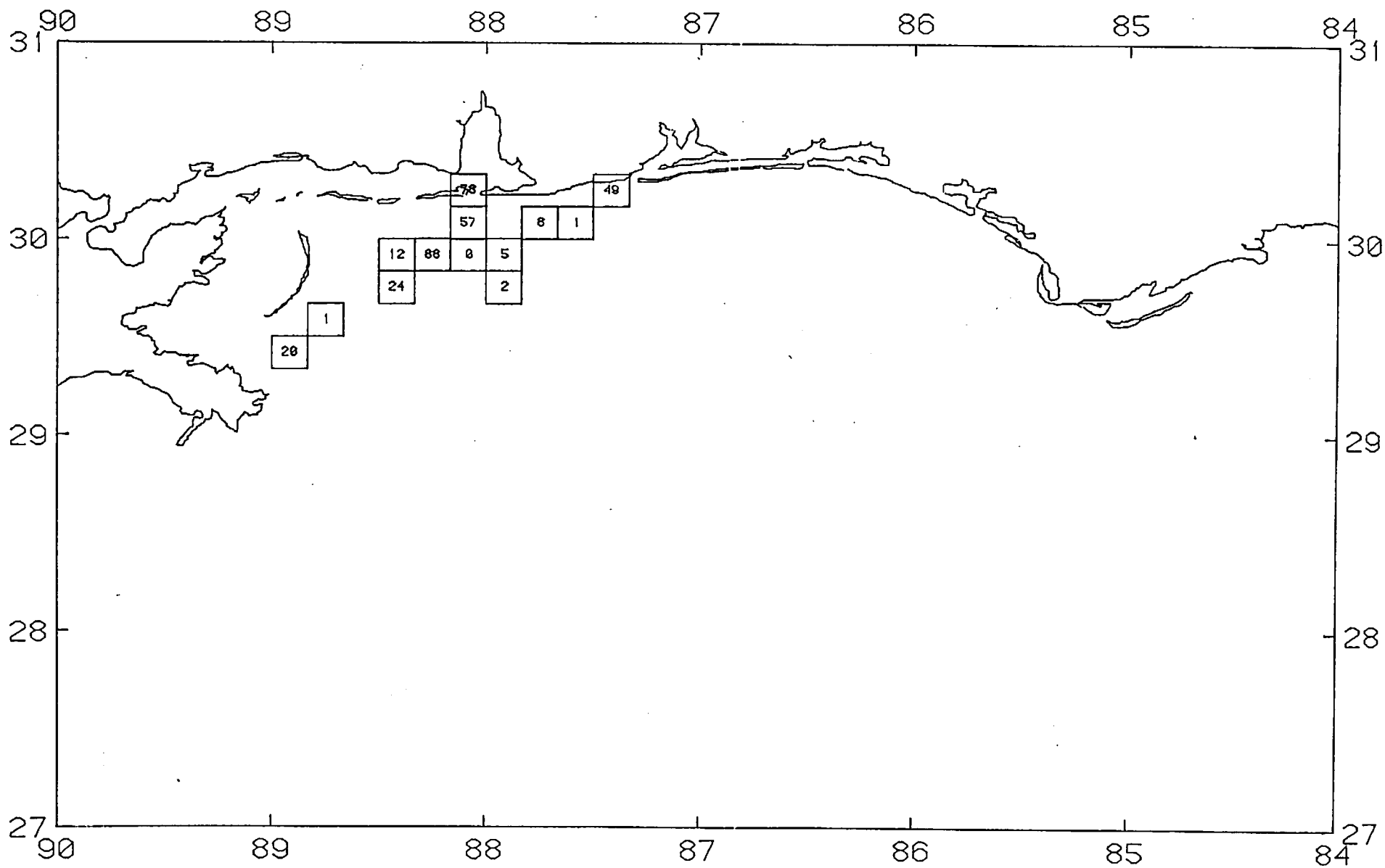


Figure 4. Finfish total weights in the Gulf of Mexico east of the Mississippi River. Numbers are expressed in kilograms per hour for a 65-ft fish trawl.

