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Annual Survey Shows High Numbers of Seed Scallops on Georges Bank, Low Numbers in Mid-Atlantic

Total Scallop Biomass Remains High in Mid-Atlantic

A NOAA Fisheries scallop survey off the northeastern coast between North Carolina and Massachusetts shows high numbers of juvenile "recruit" sea scallops and ocean quahogs on Georges Bank tempered with weak numbers for seed scallops in the Mid-Atlantic for 2009. This survey, which included the first successful use of a scallop dredge and high resolution underwater imaging system from the same vessel, also shows the overall biomass for the Mid-Atlantic remains high.

Scientists at the Northeast Fisheries Science Center (NEFSC) lab of NOAA Fisheries Service in Woods Hole, Mass., which has conducted the annual survey since 1979, are encouraged by the scallop numbers, the highest seen on Georges Bank since 2000.

Researchers also observed yellowtail flounder, various skate species, and numerous invertebrates including sponges and sea stars. High densities of the invasive tunicate *Didemnum* were observed in one area on the northern edge of Georges Bank.

"We found very high numbers of scallop recruits, or seed scallops, in the Great South Channel and on the northern edge of Georges Bank," said Dvora Hart of NEFSC, chief sea scallop assessment scientist for the center. "We went to both open and closed areas, and into Canadian waters on Georges Bank working in cooperation with Canadian colleagues. This is very encouraging news as our observed numbers were even higher than last year."

By contrast, recruitment farther south in the Mid-Atlantic Bight, from Virginia to Long Island, was the weakest in 12 years. Nonetheless, biomass or the amount of live scallops in the Mid-Atlantic, where the majority of scallops are managed by a system of rotating closed areas, remained high.

The 2009 survey documented a decline in the scallop biomass in the Elephant Trunk rotational area, off of New Jersey and Delaware. "This decline is not surprising, since over 40 million pounds of scallop meats, worth over a quarter billion dollars, has been landed from this area since it reopened in 2007," said Hart.

“Biomass in the other two rotational areas, Delmarva and Hudson Canyon, increased in 2009,” Hart said. “Hudson Canyon was closed to start its second rotational cycle in 2008, and the 2009 survey showed the biomass in that area was increasing rapidly. Delmarva was reopened to fishing in 2009 after being closed in 2007, but nonetheless showed an increase in biomass, due to the growth of a strong year class first observed in the 2008 survey.”

Hart was surprised by the numbers of small ocean quahogs observed in one area on Georges Bank. “We had over 10,000 per tow in several locations, which I have never seen in my ten years doing the survey. We usually see just a few. Ocean quahogs can live 200 years or longer, so it is important to understand their reproductive cycle.”

In collaboration with Woods Hole Oceanographic Institution, the 2009 survey employed the Habitat Mapping Camera System (HabCam), a towed underwater camera system also used in the 2007 and 2008 surveys. In a combined survey of sea scallops and other benthic organisms, the towed camera and dredge were deployed at a number of the same sites to ground truth the dredge catches and obtain physical samples to compare with the high resolution digital photographs.

“Collaboration between NEFSC and WHOI scientists on the scallop survey has been ongoing for more than three years, with over 100 paired dredge/photographic tows completed,” said Hart. “The dredge and HabCam provide different but complementary views of the bottom, giving us much more information from different perspectives, which is very helpful. It is the best possible match of traditional methods with advanced technology, and how we envision the future.”

The 2009 survey was conducted in three legs, the last ending July 3, aboard the UNOLS (University-National Oceanographic Laboratory System) research vessel *Hugh Sharp*, a 146-foot ship operated by the University of Delaware. Prior to 2008, the annual surveys were conducted by the NOAA ship *Albatross IV*, which was retired in late 2008 after 45 years of service.

The scallop survey uses a random stratified design, in which the ocean is divided into zones, or strata, of similar depth and habitat, and then dredge and camera samples are taken randomly within these zones. This is similar to the sampling design used in political polls to achieve a statistically accurate assessment of political views for all U.S. citizens.

Samples are collected using a modified commercial eight-foot sea scallop dredge with a mesh liner to retain the very small seed scallops. At each sampling station, the gear is deployed on the bottom for 15 minutes at an average tow speed of 3.8 knots (just over four miles per hour). Each station covers an area about 4,500 square meters, or about one acre. After each haul, the catch is sorted, counted and measured on deck. Some additional stations are included in the survey to monitor annual recruitment and growth rates. HabCam was deployed at many of the same locations, taking high resolution digital still images of the bottom at a rate of more than one per second. The images can then be formed into a mosaic.

In 2007 and 2008, the HabCam survey images also revealed the occurrence and distribution of the invasive tunicate species *Didemnum*, first reported on Georges Bank

in 2003. *Didemnum* smothers many bottom-dwelling organisms, and its acidic “skin” can prevent baby scallops from settling on the ocean floor.

“We saw it in patches in only one area we surveyed, but it is a real concern,” Hart said. “Physical samples came up on one of the dredges, so biologists will have some specimens to study.”

Atlantic sea scallops (*Placopecten magellanicus*) are distributed in the Northwest Atlantic from Cape Hatteras to Newfoundland and also occur in the Gulf of St. Lawrence. They live on the ocean bottom, generally at depths from 30 to 100 meters (about 100 to 300 feet) on Georges Bank and in the Mid-Atlantic region, and can live up to 20 years. Scallops usually spawn in late summer and early fall, although spawning in spring can also occur, especially in the Mid-Atlantic region. After hatching, larvae remain in the water column for four to six weeks before settling on the sea floor.

The sea scallop fishery is the largest and most valuable wild scallop fishery in the world, and in 2007 was the most valuable single-species fishery in the United States. Recent landings have been worth about \$400 million dock-side, with major landing ports at New Bedford, Mass., Cape May, N.J., and Hampton Roads, Va

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Related links:

2008 Sea Scallop Survey article:

http://www.nefsc.noaa.gov/press_release/2008/SciSpot/SS0816/index.html

Fisheries of the United States – 2008:

<http://www.st.nmfs.noaa.gov/st1/fus/fus08/index.html>

Status of U.S. Fisheries: <http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm>