



NOAA FISHERIES

Sustainable Fisheries

UPCOMING EVENTS

June 14

Northeast Port Samplers Meeting, Woods Hole MA

June 7-27

Northeast Observer Training

July 19-21

Monkfish Operational Assessment, Woods Hole MA

July 11-14

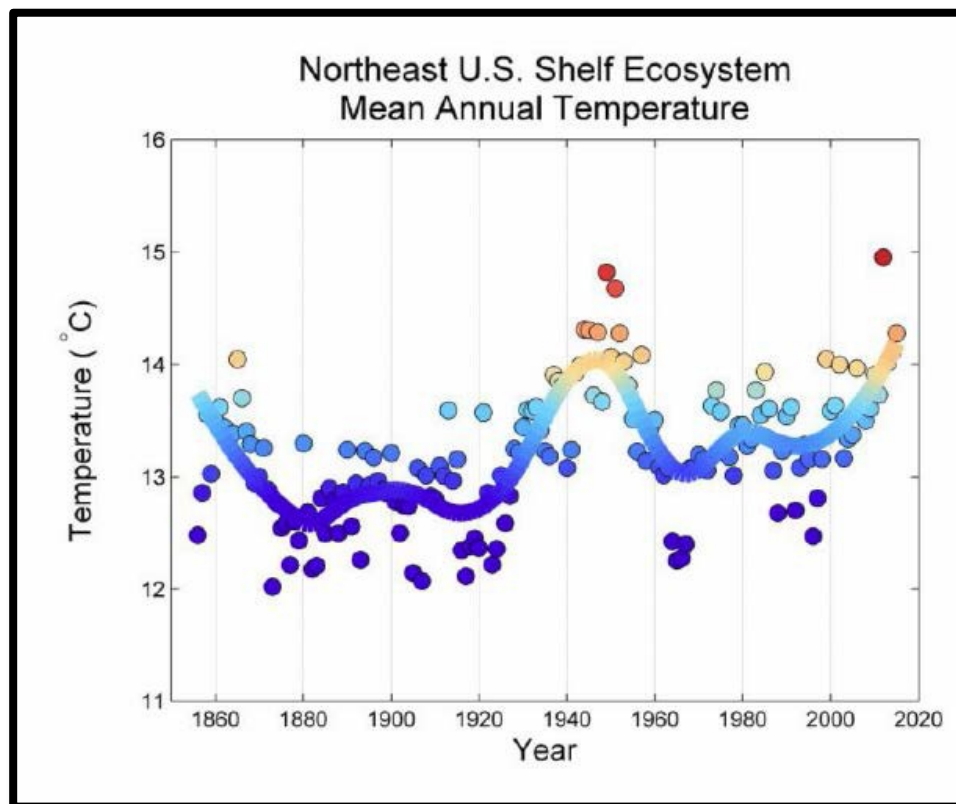
Transboundary Resource Assessment Committee Review, Woods Hole, MA

November 29-Dec 2

SAW/SARC 62, Black sea bass and witch flounder, Woods Hole MA

Top Story

Fisheries and Climate Change



The Northeast shelf is among the fastest warming areas of the world ocean. Studies suggest that future warming off the Northeastern U.S. may be greater and occur at an even faster rate than previously projected.

NOAA Fisheries Releases Draft Northeast Climate Science Action Plan

Public comment period open through July 29, 2016

NOAA Fisheries is seeking comments on a draft plan to help guide our approach to increase the production, delivery, and use of climate-related information and to reduce impacts and increase resilience of fish stocks, fishing-dependent communities, and protected species. As part of its efforts to increase the production, delivery, and use of climate-related information, NOAA Fisheries has released a draft climate science action plan for the U.S. Northeast. It outlines a strategy and specific actions for increasing understanding of, preparing for, and responding to climate change effects on the region's ocean species -- including marine and anadromous fish, invertebrates, marine mammals, sea turtles and seabirds -- and the people that depend on them. The core elements of the Northeast Regional Action Plan include developing new multispecies models that incorporate environmental terms such as temperature and ocean acidification, conducting work to better understand how climate change is forcing change in species distribution and habitat use, initiating a Northeast Climate

Latest NEFSC Publications

Caldarone EM, MacLean SA, Beckman BR. 2016. Evaluation of nucleic acids and plasma IGF1 levels for estimating short-term responses of postsmolt Atlantic salmon (*Salmo salar*) to food availability. *Fish Bull* 114(3):288-301. doi:10.7755/FB.114.3.3

Colburn LL, M Jepson, C Weng, T Seara, J Weiss, JA Hare. 2016. Indicators of climate change and social vulnerability in fishing dependent communities along the Eastern and Gulf Coasts of the United States, *Marine Policy*.

Bjorndal, K. A., M. Chaloupka, V. S. Saba, *et al.* 2016. Somatic growth dynamics of West Atlantic hawksbill sea turtles: a spatio-temporal perspective. *Ecosphere* 7(5): e01279. 10.1002/ecs2.1279

Seyoum S, C Puchutulegi, RS McBride. 2016. Isolation and characterization of 24 polymorphic microsatellite loci for the study of genetic population structure of the sheepshead *Archosargus probatocephalus* (*Actinopterygii, Perciformes, Sparidae*). *BMC Research Notes* 20169:251 DOI: 10.1186/s13104-016-2058-7

Wigley SE, C Tholke, G Shield. 2016. 2016 discard estimation, precision, and sample size analyses for 14 federally managed species groups in the waters off the northeastern United States. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 16-03; 168 p.

Hennen DR, R Mann, N Charriere, VA Nordahl. 2016. Testing the Performance of a Hydraulic Clam Dredge Modified to Capture Small Animals. NOAA Tech Memo NMFS NE 237; 15 p.

Deary AL, B Metscher, RW Brill, EJ Hilton. 2016. Shifts of sensory modalities in early life history stage estuarine fishes (Sciaenidae) from the Chesapeake Bay using X-ray micro computed tomography. *Environ Biol Fish*. DOI 10.1007/s10641-016-0479-8.

Mercaldo-Allen R, R Goldberg, P Clark, C Kuropat, SL Meseck, JM Rose. 2016. Benthic Ecology of Northern Quahog Beds with Different Hydraulic Dredging Histories in Long Island Sound *Journal of Coastal Research* 32(2):408-415.

Munroe DM, DA Narv, D Hennen, L Jacobson, R Mann, EE Hofmann, EN Powell, JM Klinck. The roles of fishing and bottom water temperature as drivers of change in maximum shell length in Atlantic surfclams (*Spisula solidissima*). *Estuarine, Coastal and Shelf Science*. v 170, p 112-122 do

Science Strategy Steering Group, cooperative research with the fishing industry, and integrating social science into ecosystem assessments in order to better account for human dimensions. More here:

http://www.nefsc.noaa.gov/press_release/pr2016/news/nr1604/

Climate Warming Continues to Affect Northeast Shelf Waters and the Ocean Food Chain

Warmer surface temperatures, increased wind speeds, and larger temperature differences among water masses are affecting the base of the food chain in ocean waters off the Northeastern U.S., modifying the timing and magnitude of plankton blooms in the region. These findings appear in the latest Current Conditions report from NOAA's Northeast Fisheries Science Center (NEFSC), which tracks ocean conditions on the Northeast Shelf. The report covers July through December 2015. Given the interest in shifting ocean conditions, wind speed and frontal strength are reported for the first time in this issue, and will be an ongoing feature in future editions. The report also noted the impact changes in the spring and fall thermal transition dates have on plankton bloom timing. The fall 2015 transition date, marking the occurrence of the average temperature between summer and winter, was among the latest dates recorded during the past three decades:

<http://www.nefsc.noaa.gov/ecosys/current-conditions/>

Changing Ocean Conditions Affect Quality of Prey for Atlantic Salmon, Other Species

NEFSC researchers and their colleagues have found that changes in ocean conditions in the Northwest Atlantic during the past 40 years have altered the food web, changing the quantity and quality of important prey species. These food-web changes are thought to have influenced the survival and abundance of Atlantic salmon and many other ecologically, commercially, and culturally important species. During the early 1990s ecosystem conditions changed across the Northwest Atlantic, including phytoplankton and zooplankton. This 'regime shift', as scientists call it, affected organisms from the bottom to the top of the food web. Changes in what small planktonic organisms ate cascaded up through the food web, affecting the quality of food available to larger forage species like capelin and ultimately many other marine mammal, sea bird and larger fish species that depend on them as prey. To understand these food web changes, researchers examined both the historical and contemporary sample from salmon stomachs collected during the commercial fishery that occurs annually off the West Greenland coast. Results showed Atlantic salmon ate prey that varied in both type and size, but overtime the available prey changed to less nutritious species than were available in the past:

http://www.nefsc.noaa.gov/press_release/pr2016/scispot/ss1607/

Warming Ocean May Bring Major Changes for U.S. Northeast Fishery Species

NOAA scientists, led by NEFSC researchers, recently published the first assessment of just how vulnerable U.S. marine fish and invertebrate species are to the effects of climate change. The study examined 82 species that occur off the Northeastern U.S., where ocean warming is occurring rapidly. Researchers found that most species evaluated will be affected, and that some are likely to be more resilient to changing ocean conditions than others. The study appeared in PLOS ONE, an online scholarly science journal. The method for assessing vulnerability was adapted for marine species from similar work by the U.S. Fish and Wildlife Service to characterize the vulnerability of wildlife species to climate change.

The method tends to categorize species that are “generalists” as less vulnerable to climate change than are those that are “specialists.” For example, Atlantic cod and yellowtail flounder are more generalists, since they can use a variety of prey and habitat, and are ranked as only moderately vulnerable to climate change. The Atlantic sea scallop is more of a specialist, with limited mobility and high sensitivity to the ocean acidification that will be more pronounced as water temperatures warm. Sea scallops have a high vulnerability ranking. More on the study here:

http://www.nefsc.noaa.gov/press_release/pr2016/scispot/ss1603/

Science Shorts

Potential Western Atlantic Spawning Area Found for Atlantic Bluefin Tuna: NEFSC researchers and the University of Massachusetts Boston have found evidence of Atlantic bluefin tuna spawning activity off the northeastern United States in an area of open ocean south of New England and east of the Mid-Atlantic states called the Slope Sea: http://www.nefsc.noaa.gov/press_release/pr2016/scispot/ss1605/

NOAA Researchers are Building a National Ocean Listening Network: Northeast Fisheries Science Center (NEFSC) researchers recently put five powerful recording instruments along the Northeast continental shelf break to listen to the sounds made by whales, dolphins and other marine species and to monitor ocean noise in general. It’s part of a national effort to establish a network to monitor long- term changes in just how noisy the ocean is:

http://www.nefsc.noaa.gov/press_release/pr2016/scispot/ss1608/

Spiny Dogfish Experiments Completed: Researchers at the NEFSC Howard Lab have completed a laboratory research project on evacuation rates of adult female spiny dogfish. The results can be used to improve spiny dogfish consumption rate estimates used in northeast U.S. single-species and multi-species models.

Shipboard Weather Stations Help Forecasters, Fishermen, and Fishery Scientists

Shipboard weather stations are the latest in new technologies NEFSC researchers are offering to deploy on commercial fishing vessels. The weather station includes a barometer to measure atmospheric pressure, anemometer to measure wind speed and direction, and an air temperature gauge. The station also has a built-in computer that factors out the ship’s motion to derive a true wind speed and direction:

<http://www.nefsc.noaa.gov/news/features/ocean-data-pilot-studies/stations.html>

Pilot Studies Test Bottom-Mounted Temperature Loggers on Fishing Boats:

There are 25 temperature depth loggers on NEFSC Study Fleet boats and 9 on vessels affiliated with other NEFSC Northeast cooperative Research Program initiatives. More than three million records have been collected from these instruments and shared with regional oceanographers. Now, transmitting these data in real time is possible:

<http://www.nefsc.noaa.gov/news/features/ocean-data-pilot-studies/loggers.html>

Know the Rules: Free App Connects Anglers with Saltwater Fishing Regulations:

Recreational fishermen from Maine to Texas can now keep track of saltwater fishing regulations just by looking at their Smartphone. A free app, Fish Rules, provides images of various species for identification and lets fishermen know in real time if a fish is in season at their location, how many they can keep, minimum size, bag and vessel limit, and more. NEFSC researchers have helped expand coverage to the Northeast: <http://www.nefsc.noaa.gov/news/features/fish-rules/>



NEFSC oceanographer Jim Manning with a weather station and satellite transmitter that make up the shipboard weather stations being field tested now.

New Study: Ocean Acidification Effects in Winter Flounder: The NEFSC Ocean Acidification Team is comparing the sensitivity of early life-stages of winter flounder from different stocks (inshore vs. offshore) to elevated CO₂ as expected in the oceans in the future. Embryos and larvae will be subjected to three CO₂ levels at each of three temperatures and scored for survival, growth, development rates, and behavioral performance.

ASMFC/MAFMC Collaborative Fisheries Program Atlantic Mackerel Winter Habitat Project: Investigators will identify “cryptic” habitats and estimate population availability to assessment surveys and the fishery. The PIs include NEFSC scientists, mackerel fishermen, fishing industry veterans, oceanographers, and fishery habitat ecologists with collaborators from the leading mackerel companies in Massachusetts, Rhode Island and New Jersey.

Slocum Glider Deployment, Great South Channel: Two gliders have been conducting real-time acoustic monitoring directed at finding North Atlantic right whales and other baleen whale species in a joint project of WHOI, the US Navy, and the NEFSC: <http://dcs.whoi.edu/>

Essential fish habitat data portal created: The NEFSC Behavioral Ecology Branch is building a web portal for its essential fish habitat data, based on both inshore sampling and the NEFSC bottom trawl survey database. The web portal allows users to generate EFH maps “on the fly”. Once security protocols are developed and servers configured, the portal will become public.

NEFSC hydrographic data added to World Ocean Database archive: 1,240 water column profiles of temperature and salinity collected and processed by the NEFSC Oceanography Branch during 2015 were added to this oceanographic archive maintained by NOAA National Centers for Environmental Information. NEFSC data are contributed annually, and account for more than 90% of all data submitted for this region.

Milford Lab-Envera probiotic project completed: This spring, NEFSC aquaculture researchers finished the last of laboratory work under a Cooperative Research and Development Agreement between the Milford Lab and Envera, an industrial microbiology company working to develop the probiotic for commercial use. Milford researchers discovered that the probiotic, which occurs naturally in oysters and northern bay scallops, can be used to fend off a common pathogen that threatens larval oysters.

Assessment Update

Monkfish: The Monkfish Working Group completed the draft operational assessment during May 24-27. The peer review will occur June 20 at the NEFSC Woods Hole Laboratory. Fishery and survey catch were updated and a framework was developed for providing catch advice for 2017-2019:

<http://www.nefsc.noaa.gov/saw/monkfish2016/index.html>

Atlantic surfclam: The SAW 61 Atlantic Surfclam Working Group completed the draft assessment at its final meeting May 31-June 3. The peer review will be July 19-21 at the NEFSC Woods Hole Lab: <http://www.nefsc.noaa.gov/saw/>



Slocum glider



Monkfish

Cruise Update

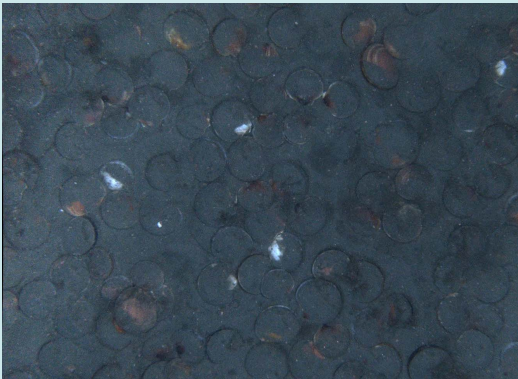
Year 3 of Western Gulf of Maine Bottom Longline Survey completed: Northeast Cooperative Research Program staff and two commercial vessel partners completed 45 survey stations in the Western Gulf of Maine. Following that work, the NCRP survey crew teamed up with scientists from the New England Aquarium to catch groundfish by rod-and-reel to further a barotrauma study, a collaboration funded by the GARFO Protected Resources Division.

NOAA Ship *Henry Bigelow*, Spring Bottom Trawl Survey: The bottom trawl survey got off to a late start owing to shipyard delays in delivering the vessel from a maintenance period. A further short delay occurred to complete generator maintenance. The survey was otherwise carried out as planned, with an additional leg to ensure Gulf of Maine stations were covered, and returned to port on June 7.

NOAA Ship *Gordon Gunter*, EcoMon cruise: EcoMon is underway, and has completed its southern, Mid-Atlantic, southern New England, and Georges Bank stations. Mid-Atlantic plankton catches were typical for this time of year, consisting of mostly copepods, some arrow-worms, and a fair number of hyperiid amphipods. Southern New England plankton included considerable amounts of *Calanus finmarchicus* copepods in patchy concentrations. Also present in some tows were *Phronima* amphipods (thought to have inspired the creature in *Alien*). The cruise is deploying an Imaging FlowCytoBot taking photos of the smaller organisms that would slip through the meshes of the plankton nets.



