

*CRUISE RESULTS*  
*NOAA Research Vessel GORDON GUNTER*  
*Cruise No. GU 13-02*  
*Spring Ecosystem Monitoring Survey*

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CRUISE PERIOD AND AREA

The NOAA research vessel *GORDON GUNTER* sampled at a total of 155 stations from 9 June to 24 June 2013. The cruise had good coverage of the Mid-Atlantic Bight and Southern New England areas, but only partial coverage of Georges Bank and the Gulf of Maine due to a combination of ship problems that delayed the start of the cruise, and some bad weather that prevented work on the eastern portions of Georges Bank and the Gulf of Maine.

OBJECTIVES

The primary objective of this cruise was to assess various components of the Northeast U.S. Continental Shelf Ecosystem from water currents to plankton, juvenile fishes, marine mammals, sea turtles, and seabirds. Specifically we assessed the spatial distribution of the following parameters: water currents, water properties, phytoplankton, microzooplankton, mesozooplankton, juvenile fish and invertebrates, sea turtles, marine mammals, and sea birds.

Key parameters measured for the Ecosystem Monitoring Program included ichthyoplankton and zooplankton composition, abundance and distribution, plus water column temperature, salinity, and chlorophyll-*a* fluorescence.

Operational objectives of this cruise were to:

- ! Collect underway data using a TSG, fluorometer, PCO<sub>2</sub> system, SCS, EK-60 Scientific Sounder and ADCP,
- ! Complete CTD and bongo operations at stations throughout the survey area,
- ! Collection of samples for the Census of Marine Zooplankton (CMarZ) genetics studies.
- ! Collection of samples for aging and genetic analysis of fish larvae and eggs.
- ! Gather data on trends in ocean acidification and nutrient levels by collecting seawater samples at various depths with a rosette water sampler at predetermined fixed locations.
- ! Conduct marine mammal and seabird observations.

METHODS

The survey consisted of 155 stations at which the vessel stopped to lower instruments over the port side of the vessel from an A-frame and two conductive-wire winches. Of these, 17 were on Georges Bank, 30 were in the Gulf of Maine, 25 were in Southern New England and the remaining 83 stations were in the Middle Atlantic Bight (Figure 1). The reason there were so many more samples taken in the Mid-Atlantic Bight was due to 4 transects of closely spaced stations in the offshore waters of that

area.

Plankton and hydrographic sampling was conducted by making double oblique tows using the 61-cm bongo sampler and a Seabird CTD. The tows were made to approximately 5 meters above the bottom, or to a maximum depth of 200 meters. All plankton tows were conducted at a ship speed of 1.5 – 2.0 knots. Plankton sampling gear consisted of a 61-centimeter diameter aluminum bongo frame with two 335-micron nylon mesh nets. At the randomly designated Census of Marine Zooplankton (CMarZ) stations a 20-cm diameter PVC bongo frame fitted with paired 165-micron nylon mesh nets was put on the towing wire one half meter above the Seabird CTD with a wire stop and towed together with the large aluminum bongo frame. A similar PVC bongo frame fitted with two 335 micron mesh nets was towed in a similar fashion at most of the remaining plankton stations to collect larval fish and egg samples for genetics and otolith analysis at the Narragansett NEFSC lab. A 45-kilogram bell-shaped lead weight was attached by a 20-centimeter length of 3/8-inch diameter chain below the aluminum bongo frame to depress the sampler (Figure 2). The flat bottomed configuration of the depressor weight made for safer deployment and retrieval of the sampling gear when the boat was rolling in rough seas. No flowmeters were used in the 20-cm bongos. The plankton sampling gear was deployed off the port side of the vessel using an A-frame and a conducting cable winch. After retrieval the bongo nets were washed down on a table set up near the A-frame to obtain the plankton samples. The 61-centimeter bongo plankton samples were preserved in a 5% solution of formalin in seawater. The CMarZ genetics samples and the genetics and otolith larval fish and egg samples were preserved in 95% ethanol, which was changed once 24 hours after the initial preservation. Tow depth was monitored in real time with a Seabird CTD profiler. The Seabird CTD profiler was hard-wired to the conductive towing cable, providing simultaneous depth, temperature, and salinity for each plankton tow. A CTD 9/11 Niskin bottle rosette sampler cast was made at all the fixed stations to obtain water samples for nutrient analysis, as well as profiles of water temperatures, salinities, and chlorophyll-*a* and oxygen levels (Figure 3). A fluoroprobe unit was mounted on the array to provide data as to the type of algae present throughout the water column based on the fluorescence observed at different wavelengths and a Laser In-Situ Scattering and Transmissometry (LISST) instrument provided size spectrum analysis of suspended particles in the water column.

