

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

OREGON II Cruise 91-03 (194)  
4/16-5/24/91

## INTRODUCTION

The NOAA ship OREGON II departed Pascagoula, MS on April 16, 1991 to conduct the spring SEAMAP ichthyoplankton cruise OT 91-03 (194). The survey was conducted to determine distribution and abundance of the various developmental stages of bluefin tuna and mackerel within the northern Gulf of Mexico Exclusive Economic Zone (EEZ). Ancillary projects included marine mammal recognition training and the evaluation of the double neuston frame in comparison to the single neuston frame with respect to organisms taken during a tow. The MOCNESS effort mentioned in the cruise instructions was canceled because of time constraints.

The survey was divided into three SEAMAP components (part 1, April 16-30, part 2, May 2-13, and part 3, May 18-23, 1991). Inclement weather forced the cancellation of 14 of 78 stations during part 1, and 9 of 78 stations were not sampled during parts 2 and 3. Stations were missed during parts 2 and 3 because operations were interrupted by legal proceedings concerning the OREGON II that required key personnel needed for ships operations.

A total of one hundred and thirty-nine (139) of a proposed 156 stations were occupied from April 16 through May 23, 1991.

## Objectives

### SEAMAP

- 1) Collect ichthyoplankton, particularly bluefin tuna eggs and larvae, for distribution and abundance determinations.
- 2) Collect environmental data and chlorophyll samples from each station.
- 3) Collect neuston samples at selected sites for avoidance comparisons between the single and double neuston gear types.

## Non-SEAMAP

- 1) Conduct line-transect sampling training for marine mammals along the cruise track defined for plankton sampling.

## METHODS

### SEAMAP

Standard SEAMAP environmental and ichthyoplankton collection procedures were implemented during two 78 station passes of the survey. Station selection followed a systematic grid pattern for each 30 minutes of latitude and longitude between 38 and 2000 fathoms (fm) (Figures 1 and 2). SEAMAP sampling sites illustrated in Figure 5 represent stations where a single neuston sample was taken, in addition to the double neuston sample, for avoidance comparisons.

One bongo and one double neuston tow was made at each preselected station. Bongo tows were double oblique surface to near bottom or 200 m using 0.333 mm mesh nets (Figure 3). Vessel speed was adjusted during each tow to maintain a 45° wire angle. A double neuston tow was made after each bongo tow using two 1 x 2 m frames welded together and outfitted with two 0.947 mm mesh nets (Figure 4). Neuston tows were of 10 minute duration at 1.0-2.0 knots. Before execution of the bongo and neuston tows the ship was stopped for a CTD/STD and hydrocast. The hydrocast was made to collect multiple depth water samples from 30, 50, 60, 70, 80 and 100 m in addition to the standard SEAMAP surface, midwater and maximum depth water samples. Three liter chlorophyll samples were taken from these additional sample sites at each station during part 1, and one liter chlorophyll samples during parts 2 and 3. The right bongo and neuston samples were preserved in 10% formalin for 48 hours and were then transferred to 95% ethanol. The left bongo and neuston samples were preserved using an ethanol-ethanol (95%) transfer. Single neuston tows made for comparison work were preserved in 10% formalin for 48 hours and were changed to 95% ethanol (Figure 5).

### Marine Mammal

A dual objective during all three legs of the cruise was to collect data on marine mammals in the northern Gulf. The data will be used to learn about the diversity, density and distribution of marine mammal species in the Gulf. Line transect data was collected by two teams of three observers during daylight hours, weather permitting. Two observers searched for marine mammals using 25X binoculars mounted on ship's flying bridge. A third observer searched for marine mammals near the ship and recorded data. Data was recorded on data sheets and entered on a laptop

computer using a BASIC data acquisition program. Observers from the Southeast Fisheries Center, Southwest Fisheries Center and Texas A&M University participated in the cruise.

## RESULTS

The following table displays cumulative totals of samples collected and casts made at one hundred and thirty-three sampling sites (133) over a period of thirty-four (34) days.

Table 1. Samples collected and casts made by principle gear used during SEAMAP ichthyoplankton cruise OT-91-03 (194)

Principle Gear Type	Part 1	Part 2	Part 3	Total
Left Bongo	13	46	8	67
Right Bongo	12	47	8	67
Double Neuston				
Right	28	98	14	140
Left	28	101	17	146
Single Neuston	0	12	0	12
Surface Chlorophyll	64	58	17	139
Multiple Depth Chlorophyll	64	26	8	98
Hydrocasts	64	58	17	139
STD Profiles	0	0	17	17
CTD Profiles	55	1	0	56
XBT	7	9	3	19
Thermosalinograph Readings	0	48	0	48
Salinity Sample	62	58	17	137
Dissolved Oxygen	60	58	17	135

One hundred and thirty-nine preselected SEAMAP stations were completed during parts 1 (64 stations) 2 (58 stations; 6 of 14 remaining from first pass and 52 second pass stations) and 3 (17 stations). Left bongo samples were deposited with Gulf Coast Research Lab (GCRL) for processing, analysis, and storage. The right bongo, single and double neuston samples are to be shipped to ZSIOP, Szczecin, Poland for sorting. Chlorophyll samples and all remaining data were returned to NMFS Pascagoula Laboratory for analysis, comparison and archiving.

### Marine Mammal Results

A total of 217 hours were spent searching for marine mammals and 4,267 transect kilometers were surveyed. At least 13 cetacean species were sighted in 93 herd sightings (Table 2). These species

were as follows: Bryde's whale (3 herd sightings), sperm whale (5), dwarf sperm whale (3), Cuvier's beaked whale (1), pygmy killer whale (1), false killer whale (1), rough-toothed dolphin (1), bottlenose dolphin (12), Risso's dolphin (2), Atlantic spotted dolphin (1), pantropical spotted dolphin (27), striped dolphin (3), and Clymene dolphin (4).

#### ACKNOWLEDGEMENTS

Sincere appreciation is expressed to the officers and crew of the OREGON II for their assistance in the completion of this survey. Their professionalism, expertise and dedication, during a survey surrounded by uncontrollable events, are to be commended.

#### CRUISE PARTICIPANTS

Part 1 (April 16-30, 1991)

<u>Name</u>	<u>Title</u>	<u>Organization</u>
Robert Ford	Field Party Chief	NMFS, Pascagoula, Miss.
Keith Mullin	Fishery Biologist	NMFS, Pascagoula, Miss.
Wayne Hoggard	Fishery Biologist	NMFS, Pascagoula, Miss.
Carolyn Rogers	Bio. Technician	NMFS, Pascagoula, Miss.
Brian Underwood	Student Trainee	NMFS, Pascagoula, Miss.
Jill Wisniewski	Cooperator	NMFS, Pascagoula, Miss.
Dagmar Ferti	Cooperator	Texas A&M
Matt Pickett	NOAA Corps	NMFS, Miami, Fla.
Robert Pittman	Fishery Biologist	NMFS, La Jolla, Calif.
Scott Benson	Fishery Biologist	NMFS, La Jolla, Calif.
Darlene Johnson	Fishery Biologist	NMFS, Miami, Fla.

Part 2 (May 2-13, 1991)

<u>Name</u>	<u>Title</u>	<u>Organization</u>
Alonzo Hamilton, Jr.	Field Party Chief	NMFS, Pascagoula, Miss.
Karen Lecke-Mitchell	Fishery Biologist	NMFS, Pascagoula, Miss.
Perry Thompson	Fishery Biologist	NMFS, Pascagoula, Miss.
Carol Roden	Fishery Biologist	NMFS, Pascagoula, Miss.
Keith Mullin	Fishery Biologist	NMFS, Pascagoula, Miss.
Carolyn Rogers	Bio. Technician	NMFS, Pascagoula, Miss.
Ann Marie Eklund	Fishery Biologist	NMFS, Miami, Fla.
Darlene Johnson	Fishery Biologist	NMFS, Miami, Fla.
Scott Benson	Fishery Biologist	NMFS, La Jolla, Calif.
Robert Pittman	Fishery Biologist	NMFS, La Jolla, Calif.
Jill Wisniewski	Cooperator	NMFS, Pascagoula, Miss.
Tom Jefferson	Cooperator	Texas A&M

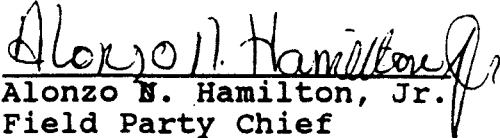
CRUISE PARTICIPANTS (Cont'd)


Part 3 (May 14-24, 1990)

<u>Name</u>	<u>Title</u>	<u>Organization</u>
Alonzo Hamilton, Jr.	Field Party Chief	NMFS, Pascagoula, Miss.
Brian Underwood	Student Trainee	NMFS, Pascagoula, Miss.
Carol Roden	Fishery Biologist	NMFS, Pascagoula, Miss.
Karen Lecke-Mitchell	Fishery Biologist	NMFS, Pascagoula, Miss.
Wayne Hoggard	Fishery Biologist	NMFS, Pascagoula, Miss.
Ann A. Avrigian	Bio. Technician	NMFS, Panama City, Fla.
Ann Marie Eklund	Fishery Biologist	NMFS, Miami, Fla.
Darlene Johnson	Fishery Biologist	NMFS, Miami, Fla.
Larry Hansen	Fishery Biologist	NMFS, Miami, Fla.
Scott Benson	Fishery Biologist	NMFS, La Jolla, Calif.
Robert Pittman	Fishery Biologist	NMFS, La Jolla, Calif.
Tom Jefferson	Cooperator	Texas A&M

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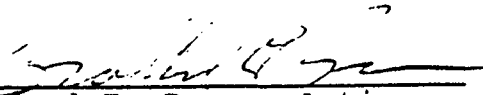
  
Bradford E. Brown, Acting  
Southeast Science & Research  
Director

Table 2. 1991 northern Gulf of Mexico marine mammal ship survey (hours = hours on survey, KM - transect kilometers surveyed, SS - the average Beaufort sea state while on survey, No. - number of sightings, \* - off survey sighting).

Date	Hours	KM	SS	No.	Species
Leg 1					
17 April	7.8	162	3.2	7	* <u>Tursiops</u> sp. Unidentified dolphin Unidentified dolphin Unidentified dolphin *Unidentified dolphin Unidentified dolphin Unidentified dolphin
18 April	8.5	187	1.6	14	* <u>Stenella attenuata</u> <u>S. attenuata</u> <u>Kogia</u> sp. <u>Pseudorca</u> sp. <u>Ziphius</u> sp. <u>S. attenuata</u> Unidentified dolphin <u>S. attenuata</u> <u>K. simus</u> <u>S. attenuata</u> <u>S. attenuata</u> Unidentified dolphin <u>S. attenuata</u> <u>Tursiops</u> sp.
19 April	8.2	160	3.5	5	Unidentified dolphin Unidentified dolphin *Unidentified dolphin <u>S. attenuata</u> <u>S. attenuata</u>
20 April	7.6	136	3.4	1	<u>Physeter</u> sp.
21 April	8.1	138	4.4	3	Unidentified dolphin <u>S. coeruleoalba</u> <u>Tursiops</u> sp.
22 April	8.2	150	2.6	10	Unidentified dolphin Beaked whale Unidentified odontocete <u>K. simus</u> <u>S. attenuata</u> <u>S. attenuata</u> <u>S. clymene</u> <u>S. attenuata</u> <u>S. attenuata</u> <u>S. attenuata</u>

Table 2. (Continued)