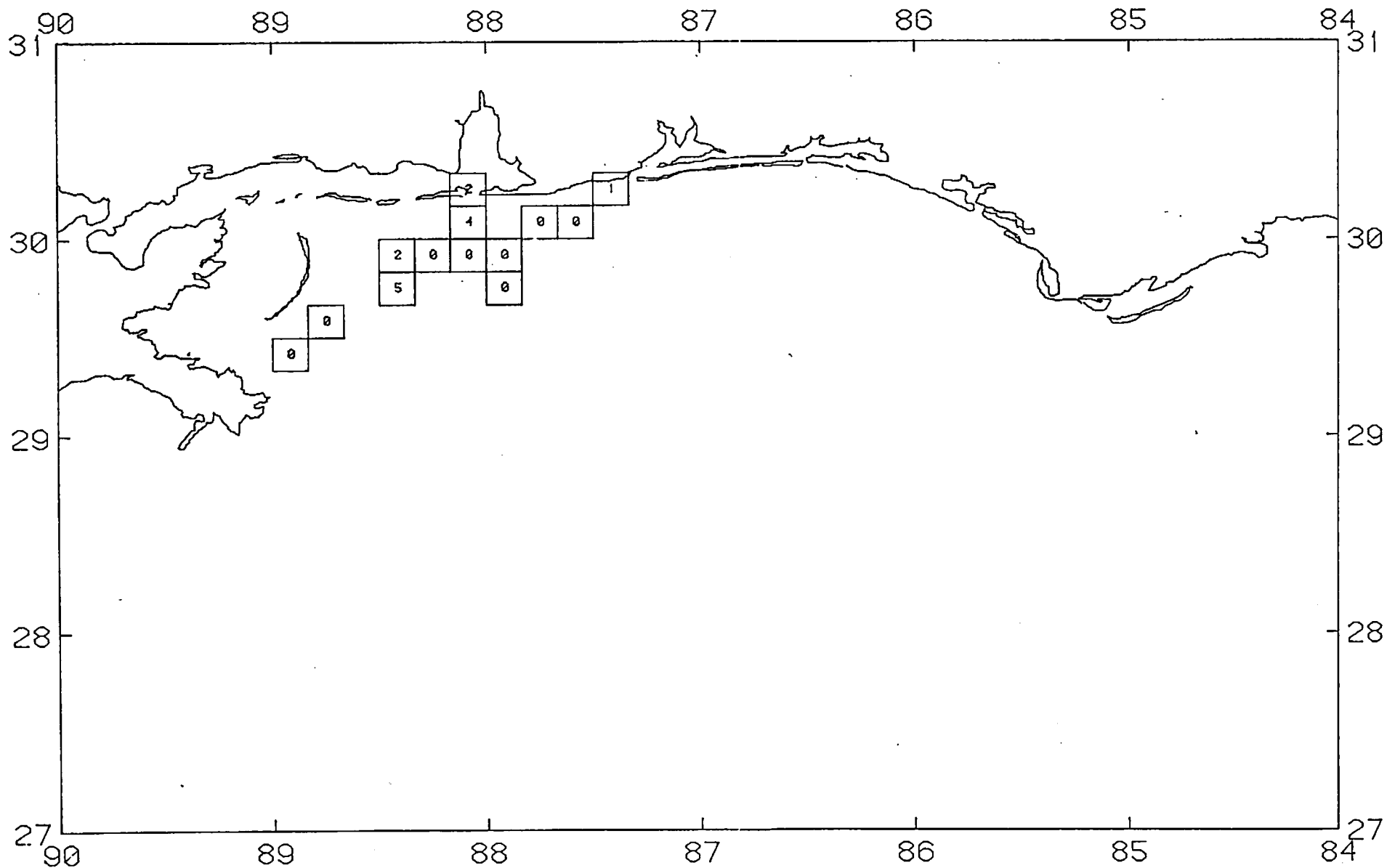


Figure 5. Total weights of penaeid shrimp in the Gulf of Mexico east of the Mississippi River. Numbers are expressed in kilograms per hour for a 65-ft fish trawl.

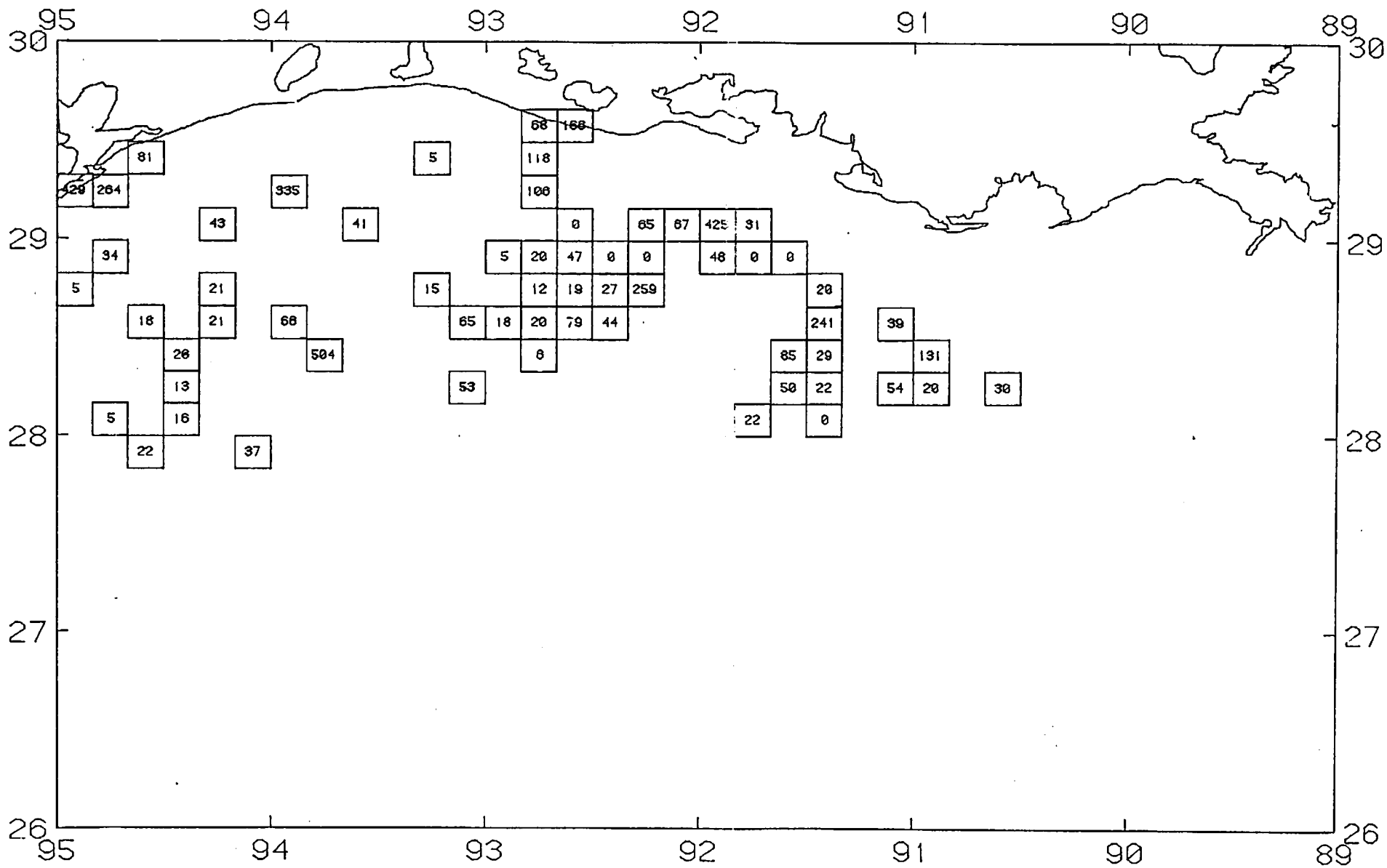


Figure 6. Finfish total weights in the Gulf of Mexico west of the Mississippi River. Numbers are expressed in kilograms per hour for a 40-ft shrimp trawl.