Continuous monitoring of the seawater salinity, temperature and chlorophyll-*a* level, and partial pressure of carbon dioxide (pCO<sub>2</sub>) from a depth of 3.7 meters along the entire cruise track was done by means of a thermosalinograph, a flow-through fluorometer and a pCO<sub>2</sub> system hooked up to the ship's scientific flow-through seawater system. The Scientific Computer System (SCS) recorded the output from both the thermosalinograph, and the fluorometer at 10-second intervals. The data records were given a time-date stamp by the GPS unit.

## RESULTS

A summary of routine survey activities is presented in Table 1. Areal coverage for the cruise is shown in Figure 1. The NOAA vessel *GORDON GUNTER* sailed on June 9 instead of June 4 from its berth on Pier 2 of the Newport Naval Station while waiting for parts to repair the ship's steering. Sampling was started on the eastern portion of the Southern New England area before proceeding to Georges Bank. After completing stations on the western part of Georges Bank, it was decided to drop the eastern Georges and the Scotian Shelf stations in order to meet the time constraints for a planned personnel exchange and also to avoid the 40 knot winds and 17 foot seas that were forecast for those offshore areas.

The personnel exchange took place by small boat on June 16 in Buzzards Bay near Woods Hole. A launch piloted by Carl Rhodes and Michael Abbott delivered David Richardson, Paula Rychtar, a Port Meteorological Officer for the NWS in Pascagoula, MS and Caridad Gonzales, a programmer from AOML, Miami, Sarah Dingman from Narragansett and Kristopher Winiarski, the replacement bird observer, to the vessel from Woods Hole. Holly Goyert, Cathleen Turner and Chris Melrose disembarked from the *GUNTER* and returned to Woods Hole.

Following the personnel exchange the *GORDON GUNTER* started sampling in the Southern New England area, working south towards the Mid-Atlantic Bight. On the southern portion of the Mid-Atlantic Bight, four off-shelf transects were sampled with the Bongo nets. One side of each net was fixed in formalin for standard ichthyoplankton processing, while the other side was fixed in ethanol to provide material for genetics and otolith analysis. Off-shelf areas have generally been poorly sampled on ECOMON and MARMAP surveys. However, some species (e.g. White Hake) may spawn off the shelf, while others are transported from more southerly spawning areas to the northeast shelf and must transit across the slope waters. The collection of ichthyoplankton from these waters can provide information to help resolve both of these processes.

After completing the fourth off-shore transect the *GORDON GUNTER* sailed to the Atlantic Marine Operations Center in Norfolk, VA, where the GU 1302 Spring Ecosystem Monitoring Survey ended on June 29, 2014.

#### DISPOSITION OF SAMPLES AND DATA

All samples and data, except for the zooplankton genetics samples, the University of Maine nutrient samples, and the Seabird CTD data, were delivered to the Ecosystem Monitoring Group of the NEFSC, Narragansett, RI, for quality control processing and further analysis. The zooplankton genetics samples were delivered to Nancy Copley of the Woods Hole Oceanographic Institute. The nutrient samples were sent to Maura Thomas and Dave Townsend at the University of Maine. The CTD data were delivered to the Oceanography Branch of the NEFSC, Woods Hole, MA.

#### SCIENTIFIC PERSONNEL

##### National Marine Fisheries Service, NEFSC, Narragansett, RI

Christopher Melrose<sup>1</sup>, Chief Scientist  
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Table 1. Summary of sample activities conducted at 155 stations at which the *GORDON GUNTER* stopped to lower instruments over the side during Cruise No. GU 1302. Latitude and Longitude are shown in decimal degrees. Std BON/CTD = 61 cm bongo Standard Protocol, CTD PROFILE 911 = fixed station, 2B3 = 333 mesh 20 cm bongo 2B1 = 165 mesh 20 cm bongo, NUT=nutrients

