



## NOAA FISHERIES

### UPCOMING EVENTS

November 27-30

Summer Flounder Stock Assessment  
Review Committee Meeting Woods Hole,  
MA

December 4-5

16th Flatfish Biology Conference  
Westbrook, CT

January 9-11, 2019

Northeast Aquaculture Conference &  
Exposition/Milford Aquaculture Seminar  
Boston, MA



Part of the fishing fleet in port in Stonington, CT.  
Photo credit: NOAA Fisheries/Shelley Dawicki

## Top Stories



## Can Science Help Fisheries Adapt to a Warming Ocean?

Armed with decades of data and a strong appreciation of what climate change could mean for fisheries, Northeast Fisheries Science Center researchers are focusing on science to help navigate this rapidly evolving future.

In 2016, the Center released a fisheries climate action plan for the region. In 2018, Congress provided funding to pursue that plan. Our Center responded with projects that would result in the greatest benefit in the near-term. It's a multi-year, dedicated effort to create the kind of information needed as we strive to maintain viable fisheries in a warming world ocean.

Ten projects are underway to improve stock assessments through new modeling, better surveys, and more work to understand the vulnerabilities of coastal communities to climate change. Some of these are new, but some support existing projects. While no single project can do the job, the combined results along with stronger regional collaborations and partnerships can make progress.

Center scientists are working with research partners from around the region, including commercial longline fishermen, the Gulf of Maine Research Institute, Massachusetts Division of Marine Fisheries, Rutgers University, SUNY Stony Brook, University of Massachusetts Dartmouth, and Woods Hole Oceanographic Institution as well as Delaware Sea Grant and several NOAA Laboratories. More here: <https://www.nefsc.noaa.gov/rcb/projects/groundfish-and-climate/>

## Reaching Out to a Vital but Little Understood Fishing Asset: The Crew

Social scientists from NOAA's Northeast Fisheries Science Center have been visiting major fishing ports in the region to talk face-to-face with the workers who make commercial fishing operations. Researchers plan to be where crew are likely to be, at times when they might have a few moments to talk about themselves and their work.

This effort is one piece of a larger Northeast Fisheries Science Center effort to gather information about people whose livelihoods are supported by commercial fishing

## Latest NEFSC Publications

Mackenzie CL, Tarnowski M. 2018. Large Shifts in Commercial Landings of Estuarine and Bay Bivalve Mollusks in Northeastern United States after 1980 with Assessment of the Causes. *Marine Fisheries Review* 80(1):1-28.

Adams CF, Alade LA, Legault CM, O'Brien L, Palmer MC, Sosebee KA, Traver ML. 2018. Relative importance of population size, fishing pressure and temperature on the spatial distribution of nine Northwest Atlantic groundfish stocks. *PLOS ONE* 13(4): e0196583.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE, Byrd B, Chavez-Rosales S, Col TVN, Engleby L, Garrison LP, Hatch J, Henry A, Horstman SC, Litz J, Lyssikatos MC, Mullin KD, Orphanides C, Pace RM, Palka DL, Soldevilla M, Wenzel FW. 2018. US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2017. NOAA Tech Memo NMFS NE-245; 371 p.

Kosaka R, Steinback S. 2018. 2012 National Ocean Recreation Expenditure Survey, National Report. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-185, 102 p.

Vogeler S, Miller-Ezzy P, Li X, Wikfors GH, Joyce A. 2018. First report of a putative involvement of the NMDA pathway in Pacific oyster (*Crassostrea gigas*) development: Effect of NMDA receptor ligands on oyster metamorphosis with implications for bivalve hatchery management. *Aquaculture* 497:140-146.

Northeast Fisheries Science Center (NEFSC). 2018. 65th Northeast Regional Stock Assessment Workshop (65th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 18-08; 38 p.

Lyssikatos MC, Garrison LP. 2018. Common Bottlenose Dolphin (*Tursiops truncatus*) gillnet bycatch estimates along the US Mid-Atlantic Coast, 2007-2015. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 18-07; 37 p.

