CRUISE RESULTS
UNOLS R/V HUGH R. SHARP
Cruise No. S1 18-02
Fall Northeast Ecosystem Monitoring Survey

For further information, contact Jerome Prezioso
National Marine Fisheries Service, Northeast Fisheries
Science Center, Woods Hole, Massachusetts 02543-1097.

DATE: 7 March 2019

7 March 2019

CRUISE RESULTS
*UNOLS R/V **HUGH R. SHARP***
Cruise No. S1 18-02
Fall Northeast Ecosystem Monitoring Survey

CRUISE PERIOD AND AREA

The *UNOLS R/V HUGH R. SHARP* sampled a total of 60 stations from 1 to 12 November 2018. The vessel left Lewes, Delaware at 1500 hours EST on Thursday, 1 November to head south towards Cape Hatteras, the southernmost part of the survey area. The entire Middle Atlantic Bight was covered, but due to strong winds and high seas, and the low cruising speed of the vessel (8 knots maximum), the only additional sampling that took place was in the inshore portion of the Southern New England area before time elapsed for this survey.

OBJECTIVES

The principal objective of this survey was to assess the pelagic components of the Northeast U.S. Continental Shelf Ecosystem from water currents to plankton, pelagic fishes, marine mammals, sea turtles, and seabirds. The spatial distribution of the following parameters was quantified: water properties, phytoplankton, microzooplankton, mesozooplankton, pelagic fish and invertebrates. Both traditional and novel techniques and instruments were used.
Other operational objectives of this cruise were to:

1) collect near-surface underway data and imagery from the entire cruise track using a TSG, fluorometer, EK-60 Scientific Sounder, and an Imaging FlowCytoBot unit.

2) complete CTD and bongo operations at stations throughout area.

3) collect samples for the Census of Marine Zooplankton (CMarZ) genetics studies.

4) collect samples for aging and genetic analyses of fish larvae and eggs.

5) 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.

6) collect plankton samples by conducting vertical casts at selected stations using a 70 cm diameter ring net equipped with 200 micron mesh, for comparison with samples caught by the bongo samplers towed in a double oblique manner.

METHODS

The survey originally consisted of 155 random-stratified and fixed stations at which the vessel planned to stop and lower bongo-style plankton nets from the stern of the vessel with a gantry and a CTD-rosette deploying crane on the starboard side. Both were equipped with conductive-wire winches. The stern gantry winch was supplied by the NEFSC, and was not part of the ship's equipment inventory. Weather and an 8 knots cruising speed limited station coverage to 60 stations (Figure 1).

Plankton and hydrographic sampling was conducted with double oblique tows using the 61-cm bongo sampler and a Seabird CTD. The tows extended 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. Since these plankton tows were done from the stern of the vessel, and the R/V SHARP uses twin Z drive units for propulsion, the Z drives were angled outward slightly instead of being pointed directly astern to minimize water turbulence and backwash to the towed nets. Plankton sampling gear consisted of a 61-centimeter diameter aluminum bongo frame with two 335-micron nylon mesh nets equipped with analog flowmeters that recorded the number of revolutions during the tow. At 14 randomly designated Census of Marine Zooplankton (CMarZ) stations, a 20-cm diameter PVC bongo frame fitted with paired 165-micron nylon mesh nets was added to the towing wire one half meter above the Seabird CTD and towed together with the large aluminum bongo frame (Figure 2). No flowmeters were deployed with the 20-cm bongos. At all other plankton stations, 20 cm 335 micron mesh nets were deployed above the standard CTD/61-cm Bongo sampler in order to collect larval fish and egg samples for NOAA researcher David Richardson. These samples were preserved for genetics and otolith analysis to be carried out 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. The flat-bottomed configuration of the bell-shaped depressor weight made for safer deployment and retrieval of the sampling gear when the boat was rolling in rough seas. The plankton sampling gear was deployed off the stern of the vessel using the vessel's gantry and the NEFSC-supplied conducting cable winch (Figure 2). Tow depth was monitored in real time with a Seabird CTD profiler. The Seabird CTD profiler provided simultaneous depth, temperature, and salinity during each plankton tow. A Power Data Interface Module (PDIM) signal booster was used to facilitate data transfer at high baud rates over more than 1600 meters of conducting wire spooled onto the oceanic winch. After retrieval, both the large and small bongo nets were washed down with seawater on a sheet of plywood zip-tied to a metal shipping crate on deck 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 from the 20-centimeter bongo nets were preserved in 95% ethanol, which was changed once, 24 hours after the initial preservation.

The 70 cm ring net was never used due to the difficulties of deploying it safely from the stern of this vessel. There was no opportunity for rigging it to the tow wire while standing on the stern due to vessel motion and lack of any railing (Figure 3).

A Seabird 911+ CTD was deployed on a rosette frame with a carousel water sampling system (SBE32) and 12 10-liter Niskin bottles at all fixed stations (Figure 4). The package was deployed from the starboard side-sampling station, using a dedicated crane and conducting cable winch. This CTD and rosette package was deployed on vertical casts, collecting profiles of water temperature, salinity, chlorophyll-a and oxygen levels. Water samples were collected by the Niskin sampling bottles at multiple depths along the upcast to be processed ashore for nutrients and carbonate chemistry. Analysis for chlorophyll-a levels from these water samples was conducted onboard the vessel in the chemistry lab, using a Turner Designs 10-AU fluorometer and a filtration setup. Water samples for the chlorophyll-a analysis were drawn from the surface, chlorophyll-max layer and from one depth below the chlorophyll-max layer. These were taken as a check for the submersible fluorometer mounted on the rosette. Care was taken to draw a nutrient sample from the same bottle that each Dissolved Inorganic Carbon (DIC) sample had been drawn from, to ensure the best possible correlation between the DIC and nutrient parameters.

An ImagingFlowCytobot (IFCB) unit and a seawater optical properties sensor manifold were plumbed into the flow-through seawater system in the wet lab (Figure 5)**.** The IFCB captured near-surface images of diatoms, dinoflagellates and marine ciliates all along the cruise track on an independent computer provided by the Woods Hole Oceanographic Institution (WHOI) (Figure 6). This system was monitored daily by Kyle Turner from the Graduate School of Oceanography at URI. Kyle also measured the optical properties of near-surface seawater using an optical sensor manifold and the water column optical properties by filtering water taken from various depths at fixed stations sampled in the Mid-Atlantic Bight and Southern New England areas.

Marine mammal and seabird observations and photography were conducted from the bridge and flying bridge of the *HUGH R. SHARP* by seabird and marine mammal observers John Loch and Nick Metheny (Figure 7).

RESULTS

A summary of routine survey activities is presented in Table 1. Areal coverage for the cruise is shown in Figure 1. Due to time constraints imposed by marginal weather for much of the trip and the slow 8 knot cruising speed of the vessel, only a total of 60 stations were completed. Of these 38 were in the Middle Atlantic Bight (MAB), and 22 were in Southern New England (SNE) areas. Sampling in the southern New England region was limited to inshore stations due to adverse weather conditions that made offshore operations unsafe aboard the R/V SHARP (Figure 1). It should be pointed out that the 15 days originally allocated for this cruise were not sufficient to cover the entire Gulf of Maine to Georges Bank to Cape Hatteras scope of this survey. Normally, 18 to 21 days would be required using a faster vessel that could achieve at least 10 knots of cruising speed. From that original 15 day allocation, one day was given up to allow the vessel to end the cruise in Woods Hole, facilitating demobilization of all the gear, including the 2500 lb. hydro winch that was originally shipped to Lewes Delaware from Woods Hole, Massachusetts to start the cruise. Three more days were lost when the vessel was forced to stop working or seek shelter in Norfolk, Virginia, Sandy Hook, New Jersey, and returned to Woods Hole earlier than planned, to avoid storms.

DISPOSITION OF SAMPLES AND DATA

All samples and data, except for the CMarZ zooplankton genetics samples, the University of Maine nutrient samples, and the Seabird CTD data, were delivered to the NEFSC Ecosystem Monitoring Group in Narragansett, RI for quality control processing and further analysis. The CMarZ samples and associated data were delivered to Nancy Copley at the Woods Hole Oceanographic Institution. The nutrient samples were sent by overnight UPS to Maura Thomas at the University of Maine, School of Marine Sciences, 5706 Aubert Hall, Orono, ME. The ImagingFlowCytoBot unit and the images and data it collected were delivered to Emily Peacock at WHOI. The URI seawater optical property data was taken to the Graduate School of Oceanography at URI by Kyle Turner. The CTD data were delivered to NEFSC Oceans and Climate Branch staff in Woods Hole, MA. Marine mammal observation data and the seabird observation data went to Tim White at the Bureau of Ocean Energy Management (BOEM) in Reedsville, MD and Beth Josephson, NEFSC Protected Species Branch, Woods Hole, MA.

SCIENTIFIC PERSONNEL

National Marine Fisheries Service, NEFSC, Narragansett, RI

Jerome Prezioso Chief Scientist
Christopher Taylor

National Marine Fisheries Service, NEFSC, Woods Hole, MA

Tamara Holzwarth-Davis

National Satellite Data & Information Service (NESDIS)

Charles Kovach

University of Rhode Island Student Researcher

Kyle Turner

Integrated Statistics Marine Mammal and Seabird Observers

John Loch
Nick Metheny

****

For further information contact:
Paula Fratantoni, Branch Chief, Oceans and Climate Branch
National Marine Fisheries Service, Northeast Fisheries Science Center
Woods Hole, MA 02543
Tel(401) 495-2306;
INTERNET “paula.fratantoni@noaa.gov”.

Table 1. Summary of sample activities conducted at 60 stations at which the *HUGH R. SHARP* stopped to lower instruments over the side during Cruise No. S1 1802. Latitude and Longitude are shown in decimal degrees. Std BON/CTD = 61 cm bongo Standard Protocol, CTD 911 = fixed station, SAL=salinity sample 2B3 D = 333 mesh 20 cm bongo Dave R. samples, 2B1 C = 165 mesh 20 cm bongo CMARZ samples, , DIC = Dissolved Inorganic Carbon, NUT = Nutrients, CHL = Chlorophyll, URI = URI optical sample

CTD Cast	Site ID/ STA#	Date GMT (dd)	Latitude (dd)	Longitude (dd)	Bottom Depth(m)	Operations
1	1	November 2, 2018	38.005	-74.9567	23	CTD PROFILE 911+, NUT, DIC , URI, SAL
1	2	November 2, 2018	37.8283	-74.92	31	BON/CTD
3	3	November 2, 2018	37.665	-74.9133	31	BON/CTD
4	4	November 2, 2018	37.67	-75.4217	19	BON/CTD
5	5	November 2, 2018	36.6717	-75.7533	13	BON/CTD, 2B3 D
6	6	November 3, 2018	36.5883	-75.8317	13	BON/CTD, 2B1 C
7	7	November 4, 2018	36.3333	-75.25	35	BON/CTD, 2B3 D
8	8	November 5, 2018	36.1667	-75.17	35	BON/CTD, 2B3 D
2	9	November 5, 2018	36.005	-75.1683	32	CTD PROFILE 911+ , NUT, DIC , URI, CHL
3	10	November 5, 2018	36	-74.7767	380	CTD PROFILE 911+ , NUT, DIC , URI, CHL
9	11	November 5, 2018	35.8333	-74.915	82	BON/CTD, 2B1 C
10	12	November 5, 2018	35.83	-75.415	25	BON/CTD, 2B3 D
11	13	November 5, 2018	35.9117	-75.5083	21	BON/CTD, 2B3 D
4	14	November 5, 2018	36.0017	-75.4717	23	CTD PROFILE 911+ , NUT, DIC , URI, CHL
12	15	November 6, 2018	36.915	-75.3333	28	BON/CTD, 2B1 C
13	16	November 6, 2018	36.7483	-74.835	51	BON/CTD, 2B1 C
14	17	November 7, 2018	36.9933	-74.9167	49	BON/CTD, 2B3 D
15	18	November 7, 2018	37.0767	-74.585	133	BON/CTD, 2B3 D
5	19	November 7, 2018	37.7033	-74.2517	118	CTD PROFILE 911+ NUT, DIC , URI, CHL,SAL
16	20	November 7, 2018	37.7467	-74.3317	82	BON/CTD, 2B1 C
17	21	November 7, 2018	37.75	-74.415	67	BON/CTD, 2B3 D
6	22	November 7, 2018	37.8383	-74.5783	55	CTD PROFILE 911+ , NUT, DIC , URI, CHL
18	23	November 7, 2018	37.995	-74.4233	53	BON/CTD, 2B3 D
19	24	November 7, 2018	38.0767	-74.335	49	BON/CTD, 2B3 D
20	25	November 7, 2018	38.165	-74.415	43	BON/CTD, 2B3 D
21	26	November 7, 2018	38.3183	-74.3433	44	BON/CTD, 2B1 C
22	27	November 7, 2018	38.5833	-73.5067	75	BON/CTD, 2B3 D
23	28	November 8, 2018	38.75	-73.1717	99	BON/CTD, 2B3 D
7	29	November 8, 2018	39.0117	-72.585	1140	CTD PROFILE 911+ NUT, DIC , URI, CHL,SAL
8	30	November 8, 2018	39.0533	-72.7433	199	CTD PROFILE 911+ NUT, DIC , URI, CHL,SAL

