

NOAA Ship Oregon II Cruise 0402 (258)

May 11 - 31, 2004

INTRODUCTION

The NOAA Ship Oregon II departed Pascagoula, MS on May 11, 2004 to conduct the Southeast Area Monitoring and Assessment Program (SEAMAP) spring ichthyoplankton survey in the northern Gulf of Mexico. The customary two northern Gulf of Mexico passes were reduced to one because of an extended shipyard period. In the remaining time, a total of three days were lost to vessel medical emergencies and administrative concerns. Seventeen successful sea days were worked, resulting in all 98 targeted sites being sampled. The NOAA Ship Gordon Gunter was responsible for completing twelve stations in support of this effort.

OBJECTIVES

1. Collect ichthyoplankton with 60 cm bongo and 1 x 2 m neuston gear primarily for bluefin tuna abundance and distribution of eggs, larvae and small juveniles.
2. Deploy Spanish bongo gear at each standard SEAMAP bongo site to compare catch differences between standard SEAMAP and Spanish ichthyoplankton sampling gear for bluefin tuna eggs and larvae. If time permits conduct 500m tows for performance evaluations.
3. Obtain station associated environmental and oceanographic data throughout the survey area using the SBE 9/11 Conductivity, Temperature and Depth recorder (CTD), outfitted with the following sensors:
 - Temperature, SBE 03-02/F
 - Conductivity, SBE 04-02/0
 - Pressure, Digiquartz 410K-105
 - Dissolved Oxygen, SBE 43
 - Fluorometer, Wetlabs Wetstar
 - Transmissometer, Wetlabs C-Star.
4. Obtain real time depth, temperature and salinity data for each of the standard SEAMAP bongo profiles using the SEACAT SBE - 19.
5. Measure chlorophyll *a* at three levels of the water column: surface, bottom (to a maximum of 200 m), midwater and/or the chlorophyll maximum using bench top fluorometry, Turner Designs model 10-AU-005 fluorometer with optical kit 10-040R at all plankton stations.

METHODS

Cruise objectives, were implemented in accordance with procedures outlined in the SEAMAP data collections manual and the cruise operational plan.

Primary station operations consisted of two alternating predetermined protocols upon arrival. One consisted of a neuston tow, a standard SEAMAP bongo tow, a Spanish bongo tow and a CTD profile with a rosette water sampler and three Niskin bottles. The other station protocol consisted of a neuston tow, and a CTD profile with a rosette water sampler and three Niskin bottles.

Other Environmental Parameters

Other environmental data collected at designated ichthyoplankton station during daylight hours includes, Secchi disc depth and water color. The continuous-flow thermosalinograph / fluorometer (SBE-21) was in use 24 hours/day. Oxygen titrations were performed for the first ten days of the survey. During that period, the Winkler readings were erratic when compared to the CTD oxygen readings. After rechecking the readings and after some discussion, it was determined that the quality of the chemicals were the problem. The necessary reactions for the Winkler titration could not occur because the chemicals were improperly stored while awaiting use. As a result, there are no oxygen reference data for this survey. Niskin bottle water samples were also processed for chlorophyll *a* concentrations at surface, mid and max depths.

RESULTS

Over the course of the two surveys, SEAMAP ichthyoplankton was collected from 86 of 98 stations aboard the Oregon II and 12 of 98 stations aboard the Gordon Gunter (Figure 1). A breakdown of samples collected by gear is given in Table 1.

A list of stations, by vessel and gear, comprising one complete pass over the survey track in the month of May is given in Tables 2 – 7. Sample dates and times are GMT. Abbreviations used in table headers are defined as: P-Sta. # = Pascagoula station number; S-Sta. # = SEAMAP station number; Smp. # = SEAMAP sample number; R-B = Right Bongo; L-B = Left Bongo; NN = Neuston; SBL = Spanish bongo left; SBR = Spanish bongo right; Pres. = Initial preservative; Form = Formalin and ETOH = Ethyl alcohol.

A listing of chlorophyll *a* data collected is also presented in Table 8. The method used for chlorophyll *a* extraction was a modification of Welschmeyer (1994). The column headers are from the Scientific Computing System (SCS) Access database and are defined as follows: PASC = Pascagoula station number; SEAMAP = SEAMAP station number; STA_LAT = Beginning latitude; STA_LON = Beginning longitude; STA_DEPTH = Beginning depth in meters; SRFDEPTH = Surface depth; MIDDEPTH = Midwater depth; MAXDEPTH = Maximum depth or bottom; CHLSRF = Surface chlorophyll reading; CHLMID = Midwater chlorophyll; CHLMAX = Maximum depth or Bottom chlorophyll reading and WTRDEPTH = Station depth during the CTD cast. Approximate locations of sampling effort presented in the tables are shown in Figures 1 - 4.

Ichthyoplankton samples collected during the surveys were assigned SEAMAP numbers before deposition of standard SEAMAP left bongos with GCRL. Standard SEAMAP right bongos and neustons were shipped to ZSIOP Szczecin, Poland for sorting. The Spanish gear collections

were data based prepared for shipment to Miami. The SBE - 21 sea surface profiles of the survey track, Turner fluorometer values and all other environmental data were returned to the NMFS Mississippi laboratories for analysis, editing, comparison, and archiving.

TABLE 1. Breakdown of SEAMAP Ichthyoplankton and Environmental Collections aboard Oregon II 04-02 (258) and Gordon Gunter 04-02 (27)

GEAR TYPE	Oregon II	Gordon Gunter
BONGO:		
SEAMAP:		
LEFT:	39	7
RIGHT:	38	7
70cm Spanish:		
LEFT:	42	0
RIGHT:	42	0
NEUSTON:		
SEAMAP:	86	12
Bench top Fluorometry Chlorophyll a:		
Surface Measures:	86	0
Mid Depth Measures:	81	0
Maximum	81	0
CTD		
SBE 9/11:	87	12
SBE 19:	40	7

PARTICIPANTS

Oregon II:		
<u>Name</u>	<u>Title</u>	<u>Organization</u>
Alonzo N. Hamilton, Jr.	Field Party Chief	NMFS Pascagoula, MS
Lanora Lang	Fishery Biologist II	Johnson Controls
Pamela Bond	Res. Fish Biologist	NMFS Pascagoula, MS
Dean Landi	Fishery Biologist II	Johnson Controls

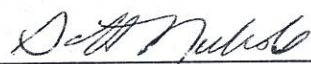
Gordon Gunter:

<u>Name</u>	<u>Title</u>	<u>Organization</u>
Glenn Zapfe	Fishery Biologist II	Johnson Controls
Andre' Debose	Res. Fish Biologist	NMFS Pascagoula, MS

SUBMITTED BY:


Alonzo N. Hamilton, Jr. Field Party Chief

APPROVED BY:


Scott Nichols, Director, Mississippi Laboratories

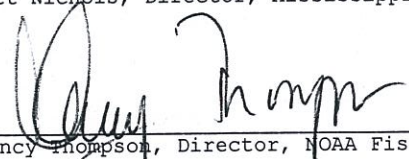

Nancy Thompson, Director, NOAA Fisheries SEFSC

Table 2. Oregon II Cr. 0402 (258) Left SEAMAP & Spanish Bongo Sample Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
002	B151	30848	L - B	95% ETOH	05/13/2004 6:20:03	
002	B151	30851	SBL	95% ETOH	05/13/2004 7:20:52	
004	B149	30854	L - B	95% ETOH	05/13/2004 15:18:08	
004	B149	30857	SBL	95% ETOH	05/13/2004 15:58:51	Charted depth
006	B131	30860	L - B	95% ETOH	05/14/2004 2:04:37	BONGO BOTTOM button pushed about 1 minute late
006	B131	30863	SBL	95% ETOH	05/14/2004 2:26:44	
008	B129	30866	L - B	95% ETOH	05/15/2004 12:48:18	
008	B129	30869	SBL	95% ETOH	05/15/2004 13:11:16	Extremely marginal working conditions.
009	B262		L - B		05/15/2004 18:29:14	Chart depth entered BONGO ABORTED 1st attempt wire near propellers 2nd attempt wind blew net dangerously for deck crew
009	B262	30872	SBL	95% ETOH	05/15/2004 18:51:15	Chart depth 2562 m
010	B7	30874	L - B	95% ETOH	05/15/2004 23:09:52	Chart depth 3300m
010	B7	30877	SBL	95% ETOH	05/15/2004 23:33:12	Chart depth 3300m suspect bad left flowmeter will check seems ok need to add water and recheck before next station
012	B8	30880	SBL	95% ETOH	05/16/2004 6:15:23	Standard oblique bongo cancelled because of 4.2 knot current.
015	B6	30885	L - B	95% ETOH	05/16/2004 17:46:12	Chart depth 3200m
015	B6	30888	SBL	95% ETOH	05/16/2004 18:11:06	Chart depth 3200m
017	B5	30892	SBL	95% ETOH	05/17/2004 3:15:56	Chart depth 3307m NO regular BONGO this station
019	B163	30895	L - B	95% ETOH	05/17/2004 11:58:19	Chart depth
019	B163	30898	SBL	95% ETOH	05/17/2004 12:20:19	Chart depth
022	B2	30902	L - B	95% ETOH	05/18/2004 0:52:09	EQ50 in and out at this depth 699m
022	B2	30905	SBL	95% ETOH	05/18/2004 1:13:03	EQ50 in and out at this depth 699m

Table 2. Oregon II Cr. 0402 (258) Left SEAMAP & Spanish Bongo Sample Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
024	B1	30908	L - B	95% ETOH	05/21/2004 2:55:28	Chart depth 1429m FROM Rt. Bongo. One 7 inch salp and one 4 inch flying fish FROM Lt bongo One 6 inch salp and two 5 inch flying fish
024	B1	30911	SBL	95% ETOH	05/21/2004 3:19:37	Chart depth 1429m
027	B3	30915	L - B	95% ETOH	05/21/2004 15:59:45	did not hit bongo bottom button Halobates present in Rt bongo
027	B3	30918	SBL	95% ETOH	05/21/2004 16:23:52	Halobates present in Rt bongo
029	B4	30921	L - B	95% ETOH	05/21/2004 23:34:58	Chart depth 3060 m 3 knot current
029	B4	30924	SBL	95% ETOH	05/22/2004 0:08:59	Chart depth 3060 m
031	B9	30927	L - B	95% ETOH	05/22/2004 7:02:11	
031	B9	30930	SBL	95% ETOH	05/22/2004 7:27:29	
033	B10	30933	L - B	95% ETOH	05/22/2004 15:19:43	Charted depth 3019.5m. 2.6 kt. Current at station.
033	B10	30936	SBL	95% ETOH	05/22/2004 15:45:24	Wire out estimated 7meters. 2.6 kt. Current at station.
035	B11	30939	L - B	95% ETOH	05/22/2004 21:45:00	Chart depth 2960 m
035	B11	30942	SBL	95% ETOH	05/22/2004 22:08:42	Chart depth 2960 m
038	B12	30946	L - B	95% ETOH	05/23/2004 9:09:22	No prominent current.
038	B12	30949	SBL	95% ETOH	05/23/2004 9:35:40	
040	B13	30952	L - B	95% ETOH	05/23/2004 16:40:43	Chart depth 3111 m
040	B13	30955	SBL	95% ETOH	05/23/2004 17:03:21	Chart depth 3111 m
042	B14	30958	L - B	95% ETOH	05/23/2004 23:37:39	Chart depth 3040
042	B14	30961	SBL	95% ETOH	05/24/2004 0:00:29	Chart depth 3040
044	B15	30964	L - B	95% ETOH	05/24/2004 7:09:15	
044	B15	30967	SBL	95% ETOH	05/24/2004 7:35:17	
046	B18	30970	L - B	95% ETOH	05/24/2004 13:39:52	
046	B18	30973	SBL	95% ETOH	05/24/2004 14:04:01	chart depth 910 fathoms

Table 2. Oregon II Cr. 0402 (258) Left SEAMAP & Spanish Bongo Sample Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
048	B19	30976	L - B	95% ETOH	05/24/2004 21:11:59	Chart depth 2900 m
048	B19	30979	SBL	95% ETOH	05/24/2004 21:33:28	Chart depth 2900 m
050	B20	30982	L - B	95% ETOH	05/25/2004 4:13:51	Chart depth 2268 m
050	B20	30985	SBL	95% ETOH	05/25/2004 4:36:11	Chart depth 2268 m
052	B21	30988	L - B	95% ETOH	05/25/2004 11:33:21	Sargassum patches prominent
052	B21	30991	SBL	95% ETOH	05/25/2004 11:57:27	Left flowmeter # B12074 was damaged. Replaced with # B15601.
054	B24	30994	L - B	95% ETOH	05/25/2004 18:21:47	Chart depth 1280 m
054	B24	30997	SBL	95% ETOH	05/25/2004 18:44:31	Chart depth 1280 m
056	B25	31000	L - B	95% ETOH	05/25/2004 23:43:11	Chart depth 2000 m
056	B25	31003	SBL	95% ETOH	05/26/2004 0:07:14	Chart depth 2000 m
058	B26	31006	L - B	95% ETOH	05/26/2004 6:57:04	prominent ground swell
058	B26	31009	SBL	95% ETOH	05/26/2004 7:22:03	prominent ground swell One flying fish removed from right bongo
060	B27	31012	L - B	95% ETOH	05/26/2004 14:30:28	Sargassum no problem. Overshot target depth. went to 222m
060	B27	31015	SBL	95% ETOH	05/26/2004 14:56:07	Flow meter readings questionable. The gear was fished upside down. Tow was not repeated. Flowmeters checked out fine.
062	B28	31018	L - B	95% ETOH	05/26/2004 21:18:03	Chart depth 1660 m
062	B28	31021	SBL	95% ETOH	05/26/2004 21:38:30	Chart depth 1660 m
064	B29	31024	L - B	95% ETOH	05/27/2004 5:14:28	Chart depth 2650 m
064	B29	31027	SBL	95% ETOH	05/27/2004 5:39:02	
066	B30	31030	L - B	95% ETOH	05/27/2004 12:24:19	
066	B30	31033	SBL	95% ETOH	05/27/2004 12:48:34	
068	B31	31036	L - B	95% ETOH	05/27/2004 19:52:55	Depth 823 m
068	B31	31039	SBL	95% ETOH	05/27/2004 20:16:01	Chart Depth 823 m

Table 2. Oregon II Cr. 0402 (258) Left SEAMAP & Spanish Bongo Sample Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
070	B231	31041	L - B	10% Form	05/28/2004 3:38:41	Right codend lost Left sample sent to Poland. No Spanish bongo sample taken at this site. Too windy.
072	B223	31045	L - B	95% ETOH	05/28/2004 10:08:16	
072	B223	31048	SBL	95% ETOH	05/28/2004 10:24:59	Attack of the crab's station.
074	B216	31051	L - B	95% ETOH	05/28/2004 16:38:42	
074	B216	31054	SBL	95% ETOH	05/28/2004 16:52:24	
076	B23	31057	L - B	95% ETOH	05/28/2004 23:41:42	Station moved 2 miles due to rigs
076	B23	31060	SBL	95% ETOH	05/29/2004 0:02:59	Station moved 2 miles due to rigs
078	B22	31063	L - B	95% ETOH	05/29/2004 6:58:37	
078	B22	31066	SBL	95% ETOH	05/29/2004 7:16:59	
080	B17	31069	L - B	95% ETOH	05/29/2004 14:57:28	
080	B17	31072	SBL	95% ETOH	05/29/2004 15:18:37	
082	B16	31075	L - B	95% ETOH	05/29/2004 22:26:22	EQ 50 depth 536.6 BONGO BOTTOM button pressed about 30 seconds late
082	B16	31078	SBL	95% ETOH	05/29/2004 22:49:01	EQ 50 depth 546.1
084	B83	31081	L - B	95% ETOH	05/30/2004 6:02:03	
084	B83	31084	SBL	10% Form	05/30/2004 6:24:46	Gear fished upside down
086	B82	31087	L - B	95% ETOH	05/30/2004 13:50:38	Last SEAMAP station
086	B82	31090	SBL	95% ETOH	05/30/2004 14:16:47	
087	B251	31092	SBL	95% ETOH	05/30/2004 20:02:35	DEEP SPANISH BONGO STATION Chart depth 1560 m. 1st attempt with conventional configuration had insufficient weight for proper descent rate. 2nd attempt 98 additional pounds produced these recorded results.

Table 3. Oregon II Cr. 0402 (258) Right SEAMAP & Spanish Bongo Sample Data						
P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
002	B151	30847	R - B	10% Form	05/13/2004 6:20:03	
002	B151	30850	SBR	10% Form	05/13/2004 7:20:52	
004	B149	30853	R - B	10% Form	05/13/2004 15:18:08	
004	B149	30856	SBR	10% Form	05/13/2004 15:58:51	Charted depth
006	B131	30859	R - B	10% Form	05/14/2004 2:04:37	BONGO BOTTOM button pushed about 1 minute late
006	B131	30862	SBR	95% ETOH	05/14/2004 2:26:44	
008	B129	30865	R - B	10% Form	05/15/2004 12:48:18	
008	B129	30868	SBR	10% Form	05/15/2004 13:11:16	Extremely marginal working conditions.
009	B262		R - B		05/15/2004 18:29:14	Chart depth entered BONGO ABORTED 1st attempt wire near propellers 2nd attempt wind blew net dangerously for deck crew
009	B262	30871	SBR	95% ETOH	05/15/2004 18:51:15	Chart depth 2562 m
010	B7	30873	R - B	10% Form	05/15/2004 23:09:52	Chart depth 3300m
010	B7	30876	SBR	95% ETOH	05/15/2004 23:33:12	Chart depth 3300m suspect bad left flowmeter will check seems ok need to add water and recheck before next station
012	B8	30879	SBR	10% Form	05/16/2004 6:15:23	Standard oblique bongo cancelled because of 4.2 knot current.
015	B6	30884	R - B	10% Form	05/16/2004 17:46:12	Chart depth 3200m
015	B6	30887	SBR	95% ETOH	05/16/2004 18:11:06	Chart depth 3200m
017	B5	30891	SBR	95% ETOH	05/17/2004 3:15:56	Chart depth 3307m NO regular BONGO this station
019	B163	30894	R - B	10% Form	05/17/2004 11:58:19	Chart depth
019	B163	30897	SBR	10% Form	05/17/2004 12:20:19	Chart depth
022	B2	30901	R - B	10% Form	05/18/2004 0:52:09	EQ50 in and out at this depth 699m
022	B2	30904	SBR	95% ETOH	05/18/2004 1:13:03	EQ50 in and out at this depth 699m
024	B1	30907	R - B	10% Form	05/21/2004 2:55:28	Chart depth 1429m FROM Rt. bongo One 7 inch salp and one 4 inch flying fish FROM Lt bongo One 6 inch salp and two 5 inch flying fish

Table 3. Oregon II Cr. 0402 (258) Right SEAMAP & Spanish Bongo Sample Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
024	B1	30910	SBR	95% ETOH	05/21/2004 3:19:37	Chart depth 1429m
027	B3	30914	R - B	10% Form	05/21/2004 15:59:45	did not hit bongo bottom button Halobates present in Rt. bongo
027	B3	30917	SBR	10% Form	05/21/2004 16:23:52	Halobates present in Rt. bongo
029	B4	30920	R - B	10% Form	05/21/2004 23:34:58	Chart depth 3060 m 3 knot current
029	B4	30923	SBR	10% Form	05/22/2004 0:08:59	Chart depth 3060 m
031	B9	30926	R - B	10% Form	05/22/2004 7:02:11	
031	B9	30929	SBR	10% Form	05/22/2004 7:27:29	
033	B10	30932	R - B	10% Form	05/22/2004 15:19:43	Charted depth 3019.5m. 2.6 kt. Current at station.
033	B10	30935	SBR	10% Form	05/22/2004 15:45:24	Wire out estimated 7meters. 2.6 kt. Current at station.
035	B11	30938	R - B	10% Form	05/22/2004 21:45:00	Chart depth 2960 m
035	B11	30941	SBR	10% Form	05/22/2004 22:08:42	Chart depth 2960 m
038	B12	30945	R - B	10% Form	05/23/2004 9:09:22	No prominent current.
038	B12	30948	SBR	10% Form	05/23/2004 9:35:40	
040	B13	30951	R - B	10% Form	05/23/2004 16:40:43	Chart depth 3111 m
040	B13	30954	SBR	10% Form	05/23/2004 17:03:21	Chart depth 3111 m
042	B14	30957	R - B	10% Form	05/23/2004 23:37:39	Chart depth 3040
042	B14	30960	SBR	10% Form	05/24/2004 0:00:29	Chart depth 3040
044	B15	30963	R - B	10% Form	05/24/2004 7:09:15	
044	B15	30966	SBR	10% Form	05/24/2004 7:35:17	
046	B18	30969	R - B	10% Form	05/24/2004 13:39:52	
046	B18	30972	SBR	10% Form	05/24/2004 14:04:01	chart depth 910 fathoms
048	B19	30975	R - B	10% Form	05/24/2004 21:11:59	Chart depth 2900 m
048	B19	30978	SBR	10% Form	05/24/2004 21:33:28	Chart depth 2900 m

Table 3. Oregon II Cr. 0402 (258) Right SEAMAP & Spanish Bongo Sample Data						
P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
050	B20	30981	R - B	10% Form	05/25/2004 4:13:51	Chart depth 2268 m
050	B20	30984	SBR	10% Form	05/25/2004 4:36:11	Chart depth 2268 m
052	B21	30987	R - B	10% Form	05/25/2004 11:33:21	Sargassum patches prominent
052	B21	30990	SBR	10% Form	05/25/2004 11:57:27	Left flowmeter # B12074 was damaged. Replaced with # B15601.
054	B24	30993	R - B	10% Form	05/25/2004 18:21:47	Chart depth 1280 m
054	B24	30996	SBR	10% Form	05/25/2004 18:44:31	Chart depth 1280 m
056	B25	30999	R - B	10% Form	05/25/2004 23:43:11	Chart depth 2000 m
056	B25	31002	SBR	10% Form	05/26/2004 0:07:14	Chart depth 2000 m
058	B26	31005	R - B	10% Form	05/26/2004 6:57:04	prominent ground swell
058	B26	31008	SBR	10% Form	05/26/2004 7:22:03	prominent ground swell One flying fish removed from right bongo
060	B27	31011	R - B	10% Form	05/26/2004 14:30:28	Sargassum no problem. Overshot target depth. went to 222m
060	B27	31014	SBR	10% Form	05/26/2004 14:56:07	Flow meter readings questionable. The gear was fished upside down. Tow was not repeated. Flowmeters checked out fine.
062	B28	31017	R - B	10% Form	05/26/2004 21:18:03	Chart depth 1660 m
062	B28	31020	SBR	10% Form	05/26/2004 21:38:30	Chart depth 1660 m
064	B29	31023	R - B	10% Form	05/27/2004 5:14:28	Chart depth 2650 m
064	B29	31026	SBR	10% Form	05/27/2004 5:39:02	
066	B30	31029	R - B	10% Form	05/27/2004 12:24:19	
066	B30	31032	SBR	10% Form	05/27/2004 12:48:34	
068	B31	31035	R - B	10% Form	05/27/2004 19:52:55	Depth 823 m
068	B31	31038	SBR	10% Form	05/27/2004 20:16:01	Chart Depth 823 m
070	B231		R - B		05/28/2004 3:38:41	Right codend lost Left sample sent to Poland. No Spanish bongo sample taken at this site. Too windy.
072	B223	31044	R - B	10% Form	05/28/2004 10:08:16	
072	B223	31047	SBR	10%	05/28/2004	Attack of the crab's station.

Table 3. Oregon II Cr. 0402 (258) Right SEAMAP & Spanish Bongo Sample Data						
P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
				Form	10:24:59	
074	B216	31050	R - B	10% Form	05/28/2004 16:38:42	
074	B216	31053	SBR	10% Form	05/28/2004 16:52:24	
076	B23	31056	R - B	10% Form	05/28/2004 23:41:42	Station moved 2 miles due to rigs
076	B23	31059	SBR	10% Form	05/29/2004 0:02:59	Station moved 2 miles due to rigs
078	B22	31062	R - B	10% Form	05/29/2004 6:58:37	
078	B22	31065	SBR	10% Form	05/29/2004 7:16:59	
080	B17	31068	R - B	10% Form	05/29/2004 14:57:28	
080	B17	31071	SBR	10% Form	05/29/2004 15:18:37	
082	B16	31074	R - B	10% Form	05/29/2004 22:26:22	EQ 50 depth 536.6 BONGO BOTTOM button pressed about 30 seconds late
082	B16	31077	SBR	10% Form	05/29/2004 22:49:01	EQ 50 depth 546.1
084	B83	31080	R - B	10% Form	05/30/2004 6:02:03	
084	B83	31083	SBR	10% Form	05/30/2004 6:24:46	Gear fished upside down
086	B82	31086	R - B	10% Form	05/30/2004 13:50:38	Last SEAMAP station
086	B82	31089	SBR	2	05/30/2004 14:16:47	
087	B251	31091	SBR	2	05/30/2004 20:02:35	DEEP SPANISH BONGO STATION Chart depth 1560 m. 1st attempt with conventional configuration had insufficient weight for proper descent rate. 2nd attempt 98 additional pounds produced these recorded results.

Table 4. Oregon II Cr. 0402 (258) SEAMAP Neuston Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
001	B152	30846	NN	95% ETOH	05/13/2004 1:25:27	1st station seas 3 to 5 feet one 7 inch flying fish and one 4 inch flying fish removed
002	B151	30849	NN	95% ETOH	05/13/2004 6:45:57	
003	B150	30852	NN	95% ETOH	05/13/2004 11:21:48	1000 fathoms
004	B149	30855	NN	95% ETOH	05/13/2004 15:03:12	1800 fathoms
005	B147	30858	NN	95% ETOH	05/13/2004 21:19:15	
006	B131	30861	NN	95% ETOH	05/14/2004 1:48:01	
007	B130	30864	NN	95% ETOH	05/15/2004 8:10:57	
008	B129	30867	NN	95% ETOH	05/15/2004 12:22:51	
009	B262	30870	NN	95% ETOH	05/15/2004 18:09:44	Chart depth 2562 m
010	B7	30875	NN	95% ETOH	05/15/2004 22:53:41	Chart depth 3300 m
011	B261	30878	NN	95% ETOH	05/16/2004 2:48:28	Chart depth 3411m one 7 inch and one 5 inch salp removed from sample
012	B8	30881	NN	95% ETOH	05/16/2004 5:34:20	Cancelled bongo at station because of 4.2 knot current
013	B74	30882	NN	95% ETOH	05/16/2004 10:23:58	
014	B270	30883	NN	95% ETOH	05/16/2004 13:01:32	1770 fathoms
015	B6	30886	NN	95% ETOH	05/16/2004 17:31:18	Chart depth 3200m
016	B77	30889	NN	95% ETOH	05/16/2004 22:31:01	Chart depth 3180m
017	B5	30890	NN	95% ETOH	05/17/2004 3:01:40	Chart depth 3307m
018	B78	30893	NN	95% ETOH	05/17/2004 7:52:21	Surface current running 0.6 kts. NW. 1 large puffer removed from sample.
019	B163	30896	NN	95% ETOH	05/17/2004 11:41:35	Chart depth
020	B164	30899	NN	95% ETOH	05/17/2004 16:15:10	Charted depth 337m.
021	B170	30900	NN	95% ETOH	05/17/2004 21:12:38	
022	B2	30903	NN	95% ETOH	05/18/2004 0:33:34	EQ50 in and out at this depth 699m
023	B176	30906	NN	95%	05/20/2004	Two 2-4 inch jellyfish of unknown ID were

Table 4. Oregon II Cr. 0402 (258) SEAMAP Neuston Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
				ETOH	23:24:17	removed from sample
024	B1	30909	NN	95% ETOH	05/21/2004 2:38:20	Chart depth 1429m FROM Neuston four 5 inch flying fish and two 3 inch unidentified jellyfish and about 2 gallons sargassum
025	B81	30912	NN	95% ETOH	05/21/2004 6:38:01	Chart depth 2290. Halobates in sample
026	B80	30913	NN	95% ETOH	05/21/2004 12:16:08	Chart depth 890m. Halobates present.
027	B3	30916	NN	95% ETOH	05/21/2004 15:41:18	charted depth 1550 fathoms
028	B79	30919	NN	95% ETOH	05/21/2004 19:42:51	Chart depth 4850 m Halobates present in sample
029	B4	30922	NN	95% ETOH	05/21/2004 23:19:41	Chart depth 3060 m
030	B76	30925	NN	95% ETOH	05/22/2004 4:44:19	Chart depth 2910 m
031	B9	30928	NN	95% ETOH	05/22/2004 6:44:41	charted depth 3075m
032	B273	30931	NN	95% ETOH	05/22/2004 11:28:53	chart depth 3147
033	B10	30934	NN	95% ETOH	05/22/2004 15:03:56	Charted depth 1650 fathoms. Halobates found in sample. 2.6kt current at station.
034	B66	30937	NN	95% ETOH	05/22/2004 18:37:41	Chart depth 2730 m About 1 quart of the little white straw things removed from sample
035	B11	30940	NN	95% ETOH	05/22/2004 21:28:11	Chart depth 2960 m Halobates present in sample
036	B65	30943	NN	95% ETOH	05/23/2004 1:35:11	Chart depth 2646 m
037	B288	30944	NN	95% ETOH	05/23/2004 5:45:19	Charted depth 2360m. Halobates present in sample.
038	B12	30947	NN	95% ETOH	05/23/2004 8:49:22	Chart depth 1250 fathoms. 6 flying fish removed.
039	B63	30950	NN	95% ETOH	05/23/2004 12:52:16	chart depth 1549 fathoms
040	B13	30953	NN	95% ETOH	05/23/2004 16:25:47	Charted depth 1700 fathoms Halobates in sample
041	B291	30956	NN	95% ETOH	05/23/2004 20:10:56	Chart depth 2920 m
042	B14	30959	NN	95% ETOH	05/23/2004 23:23:11	Chart depth 3040
043	B62	30962	NN	95% ETOH	05/24/2004 3:34:21	Chart depth 3005 m Halobates in sample
044	B15	30965	NN	95% ETOH	05/24/2004 6:53:37	1 large burrfish released.
045	B296	30968	NN	95% ETOH	05/24/2004 10:20:28	charted depth