CTD Cast#	SiteID/ STA#	Date GMT	Latitude (dd)	Longitude (dd)	Bottom Depth (m)	Operation
1	1	6/9/2013	41.1383	-70.9583	32	Std BON/CTD, 2B3
2	2	6/9/2013	41.05	-70.7717	46.4	Std BON/CTD, 2B1
3	3	6/9/2013	41.105	-70.6183	42.7	CTD PROFILE 911, NUT
4	4	6/10/2013	40.9983	-70.3067	40.3	Std BON/CTD, 2B3
5	5	6/10/2013	40.755	-70.55	56.8	Std BON/CTD, 2B3
6	6	6/10/2013	40.6683	-70.6133	61.5	CTD PROFILE 911, NUT
7	7	6/10/2013	40.02	-70.7583	243	Std BON/CTD, 2B1
8	8	6/10/2013	39.8317	-70.6217	328.4	CTD PROFILE 911, NUT
9	9	6/10/2013	40.0367	-70.6	171.8	CTD PROFILE 911, NUT
10	10	6/10/2013	40.075	-70.135	161.8	Std BON/CTD, 2B3
11	11	6/10/2013	40.2283	-69.7333	85.8	Std BON/CTD, 2B3
12	12	6/10/2013	40.3767	-69.775	74.9	Std BON/CTD, 2B1
13	13	6/10/2013	40.3183	-69.27	84	Std BON/CTD, 2B3
14	14	6/10/2013	40.2983	-69.0267	97.1	Std BON/CTD, 2B1
15	15	6/11/2013	40.5717	-68.6933	67.4	Std BON/CTD, 2B3
16	16	6/11/2013	40.6883	-68.635	56.9	Std BON/CTD, 2B1
17	17	6/11/2013	40.895	-69.1583	69.9	CTD PROFILE 911, NUT
18	18	6/11/2013	41.4283	-69.56	30.6	Std BON/CTD, 2B3
19	19	6/11/2013	41.7733	-69.3917	175	Std BON/CTD, 2B3
20	20	6/11/2013	41.8917	-69.3633	206	Std BON/CTD, 2B1
21	21	6/11/2013	41.6383	-69.3167	176.2	Std BON/CTD, 2B3
22	22	6/11/2013	41.4883	-69.1467	162.7	Std BON/CTD, 2B1
23	23	6/11/2013	41.245	-69.27	74.9	Std BON/CTD, 2B3
24	24	6/12/2013	40.96	-68.7683	66.2	Std BON/CTD, 2B1
25	25	6/12/2013	41.09	-68.49	51.6	Std BON/CTD, 2B1
26	26	6/12/2013	40.9167	-68.355	50.6	Std BON/CTD, 2B3
27	27	6/12/2013	40.7767	-68.4217	50.8	Std BON/CTD, 2B3
28	28	6/12/2013	40.6983	-68.3867	64.8	Std BON/CTD, 2B3
29	29	6/12/2013	40.4233	-67.995	142.5	Std BON/CTD, 2B3
30	30	6/12/2013	40.2467	-67.6933	2400	CTD PROFILE 911, NUT

