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Research Cruise Summary Report
2025

Project Name:	*Seasonal Survey of Scallop Fishery on the Eastern Part of Georges Bank*
Vessel Name:	Concordia
Departure Date:	4/22/2025
Land Date:	4/27/2025
Port:	New Bedford, MA
Chief Scientist:	Luisa Garcia
Scientific Crew:	Natalie Jennings, Farrell Davis, Cassandra Tillotson
Report Completed by:	Luisa Garcia

BACKGROUND

As with previous cruises conducted under this project, this survey focused on the eastern region of Georges Bank (GB), specifically targeting the Closed Area II (CAII), CAII Extension (CAII-Ext), and Southern Flank (SF) (**Figure 1**).

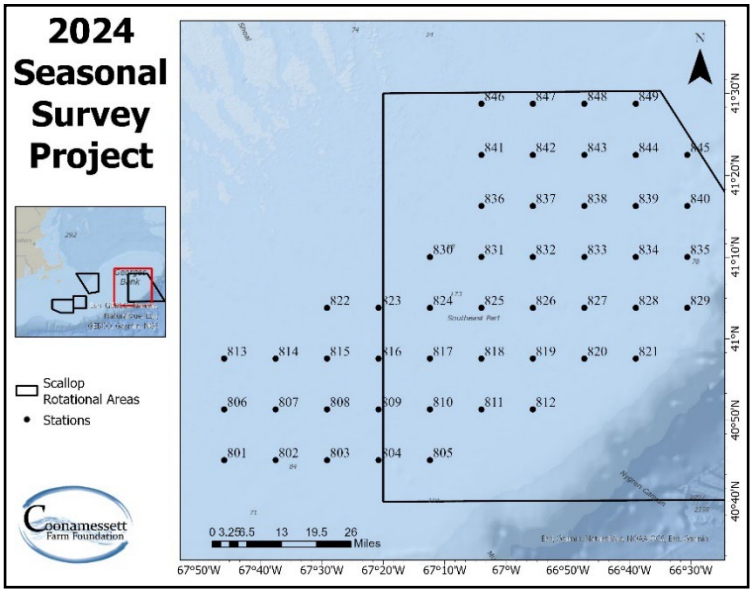

Figure 1. Location of the survey stations for the 2024 seasonal survey on the eastern portion of GB, with stations spaced ~7 nm apart.

CRUISE OBJECTIVES

The primary objective of each field trip in this study is to gather comprehensive biological and ecological data at all designated stations within the eastern GB study area (**Figure 1**). These data include species identification and enumeration, individual measurements (shell height or length), total weights, scallop meat weights, scallop and flatfish gonad weights, sex determination, and reproductive condition assessments. This comprehensive sampling approach supports the broader goals of the project, which are:

1. **Quantify seasonal biomass fluctuations** of pre-recruit, recruit, and adult Atlantic sea scallops (*Placopecten magellanicus*) using catch data from a standard dredge equipped with a 40-mm mesh cover net.
2. **Collect gonadal tissue samples** from scallops to examine seasonal and spatial trends in reproductive activity and spawning dynamics across eastern GB.
3. **Assess seasonal variation in scallop health indicators** through macroscopic evaluation of meat color, presence of nematodes, orange pustules, and shell blisters.
4. **Analyze predator–prey interactions** by evaluating the spatial distribution and relative abundance of key predators and their relationship to scallop and clapper distributions.
5. **Monitor seasonal shifts in the abundance of bycatch species**, particularly in relation to scallop aggregation patterns.
6. **Determine spawning periods of yellowtail flounder (*Limanda ferruginea*) and windowpane flounder (*Scophthalmus aquosus*)** in eastern GB through gonadal examinations.
7. **Conduct biological assessments of American lobster (*Homarus americanus*)** incidentally caught in dredges, recording metrics such as size, sex, shell hardness, egg presence, shell disease symptoms, and signs of mechanical damage.

This report summarizes findings from the fifth cruise of the 2024 RSA Seasonal Survey. During this cruise, 49 stations were sampled using two 15-foot-wide (4.57 m) New Bedford-style scallop dredges (**Figure 1**). One dredge was outfitted with a 40-mm mesh cover net designed to capture small or juvenile individuals (scallops, fish, and other invertebrates) that would otherwise escape commercial gear.

Following each tow, the contents of the dredges and cover net were sorted by species. Individuals were counted, measured using electronic measuring boards, and weighed using calibrated Marel 1100 series electronic scales. All data were recorded in digital format to ensure accuracy and efficiency during field processing.

OBSERVATIONS & KEY TAKE AWAYS

During the April 2025 survey trip on eastern GB, cyanobacterial mats were documented for the first time in this region (**Figure 2a**), at least within the scope of this monitoring effort. These observations were concentrated on specific areas within the study domain, as shown in **Figure 2b**.

A

B

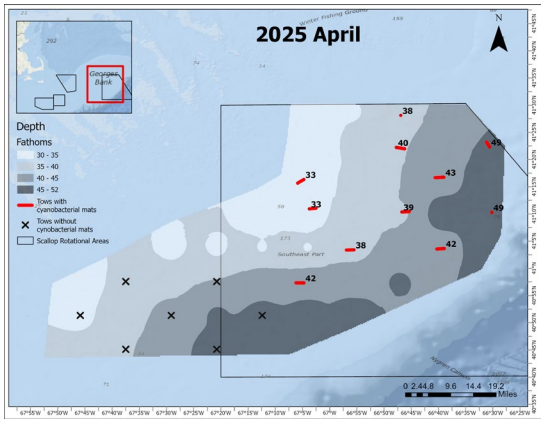

Figure 2. A - Image of a cyanobacterial mat specimen collected during the survey, placed in a petri dish under laboratory lighting. The mat appears as a dense, dark green-brown aggregate. **B -** Map indicating where cyanobacterial mats were observed by the red lines. Depth contours are shaded in gray (in fathoms), with darker tones representing deeper areas.

Laboratory analysis of the collected cyanobacterial mats, conducted by Dr. Wikfors (Milford Lab), confirmed the material as extracellular polymeric substances secreted by cyanobacteria. These mats are composed of microbial consortia, typically involving a photosynthetic cyanobacterium, visible in photomicrographs as red-fluorescent cells (**Figure 3**) and a heterotrophic partner capable of nitrogen fixation. Such communities are known to develop under specific environmental conditions: clear, shallow waters where sunlight can reach the seafloor and where nitrate and ammonia levels are low, limiting diatom productivity. The extracellular matrix functions like “fly paper,” trapping sediment particles, diatoms, and other microbes, which accounts for the mat’s brownish coloration. Notably, these mats had not been observed at the same locations during recent surveys, suggesting a seasonal shift, potentially driven by reduced dissolved nitrogen. While the presence of such mats likely indicates oligotrophic conditions that may reduce phytoplankton availability in the water column, it is currently unclear how this affects scallop feeding, which relies on suspended particulate matter. However, based on current observations, the cyanobacterial mat is not believed to pose a toxic risk, as harmful cyanobacteria are rarely encountered in marine environments.

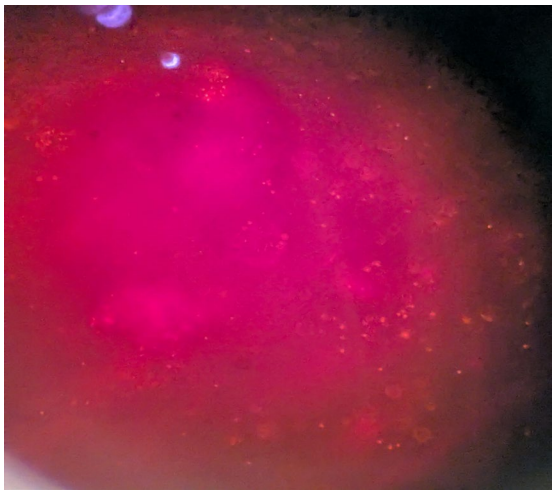

Figure 3. A microscopic view of a sample from the cyanobacterial mat showing pigmentation characteristic of cyanobacteria.

RESULTS

A total of 49 stations were surveyed during this cruise, resulting in the capture of 25 distinct species (**Table 1**). Although the overall catch was slightly higher than the previous cruise, scallop abundance remained low relative to prior years' surveys. In contrast to the previous trip, this survey observed a greater number of individuals retained by the uncovered dredge compared to both the covered dredge and the cover net. Size composition varied minimally across gear types; however, the cover net consistently retained the smallest size classes of scallops (**Figure 4**), as expected.

During the survey, 19 yellowtail flounder were collected, with sizes ranging from 33 to 45 cm. One individual exhibited signs of *Ichthyophonus* infection (**Figure 5**). In addition, 146 windowpane flounder were captured, ranging from 5 to 37 cm in length. While this represents the highest number of flounders recorded among all species during this trip, it is a decrease compared to the previous survey.

Table 1. Weights (lbs) of species captured during the April survey trip on the eastern GB.

Species caught	Uncovered dredge	Covered dredge	Cover net
Unclassified Skates	3892.17	1487.16	158.53
Barndoor Skate	114.09	17.64	0.92
Silver Hake	0.59	0.396	4.49
Atlantic cod	6.56	0	0
Haddock	0	1.628	15.4
White Hake	0	0	1.28
Red Hake	8.76	1.06	112.68
Summer Flounder	56.85	3.5	0
Fourspot Flounder	15.84	6.89	16.65

Yellowtail Flounder	13.9	9.61	4.93
Winter Flounder	5.39	0	0
Grey Sole	2.38	2.53	0.73
Windowpane Flounder	49.19	12.52	8.84
Gulfstream Flounder	0	0	1.58
Longhorn Sculpin	0	0	20.70
Sea Raven	6.64	0	0
Searobin	31.88	8.58	81.82
Ocean Pout	0	0	27.28
Monkfish	181.35	3.61	0
American Lobster	49.35	3.25	0
Jonah Crab	9.97	7.28	1.8
Rock Crab	0.572	0	2.93
Sea Scallop	1624.2	710.2	999.2
Northern Moon Snail	4.9	2.53	68.2
Waved Whelk	0.95	0.3	11.8