CTD Cast	Site ID STA	Date / GMT	Latitude dd	Longitude dd	Bottom depth (m)	Operations
24	31	November 8, 2018	39.4117	-72.995	66	BON/CTD, 2B3 D
25	32	November 8, 2018	39.5833	-73.495	40	BON/CTD, 2B3 D
26	33	November 8, 2018	39.5733	-73.585	37	BON/CTD
9	34	November 8, 2018	39.3583	-73.395	48	CTD PROFILE 911+ NUT, DIC , URI, CHL,SAL
27	35	November 8, 2018	39.17	-73.2567	62	BON/CTD, 2B1 C
28	36	November 8, 2018	39.0833	-73.495	53	BON/CTD, 2B3 D
29	37	November 8, 2018	39.325	-73.83	35	BON/CTD, 2B3 D
30	38	November 9, 2018	39.2517	-74.2433	24	BON/CTD
31	39	November 9, 2018	39.1683	-74.585	17	BON/CTD, 2B3 D
32	40	November 9, 2018	39.4967	-74.1733	17	BON/CTD, 2B3 D
10	41	November 9, 2018	39.7067	-74.01	22	CTD PROFILE 911+ NUT, DIC , URI, CHL,SAL
33	42	November 9, 2018	39.9933	-73.7633	31	BON/CTD, 2B1 C
34	43	November 9, 2018	40.33	-73.2567	36	BON/CTD, 2B1 C
35	44	November 9, 2018	40.4933	-73.3417	26	BON/CTD, 2B3 D
36	45	November 11, 2018	40.4183	-72.6683	48	BON/CTD, 2B3 D
37	46	November 11, 2018	40.2517	-72.6717	55	BON/CTD, 2B3 D
38	47	November 11, 2018	40.3283	-72.505	52	BON/CTD, 2B1 C
39	48	November 11, 2018	40.33	-72.3317	57	BON/CTD, 2B3 D
40	49	November 11, 2018	40.3317	-72.0833	62	BON/CTD, 2B3 D
41	50	November 11, 2018	40.415	-72.165	60	BON/CTD, 2B1 C
42	51	November 11, 2018	40.8317	-72.25	36	BON/CTD, 2B3 D
43	52	November 11, 2018	40.9133	-72.1717	20	BON/CTD, 2B1 C
44	53	November 12, 2018	40.835	-71.925	40	BON/CTD, 2B3 D
45	54	November 12, 2018	40.9083	-71.505	57	BON/CTD, 2B1 C
46	55	November 12, 2018	41.0783	-71.255	38	BON/CTD, 2B3 D
47	56	November 12, 2018	40.665	-70.6267	61	BON/CTD, 2B3 D
11	56	November 12, 2018	40.665	-70.63	61	CTD PROFILE 911+NUT, DIC , URI, CHL,SAL
48	57	November 12, 2018	40.7533	-69.835	43	BON/CTD, 2B1 C
49	58	November 12, 2018	40.9967	-70.3333	42	BON/CTD, 2B3 D
50	59	November 12, 2018	40.9983	-70.6633	47	BON/CTD, 2B3 D
51	60	November 12, 2018	41.1033	-70.6217	43	BON/CTD, 2B3 D
12	60	November 12, 2018	41.1	-70.625	44	CTD PROFILE 911+ , NUT, DIC , URI, CHL

TOTALS:	**Std BON/CTD Casts**	**=**	**50**
	2B3 D Bongo Casts	**=**	**31**
	2B1 C (CMarZ) Bongo Casts	**=**	**14**
	CTD PROFILE 911 Casts	**=**	**12**
	Nutrient Samples	**=**	**66**
	Chlorophyll Samples	**=**	**33**
	Dissolved Inorganic Carbon samples (DIC)	**=**	**33**
	Salinity Samples	**=**	**14**
	URI Optical Water Samples	**=**	**26**

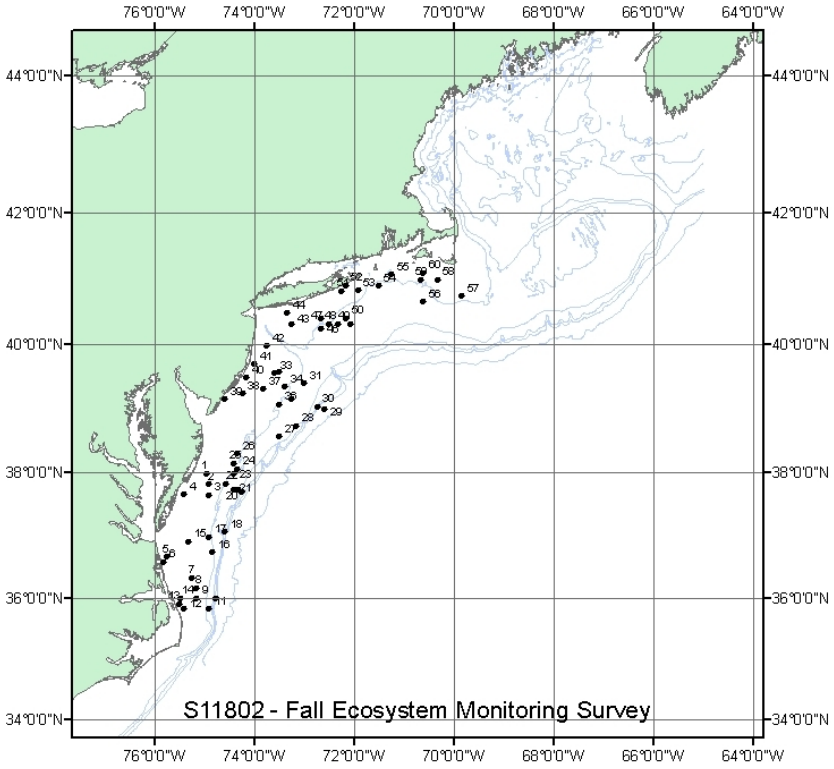

Figure 1. Station locations that were sampled and numbered consecutively during Fall Ecosystem Monitoring Survey S1 1802, 1 – 12 November 2018.

Figure 2. 61 and 20 cm bongo net array being deployed from the stern of the R/V Sharp.

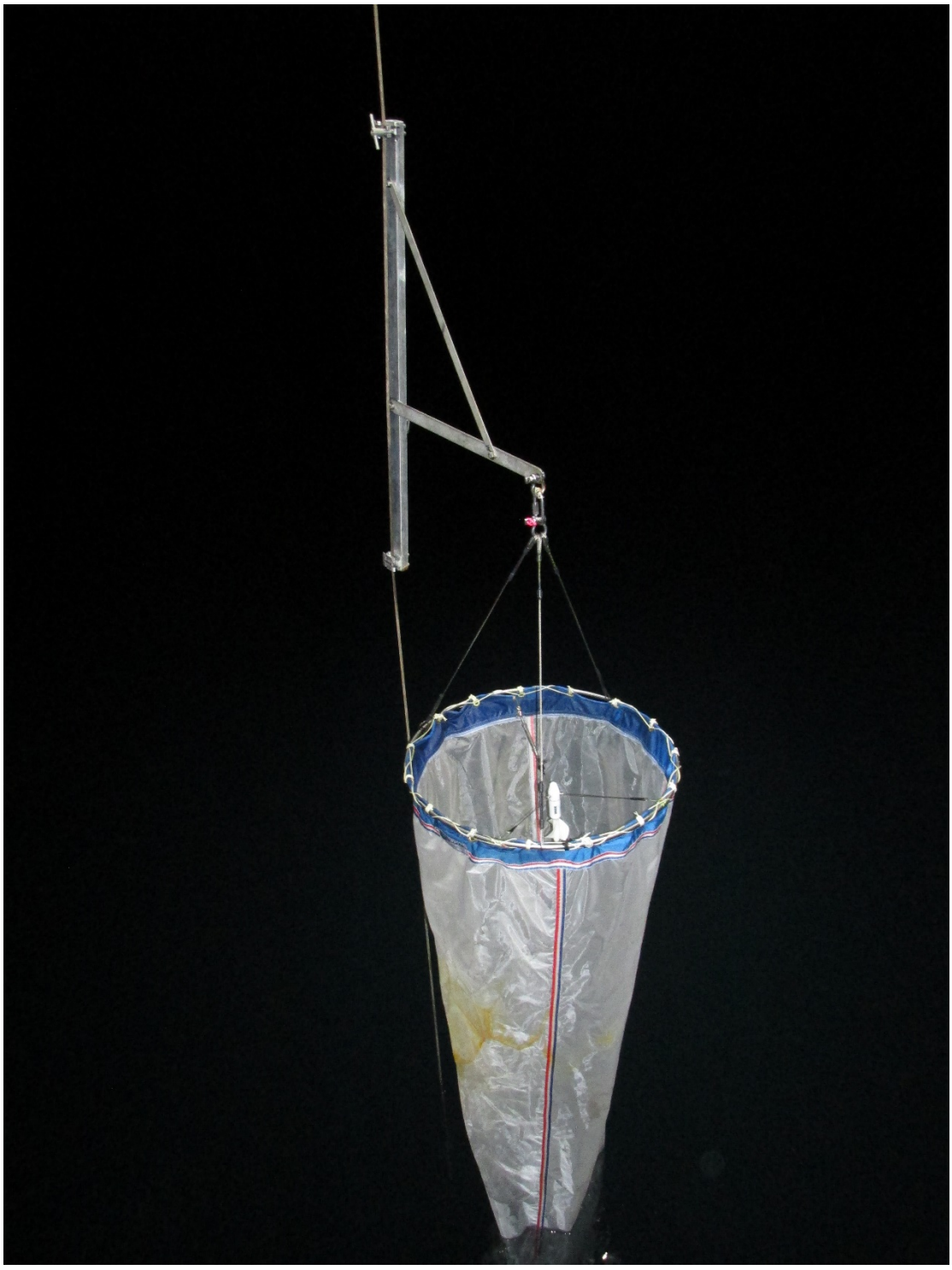

Figure 3. A 70 cm diameter ring net with 200 micron mesh as deployed from the Side-sampling station on the Henry Bigelow. It was not possible to deploy this net from the Sharp due to difficulty with working off the stern.

