ENVIRONMENTAL IMPACT REPORT 2-76

Reduction in Abundance of Siphonophores on New England Fishing Grounds in Spring 1976

by

Carolyn A. Rogers
National Marine Fisheries Service
Northeast Fisheries Center
Narragansett, Rhode Island

MARMAP Contribution 120

Laboratory Reference #76-09
May 17, 1976

Late last fall and winter the New England coastal fishing industry, especially that based in Gloucester, Massachusetts, and Portland and Rockland, Maine was severely hampered by the swarming of siphonophores which occurred in such numbers and density that their gelatinous bodies clogged trawl nets and caused significant loss of fishing time. Dollar loss to the fishing industry was estimated to be as high as $300,000. The species causing the clogging was identified as Nanomia cara, a normally occurring species in the Gulf of Maine. The distribution of Nanomia was examined by the staff of the Northeast Fisheries Center and in February 1976 a report on the findings was distributed. During the winter, fishing resumed with few reports of net-clogging organisms, collectively referred to as "lipo." In late March and April reports from Gloucester indicated that fishermen again were encountering "lipo."

Port Agents asked interested fishermen to bring in samples of "lipo" and other net-clogging organisms for examination. Several fishermen from Gloucester and Portland collected some samples. Similar organisms were collected from ALBATROSS IV trawl nets during fishery assessment surveys in New England coastal waters. In addition, samples of plankton, neuston, and bottom sediments were collected at 25 locations along two transects from Cape Ann to the Wilkinson Basin and in the Scantum Basin area from the ALBATROSS IV in April and again in May (Figs. 1 and 2, Tables 1a and 1b).

Examination of bottom samples which were collected with a variety of gear (naturalists' dredge, Dietz-Lafond grab, Ponar grab, Smith-McIntyre grab) revealed no lipo-like organisms. Plankton and neuston samples collected on the April transect (Fig. 1) had siphonophores at each location, but they were not abundant. Concentrations of Phaeocystis pouchetii, a planktonic alga which is enveloped in large gelatinous masses in the spring during its reproductive phase, were also found in these samples, with greatest densities in the more coastal (shallow) locations off Cape Ann and Newburyport.

During May, Nanomia cara was present in the plankton. However, as in April, numbers were low along the entire transect. In addition, the siphonophore colonies were smaller than those collected in the autumn. During our earlier studies three categories of relative abundance were established based on an examination of the numbers of siphonophore remains in the plankton samples: 1) high, 2) moderate, and 3) few. All samples in spring were categorized as "few" compared to the autumn-winter estimates which were generally "high."

Examination of samples obtained from trawl nets during April revealed the usual invertebrates, such as brittle stars, worms and worm tubes, bryozoans, hydroids, small bivalves, urchins, and large jellyfish. The principal sources of gelatinous material in these samples, however, were Cerianthus borealis tubes. C. borealis is an anemone-like anthozoan which constructs a long, rough, thick tube of mud and various other materials cemented together by mucus. The tubes are often two feet in length and are buried in sandy bottoms. Cerianthus is a very abundant species throughout the Gulf of Maine and especially in deep water. In addition, two samples contained Phaeocystis; one was from an inshore location and the other, which also contained siphonophores, was collected in the Fippenies area. In general all the samples examined contained the typical species of organisms and numbers which would be expected at this time of year at the locations sampled.

Low Incidence of Net Fouling in Spring

Conversations with Port Agents from Pt. Judith, Rhode Island, New Bedford, Provincetown, and Boston, Massachusetts, indicated that there had been no significant problem with net-fouling organisms on vessels fishing from these ports during spring. Port Agents Bob Morrill of Portland, Maine, and Vito Giacalone of Gloucester, Massachusetts, indicated that loss of fishing time due to net-fouling organisms in spring was minimal; much reduced from autumn. They each reported the presence of a green slime up in the water column, especially in the inshore waters. From their description, and from trawl net and plankton samples it is concluded that this slime is the alga *Phaeocystis*. There were also reports of small jellyfish in Ipswich Bay; this was verified by the presence of small hydromedusae in plankton and trawl net samples. Although nets occasionally get clogged with these gelatinous masses, fishermen were usually able to avoid them and they were not in sufficient quantities to reduce fishing effort. Morrill also commented that many boats were fishing areas which had not been fished for four or five years. It is possible to conclude therefore that the populations of *Cerianthus* had not been reduced as in areas of heavy fishing pressure, so the tubes in which these organisms live were found more frequently and in greater numbers than usual in the trawl nets.