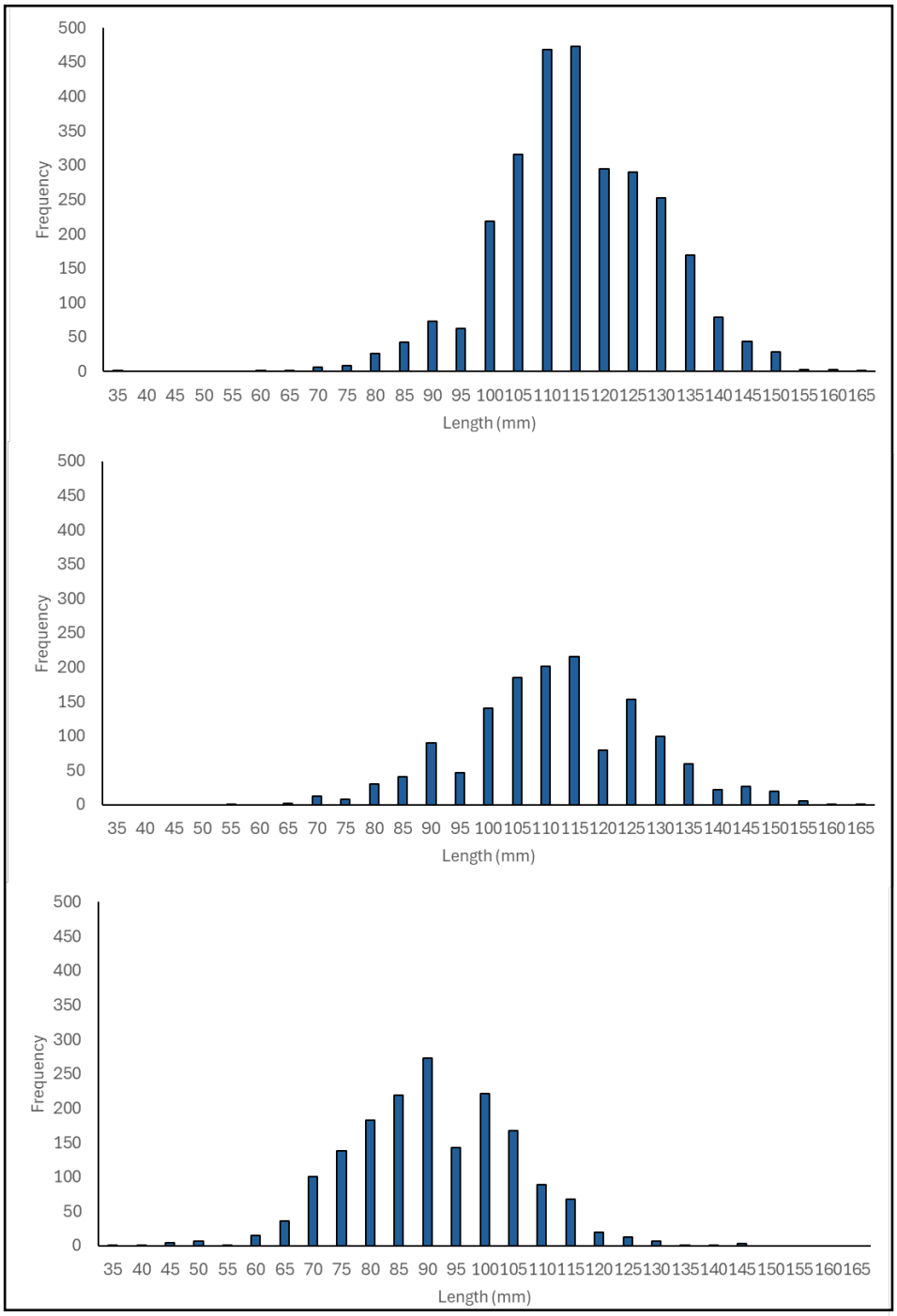

Figure 4. Length frequency distribution of scallops for: **a)** uncovered dredge, **b)** covered dredge, and **c)** cover net, collected during the April trip of the 2024 seasonal survey.

Figure 5. Picture of the yellowtail flounder caught during the April survey trip exhibiting *Ichthyphonus* lesions localized on the liver.

ADDITIONAL COMMENTS

Here are a few photos taken during the trip:

Figure 6. Image showing the catch from an uncovered dredge tow containing scallops, starfish, mussels and unclassified skates.

Figure 7. A - Image of a freshly opened female scallop. Note the purple color of the upper shell margin. **B-** Image of the upper valve of a scallop heavily encrusted with a diverse assemblage of benthic invertebrates, including multiple yellowish tunicates and pink colonial tunicates. The fouling community is embedded within sediment and biofilm, indicating prolonged benthic exposure. Such epibiont overgrowth can impact scallop health and growth by increasing shell weight and altering hydrodynamics.