Figure 4. Niskin bottle and CTD 911 rosette being deployed from the side sampling Station of the R/V Sharp.

Figure 5. ImagingFlowCytoBot (tall gray cylinder) and URI seawater optical sensor array in the Sharp wetlab.

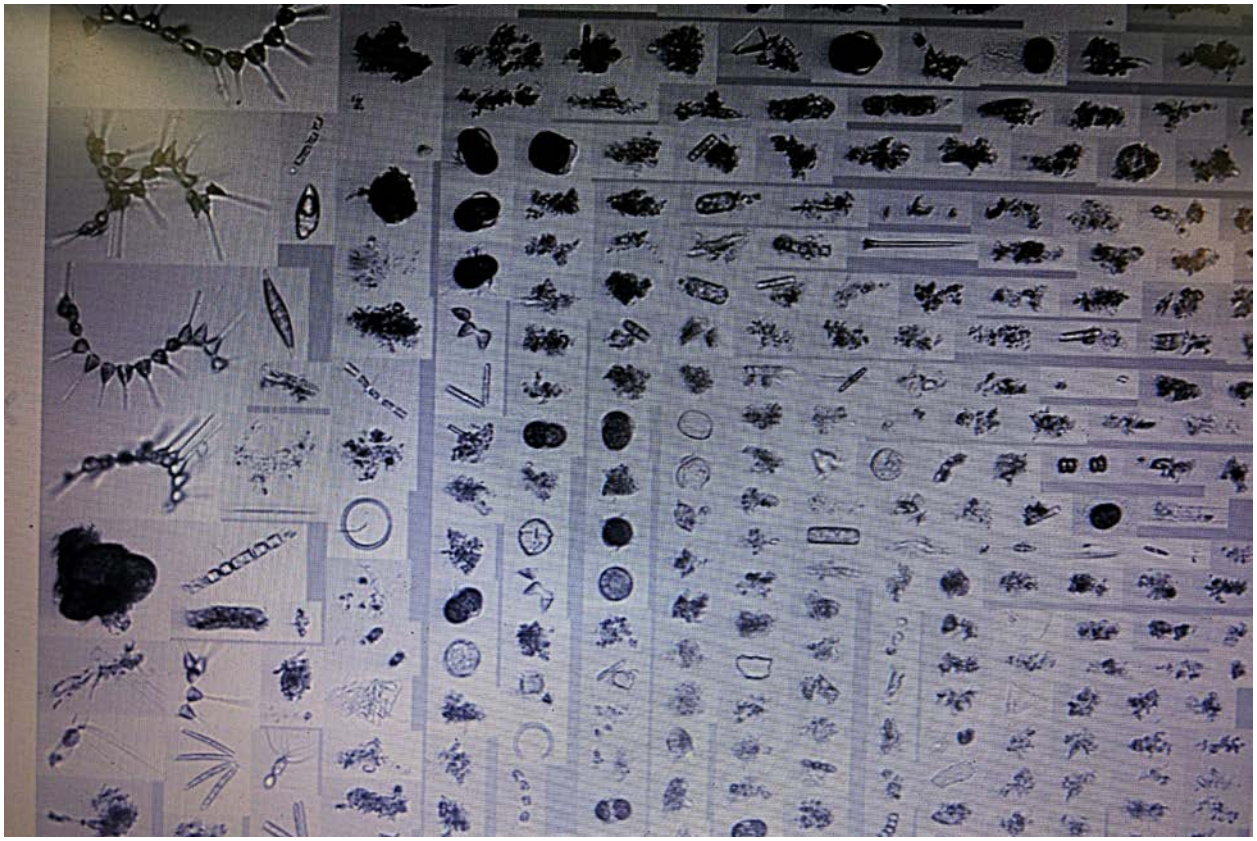

Figure 6. Images of diatoms recorded by the Imaging FlowCytoBot.

Figure 7. Marine mammal and seabird observer, Nick Metheny, at his observation post on the flying bridge of the Hugh R. Sharp.