Tanaka KR, Chang JH, Ying Xue Y, Li Z, Jacobson LD, Chen Y. 2018. Mesoscale climatic impacts on the distribution of *Homarus americanus* in the US inshore Gulf of Maine. *Canadian Journal of Fisheries and Aquatic Sciences*.

Harmful Algal Blooms - A Compendium Desk Reference. ISBN: 9781118994658. John Wiley & Sons, 2018. Chapter 14, Culture and Culture Collections by Gary H. Wikfors and Steve L. Morton

and the second to focus on crew, including hired captains. The first survey was conducted in 2012 and 2013.

No information is collected that would identify an individual taking the survey; no names or contact information or names of employers or vessels. Instead, the survey focuses on topics such as recent work, typical fishing activity in a year, availability of work, types of work, fishing income, perceptions of fishery management and ability to participate in those decisions, job satisfaction, and well-being. It also gathers demographic information.

In August and September they surveyed in New Bedford, Gloucester, and Fairhaven, Mass.; in Point Judith, RI; and in Stonington, Portland, Rockland, Owl's Head, and Kennebunkport, Maine. Just over 180 completed surveys were obtained. In October the team will be in New York and New Jersey, with plans to head to Virginia and North Carolina in November. Surveys will continue in early 2019. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/other/crew-survey-2018/](https://www.nefsc.noaa.gov/press_release/pr2018/other/crew-survey-2018/)

## Science Shorts

### Fish Stock Rebuilding Success Influenced by Warming Ocean

The Southern New England/Mid-Atlantic stock of winter flounder has declined over the last 30 years despite reduced fishing pressure. Ocean warming can be an additional factor preventing its recovery to historical levels even if no fishing occurs. Researchers from NOAA Fisheries and colleagues modified the stock assessment model used to understand the current winter flounder population, and to estimate its future growth. They included likely future temperatures as a factor when estimating stock size. They found that future projections showed that under low fishing pressure, stocks would rebuild. However, when projections include warming ocean temperature, meeting rebuilding targets would be challenging even under reduced or no fishing pressure. More here:

[https://www.nefsc.noaa.gov/press\\_release/pr2018/scispot/ss1806/](https://www.nefsc.noaa.gov/press_release/pr2018/scispot/ss1806/)

### True's Beaked Whales No Longer Secret

For a month this summer, researchers from the Northeast Fisheries Science Center and colleagues surveyed the waters south of Cape Cod along the edge of the continental shelf and farther offshore looking for True's beaked whales, a species about which very little is known. On this cruise, however, researchers made what could be a beaked whale breakthrough, seeing or hearing multiple True's beaked whales nearly every day they were in their primary study area, about 200 miles off Cape Cod. These whales are so elusive that they have rarely been seen alive, much less studied. Researchers also tagged a True's beaked whale with a suction-cup digital acoustic recording tag (DTAG), the first time ever for this species. The tag recorded the movements and acoustic behavior of the individual for 12 hours before it came off and was recovered. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/features/cetacean-survey-gunter-2018/](https://www.nefsc.noaa.gov/press_release/pr2018/features/cetacean-survey-gunter-2018/)

### Researchers Demonstrate Shark Vertebral Band Pairs Are Related to Growth, Not Time

Band pairs in shark vertebrae have been used for decades to estimate shark age, of practical use in conserving overfished sharks and managing the remaining shark fisheries. However, recent research demonstrates that previous methods used to determine the age of sharks have underestimated those ages, particularly

**Latest NEFSC Publications** (continued from page 2)

McBride, RS, MK Tweedie, and K Oliveira. 2018. Reproduction, first-year growth, and expansion of spawning and nursery grounds of black sea bass (*Centropristis striata*) into a warming Gulf of Maine. *Fishery Bulletin* 116: 323-336. DOI: 10.7755/ FB.116.3-4.10.