Phronima amphipod -- the *Alien* prototype



HabCam image from Nantucket Lightship Closed Area, 90+ sea scallops

R/V *Hugh R. Sharp*, Integrated Sea Scallop/Benthic Survey: The cruise is underway. The sampling array known as the HabCam was lost on May 20 when it separated from its tow line. A [recovery effort](#) was mounted and the HabCam was retrieved. The cruise resumed operations in the early hours of May 29. The Leg 2 planned 230+nm Nantucket Lightship HabCam track was completed. To streamline Leg 3's cruise track, Leg 2 executed three of Leg 3's dredge stations. One of those was a fixed site that yielded more than 63,000 seed almost three years ago. This year, that same station yielded a clean catch of nearly 1200 kg containing more than 12,000 three-year-old scallops. HabCam images also confirm that portions of the Lightship and the area just east of it, where the fixed station is located, are still extraordinarily productive.

Cooperative Sea Turtle Tagging Cruise: The cruise is occurring aboard the commercial scallop vessels F/V *Kathy Ann* and F/V *Ms. Many*. Fourteen tags were deployed on turtles in U.S. Mid-Atlantic shelf waters and another tag on the edge of the Gulf Stream. The tagged turtles on the shelf remained on the shelf; the turtle near the Gulf Stream has moved north with the Gulf Stream and then into the edge of the large warm core ring south of Georges Bank. Biological data was also collected, including blood chemistry, for a joint health assessment project and cloacal samples that revealed the presence of nematode eggs (of the same species thought to infect sea scallops). The cruise is being conducted in partnership with [Coonamessett Farm Foundation](#), supported by the [NEFMC Sea Scallop Research Set-Aside Program](#), and [AMAPPS](#).

ASMFC Northern Shrimp Survey: The NEFSC Ecosystem Survey Branch has finalized an upcoming door calibration experiment. This will address safety issues and industry concerns about our gear. The shrimp survey will occur mid-July through mid-August aboard the R/V *Gloria Michelle*. Considerable time will be spent on calibration efforts between the old and new doors at that time.

Aerial Right Whale Survey: The survey started up for the season in late March, and the team is flying several times a week, weather permitting. On the 23rd of May, substantial time was spent documenting an entangled right whale #1306, also known as Velcro, a 30+ year old male. The entanglement is not considered life threatening at this time: <http://www.nefsc.noaa.gov/psb/surveys/index.html>

Fishery Monitoring Update

New editions of the Northeast Fisheries Observer Program Manuals are available: The very large training manual has been updated and made into three smaller manuals, the *Operations Manual*, *Data Entry Manual*, and *On-Deck Reference Guide*: <http://www.nefsc.noaa.gov/fsb/training/>

Experimental Fishery Permit issued for groundfish electronic monitoring project:

The experimental fishery allows some groundfish sector vessels to use electronic monitoring in lieu of at-sea monitors when selected for coverage. The Fixed Gear Sector, Gulf of Maine Research Institute, and Maine Sectors have vessels ready to participate. More will be added in late summer and fall from Cape Cod Commercial Fishermen's Alliance and Maine once they start groundfishing. NEFSC's Fisheries Sampling Branch will be auditing the electronic monitoring data to develop performance standards for the providers and to determine the appropriate rate of video review in an operational program. Other participants in the EFP include The Nature Conservancy, Maine Coast Fishermen's Association, and fishermen from the NEFS XI, and the Georges Bank Cod Fixed Gear Sector.

Herring/Mackerel Fishery Electronic monitoring: The NEFSC and GARFO expect to issue a contract in June to investigate the use of electronic monitoring to improve catch monitoring and accountability in the herring/mackerel mid-water trawl fishery. We continue to work to educate and inform the industry of this project with the hope of full fleet participation.

Monitoring and Observation Effort Update, June 7, 2016

Northeast Groundfish			
Program	Sea days	Trips	Coverage rate (14% target)
At-Sea Monitoring	80	27	3.4%
Northeast Fishery Observer Program (NEFOP) monitoring	91	28	5.6%
All NEFOP¹			
	600	371	

¹ Since April 1, 2016



A right whale feeding, May 12 during a survey of Howell Swell. Images collected under MMPA research permit #17355.