Date	Hours	KM	SS	No.	Species
23 April	8.5	140	5.2	1	<u>Physeter sp.</u>
24 April	7.8	155	2.3	4	<u>S. attenuata</u> <u>Physeter sp.</u> <u>Physeter sp.</u> <u>S. attenuata</u>
25 April	7.4	138	3.4	1	<u>S. attenuata</u>
26 April	6.9	143	5.0	2	<u>S. clymene</u> * <u>S. attenuata</u>
27 April	6.9	116	5.0	1	<u>Physeter sp.</u>
28 April	2.3	43	3.7	0	
29 April	8.5	166	4.5	2	<u>S. attenuata</u> <u>S. attenuata</u>
LEG 2					
02 May	8.7	172	3.0	1	<u>S. coeruleoalba</u>
03 May	12.8	269	2.6	6	<u>Unidentified Odontocele</u> <u>Grampus sp.</u> <u>Tursiops sp.</u> <u>Tursiops sp.</u> <u>Tursiops sp.</u> <u>Unidentified Odontocele</u>
04 May	7.8	155	2.3	12	<u>Balaenopter edeni</u> <u>Tursiops sp.</u> <u>Balaenopter sp.</u> <u>Unidentified dolphin</u> <u>Tursiops sp.</u> <u>Unidentified Odontocele</u> <u>B. edeni</u> <u>Unidentified Odontocele</u> <u>Unidentified Odontocele</u> <u>B. edeni</u> * <u>Tursiops sp.</u> <u>S. frontalis/Tursiops</u>
05 May	9.8	197	4.3	4	<u>S. attenuata</u> <u>Unidentified dolphin</u> <u>Unidentified small whale</u> * <u>Tursiops/Unidentified dolphin</u>

Table 2. (Continued)

Date	Hours	KM	SS	No.	Species
06 May	9.1	187	3.3	2	* <u>S. attenuata</u> <u>S. attenuata</u>
07 May	9.8	186	4.0	1	<u>S. attenuata</u>
08 May	3.9	81	4.6	1	* <u>S. attenuata</u>
09 May	8.1	139	4.8	0	
10 May	9.9	192	4.1	1	* <u>S. attenuata</u>
11 May	9.3	205	4.6	3	Feresa Unidentified dolphin <u>S. coeruleoalba</u>
12 May	12.8	272	2.8	5	Unidentified dolphin <u>S. clymene</u> Unidentified Odontocete <u>K. simus</u> Unidentified dolphin
LEG 3					
19 May	5.2	102	5.0	2	<u>Tursiops sp.</u> <u>Tursiops sp.</u>
20 May	6.4	132	4.2	3	<u>S. clymene</u> Grampus Steno
21 May	7.0	144	4.2	1	<u>S. attenuata</u>



