

NOAA FISHERIES

UPCOMING EVENTS

September 17-21

Summer Flounder SAW Data/Model/
BRP Meeting
Woods Hole, MA

October 2-5

Summer Flounder SAW Model/BRP/
Projection Meeting
Woods Hole, MA

November 27-30

Summer Flounder Stock Assessment
Review Committee Meeting
Woods Hole, MA



Henry Milliken is now the Acting Chief of the Cooperative Research Branch, part of the NEFSC's Fishery Monitoring & Research Division. Milliken, who started the acting position on June 25, has a strong background in research, leadership, and program management with a history of working with the fishing industry. He normally works in the Protected Species Branch in the Resource Evaluation and Assessment Division and leads the Center's conservation engineering efforts to reduce bycatch of sea turtles, cetaceans, and other protected species in commercial fishing gear.

Top Story

Monitoring the Northeast Shelf Ecosystem



Left: Andrew Cogswell from DFO Canada with a ring net later deployed from the *Henry B. Bigelow* in the Gulf of Maine during the late spring EcoMon cruise. Right: Cruise track drawn as a red line on a paper chart showing the areas visited by the survey. Photo credit: Jerry Prezioso, NEFSC

Researchers from the Northeast Fisheries Science Center have been collecting plankton and hydrographic data in waters off the Northeast U.S. coast six times a year since the early 1970s. The current program, Ecosystem Monitoring (EcoMon), began in 1992. Two EcoMon surveys are conducted jointly with the Center's bottom trawl surveys in spring and autumn on the NOAA Ship *Henry B. Bigelow*. The other four surveys in winter, late spring, late summer and late autumn are dedicated to plankton and hydrographic data collection. The late spring 2018 EcoMon survey was conducted May 23-June 6.

Long-term shelf-wide surveys provide data with many applications. Larval fish and eggs from the surveys can be used to calculate estimates of spawning stock biomass and overall fish biodiversity. In addition, analyses of data from surveys provide valuable information on the timing and location of spawning, and may provide an early signal of changes in environmental or habitat needs. Pelagic fish eggs and larvae are often easier to catch than juveniles and adults. Zooplankton collections allow managers to estimate the amount of food available for predators like marine mammals, fish, and seabirds.

EcoMon surveys are conducted at 120 randomly selected stations and 35 fixed stations throughout the continental shelf and slope of the northeastern U.S., from Cape Hatteras, N.C., to Cape Sable, Nova Scotia, and cover all of Georges Bank and the Gulf of Maine. The entire shelf from Cape Hatteras to Cape Sable is known as the Northeast U.S. Continental Shelf Large Marine Ecosystem. The ecosystem is divided into four regions – Mid-Atlantic Bight, Southern New England, Georges Bank, and the Gulf of Maine.

Thirty randomly selected plankton stations are targeted for sampling in each of the four regions on each survey. Thirty-five fixed hydrographic stations were added to the surveys in 2012 to collect additional water temperature and salinity data. Fixed stations are arranged to help oceanographers examine water properties like temperature and salinity, which helps describe the ecosystem and water circulation patterns. Stations are arranged across the shelf in the Mid-Atlantic Bight and Southern New England, from near the coast to off the shelf. Stations in the Georges Bank and Gulf of Maine regions are located along the coast, on the bank, in the deep

Latest NEFSC Publications

Mizuta DD and GH Wikfors. 2018. Seeking the perfect oyster shell: a brief review of the current knowledge. *Reviews in Aquaculture*: 1-17. (<https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12247>).

Lefebvre LS, SG Beyer, DM Stafford, NS Kashef, EJ Dick, SM Sogard, JC Field. 2018. Double or nothing: Plasticity in reproductive output in the chilipepper rockfish (*Sebastes goodei*). *Fisheries Research* 204:258-268.

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. <https://doi.org/10.1371/journal.pone.0196583>

Northeast Fisheries Science Center (NEFSC). 2018. 64th Northeast Regional Stock Assessment Workshop (64th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 18-06; 529 p.

Northeast Fisheries Science Center, Greater Atlantic Regional Fisheries Office. 2018. 2018 Standardized Bycatch Reporting Methodology annual discard report with observer sea day allocation. NOAA Tech Memo NMFS NE-244; 26 p.