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CTD Cast#	SiteID/ STA#	Date GMT	Latitude (dd)	Longitude (dd)	Bottom Depth (m)	Operation
31	31	6/12/2013	40.3833	-67.6933	237	CTD PROFILE 911, NUT
32	32	6/12/2013	40.5483	-67.1217	209	Std BON/CTD, 2B1
33	33	6/12/2013	40.9767	-67.2483	76.4	Std BON/CTD, 2B3
34	34	6/13/2013	40.9267	-67.715	64.1	CTD PROFILE 911, NUT
35	35	6/13/2013	41.0617	-67.7367	54.7	Std BON/CTD, 2B1
36	36	6/13/2013	41.105	-67.965	39.7	Std BON/CTD, 2B3
37	37	6/13/2013	41.715	-68.3717	83.4	Std BON/CTD, 2B3
38	38	6/13/2013	41.74	-68.0233	35.4	Std BON/CTD, 2B3
39	39	6/13/2013	42.25	-68.0933	186.7	Std BON/CTD, 2B1
40	40	6/13/2013	42.87	-68.495	187.2	Std BON/CTD, 2B3
41	41	6/13/2013	43.1983	-68.65	169.4	Std BON/CTD
42	42	6/14/2013	43.8333	-69.13	49	Std BON/CTD, 2B1
43	43	6/14/2013	43.7717	-68.6683	125.3	CTD PROFILE 911, NUT
44	44	6/14/2013	44.0067	-68.4833	87.2	Std BON/CTD, 2B3
45	45	6/14/2013	44.2	-67.7	153.2	CTD PROFILE 911, NUT
46	46	6/14/2013	44.485	-67.225	70.2	CTD PROFILE 911, NUT
47	47	6/14/2013	44.23	-66.8783	189.2	Std BON/CTD, 2B1
48	48	6/14/2013	43.945	-67.4017	200.1	Std BON/CTD, 2B3
49	49	6/15/2013	43.3	-68.3533	165.2	Std BON/CTD, 2B3
50	50	6/15/2013	43.13	-69.27	181.4	Std BON/CTD, 2B3
51	51	26:22.0	42.9983	-70.4317	97.6	CTD PROFILE 911, NUT
52	52	6/15/2013	42.505	-69.655	256.2	Std BON/CTD, 2B3
53	53	6/15/2013	42.5033	-69.67	255.4	CTD PROFILE 911, NUT
54	54	6/15/2013	42.4717	-70.04	115	Std BON/CTD, 2B3
55	55	6/16/2013	42.4283	-70.5967	88.8	Std BON/CTD, 2B3
56	55	6/16/2013	42.4267	-70.6067	87.8	CTD PROFILE 911, NUT
57	57	6/16/2013	42.3983	-70.4983	89.3	Std BON/CTD, 2B3
58	58	6/16/2013	42.36	-70.46	71.4	CTD PROFILE 911, NUT
59	59	6/16/2013	42.3167	-70.2733	36.3	CTD PROFILE 911, NUT
60	60	6/16/2013	41.8933	-70.4283	35.1	Std BON/CTD, 2B3

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CTD Cast#	SiteID/ STA#	Date GMT	Latitude (dd)	Longitude (dd)	Bottom Depth (m)	Operation
61	61	6/16/2013	40.585	-71.0433	72.1	Std BON/CTD, 2B3
62	62	6/16/2013	40.8683	-71.48	60.1	Std BON/CTD, 2B3
63	63	6/17/2013	40.8867	-71.8983	35	Std BON/CTD, 2B3
64	64	6/17/2013	40.9317	-72.055	27.3	Std BON/CTD, 2B3
65	65	6/17/2013	40.7533	-72.3267	43.3	Std BON/CTD, 2B1
66	66	6/17/2013	40.4167	-71.8183	71.3	Std BON/CTD, 2B3
67	67	6/17/2013	40.37	-71.555	80.5	Std BON/CTD, 2B3
68	68	6/17/2013	40.15	-71.4767	88.1	Std BON/CTD, 2B3
69	69	6/17/2013	40.2317	-72.1417	67.1	Std BON/CTD, 2B3
70	70	6/17/2013	40.0017	-72.2433	82.1	Std BON/CTD, 2B3
71	71	6/17/2013	39.995	-72.425	73.8	Std BON/CTD, 2B3
72	72	6/18/2013	40.63	-73.0033	21.4	Std BON/CTD, 2B3
73	73	6/18/2013	40.295	-73.54	29.6	Std BON/CTD
74	74	6/18/2013	40.1167	-73.31	41.7	Std BON/CTD, 2B3
75	75	6/18/2013	39.8833	-73.885	24.5	Std BON/CTD, 2B3
76	76	6/18/2013	39.7883	-73.9733	20.3	Std BON/CTD, 2B3
77	77	6/18/2013	39.7167	-74.0033	22.8	CTD PROFILE 911, NUT
78	78	6/18/2013	39.76	-73.395	37.7	Std BON/CTD, 2B3
79	79	6/18/2013	39.825	-73.2517	45.1	Std BON/CTD, 2B3
80	80	6/18/2013	39.6967	-72.665	69.5	Std BON/CTD, 2B3
81	81	6/19/2013	39.3633	-72.3567	150.8	Std BON/CTD, 2B3
82	82	6/19/2013	39.01	-72.585	470	CTD PROFILE 911, NUT
83	83	6/19/2013	39.055	-72.7483	169.3	CTD PROFILE 911, NUT
84	84	6/19/2013	39.3617	-73.3933	49.5	CTD PROFILE 911, NUT
85	85	6/19/2013	39.155	-73.7267	35.5	Std BON/CTD, 2B1
86	86	6/19/2013	38.9367	-73.9783	37.2	Std BON/CTD, 2B3
87	87	6/19/2013	38.8067	-73.8683	47.1	Std BON/CTD, 2B3
88	88	6/19/2013	38.8567	-73.7817	46.8	Std BON/CTD, 2B3
89	89	6/19/2013	38.945	-73.4667	58.4	Std BON/CTD, 2B3
90	89	6/19/2013	38.9467	-73.4617	59	Std BON/CTD, 2B3



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CTD Cast#	SiteID/ STA#	Date GMT	Latitude (dd)	Longitude (dd)	Bottom Depth (m)	Operation
91	91	6/19/2013	38.8083	-73.21	81.6	Std BON/CTD, 2B3
92	91	6/19/2013	38.8133	-73.2017	80.6	Std BON/CTD, 2B1
93	93	6/19/2013	38.8067	-73.325	75.9	Std BON/CTD, 2B3
94	93	6/19/2013	38.8133	-73.3183	76.2	Std BON/CTD
95	95	6/20/2013	38.3717	-73.7183	104	Std BON/CTD, 2B3
96	95	6/20/2013	38.3633	-73.7117	109	Std BON/CTD
97	97	6/20/2013	38.345	-74.0317	65.4	Std BON/CTD, 2B3
98	97	6/20/2013	38.3417	-74.0283	65.9	Std BON/CTD
99	98	6/20/2013	38.5483	-74.0683	58.5	Std BON/CTD, 2B3
100	98	6/20/2013	38.5433	-74.0667	59	Std BON/CTD
101	99	6/20/2013	38.6317	-74.5017	35.8	Std BON/CTD, 2B3
102	99	6/20/2013	38.6267	-74.5033	37.2	Std BON/CTD
103	100	6/20/2013	38.9567	-74.7583	14.9	Std BON/CTD, 2B1
104	100	6/20/2013	38.95	-74.7567	13.3	Std BON/CTD
105	101	6/20/2013	38.455	-74.7267	33.1	Std BON/CTD, 2B3
107	101	6/20/2013	38.4417	-74.7233	33.4	Std BON/CTD
108	104	6/20/2013	38.2467	-74.705	29.3	Std BON/CTD, 2B3
109	104	6/20/2013	38.245	-74.6983	36	Std BON/CTD
110	106	6/20/2013	38.2033	-74.955	22	Std BON/CTD, 2B3
111	106	6/20/2013	38.2033	-74.9517	22.5	Std BON/CTD
112	108	6/20/2013	37.9983	-74.9567	24.3	CTD PROFILE 911, NUT
113	109	6/21/2013	37.8433	-74.555	54.6	Std BON/CTD
114	109	6/21/2013	37.84	-74.5483	55.9	CTD PROFILE 911, NUT
115	110	6/21/2013	37.775	-74.4233	62.7	Std BON/CTD
116	111	6/21/2013	37.7033	-74.26	103.8	Std BON/CTD
117	112	6/21/2013	37.6967	-74.2567	114.3	CTD PROFILE 911, NUT
118	113	6/21/2013	37.6517	-74.1417	198	Std BON/CTD
119	114	6/21/2013	37.5917	-74.0133	1400	Std BON/CTD
120	115	6/21/2013	37.5383	-73.8817	251	Std BON/CTD