Table 4. Oregon II Cr. 0402 (258) SEAMAP Neuston Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
046	B18	30971	NN	95% ETOH	05/24/2004 13:24:15	chart depth 910 fathoms
047	B59	30974	NN	95% ETOH	05/24/2004 17:31:53	Chart depth 2000 m Halobates in sample 1 five inch salp removed
048	B19	30977	NN	95% ETOH	05/24/2004 20:55:03	Chart depth 2900 m
049	B299	30980	NN	95% ETOH	05/25/2004 0:48:44	Chart depth 2362 m Halobates in sample
050	B20	30983	NN	95% ETOH	05/25/2004 3:56:56	Chart depth 2268 m
051	B58	30986	NN	95% ETOH	05/25/2004 7:54:02	charted depth 1027 fathoms
052	B21	30989	NN	95% ETOH	05/25/2004 11:16:59	Neuston towed 5 minutes due to sargassum concentration. Halobates in sample
053	B304	30992	NN	95% ETOH	05/25/2004 15:05:00	Sargassum rifts abound.
054	B24	30995	NN	95% ETOH	05/25/2004 18:08:44	Chart depth 1280 m
055	B55	30998	NN	95% ETOH	05/25/2004 22:02:09	Chart depth 1647 5 min tow due to sargassum
056	B25	31001	NN	95% ETOH	05/25/2004 23:29:26	Chart depth 2000 m One 4 inch sargassum fish removed from sample
057	B307	31004	NN	95% ETOH	05/26/2004 3:38:04	Chart depth 2362 m Halobates in sample
058	B26	31007	NN	95% ETOH	05/26/2004 6:40:42	sargassum concerns abound
059	B54	31010	NN	95% ETOH	05/26/2004 10:39:39	Sargassum in area
060	B27	31013	NN	95% ETOH	05/26/2004 14:14:32	Chart depth 800 fathoms
061	B312	31016	NN	95% ETOH	05/26/2004 18:00:58	Chart depth 1120 m
062	B28	31019	NN	95% ETOH	05/26/2004 21:03:05	Chart depth 1660 m
063	B52	31022	NN	95% ETOH	05/27/2004 1:23:36	Fathometer depth from bridge 1752 m
064	B29	31025	NN	95% ETOH	05/27/2004 5:00:24	Chart depth 2650 m
065	B313	31028	NN	95% ETOH	05/27/2004 8:37:22	Chart depth 800 fathoms. Net separated from part of bottom portion of frame during tow. No net collapsing observed. Did not repeat.
066	B30	31031	NN	95% ETOH	05/27/2004 12:08:31	charted depth 575 fathoms
067	B240	31034	NN	95% ETOH	05/27/2004 16:21:47	
068	B31	31037	NN	95%	05/27/2004	Depth 823 m tow shortened due to sargassum

Table 4. Oregon II Cr. 0402 (258) SEAMAP Neuston Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
				ETOH	19:41:54	
069	B332	31040	NN	95% ETOH	05/27/2004 23:49:03	EQ50 depth
070	B231	31042	NN	95% ETOH	05/28/2004 3:23:27	Marginal conditions winds gusting from 20 to 30 knots 3 five inch flying fish removed Halobates in sample
071	B226	31043	NN	95% ETOH	05/28/2004 6:47:24	One large sargassum fish removed from sample.
072	B223	31046	NN	95% ETOH	05/28/2004 9:52:39	
073	B217	31049	NN	95% ETOH	05/28/2004 13:28:39	prominent ground swell
074	B216	31052	NN	95% ETOH	05/28/2004 16:27:17	Plenty of sargassum in area
075	B209	31055	NN	95% ETOH	05/28/2004 19:50:37	Plenty of sargassum
076	B23	31058	NN	95% ETOH	05/28/2004 23:23:45	Station moved 2 miles due to rigs Lots of Sargassum again 30 gallons Halobates in sample
077	B202	31061	NN	95% ETOH	05/29/2004 3:17:09	Halobates in sample
078	B22	31064	NN	95% ETOH	05/29/2004 6:43:10	
079	B195	31067	NN	95% ETOH	05/29/2004 10:53:21	minimal sargassum
080	B17	31070	NN	95% ETOH	05/29/2004 14:40:13	
081	B190	31073	NN	95% ETOH	05/29/2004 18:56:10	
082	B16	31076	NN	95% ETOH	05/29/2004 22:10:12	EQ 50 depth 545.2
083	B185	31079	NN	95% ETOH	05/30/2004 2:15:55	Chart depth 1001 m One 6 inch flying fish and two 4 inch Caranx removed from sample
084	B83	31082	NN	95% ETOH	05/30/2004 5:47:53	chart depth 730 fathoms released 5 halfbeaks and 1 mackerel
085	B250	31085	NN	95% ETOH	05/30/2004 9:53:37	
086	B82	31088	NN	95% ETOH	05/30/2004 13:34:00	

Table 5. Gordon Gunter Cr. 0402 (27) Right Bongo Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
017	B165	3109 5	R - B	10% Form	05/05/2004 14:15:24	
019	B153	3109 9	R - B	10% Form	05/06/2004 4:46:58	
026	B125	3110 2	R - B	10% Form	05/14/2004 17:31:03	
027	B127	3110 5	R - B	10% Form	05/14/2004 23:59:24	
028	B126	3110 8	R - B	10% Form	05/15/2004 4:46:04	
030	B263	3111 2	R - B	10% Form	05/15/2004 17:07:07	
032	B266	3111 6	R - B	10% Form	05/16/2004 3:59:50	

Table 6. Gordon Gunter Cr. 0402 (27) Left Bongo Data

P-Sta. #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
017	B165	31096	L - B	10% Form	05/05/2004 14:15:24	
019	B153	31100	L - B	10% Form	05/06/2004 4:46:58	
026	B125	31103	L - B	10% Form	05/14/2004 17:31:03	
027	B127	31106	L - B	10% Form	05/14/2004 23:59:24	
028	B126	31109	L - B	10% Form	05/15/2004 4:46:04	
030	B263	31113	L - B	10% Form	05/15/2004 17:07:07	
032	B266	31117	L - B	10% Form	05/16/2004 3:59:50	

Table 7. Gordon Gunter Cr. 0402 (27) Neuston Data

P-Sta #	S-Sta. #	Smp. #	Gear	Pres.	Date	COMMENTS
015	B172	31093	NN	10% Form	05/05/2004 5:19:58	
016	B169	31094	NN	10% Form	05/05/2004 9:58:52	
017	B165	31097	NN	10% Form	05/05/2004 14:45:59	
018	B160	31098	NN	10% Form	05/05/2004 22:52:03	
019	B153	31101	NN	10% Form	05/06/2004 5:20:14	
026	B125	31104	NN	10% Form	05/14/2004 18:15:30	
027	B127	31107	NN	10% Form	05/15/2004 0:22:40	
028	B126	31110	NN	10% Form	05/15/2004 6:19:29	
029	B128	31111	NN	10% Form	05/15/2004 12:26:35	
030	B263	31114	NN	10% Form	05/15/2004 17:45:39	
031	B72	31115	NN	10% Form	05/15/2004 22:18:34	
032	B266	31118	NN	10% Form	05/16/2004 4:35:09	

Table 8. Oregon II Cr. 0402 (258) Chlorophyll a Readings by Depth (m)