Summary of Findings

Examination of various samples and conversations with the New England Port Agents indicate that gelatinous organisms which could clog fishing nets are not unusually abundant at this time. Last fall and winter the unusually heavy swarming of one organism, the siphonophore *Nanomia cara*, was responsible for the reduction in fishing in coastal waters, this spring the occasional fouling of nets was caused by several separate organisms: the alga *Phaeocystis*, enveloped in a gelatinous mass during its reproductive phase, which will resume a motile unicellular existence as the waters warm; the siphonophore, *Nanomia cara*, found in small numbers entangled in *Phaeocystis*; and *Cerianthus* tubes, a material often brought up in small numbers in trawls. Because of increased fishing in areas where little or no fishing has occurred in recent years the bottom population of *Cerianthus* is greater than usually observed. As these areas are fished regularly, fewer and fewer tubes will become enmeshed in the nets. Small hydromedusae have also been cited. These too are seasonal and their number should diminish as they complete their life cycle.

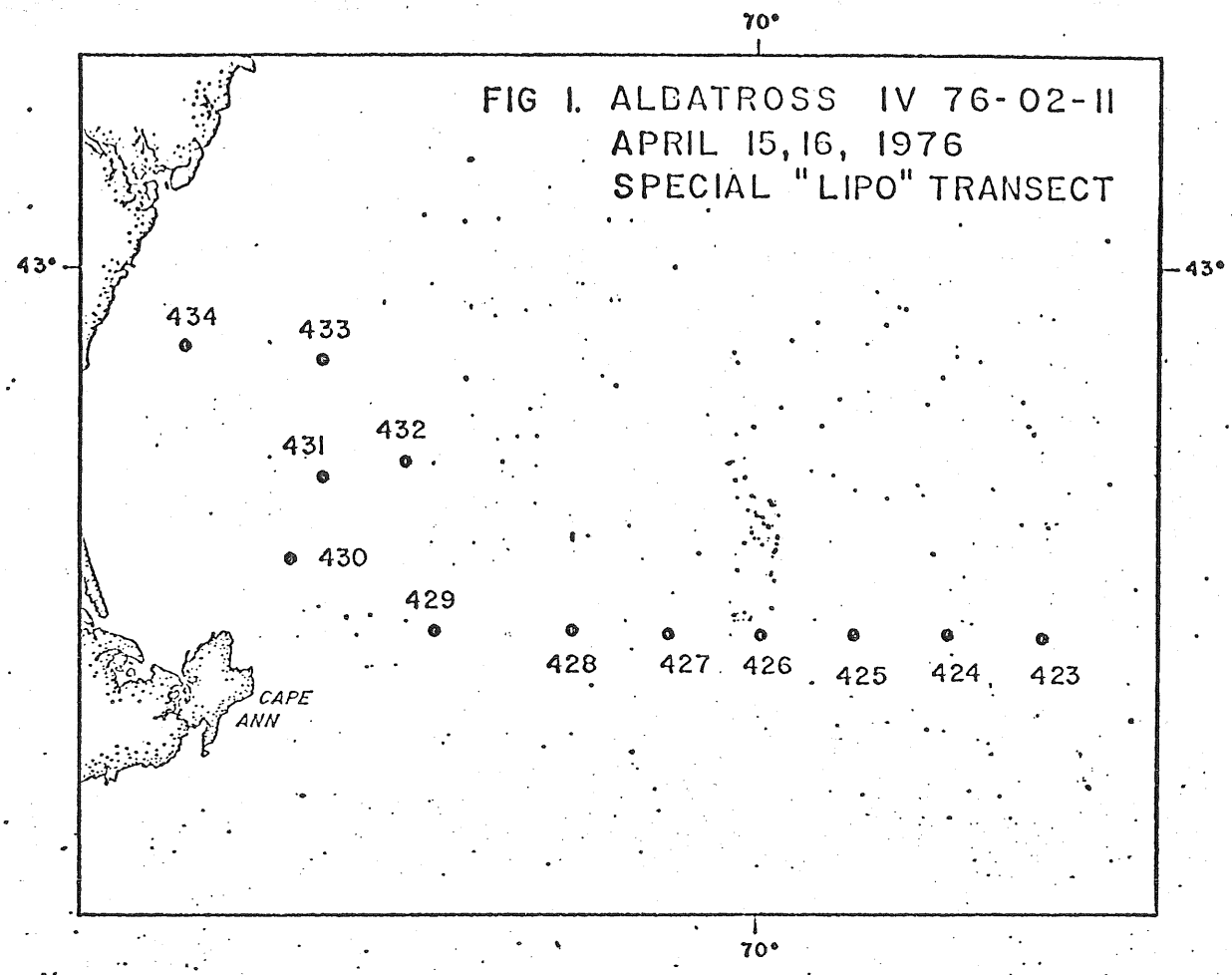
Each organism cited is resident in New England waters and there is no indication at this time that any of these populations are now abnormally abundant nor is it likely that there will be any significant adverse impact on the fishing industry as a result of their presence if populations remain at present levels. Monitoring of their abundance and distribution will continue through spring and summer by scientists of the Northeast Fisheries Center, NMFS.