Perretti CT, CM Legault. When does smoothing the output of index-based stock assessments improve estimates of population biomass? *Fisheries Research* 207:1-8.

Jeffery, N.W., Wringe, B.F., McBride, M.C., Hamilton, L.C., Stanley, R.R.E., Bernatchez, L., Clément, M., Gilbey, J., Sheehan, T.F., and Bradbury, I.R. 2018. Range-wide regional assignment of Atlantic salmon (*Salmo salar*) using genome wide single-nucleotide polymorphisms. *Fisheries Research* 206:163-175

Cammen, KM, TF Schultz, WD Bowen, MO Hammill, WB Puryear, J Runstadler, FW Wenzel, SA Wood, and M Kinnison. 2018. Genomic signatures of population bottleneck and recovery in Northwest Atlantic pinnipeds. *Ecology and Evolution* 2018:1-16. Doi:10.1002/ece3.

Liebich, KB, JF Kocik and WW Taylor. 2018. Reclaiming a space for diadromous fish in public psyche and sense of place. *Fisheries* 43:231-240.

basins, and in the major channels to record water masses entering and exiting the Gulf. The surveys routinely collect tiny plant and animal plankton and fish larvae and eggs throughout the water column to a maximum depth of 200 meters (about 650 feet) using long, funnel-shaped nets with very fine mesh known as bongo nets. Water temperature and salinity data from the surface to the instrument depth are collected simultaneously with plankton tows using another instrument called a Conductivity, Temperature and Depth (CTD) unit. Other measurements of surface and near-surface conditions are captured with shipboard sensors while the research vessel is both on station and underway. Water samples are collected to measure properties such as nutrient and chlorophyll content. More here: https://www.nefsc.noaa.gov/press_release/pr2018/features/ecomon-spring-2018/

Atlantic Cod Stock Structure Working Group

Researchers in the U.S. and Canada regularly monitor and study cod. These scientists may be working for government, or universities, or non-profit organizations. To compose a complete and detailed picture of the cod stocks means mounting a truly international and interdisciplinary effort to bring together all of the data, studies, and knowledge about stock components. In February 2018, a working group was convened to take on this challenge. Organizers plan a two-year effort: one year to synthesize information about stock structure and one year to look into the management implications of their findings. A one-day symposium June 19 brought fishermen and researchers together at the University of New Hampshire. NEFSC is hosting the working group. More here: https://www.nefsc.noaa.gov/press_release/pr2018/other/cod-stock-structure/

Science Shorts

Reconstruction of Major North Atlantic Circulation System Shows Weakening

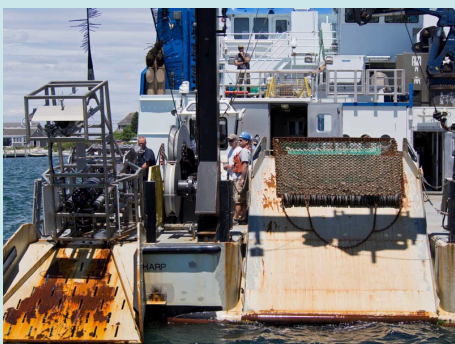
Rising levels of carbon dioxide in the atmosphere have affected one of the global oceans major circulation systems, slowing the redistribution of heat in the North Atlantic Ocean. The resulting changes have been felt along the Northeast U.S. Shelf and in the Gulf of Maine, which has warmed 99 percent faster than the global ocean over the past ten years, impacting distributions of fish and other species and their prey. Researchers from Europe and the NEFSC used computer model simulations to reconstruct changes in AMOC over time. Comparisons of these simulations with recent direct ocean measurements suggest the AMOC has slowed down or weakened by about 15 percent since the 1950s. More here: https://www.nefsc.noaa.gov/press_release/pr2018/scispot/ss1803/

URI Students, Public Join NEFSC Researchers To Study Whales Off MA/RI Coast

NOAA and University of Rhode Island scientists conducting a research cruise off the coast of Massachusetts and Rhode Island invited students and the general public to learn about their research on whales and their environment through live interactive broadcasts from the ship at sea. Christopher Orphanides, a research zoologist in the Protected Species Branch at the NEFSC's Narragansett Laboratory, was chief scientist of the research expedition April 3-8 aboard the RV *Endeavor*, operated by the University of Rhode Island (URI). He and other NEFSC and URI colleagues deployed a variety of instruments to listen for whales and collect plankton samples. Additional oceanographic data was gathered to study how environmental conditions relate to the presence of whales and their prey. More here: https://www.nefsc.noaa.gov/press_release/pr2018/features/endeavor-cruise-2018/



Dozens of harbor seals are visible on this rocky ledge, typical of areas where the seals haul out in Maine. Photo credit: NOAA Fisheries/Peter Duley, NEFSC



HabCam is at left, the scallop dredge at right in this photo of the stern of the *Hugh R. Sharp* during a Woods Hole port call between legs of the sea scallop survey. Photo credit: Shelley Dawicki, NEFSC



Chris Sasso of the SEFSC attaches a satellite tag to a leatherback turtle while veterinarian Lori Westmoreland (NCSU) prepares to measure the fat layer using ultrasound during studies off North Carolina in May. Photo Credit: NOAA Fisheries/Jamie Clark



Commander Nicole Cabana pins the new Officer in Charge of the *R/V Gloria Michelle*, LTJG Christopher Gallagher. Captain Michael Abbott, NOAA Corps (Ret.) is at the podium and presided at the June 12 ceremony. Cabana is the new NEFSC Chief of Staff. Photo credit: NOAA Fisheries/Heather Soulen

Harbor Seals: Aerial Surveys over Maine and Tagging in Virginia

The Northeast Fisheries Science Center completed an aerial survey of harbor seals along the entire coast of Maine, the first since 2012. A NOAA Twin Otter aircraft covered the area in six days, surveying nearly 1,000 locations during harbor seal pupping season, which occurs in May and June. Results of the recent survey, conducted May 19-25, will be compared with the abundance estimate from the 2012 survey. In February, several NEFSC staff joined a U.S. Navy harbor seal tracking and tagging project in the Chesapeake Bay and Virginia nearshore waters. More here: https://www.nefsc.noaa.gov/press_release/pr2018/features/harbor-seal-survey/

Research Surveys Measure Scallop Abundance

An overview of sea scallop survey operations aboard the *R/V Hugh R. Sharp*: https://www.nefsc.noaa.gov/press_release/pr2018/features/scallop-research-surveys/

Leatherback Turtles Tagged for First Time off North Carolina

NEFSC researchers and colleagues captured and tagged leatherback sea turtles off Beaufort, North Carolina May 7-16, continuing a 2017 project to assess abundance, movements, and behavior. It is the first time leatherbacks have been tagged off North Carolina, where they aggregate in coastal waters during their northward spring migration. The two-part field program involved using small vessels for capturing and sampling, and deploying a new suction-cup tag developed by DFO and partners. More here: https://www.nefsc.noaa.gov/press_release/pr2018/features/leatherback-turtle-record-2018/

Change of Command for the *R/V Gloria Michelle*

Honoring a long-held maritime tradition, the command of the NEFSC's 72-foot *R/V Gloria Michelle* was transferred June 12 from Officer in Charge (OIC) Andrew Reynaga to Junior Officer in Charge (JOIC) Christopher Gallagher. LT Reynaga assumed a new position July 2 as Antarctic Ecosystem Biologist at the Southwest Fisheries Science Center in La Jolla, California. LT Benjamin Vandine reported for duty May 18 as the new JOIC. His last assignment was as vessel operations coordinator for the Atlantic Oceanographic and Meteorological Laboratory in Miami. While there he completed a master's degree in fisheries and aquatic sciences at the University of Florida. More here: https://www.nefsc.noaa.gov/press_release/pr2018/features/gloria-michelle-command-change-2018/