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CTD Cast#	SiteID/ STA#	Date GMT	Latitude (dd)	Longitude (dd)	Bottom Depth (m)	Operation
121	116	6/21/2013	37.48	-73.7433	2000	Std BON/CTD
122	117	6/21/2013	37.4233	-73.61	2000	Std BON/CTD
123	118	6/21/2013	37.2017	-73.71	2000	Std BON/CTD, 2B3
124	119	6/21/2013	37.26	-73.8383	2000	Std BON/CTD
125	120	6/21/2013	37.3217	-73.965	2000	Std BON/CTD
126	121	6/21/2013	37.385	-74.095	1800	Std BON/CTD
127	122	6/21/2013	37.4533	-74.22	405.6	Std BON/CTD
128	123	6/21/2013	37.5217	-74.3517	162	Std BON/CTD, 2B3
129	123	6/21/2013	37.5133	-74.3433	228	Std BON/CTD
130	124	6/21/2013	37.4917	-74.3917	110.7	Std BON/CTD
131	125	6/21/2013	37.645	-74.595	56.7	Std BON/CTD
132	126	6/21/2013	37.7717	-74.84	34.2	Std BON/CTD
133	126	6/21/2013	37.7683	-74.835	33.3	Std BON/CTD, 2B3
134	128	6/22/2013	37.48	-75.2483	31.3	Std BON/CTD, 2B1
135	128	6/22/2013	37.4767	-75.2433	31.1	Std BON/CTD, 2B3
136	130	6/22/2013	37.2617	-75.675	11.5	Std BON/CTD, 2B3
137	130	6/22/2013	37.2583	-75.6717	11.3	Std BON/CTD
138	131	6/22/2013	37.2967	-75.3083	29.7	Std BON/CTD, 2B3
139	131	6/22/2013	37.2917	-75.3067	31.6	Std BON/CTD
140	132	6/22/2013	37.0583	-75.205	38	Std BON/CTD, 2B3
141	132	6/22/2013	37.055	-75.2	39.3	Std BON/CTD
142	133	6/22/2013	36.96	-75.4283	27.4	Std BON/CTD, 2B3
143	133	6/22/2013	36.9583	-75.4233	27.1	Std BON/CTD
144	134	6/22/2013	36.7917	-75.6383	24.9	Std BON/CTD
145	134	6/22/2013	36.79	-75.635	23.4	Std BON/CTD
146	135	6/22/2013	36.5033	-75.3233	25.2	Std BON/CTD, 2B3
147	135	6/22/2013	36.5	-75.3183	24.3	Std BON/CTD
148	136	6/22/2013	36.2433	-75.005	42.3	Std BON/CTD
149	136	6/22/2013	36.2383	-75.0033	42.3	Std BON/CTD
150	137	6/22/2013	36.3183	-74.8883	57.8	Std BON/CTD, 2B3

Table 1. Summary of sample activities conducted at 155 stations at which the *GORDON GUNTER* stopped to lower instruments over the side during Cruise No. GU 1302. Latitude and Longitude are shown in decimal degrees. Std BON/CTD = 61 cm bongo Standard Protocol, CTD PROFILE 911 = fixed station, 2B3 = 333 mesh 20 cm bongo 2B1 = 165 mesh 20 cm bongo, NUT=nutrients

CTD Cast#	SiteID/ STA#	Date GMT	Latitude (dd)	Longitude (dd)	Bottom Depth (m)	Operation
151	137	6/22/2013	36.32	-74.8833	60.5	Std BON/CTD
152	138	6/22/2013	36.3167	-74.74	219.4	Std BON/CTD
153	139	6/22/2013	36.3183	-74.5867	1800	Std BON/CTD
154	140	6/23/2013	36.3133	-74.43	2000	Std BON/CTD
155	141	6/23/2013	36.3133	-74.285	2000	Std BON/CTD
156	142	6/23/2013	36.3117	-74.13	2500	Std BON/CTD
157	143	6/23/2013	36.3317	-73.9717	2000	Std BON/CTD
158	144	6/23/2013	35.9933	-73.915	3000	Std BON/CTD
159	145	6/23/2013	35.9917	-74.0717	1800	Std BON/CTD
160	146	6/23/2013	35.9983	-74.2183	1800	Std BON/CTD
161	147	6/23/2013	35.9967	-74.37	1800	Std BON/CTD
162	148	6/23/2013	35.9967	-74.5167	2000	Std BON/CTD
163	149	6/23/2013	35.9933	-74.67	1200	Std BON/CTD, 2B3
164	149	6/23/2013	35.985	-74.6717	1200	CTD PROFILE 911, NUT
165	150	6/23/2013	35.9967	-74.7783	382.6	Std BON/CTD
166	150	6/23/2013	35.9983	-74.7783	389.4	CTD PROFILE 911, NUT
167	151	6/23/2013	36.0017	-75.17	33.1	Std BON/CTD
168	151	6/23/2013	36	-75.1783	35.4	CTD PROFILE 911, NUT
169	152	6/23/2013	35.87	-75.3167	28.9	Std BON/CTD, 2B3
170	153	6/23/2013	35.9967	-75.5283	21.7	Std BON/CTD
171	154	6/23/2013	35.9917	-75.535	23.5	CTD PROFILE 911, NUT
172	155	6/24/2013	36.4183	-75.7867	16.6	Std BON/CTD, 2B3
<b>TOTALS:</b>	<b>Std BON/CTD Casts</b>	<b>=</b>	<b>144</b>			
	<b>2B3 Bongo Casts</b>	<b>=</b>	<b>74</b>			
	<b>2B1 Bongo Casts</b>	<b>=</b>	<b>18</b>			
	<b>CTD PROFILE 911 Casts</b>	<b>=</b>	<b>20</b>			
	<b>Nutrient Casts</b>	<b>=</b>	<b>20</b>			