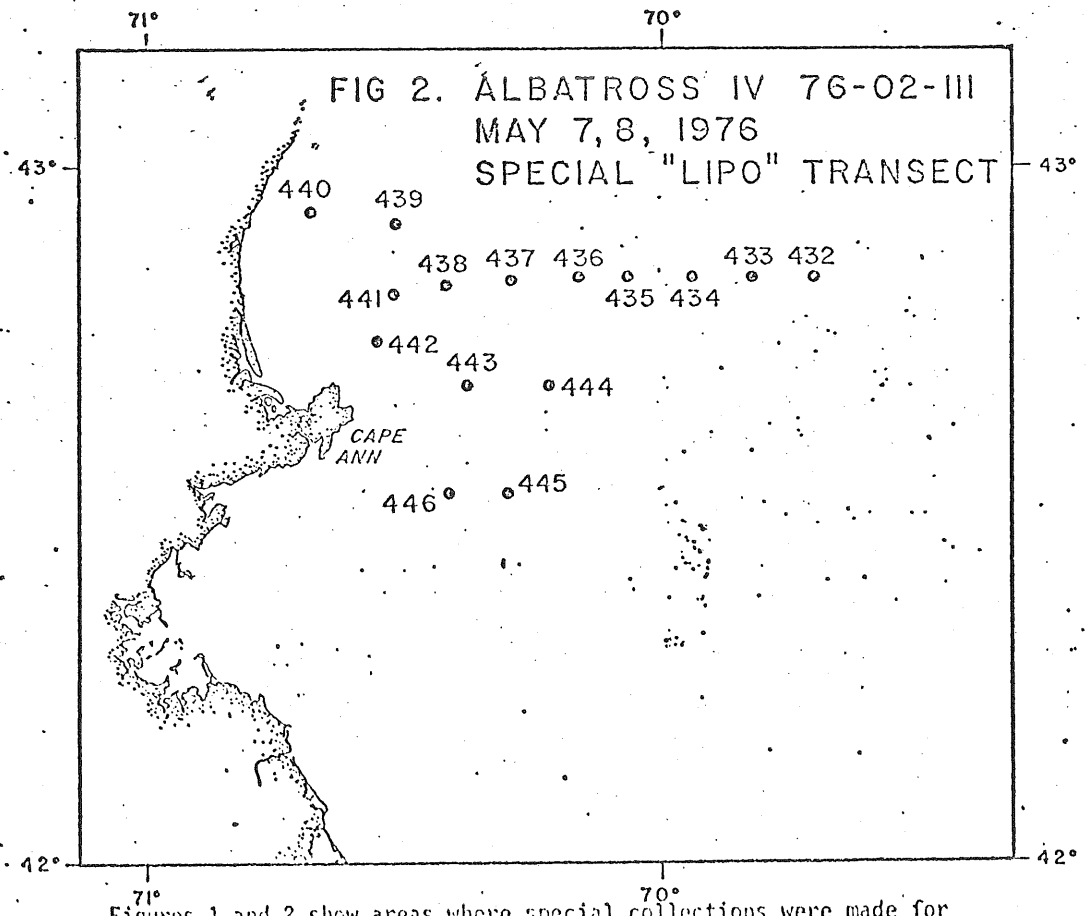
Table 1a. Special "Lipo" Transect Albatross IV 76-02-II April 15,16, 1976

	Station Location		Plankton Samples		Bottom Samples		
	Latitude °N	Longitude °W	61 cm Bongo	1.0x0.5m Neuston	Smith-McIntyre grab	Dietz-LaFond grab	Naturalists Dredge
423	42° 41'	69 40.5	✓				
424	42 41.5	69 46	✓				✓
425	42 41	69 51.5	✓	✓		✓ (Ponar grab)	✓
426	42 39	69 58	✓				✓
427	42 42	70 06	✓		✓		✓
428	42 41	70 13	✓		✓	✓	✓
429	42 41.5	70 22.5	✓		✓		✓
430	42 44.5	70.30.5	✓		✓		✓
431	42 48	70 31.5	✓		✓	✓ (Ponar grab)	✓
432	42 50	70 26	✓	✓	✓	✓	✓
433	42 55	70 32	✓	✓	✓		
434	42 56	70 40	✓	✓	✓		✓

Table 1b. Special "Lipo" Transect Albatross IV 76-02-III May 7,8, 1976

432	42 51	69 42	✓	✓			✓
433	42 50	69 50	✓	✓			✓
434	42 51	69 56	✓	✓			✓
435	42 51	70 03	✓	✓			
436	42 52	70 09	✓	✓			✓
437	42 52	70 15	✓	✓			
438	42 51	70 24.5	✓	✓			✓
439	42 54.5	70 31	✓	✓			
440	42 56	70 40.5	✓	✓			✓
441	42 49.5	70 32	✓	✓			
442	42 45	70 33	✓	✓			✓
443	42 41	70 23	✓	✓			
444	42 41	70 14	✓	✓			✓
445	42 34	70 17	✓	✓			
446	42 32	70 22	✓	✓			✓





Figures 1 and 2 show areas where special collections were made for gelatinous organisms during April and May 1976.