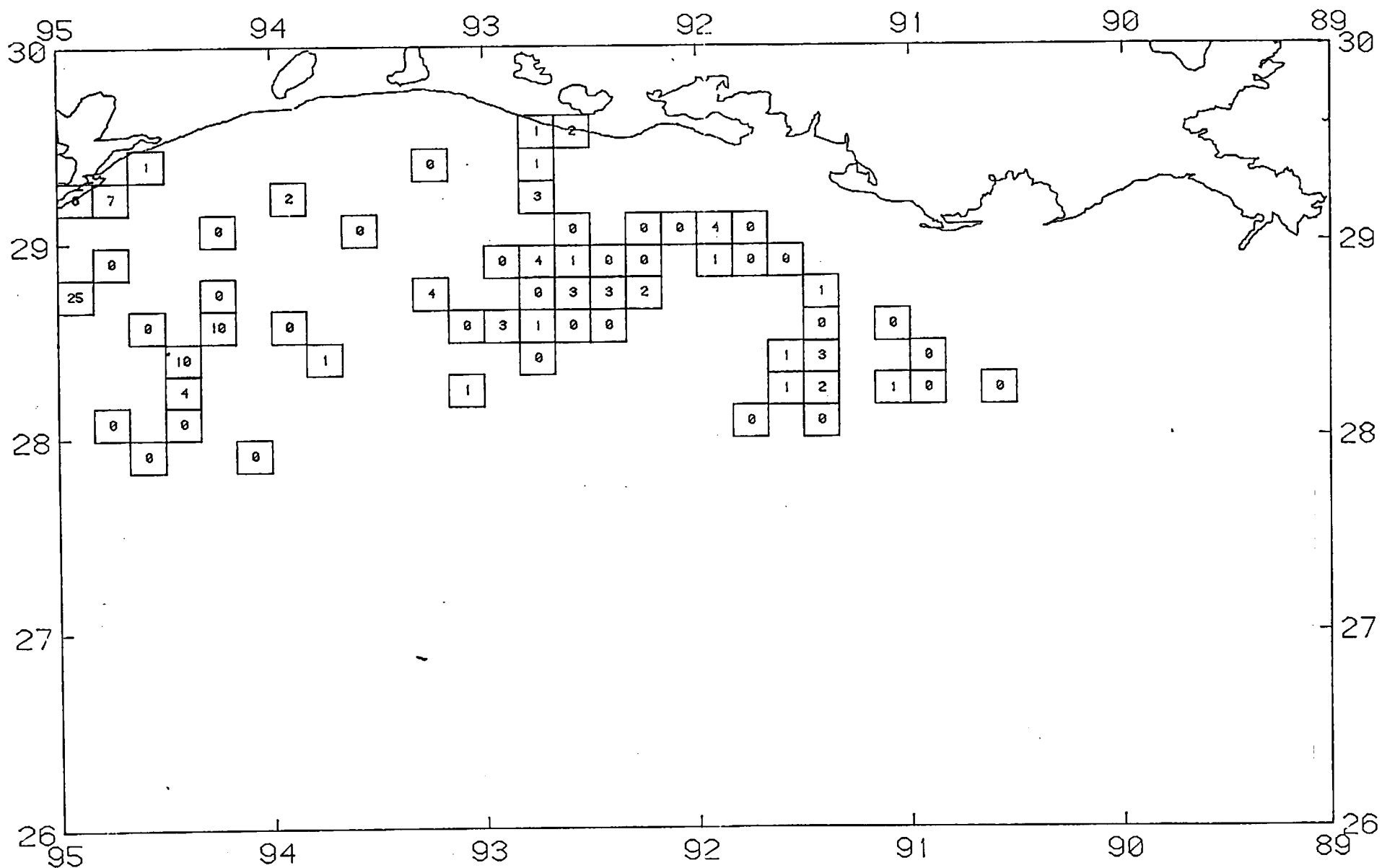


Figure 7. Total weights of penaeid shrimp in the Gulf of Mexico west of the Mississippi River. Numbers are expressed in kilograms per hour for a 40-ft shrimp trawl.



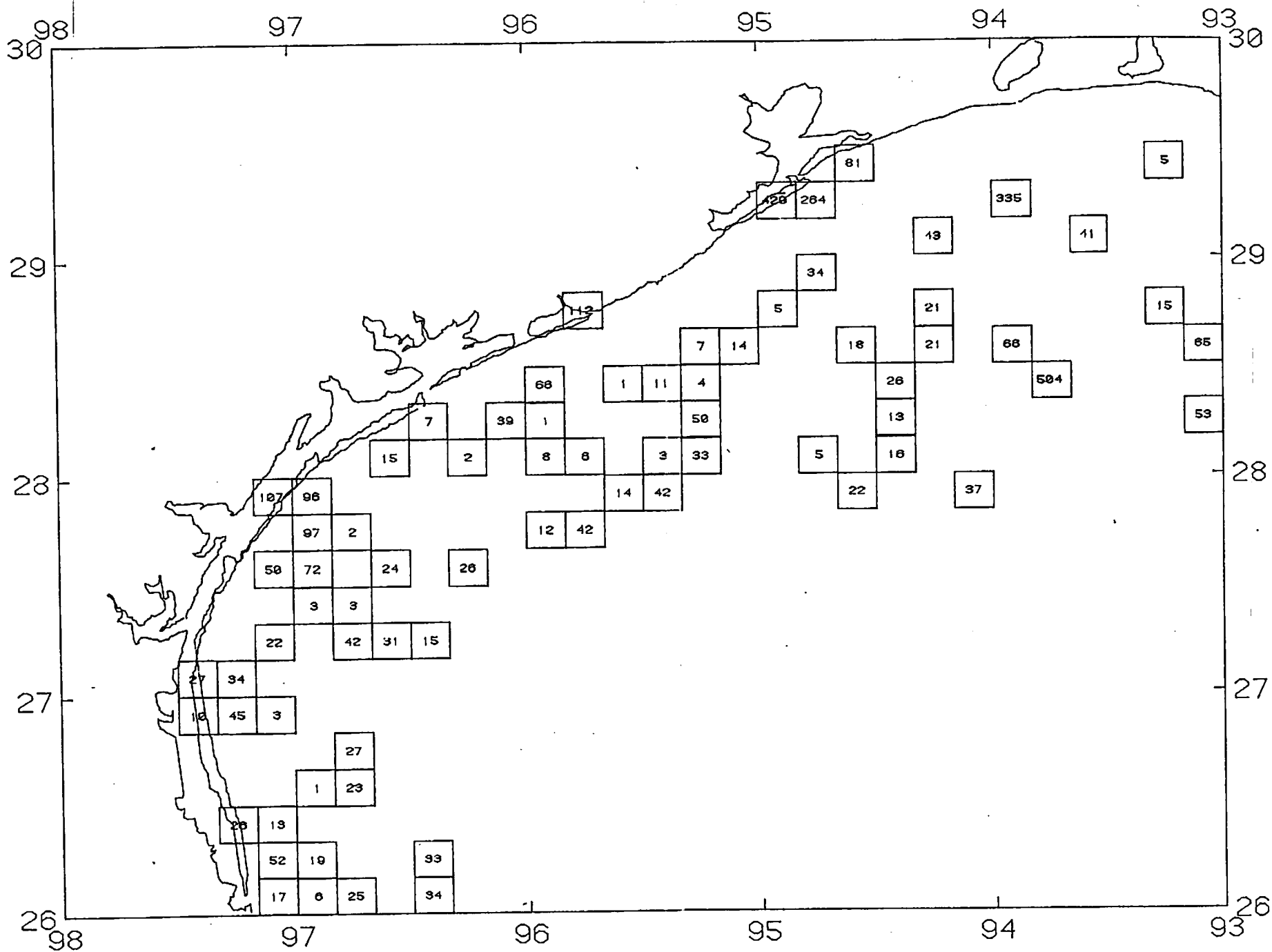


Figure 8. Finfish total weights in the northwestern Gulf of Mexico. Numbers are expressed in kilograms per hour for a 40-ft shrimp trawl.

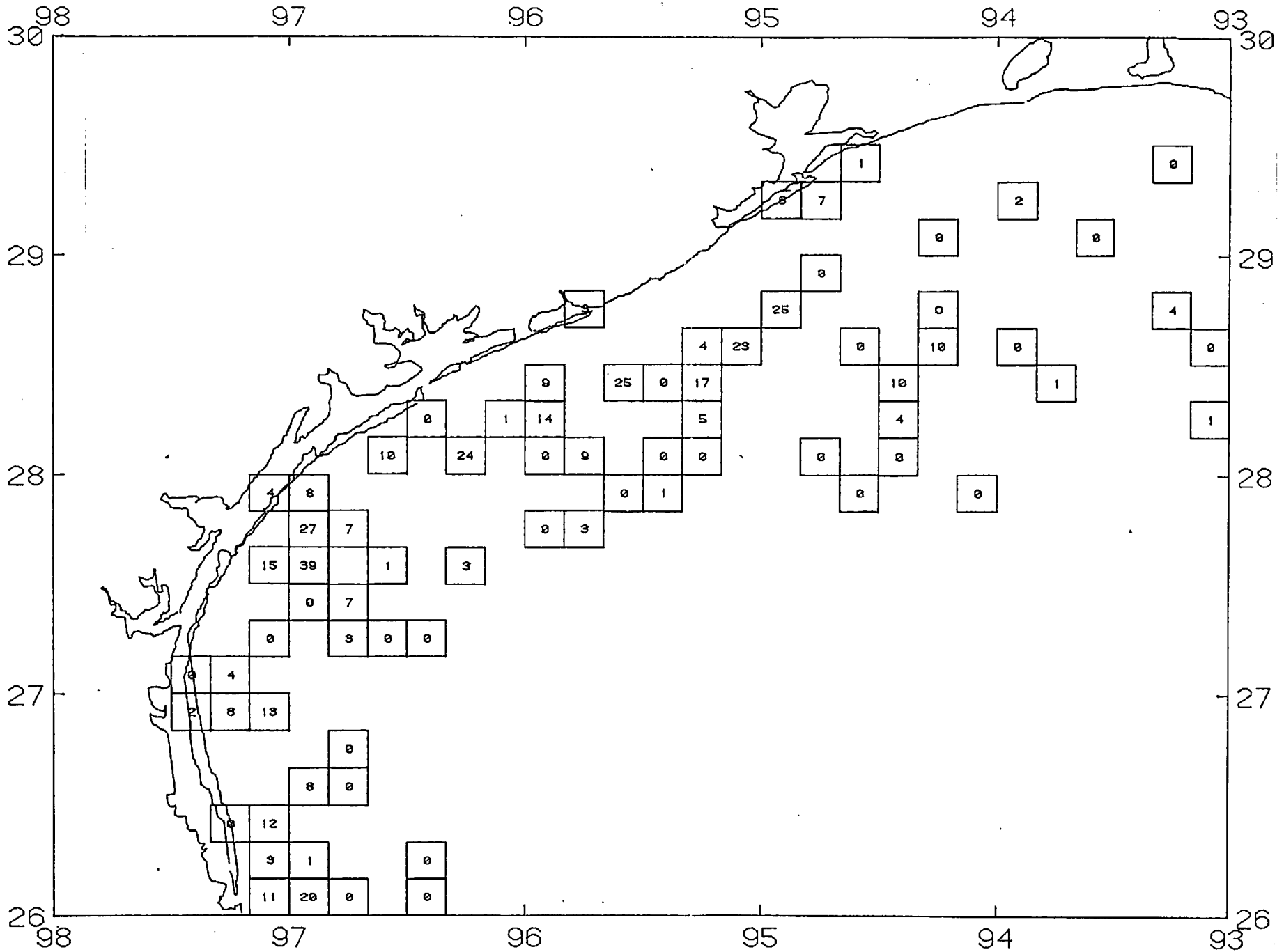


Figure 9. Total weights of penaeid shrimp in the northwestern Gulf of Mexico. Numbers are expressed in kilograms per hour for a 40-ft shrimp trawl.

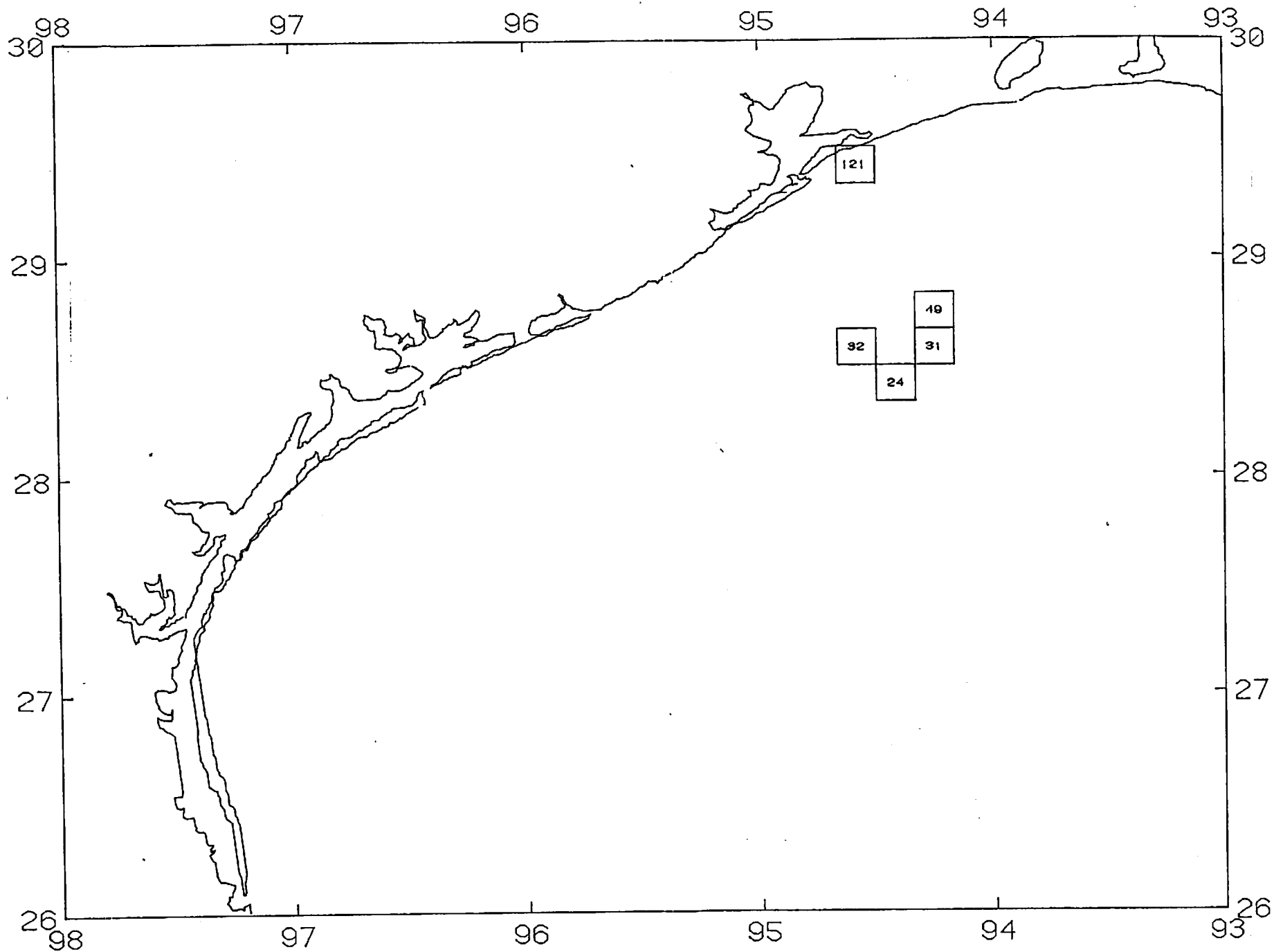


Figure 10. Finfish total weights in the northwestern Gulf of Mexico. Numbers are expressed in kilograms per hour for a 65-ft fish trawl.

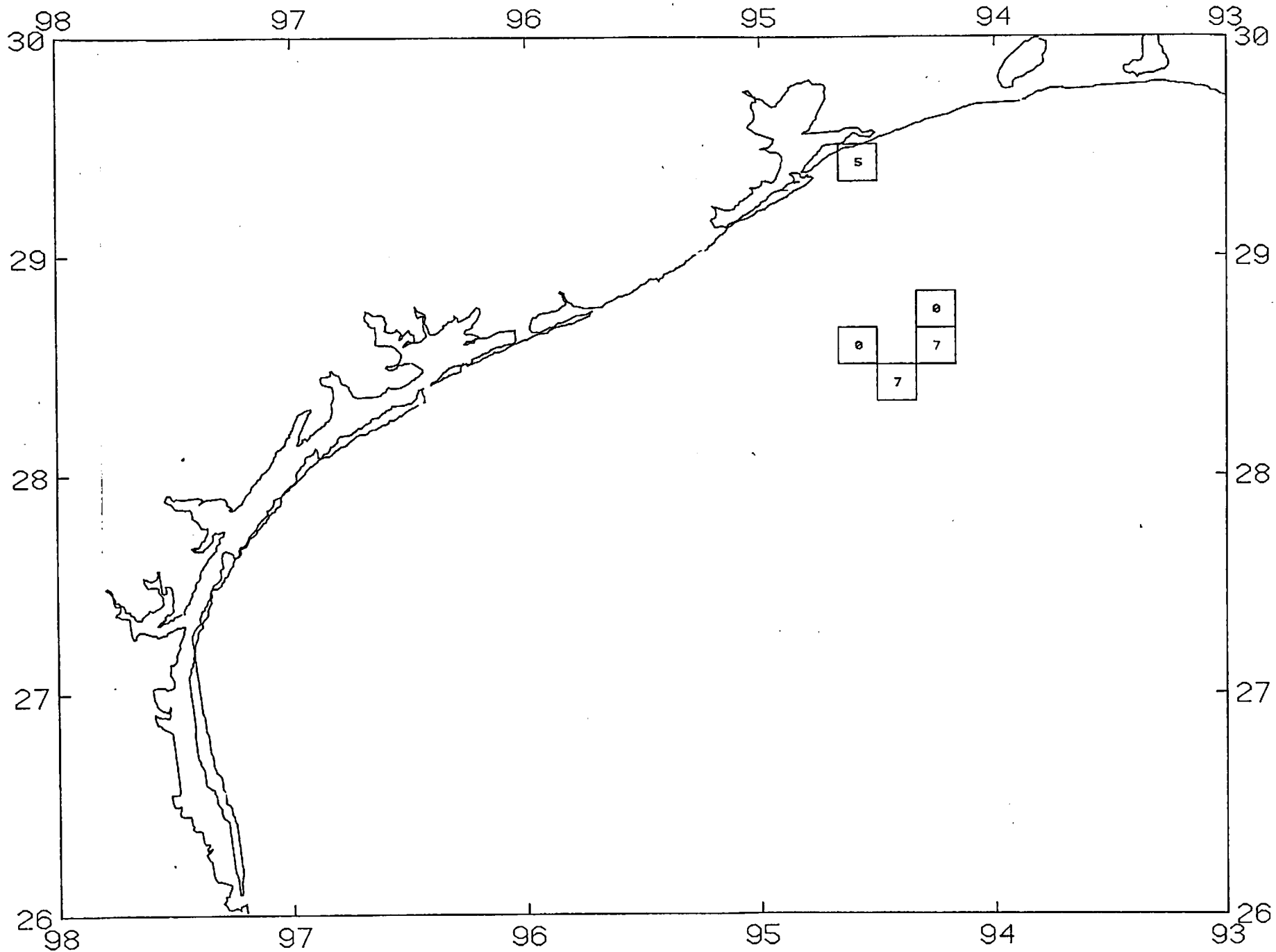


Figure 11. Total weights of penaeid shrimp in the northwestern Gulf of Mexico. Numbers are expressed in kilograms per hour for a 65-ft fish trawl.

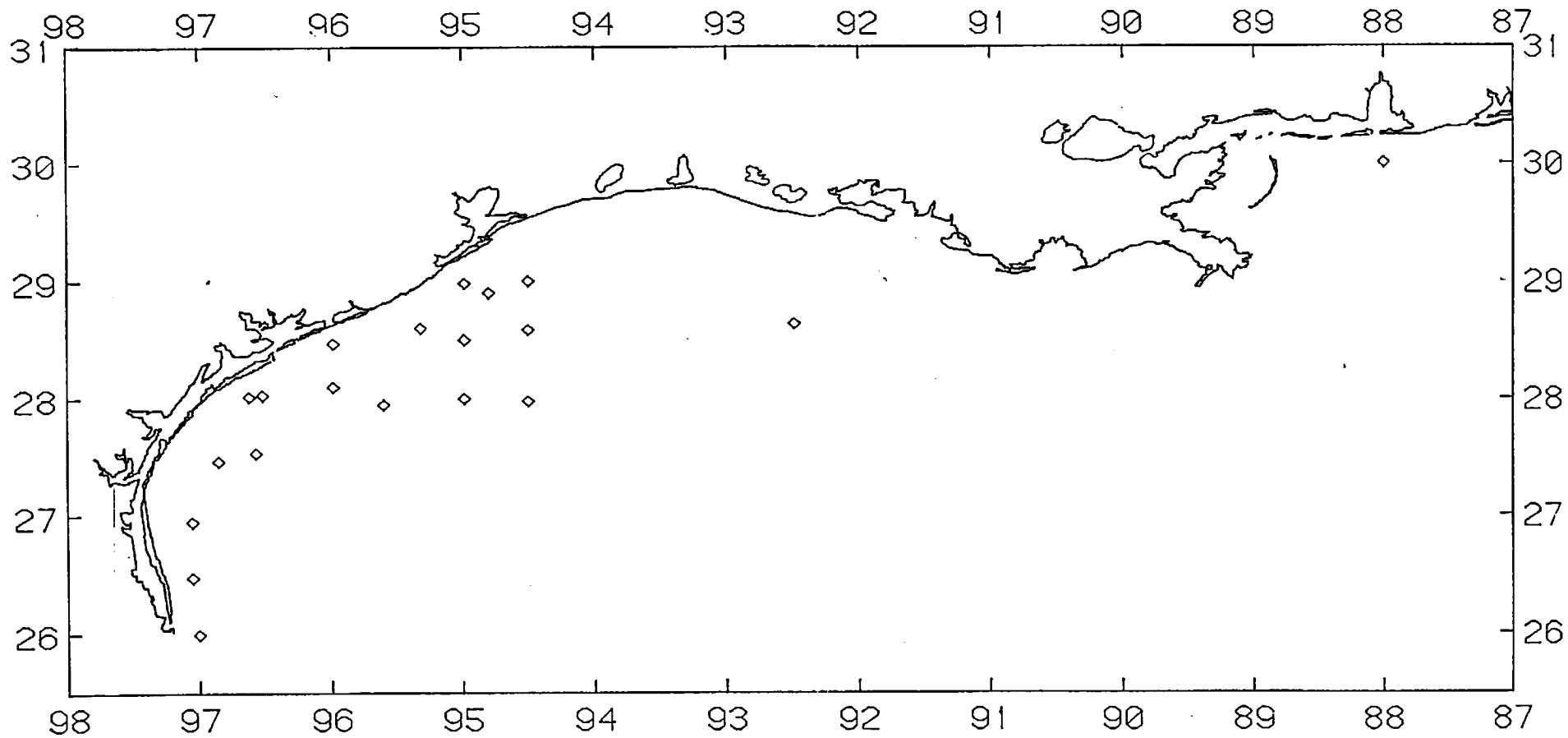


Figure 12. Ichthyoplankton trawl sites.