Vessel and Field Updates

NOAA Ship *Henry B. Bigelow* Completes Spring Bottom Trawl Survey

The spring bottom trawl survey began March 12 and was completed in mid-May. A shipyard delay, mechanical issues once underway, and poor weather shaved 21 planned sea days off the cruise plan. To maximize use of the remaining days, the number of stations in each area surveyed was adjusted. The 15 sampling stations planned for south of Cape Hatteras, NC were not attempted. All remaining areas were sampled, but fewer stations than planned were attempted in many. In all, 90% of planned trawls were completed in the Mid-Atlantic Bight, 75% in Southern New England, 65% on Georges Bank, and 50% in the Gulf of Maine. Temperature and salinity measurements were conducted at all stations occupied, roughly 70% of those that were originally planned. Plankton tows were also planned at a subset of these stations; roughly 65% were completed successfully. More here:

https://www.nefsc.noaa.gov/press_release/pr2018/other/2018-spring-bts-wrap/



Jillian Price measures the length of a spiny dogfish in the fish processing lab aboard the *Henry B. Bigelow* during the spring bottom trawl survey. Photo credit: Tom Jenkins, NOAA Teacher at Sea



The checker (left) and sampling stations are ready to go aboard the R/V *Gloria Michelle* in early May, prior to the start of the Massachusetts groundfish survey. Photo credit: Shelley Dawicki, NEFSC



A dusky shark on the line before being brought aboard for tagging and later release during the NEFSC's coastal shark bottom longline survey. Photo credit: Joe Mello



Unusual yellow sea raven photographed by a Northeast fishery observer while sampling catch aboard a commercial fishing vessel. Photo credit: NOAA Fisheries/NEFSC/NEFOP

NEFSC Aerial Survey Team Moves to Canadian Waters for Summer Months

The NEFSC aerial survey team headed north at the end of May when most whales had left Cape Cod and Gulf of Maine waters to help with North Atlantic right whale surveys in Canadian waters. In recent years, right whales have been spending less time in their usual summer feeding grounds in the Bay of Fundy and have been aggregating further north in the Gulf of St. Lawrence. The NEFSC team and Twin Otter will be working June 1 - August 31 from a base in Moncton, New Brunswick. In June the team recorded 79 fin whales, 4 blue whales, 21 humpback whales, and 301 right whales. Preliminary photo identification indicates that 111 individual right whales were sighted in the Gulf of St. Lawrence in June by the NEFSC survey.

R/V *Gloria Michelle* Begins Shrimp Survey

Door testing for the shrimp net was conducted in late June with a focus on collecting data to be used for trawl door calibration between the doors used during previous survey years and the style that will be used for the 2018 survey, which will be conducted July 8 – August 5.

2018 Integrated Benthic/Sea Scallop Survey Completed

The survey aboard the R/V *Hugh R. Sharp* got underway on May 16 and completed sampling from the Mid-Atlantic Bight to Georges Bank on June 18 when they returned to port in Woods Hole. In addition to the collection of dredge samples for biological sampling of scallops, 1797 nautical miles of HabCam transects were completed. Over 6 million images were collected on the transects, and 73,075 were viewed and annotated by cruise personnel while sailing.

Coastal Shark Bottom Longline Survey Completed, First Since 2015

Members of the NEFSC's Apex Predators Program conducted the survey in waters from Florida to the Carolinas aboard the commercial vessel *Eagle Eye II*.

First Year of Cooperative Bottom Longline Survey Underway

Year five of the survey began in late April aboard two commercial fishing vessels. The vessels and NEFSC's Cooperative Research Branch team aboard sampled at 45 stations over a three-week period. Rocky habitat for groundfish plus cusk, wolffish, halibut and thorny skates is targeted. The weather was better than in past years, catches were heavier and more samples were collected. The survey crew is also collaborating with the University of Florida this year to collect DNA samples on thorny skates to explore population and evolutionary questions.

Fishery Monitoring Update

AIS, Inc, Wins Northeast Fisheries Observer Contract

The scientific services company headquartered in Marion, Mass., was awarded a five-year, \$50 million contract to provide fisheries observers for federal monitoring programs in the Northeast. The award was announced in early June.

Observers, CRP Staff Tour Ports, Conduct Outreach

Fisheries Sampling Branch staff toured Point Pleasant, NJ in June with newly trained observers. They met vessel captains and fishermen and discussed dock and vessel interactions and safety. Cooperative Research Program staff visited Montauk, NY, May 3 to talk with fishermen about electronic reporting software.

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