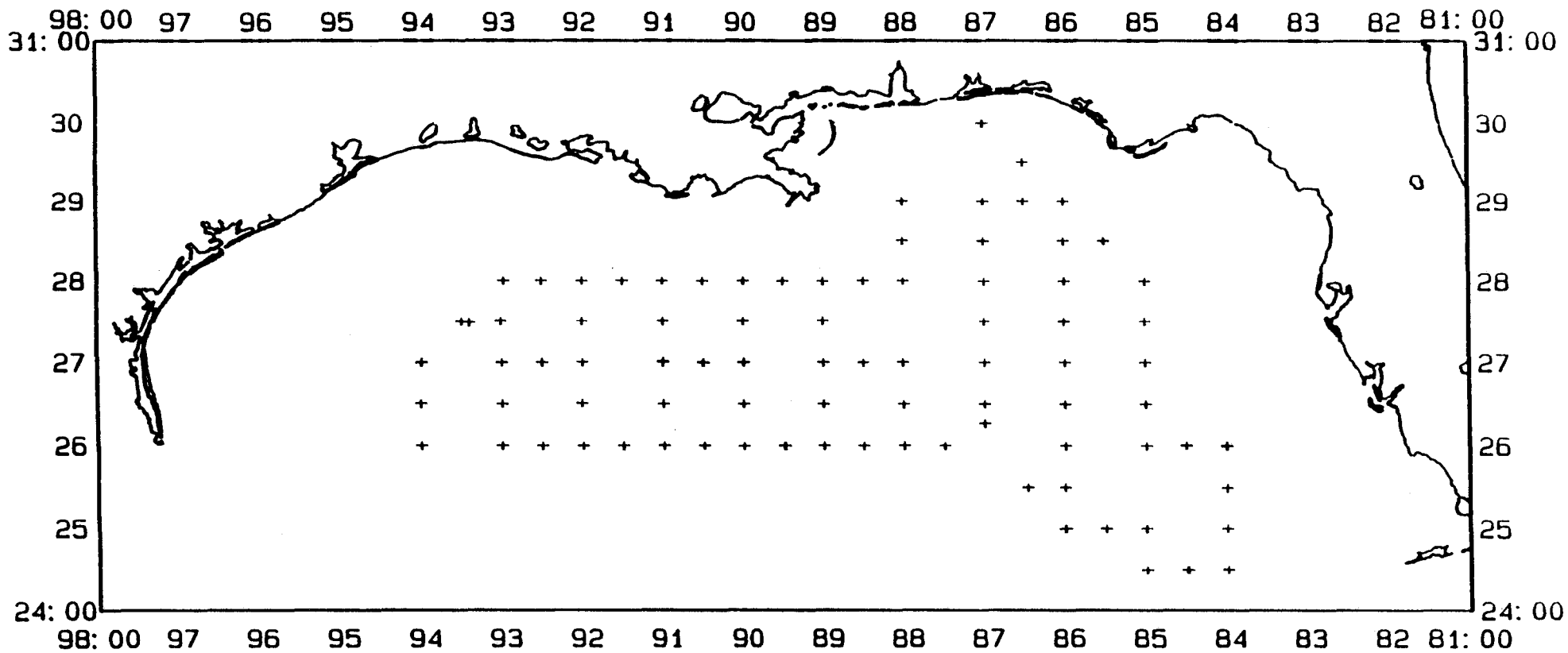


Figure 1. Sampling sites occupied during two 78 station passes over the SEAMAP sampling grid for plankton OREGON II Cruise 194.