Appendix A

Seabird Survey Report

Northeast Fisheries Science Center Contractor

16 Sumner St, Woods Hole, MA, 02543

Nicholas Metheny: procellateryx@gmail.com

Marine Species Observers: Nicholas Metheny and John Loch

Objective:

The primary goal of conducting seabird surveys aboard the Henry Bigelow in May/June 2018 was to gather data on the abundance and distribution of seabirds as a part of longer term monitoring efforts for these far-ranging apex predators. Our secondary objective in conducting theses surveys was to also collect data, when possible, on the abundance and distribution of other marine megafauna including, marine mammals, sea turtles, sharks, and other large pelagic fishes.

Collecting this data in conjunction with other biological data and abiotic factors will help better complete our "picture" of possible changes occurring in the marine ecosystem in the Northwest Atlantic from the Outer Banks to the Bay of Fundy.

Methods:

The protocol used for this survey is based on a standardized 300 meter strip transect survey, one that is used by various agencies in North America and Europe (e.g., Anon 2011, Ballance 2011; Tasker 2004).

The survey strip is 300 meters wide, with observers collecting data on all seabirds within that strip, from the bow to 90 degrees to either the port or the starboard side (depending on viewing conditions). Observations can be made in seas up to a Beaufort 7, in light rain, fog, and ship speeds between 8-12 knots (below 8 knots, the data becomes questionable to use for abundance estimates).

Surveys were conducted on the flying bridge (15 m) of the Henry Bigelow.

The software used to collect survey data was, SeeBird version 4.3.7. This program draws GPS coordinates, as well as time from the ship's navigation through a NMEA data feed, so each observation received a Lat/Long, time stamp, and ship's course. Due to some initial issues with the Ship Computer System (SCS), a GPS puck was used to replace the ship's navigation feed on the first day of surveys, until the SCS issue was fixed and a reliable feed was established on the flying bridge. The standard data collected for observations included, species, distance, number of individuals, association, behavior, flight direction, flight height, and if possible or applicable, age, sex, and plumage status. Flocks of seabirds that were once recorded in a SeaBird sub-module, have been incorporated into the regular sighting data module with species counted within a given flock being given a special notation in the comment section, marking them as part of a flock, along with an estimated distance to that flock from the transect line. On another note, while SeeBird was not specifically designed to collect data on other marine megafauna, other such observations were recorded anytime an animal was seen, both in and outside of the survey zone.

During surveys, individual observers took two-hour shifts, to prevent observer fatigue. Observers utilized binoculars (10x42 or 8x42) for general scanning purposes within the survey strip, however, if an animal proved elusive a pair of 20x60 Zeiss imaged-stabilized binoculars were used to attain positive identifications. To aide in approximating distance observers used custom made range finders based on height above water and the observers' personal body measurement (Heinemann 1981).

Results:

Seabird Sightings

Over the course of the cruise approximately 1,300 nautical miles were surveyed, from the mouth of the Delaware Bay to surveying Georges Banks and around the Gulf of Maine. A total of 2,893 birds were observed in the survey zone, within an additional 1,951 birds observed outside the zone (on and off effort). As is usual at this time of year Wilson's Storm Petrels, *Oceanites oceanicus*, out-numbered all other seabirds totaling 992 individuals seen in the survey; this being followed by Sooty Shearwaters, *Ardenna grisea,* at 580 individuals seen in the survey zone. A fair number of alcid species were observed this year (compared to years past), with survey lines going very close to two breeding colonies in the Gulf of Maine, accounting for a fraction of the Atlantic Puffin, *Fratercula arctica*, Razorbill, *Alca torda*, and Black Guillemot, *Cepphus grylle*, sightinged. Of special, note was the sighting of a wayward Franklin's Gull, *Leucophaeus pipixcan*, that was a good deal East of its normal migration route. Furthermore, there were frequent sightings of South Polar Skua, *Stercorarius maccormicki*, this trip, sometimes several times in a given day depending on the area the ship was traversing.