Galimany E, Rose JM, Dixon MS, Alix R, Li Y, Wikfors GH. 2018. Design and Use of an Apparatus for Quantifying Bivalve Suspension Feeding at Sea. *J. Visualized Experiments* (139), e58213, DOI:10.3791/58213



Fishing off a charter boat out of Bar Harbor on Mount Desert Island, Maine. Recreational fishing was one of the ocean activities included in the national survey. Photo credit: NOAA Fisheries/Tammy Murphy



A True's beaked whale on the surface. This elusive deep-diving whale was acoustically recorded and tagged for the first time during an August 2018 NEFSC cruise. Photo Credit: Salvatore Cerchio



The towed instrument platform Deep-See aboard the NOAA Ship *Henry B. Bigelow* in August. Development of the vehicle is a joint project of the NEFSC and Woods Hole Oceanographic Institution. Photo credit: Paul Caiger, Woods Hole Oceanographic Institution

in older sharks. None of the many studies conducted over the past 35 years had completely validated any shark species through an entire lifespan. A new study explored the relationship of band pair deposition to growth rather than time, explaining this discrepancy. Researchers report that band pair deposition is closely linked to growth, specifically to the animal's girth or body width. Band pair counts are related to vertebral size, rather than to time or age, and counts vary among vertebrae along the spinal column. As growth rate decreases with age, band pair deposition decreases, leading to age underestimation based on band pair counts. The findings, reported in *Marine and Freshwater Research*, have implications for accurately assessing ages for fisheries management of these species. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/scispot/ss1804/](https://www.nefsc.noaa.gov/press_release/pr2018/scispot/ss1804/)

### National Survey Shows Ocean and Coastal Recreation is Big Business

A new report by social scientists at NOAA Fisheries reveals that viewing or photographing the ocean was the top activity for ocean lovers in the U.S. in number of participants, days spent, and how much people paid to do it. The report provides results from the National Ocean Recreation Expenditure Survey. Responses to the survey indicate that in 2012, the baseline year chosen by researchers, nearly 49 million adults over 18 years of age nationwide participated in ocean and coastal recreation, spending more than 1.2 billion days along the coasts and spending over \$141 billion in ocean recreation-related goods and services. That spending supported more than 3.1 million full and part-time jobs, \$409 billion in income to businesses, and \$135 billion to household incomes. The study is the first national survey undertaken by NOAA Fisheries to estimate participation levels and the number of days people spent enjoying a broad range of ocean and coastal recreation activities. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/scispot/ss1805/](https://www.nefsc.noaa.gov/press_release/pr2018/scispot/ss1805/)

### Northeast Shelf Marine Ecosystem Conditions Show Increases in Temperatures, Habitat Expansion

Temperatures at the bottom of the water column throughout the Northeast Shelf marine ecosystem are rising, especially in the fall. At the same time, many species are expanding their habitats northeastward along the East Coast or into deeper water, according to the latest current conditions report from the Northeast Fisheries Science Center. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/features/current-conditions-spring-2018/](https://www.nefsc.noaa.gov/press_release/pr2018/features/current-conditions-spring-2018/)

### Deep-See is New Tool for Ocean Exploration

Fishery biologist and underwater acoustics researcher Mike Jech of the NEFSC's Ecosystems Surveys Branch helped develop a new instrument platform called Deep-See, a joint project with the Woods Hole Oceanographic Institution. Towed at depths where light cannot penetrate the ocean, from about 200 to 1,000 meters, Deep-See enables researchers to explore in great detail the mesopelagic zone, where the largest animal migration on earth happens every day. Testing, calibration and evaluation was conducted in August on the NOAA Ship *Henry B. Bigelow*. A 4,000-meter fiber optic cable installed on the *Bigelow* for this project, along with the vessel's other scientific and gear handling capabilities, made this research project a possibility. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/features/deep-see-test-cruise/](https://www.nefsc.noaa.gov/press_release/pr2018/features/deep-see-test-cruise/)