PASC	SEAMAP	STA_LAT	STA_LON	STA_DPTH	SRFDEPTH	MIDDEPTH	MAXDEPTH	CHLSRF	CHLMID	CHLMAX	WTRDEPTH
001	B152	2729.54	08459.45	394.50	2.09	100.00	200.00	0.076	0.723	0.009	393.70
002	B151	2658.01	08457.73	1364.40	1.80	98.02	201.22				1364.40
003	B150	2628.79	08459.81	3000.00	1.35	99.00	201.00				3000.00
004	B149	2555.90	08502.15	3600.00	2.04	99.65	200.46	0.054	0.258	0.045	3600.00
005	B147	2559.29	08429.83	220.20	1.96	100.00	199.30	0.059	0.153	0.011	220.00
006	B131	2558.79	08359.68	139.30	2.83	67.00	137.00	0.058	0.389	0.025	139.20
007	B130	2530.25	08359.25	136.50	2.17	69.00	134.00	0.047	0.358	0.058	136.40
008	B129	2458.35	08356.97	122.90	3.10	62.53	120.93	0.067	0.182	0.192	123.10
009	B262	2501.41	08428.88	2562.00	5.42	98.61	201.46	0.045	0.092	0.002	2562.00
010	B7	2459.83	08459.11	3300.00	1.56	97.00	200.00	0.064	0.115	0.012	3300.00
011	B261	2459.10	08530.39	3411.00	2.96	99.00	200.00	0.064	0.081	0.010	3411.00
012	B8	2459.55	08600.13	3600.00	2.26	101.55	200.71	0.057	0.250	0.029	3600.00
013	B74	2529.21	08600.29	3200.00	1.94	100.04	200.08	0.064	0.253	0.003	3200.00
014	B270	2529.84	08625.41	3239.10	3.00	101.00	202.00	0.067	0.245	0.004	3239.00
015	B6	2558.25	08558.83	3200.00	2.54	98.87	200.60	0.032	0.138	0.009	3200.00
016	B77	2629.31	08559.01	3180.00	1.97	100.00	201.00	0.035	0.147	0.013	3180.00
017	B5	2658.74	08557.95	3307.00	3.81	100.00	201.00	0.113	0.342	0.057	3307.00
018	B78	2729.74	08559.41	3220.00	2.97	99.63	201.81	0.078	0.075	0.012	3220.00
019	B163	2759.09	08600.30	930.00	2.55	100.12	200.36	0.069	0.154	0.018	930.00
020	B164	2829.43	08559.52	340.40	2.13	98.91	201.92	0.043	0.199	0.006	340.30
021	B170	2859.52	08629.51	382.10	3.85	99.15	200.49	0.046	0.147	0.007	383.20
022	B2	2859.04	08659.80	699.00	1.79	99.85	200.39	0.040	0.140	0.003	699.00
023	B176	2929.94	08800.12	44.40	2.00	21.00	42.00	0.053	0.037	0.182	44.00
024	B1	2859.99	08759.74	1429.00	2.00	101.00	201.00	0.059	0.151	0.003	1429.00
025	B81	2829.44	08759.94	2290.00	2.00	101.00	201.00	0.059	0.117	0.004	2290.00
026	B80	2829.37	08659.53	890.00	2.00	101.00	201.00	0.045	0.113	0.008	890.00
027	B3	2758.61	08659.35	2837.00	3.00	101.00	201.00	0.038	0.101	0.005	2836.50
028	B79	2730.00	08659.53	4850.00	2.00	101.00	202.00	0.048	0.191	0.007	4850.00
029	B4	2701.45	08656.86	3060.00	3.00	100.00	200.00	0.042	0.169	0.028	3060.00
030	B76	2630.02	08659.33	2910.00	1.00	276.00	426.00				2910.00

Table 8. Oregon II Cr. 0402 (258) Chlorophyll a Readings by Depth (m)

PASC	SEAMAP	STA_LAT	STA_LON	STA_DPTH	SRFDEPTH	MIDDEPTH	MAXDEPTH	CHLSRF	CHLMID	CHLMAX	WTRDEPTH
031	B9	2616.54	08659.77	3075.00	3.00	100.00	200.00	0.036	0.122	0.015	3075.00
032	B273	2600.87	08728.57	3147.00	1.00	101.00	201.00	0.031	0.113	0.011	3147.00
033	B10	2600.71	08800.14	3019.50	3.00	102.00	203.00	0.033	0.346	0.012	3019.50
034	B66	2631.03	08758.92	2730.00	3.00	100.00	200.00	0.027	0.120	0.031	2730.00
035	B11	2701.74	08757.59	2960.00	2.00	101.00	201.00	0.062	0.134	0.027	2960.00
036	B65	2729.48	08800.36	2646.00	2.00	100.00	199.00	0.056	0.078	0.005	2646.00
037	B288	2659.70	08829.50	2360.00	2.00	101.00	202.00	0.045	0.083	0.015	2360.00
038	B12	2658.24	08859.68	2288.00	2.00	102.00	204.00	0.053	0.168	0.012	2287.50
039	B63	2629.57	08859.90	2835.00	3.00	101.00	201.00	0.062	0.197	0.007	2834.67
040	B13	2559.29	08859.78	3111.00	2.00	101.00	202.00	0.057	0.212	0.003	3111.00
041	B291	2559.80	08930.32	2920.00	2.00	101.00	202.00	0.045	0.104	0.007	2920.00
042	B14	2559.05	08958.28	3040.00	2.00	100.00	200.00	0.034	0.190	0.003	3040.00
043	B62	2629.72	08959.92	3005.00	3.00	100.00	200.00	0.040	0.148	0.004	3005.00
044	B15	2700.23	09002.42	2180.00	1.00	102.00	203.00	0.059	0.273	0.147	2180.00
045	B296	2659.51	09030.25	1700.00	2.00	100.00	200.00	0.041	0.124	0.015	1700.00
046	B18	2658.99	09100.13	1665.00	2.00	100.00	200.00	0.047	0.168	0.007	1665.30
047	B59	2629.44	09059.83	2000.00	5.00	102.00	203.00	0.025	0.097	0.003	2000.00
048	B19	2559.50	09058.77	2900.00	2.00	101.00	201.00	0.032	0.114	0.018	2900.00
049	B299	2559.68	09130.03	2362.00	2.00	100.00	200.00	0.047	0.102	0.003	2362.00
050	B20	2558.73	09159.47	2268.00	2.00	101.00	202.00	0.037	0.134	0.005	2268.00
051	B58	2630.36	09159.85	1879.00	2.00	101.00	201.00	0.045	0.153	0.003	1879.41
052	B21	2657.88	09200.67	1700.00	3.00	101.00	201.00	0.046	0.077		1700.00
053	B304	2659.54	09230.37	1422.00	3.00	101.00	201.00	0.044	0.097	0.004	1422.00
054	B24	2659.04	09259.20	1280.00	3.00	101.00	202.00	0.027	0.081	0.002	1280.00
055	B55	2629.83	09259.55	1647.00	2.00	101.00	201.00				1647.00
056	B25	2617.46	09259.94	2000.00	3.00	100.00	200.00	0.036	0.127	0.003	2000.00
057	B307	2600.70	09330.26	2362.00	3.00	100.00	199.00	0.005	0.122	0.031	2362.00
058	B26	2601.36	09401.73	2287.00	2.00	102.00	203.00	0.027	0.191	0.005	2287.00
059	B54	2629.47	09359.94	1650.00	2.00	100.00	200.00	0.020	0.169	0.003	1650.00
060	B27	2659.13	09400.76	979.00	2.00	101.00	202.00	0.040	0.238	0.004	979.00

Table 8. Oregon II Cr. 0402 (258) Chlorophyll a Readings by Depth (m)

PASC	SEAMAP	STA_LAT	STA_LON	STA_DPTH	SRFDEPTH	MIDDEPTH	MAXDEPTH	CHLSRF	CHLMID	CHLMAX	WTRDEPTH
061	B312	2659.33	09429.62	1120.00	3.00	100.00	200.00	0.004	0.050	0.131	1120.00
062	B28	2659.10	09500.42	1660.00	2.00	102.00	203.00	0.004	0.031	0.126	1660.00
063	B52	2629.66	09500.09	1752.00	2.00	100.00	200.00	0.003	0.085	0.159	1752.00
064	B29	2602.29	09500.62	2650.00	2.00	101.00	202.00	0.004	0.065	0.097	2650.00
065	B313	2601.30	09530.03	1464.00	3.00	101.00	201.00	0.030	0.069	0.054	1464.00
066	B30	2600.64	09600.28	1052.00	3.00	101.00	201.00	0.071	0.091	0.002	1052.25
067	B240	2629.63	09559.81	1055.00	4.00	102.00	203.00	0.110	0.066	0.003	1055.00
068	B31	2659.04	09600.41	823.00	3.00	101.00	202.00	0.044	0.096	0.002	823.00
069	B332	2729.55	09559.72	228.10	2.00	101.00	201.00	0.055	0.170	0.010	228.00
070	B231	2759.42	09559.97	46.30	3.00	22.00	44.00	0.131	0.120	0.273	46.60
071	B226	2759.63	09530.26	55.30	2.00	27.00	54.00	0.574	0.200	0.184	53.00
072	B223	2759.09	09459.72	84.40	3.00	41.00	81.00	0.080	0.115	0.220	83.00
073	B217	2759.63	09429.27	72.10	3.00	34.00	68.00	0.048	0.049	0.233	72.30
074	B216	2759.51	09400.69	82.70	2.00	41.00	82.00	0.037	0.046	0.341	83.20
075	B209	2759.40	09329.99	99.00	5.00	49.00	98.00	0.033	0.082	0.145	99.30
076	B23	2759.58	09257.28	99.80	2.00	49.00	98.00	0.038	0.065	0.147	99.40
077	B202	2759.90	09230.17	107.70	2.00	53.00	105.00	0.031	0.065	0.180	107.10
078	B22	2800.10	09200.83	119.60	2.00	60.00	119.00		0.095	0.114	119.00
079	B195	2759.44	09130.20	173.70	2.00	89.00	177.00	0.039		0.012	173.70
080	B17	2759.46	09100.77	157.80	2.00	78.00	155.00	0.037	0.105	0.005	158.00
081	B190	2804.70	09029.63	144.20	2.00	68.00	136.00	0.035	0.062	0.119	143.30
082	B16	2758.71	08959.81	550.10	2.00	101.00	201.00	0.026	0.163	0.004	550.10
083	B185	2759.64	08930.27	968.10	2.00	101.00	201.00	0.051	0.079	0.005	1001.00
084	B83	2759.03	08859.71	1336.00	2.00	101.00	202.00	0.077	0.102	0.007	1335.90
085	B250	2759.19	08830.20	2240.00	3.00	104.00	207.00	0.042	0.052	0.002	2240.00
086	B82	2759.16	08801.23	2394.00	2.00	100.00	200.00	0.039	0.079	0.014	2394.00

Figure 1. Plot of SEAMAP CTD profile sites.
Empty triangles - Oregon II Cr. 0402 (258);
Filled triangles - Gordon Gunter Cr. 0402 (27).

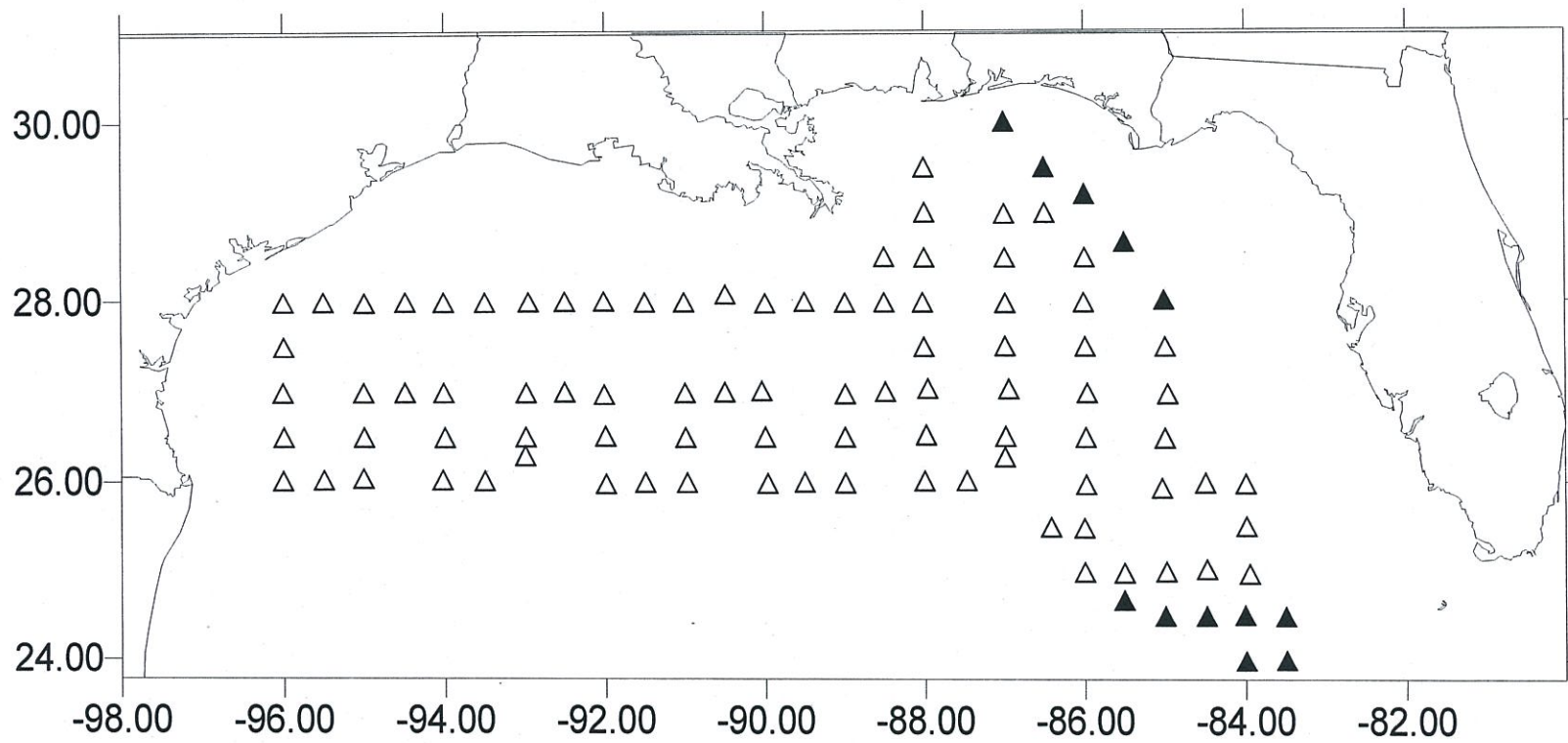


Figure 2. Plot of SEAMAP bongo sampling effort May 2004.
Empty triangle - Oregon II Cr. 0402 (258);
Filled triangle- Gordon Gunter Cr. 0402 (27).

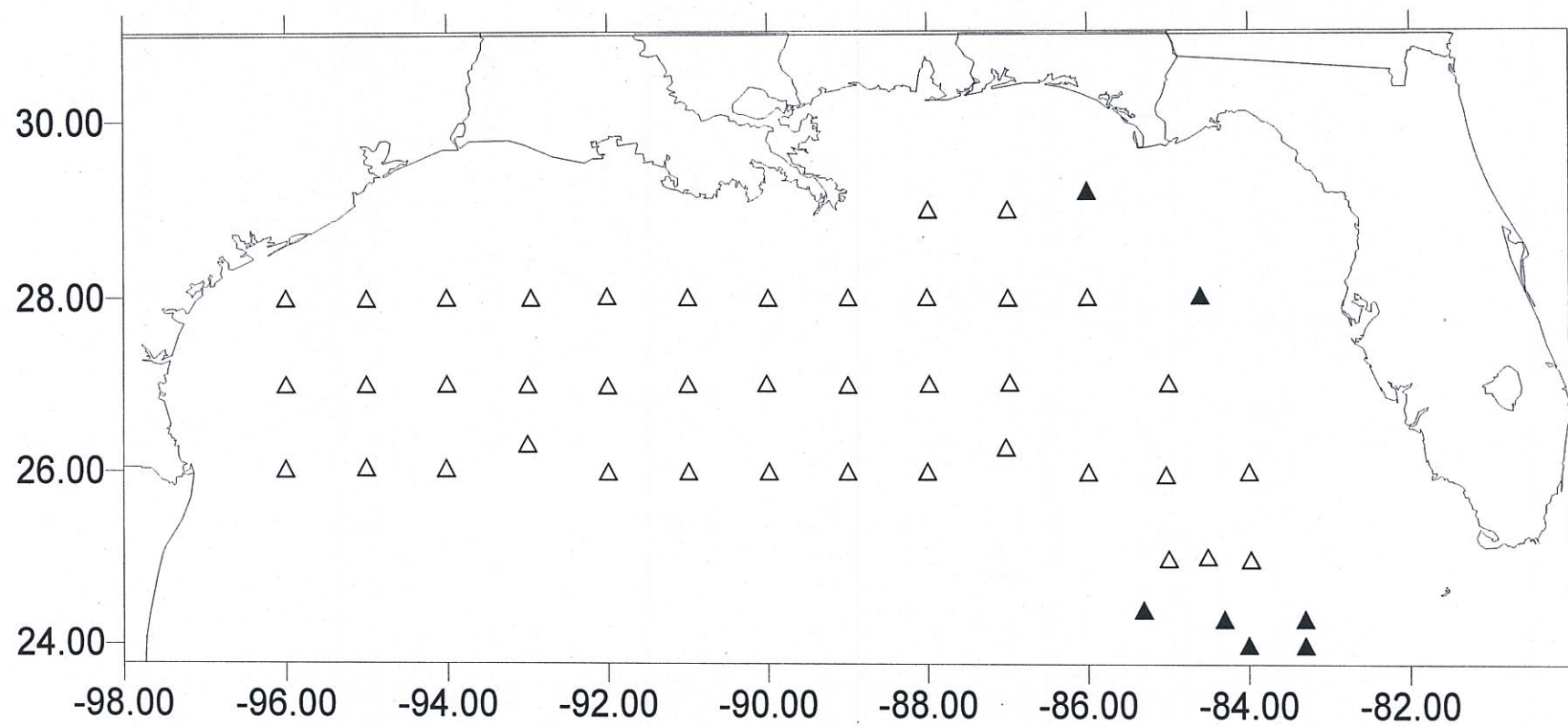


Figure 3. Plot of sampling sites for Spanish sampling gear used aboard the NOAA ship Oregon II in May, 2004.

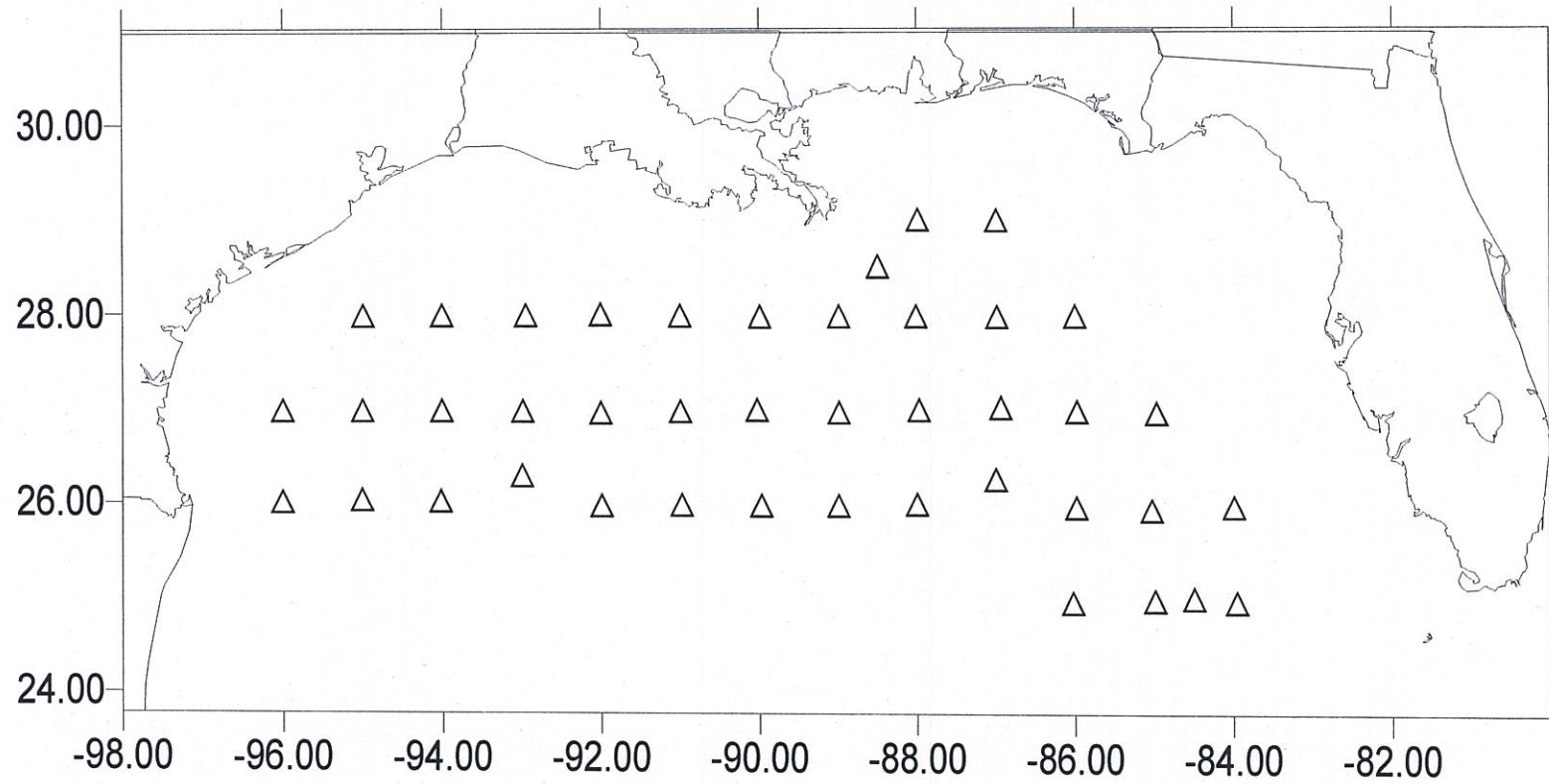


Figure 4. Plot of SEAMAP neuston sampling sites May, 2004.

Empty triangles - Oregon II Cr.0402 (258):

Filled triangles - Gordon Gunter 0402 (27).