Table 1. Total Number of Birds Observed

Common Bird Name	Scientific Name	Number Observed in Zone	Total Observed
Atlantic Puffin	*Fratercula arctica*	10	22
Black Guillemote	*Cepphus grylle*	4	5
Dovekie	*Alle alle*	6	10
Common Murre	*Uria aalge*	1	1
Razorbill	*Alca torda*	1	3
Razorbill/Murre		0	1
Common Loon	*Gavia immer*	33	80
Red-throated Loon	*Gavia stellata*	0	1
Cory's Shearwater	*Calonectris borealis*	22	32
Great Shearwater	*Puffinus gravis*	249	379
Sooty Shearwater	*Ardenna grisea*	580	1242
Manx Shearwater	*Puffinus puffinus*	13	23
Unidentified Shearwater		0	1
Wilson's Storm Petrel	*Oceanites oceanicus*	992	1430
Leach's Storm Petrel	*Oceanodroma leucorhoa*	185	148
Unidentified Storm Petrel		0	40
Unidentified Petrel		0	1
Northern Fulmar	*Fulmarus glacialis*	155	249
Arctic Tern	*Sterna paradisaea*	64	67
Common Tern	*Sterna hirundo*	123	192
Unidentified Tern		38	74
Great Black-backed Gull	*Larus marinus*	102	262
Herring Gull	*Larus argentatus*	160	362
Bonaparte's Gull	*Chroicocephalus philadelphia*	1	1
Laughing Gull	*Leucophaeus atricilla*	29	30
Franklin's Gull	*Leucophaeus pipixcan*	1	1
White-Winged Scoter	*Melanitta fusca*	5	9
Parasitic Jaeger	*Stercorarius parasiticus*	2	5
Long-tailed Jaeger	*Stercorarius longicaudus*	1	3
Unidentified Jaeger		0	1
South Polar Skua	*Stercorarius maccormicki*	23	43
Double Cresred Cormorant	*Phalacrocorax auritus*	0	20
Northern Gannet	*Morus bassanus*	36	45
Red Phalarope	*Phalaropus fulicarius*	1	1
Red-necked Phalarope	*Phalaropus lobatus*	27	28
Unidentified Phalarope		7	7
Magnolia Warbeler	*Setophaga magnolia*	2	2
Barn Swallow	*Hirundo rustica*	2	3
Cedar Waxwing	*Bombycilla cedrorum*	1	1
Red-bellied Woodpecker	*Melanerpes carolinus*	1	1
Gray Catbird	*Dumetella carolinensis*	1	1
American Goldfinch	*Spinus tristis*	1	1
American Redstart	*Setophaga ruticilla*	1	1
Cuckcoo sp	*Coccyzus sp*	1	1
Passerine		10	10
Peregrine Falcon	*Falco peregrinus*	0	1
Osprey	*Pandion haliaetus*	2	3
Total		2893	4844

Marine Mammal, Sea Turtle, and Large Fishes Sightings

The most commonly seen marine mammal, was of course, the Common Dolphin, *Delphinus delphis,* accounting for approximately 75% of all mammal sightings, followed by Pilot Whales, *Globicephala melas*, at around 9%. Of the large whales seen, Humpback Whales, *Meaptera novaengliae*, made up a majority of individuals. Of special note were a small pod of Atlantic White-sided Dolphins, *Lagenorynchu acutus*, as well as Sperm Whales, *Physeter macrocephalus*, and a group of unidientified Beaked Whale, *Mesoplodon sp;* these species are not often seen on regular survey.

Only one Loggerhead sea turtle, *Caretta caretta,* was sighted and was sighted this trip, probably mostly due to the limited time spent in warmer waters down South or in the Gulf Stream. Of special note a large number of Sunfish, *Mola mola,* and Basking Shark, *Cetorhinus maximus*, were seen off of New England. Specifically concerning the sightings of Basking Sharks, several different individuals were seen breaching clear out of the water.

Table 2. Other Sighted Marine Megafauna

Common Name	Scienctific Name	Number Observed
Fin Whale	*Balaenoptera physalus*	2
Humpback Whale	*Megaptera novaeangliae*	22
Minke Whale	*Balaenoptera acutorostrata*	2
Unidentified Whale		4
Unidentified Small Whale		1
Unidentified Large Whale		5
Sperm Whale	*Physeter macrocephalus*	2
Pilot Whale	*Globicephala melas*	43
Risso's Dolphin	*Grampus griseus*	6
Common Dolphin	*Delphinus delphis*	336
Bottlenose Dolphin	*Tursiops truncatus*	15
Atantic White-sided Dolphin	*Lagenorhynchus acutus*	5
Unidentified Dolphin		1
Mesoplodon sp		2
Loggerhead Sea Turtle	*Caretta caretta*	1
Ocean Sunfish	*Mola mola*	41
Basking Shark	*Cetorhinus maximus*	29
Blue Shark	*Prionace glauca*	1
School of Tuna (larger/small)		6
School of Fish		3

Literature Cited

Anonymous. 2011 Seabird Survey Instruction Protocol. Seabird distribution and abundance, Summer 2011. NOAA RV Henry B. Bigelow. Northeast Fisheries Science Center.

Ballance, Lisa T. 2011. Seabird Survey Instruction Manual, PICEAS 2011. Ecosystems StudiesProgram Southwest Fisheries Science Center, La Jolla, California.

Heinemann, D. 1981. A range finder for pelagic bird censusing. Journal of Wildlife Management 45: 489-493.

Tasker, M.L., Hope Jones, P., Dixon, T. and Blake, B.F. 1984. Counting seabirds at sea from ships; a review of methods employed and a suggestion for a standardized approach. Auk 101: 567 – 577.