### Faces of the NEFSC

Each month a new "face" from the Center's five laboratories is introduced. More here: [https://www.nefsc.noaa.gov/press\\_release/pr2018/features/faces-nefsc.html](https://www.nefsc.noaa.gov/press_release/pr2018/features/faces-nefsc.html)



White sharks (*Carcharodon carcharias*) are distributed but uncommon along the East Coast from Newfoundland and the Gulf of St. Lawrence in Canada to Florida, Cuba, the Bahamas and the Gulf of Mexico. They can grow to about 21 feet in length. Photo credit: Greg Skomal, Massachusetts Division of Marine Fisheries



Winter flounder in Narragansett Bay, RI. Photo credit: NOAA Fisheries/Jerry Prezioso



Sea scallops. Photo credit: NOAA Fisheries



Black sea bass larvae were among the plankton samples collected during the summer Ecosystems Monitoring survey. Photo credit: NOAA Fisheries/Harvey Walsh

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## Vessel and Field Updates

### Gulf of Maine Northern Shrimp Survey

The summer northern shrimp survey in the Gulf of Maine ended a few days early due to weather, with the vessel returning to Woods Hole on August 2. R/V *Gloria Michelle* departed August 12 for a final week of door calibration work for the shrimp survey net; a week of testing was conducted each month in June, July, and August.

### 2018 COASTSPAN Shark Survey

Members of the NEFSC's Apex Predators Program tagged primarily adult sandbar and sand tiger sharks during the survey in Delaware Bay. Three legs were conducted, one each in June, July and August. More here:

<https://www.nefsc.noaa.gov/nefsc/Narragansett/sharks/coastspan.html>

### Summer Ecosystems Monitoring Survey

The summer ecosystem monitoring (EcoMon) cruise in August on the NOAA Ship *Gordon Gunter* conducted sampling from the Mid-Atlantic Bight to Georges Bank. In addition to the core sampling of 70 bongo net stations and 20 hydrographic stations, the cruise supported several research partnership projects with scientists from the University of Rhode Island, the NOAA Ocean Acidification Program, a collaboration with NOAA's Atlantic Meteorological and Oceanographic Laboratory, and the University of Maine. A Florida charter school teacher from the NOAA Teacher at Sea program released a drifter that will supply information on ocean currents and can be tracked by her class and others. See drifter tracks from a number of student projects: [https://www.nefsc.noaa.gov/drifter/drift\\_X.html](https://www.nefsc.noaa.gov/drifter/drift_X.html)

### F/V E.S.S. Pursuit Surfclam/Ocean Quahog Survey Completed

The surfclam/ocean quahog survey departed from New Bedford on August 3, conducted leg 2 in and out of Atlantic City August 8-12, and returned to New Bedford from leg 3 on August 17.

### Electronic Reporting Expansion

Since the fall of 2017, the NEFSC Cooperative Research Branch has led a collaborative effort with the Gulf of Maine Research Institute and Cornell University's Cooperative Extension to support, expand, and enhance electronic vessel trip reporting (eVTR) in Gulf of Maine and Southern New England fisheries. Up to 35 vessels are receiving free software developed in collaboration with industry, known as the Fisheries Logbook Data Recording Software (FLDRS), training, and technical support. Some vessels will also use temperature/depth probes to collect oceanographic information, and a new onboard data visualization application, GOFISH. Participants also provide input for improvements to both FLDRS and GOFISH, and project-supported mobile hotspots and Wi-Fi hubs allow for more rapid data transmission to the NEFSC.

### Cooperative Gear Testing

NEFSC staff participated in gear research September 26-October 3, testing a cable turtle excluder device in a flounder trawl as part of collaboration with the Southeast Fisheries Science Center and industry. The work was conducted on the F/V *Karen Elizabeth* out of Pt. Judith, RI.