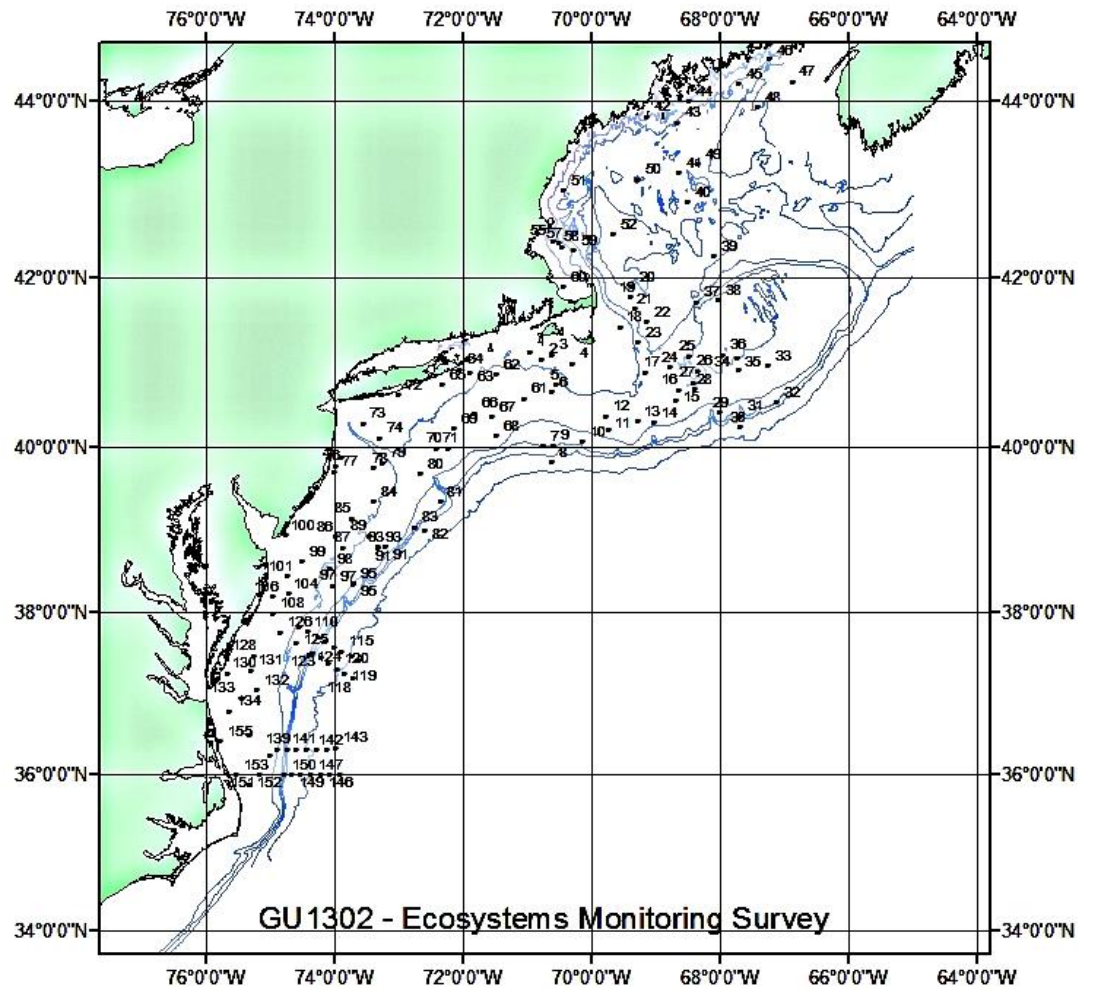


Figure 1. Station locations numbered consecutively for Late Spring Ecosystem Monitoring Survey GU 1302, 9–24 June, 2013.