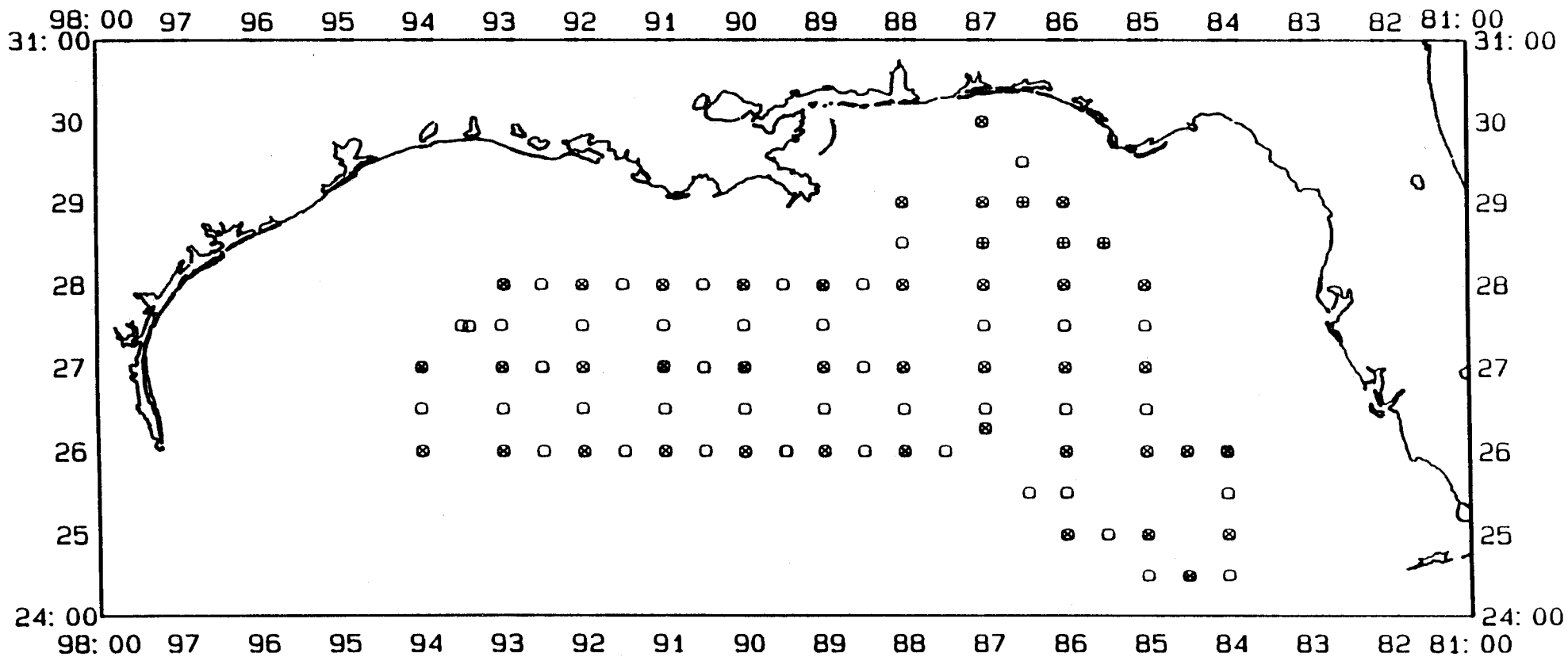


Figure 2. Location of bongo (x), double neuston's and single neuston + samples collected on OREGON II Cruise 194.

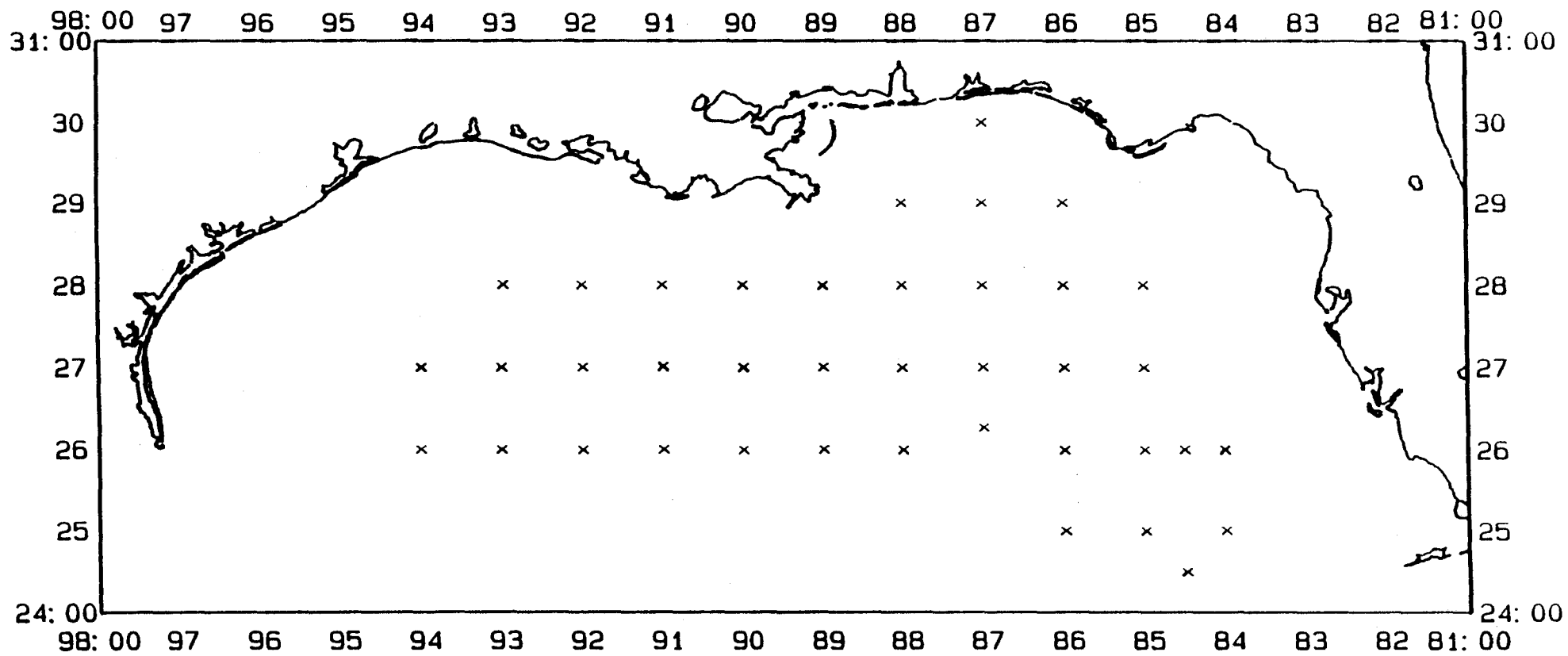


Figure 3. Location of OREGON II Cruise 194 bongo stations.

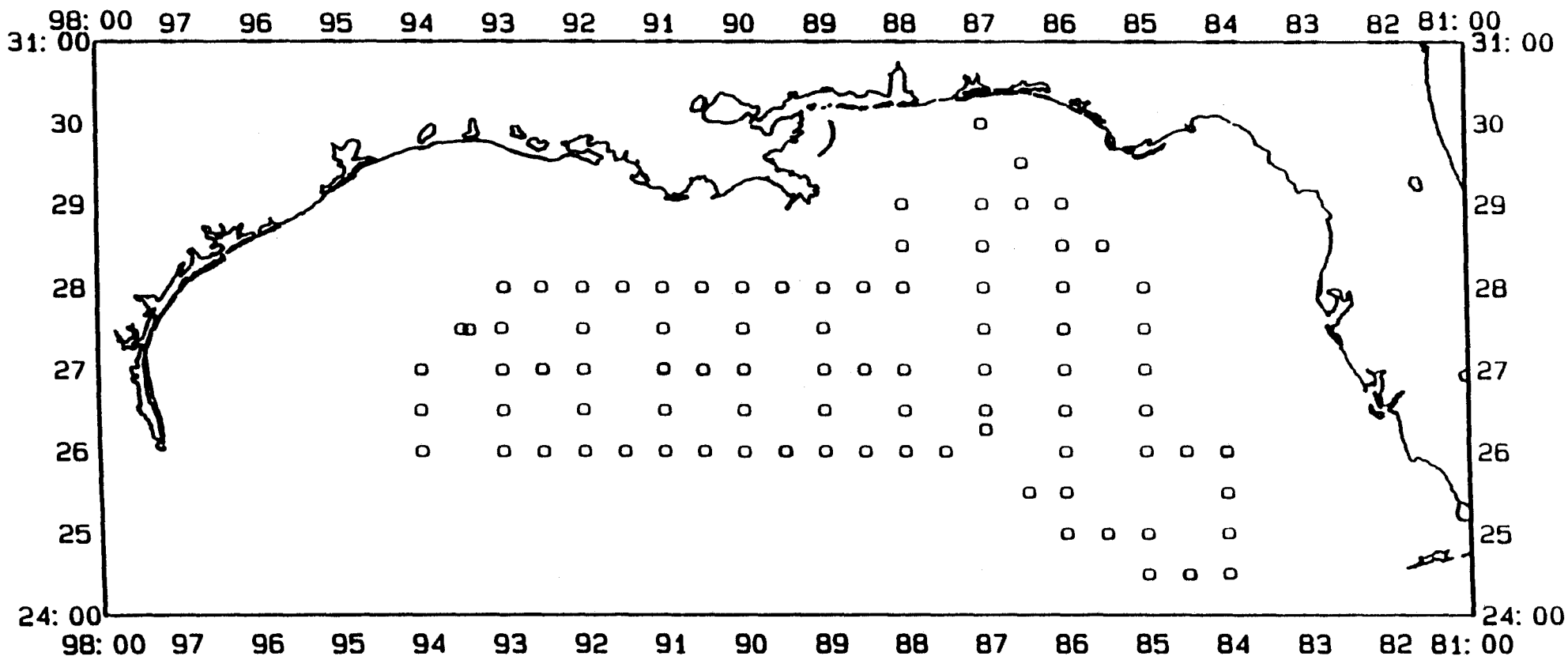


Figure 4. Location of OREGON II Cruise 194 double neuston stations.

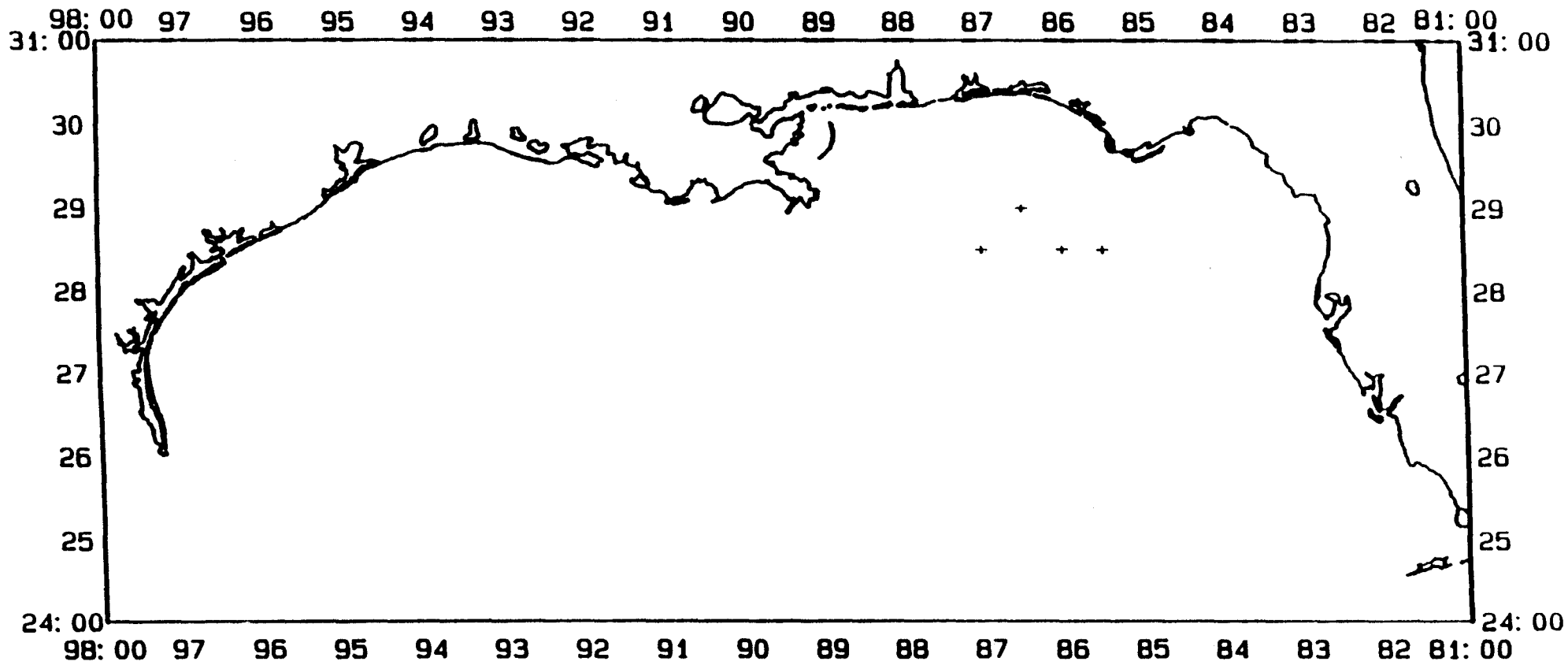


Figure 5. Location comparative neuston tow made during OREGON II Cruise 194.