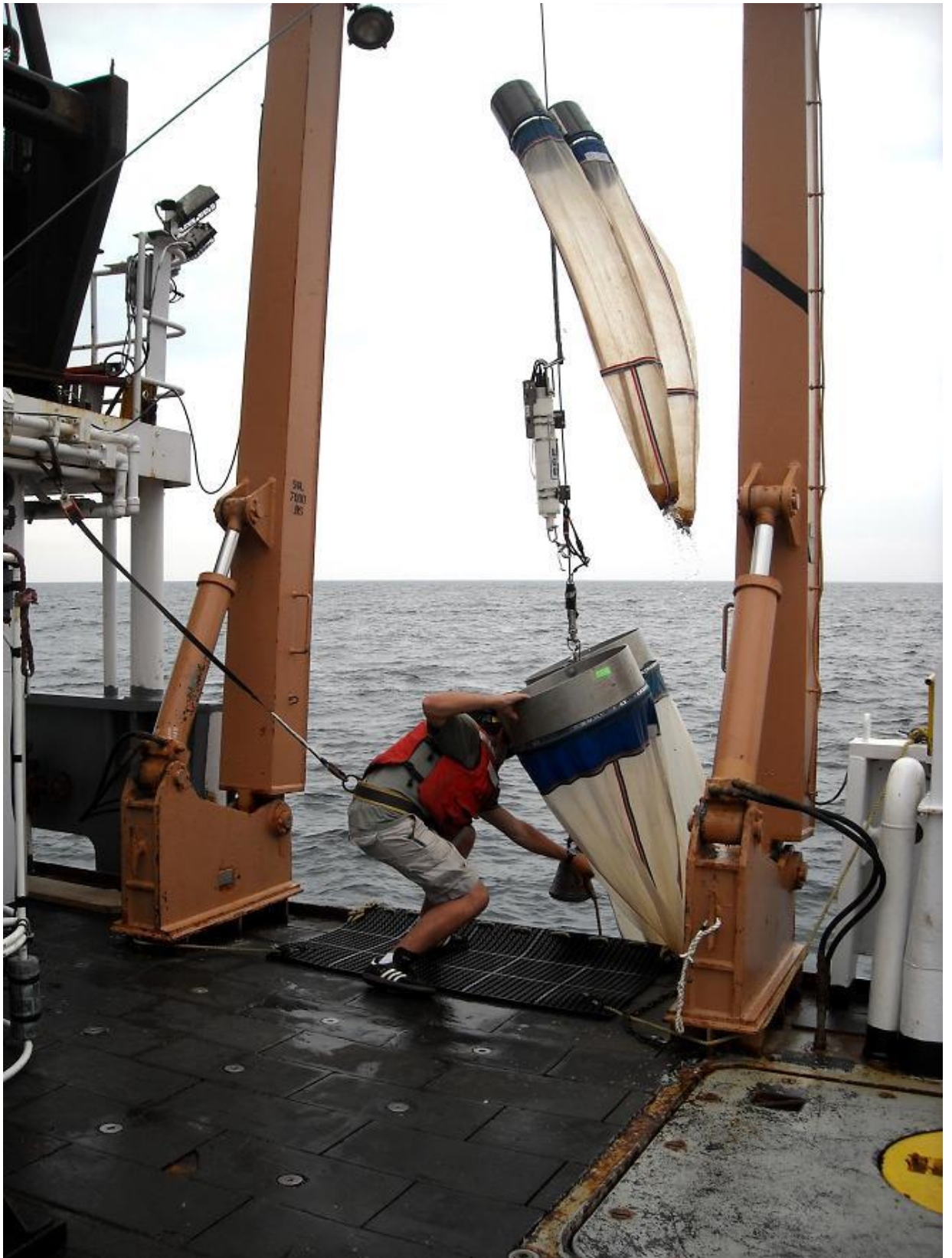


Figure 2. Bongo net array, showing 61 and 20 cm bongo nets, CTD unit and depressor weight. (Note this photo taken aboard the *DELAWARE II*).





Figure 3. Niskin bottle and CTD 9/11 array being retrieved onto *GORDON GUNTER*.