

The Northeast Regional Habitat Assessment:

A collaborative, multi-disciplinary project to develop decision support products for marine fish habitat management

Michelle Bachman, New England Fishery Management Council, Inshore Team Co-Lead (mbachman@nefmc.org)

Jessica Coakley, Mid-Atlantic Fishery Management Council, Coordinator, Inshore Team Co-Lead (jcoakley@mafmc.org)

Chris Haak, Monmouth University/NOAA Northeast Fisheries Science Center, Research Scientist (chaak@monmouth.edu)

Tori Kentner, Mid-Atlantic Fishery Management Council, Spatial Ecologist (tkentner@mafmc.org)

Laurel Smith, NOAA Northeast Fisheries Science Center, Offshore Team Lead (laurel.smith@noaa.gov)

National Fish Habitat Partnership

September 12, 2023

NRHA Goal: To describe and characterize estuarine, coastal, and offshore fish habitat distribution, abundance, and quality in the Northeast.

Four actions were identified as necessary to meet this goal:

- 1) Inshore fish habitat assessment
 - a) Fish distribution and abundance
 - b) Habitat distribution, status, and trends
- 2) Habitat vulnerability including response to changes in climate,
- 3) Spatial descriptions of species habitat use in the offshore area, and,
- 4) Habitat data visualization and decision support tools.

Acknowledgments

The Steering Committee:

Mid-Atlantic Fishery Management Council - Christopher Moore
New England Fishery Management Council - Thomas Nies
Atlantic Coast Fish Habitat Partnership - Lisa Havel
Atlantic States Marine Fisheries Commission - Bob Beal (designee Patrick Campfield)
Duke University, Marine Spatial Ecology - Patrick Halpin
Monmouth University, Urban Coast Institute - Tony McDonald
National Fish Habitat Partnership, Science and Data Committee - Gary Whelan
NOAA Fisheries Offices of Habitat Conservation - Kara Meckley, Lou Chiarella
NOAA NCCOS Marine Spatial Ecology Division - Mark Monaco
NOAA Fisheries Office of Science and Technology - Peg Brady, Tony Marshak
NOAA Northeast Fisheries Science Center - Thomas Noji (retired), Dan Wiczorak
The Nature Conservancy - Kate Wilke

Action Teams:

Gulf of Maine Research Institute - Kathy Mills
Maryland DNR - Marek Topolski
Massachusetts DMF - Mark Rousseau
NOAA Fisheries GARFO - David Stevenson, Alison Verkade,
NOAA Fisheries NEFSC - Kevin Friedland, Donna Johnson, Ryan Morse, Dave Packer, Vince Saba, Harvey Walsh
NOAA NCCOS - Andrew Leight
The Nature Conservancy - Bryan DeAngelis, Rich Bell, Marta Ribera
The PEW Charitable Trusts - Zack Greenberg
Rhode Island DEM - Eric Schneider
US Fish and Wildlife Service - Julie Devers
US Geologic Service - Stephen Faulkner
Virginia Institute of Marine Sciences - Robert Latour

NRHA/FSCVA/HCVA Crosswalk: UMass/SMASST Gavin Fay and Madeleine Guyant, and Project CoPIs, Mike Johnson, Tauna Rankin, Wendy Morrison (NOAA Fisheries)

Other Collaborators: David (Moe) Nelson (NOAA NOS), Aaron Kornbluth (PEW), Lisa Havel and Pat Campfield (ASMFC/ACFHP), Karl Vilacoba, Emily Shumchenia, and Nick Napoli (MARCO/NROC), Sarah Gaichas and Kim Hyde (NOAA Fisheries NEFSC), and Emily Farr.

Special thanks to the Councils and NOAA Fisheries Office of Habitat Conservation and Office of Science and Technology for the substantial support provided to NRHA. In addition, this work would not be possible without the support of our many partner organizations represented on our Steering Committee, action team members, and other collaborators.

Focus Species (65+, important to managers)

- **Mid-Atlantic Council:** Atlantic and chub mackerel, butterfish, longfin and shortfin squid, surfclam, ocean quahog, summer flounder, scup, black sea bass, bluefish, golden and blueline tilefish, spiny dogfish
- **New England Council:** Cod, cusk, haddock, pollock, Acadian redfish, plaice, halibut, winter flounder, witch flounder, yellowtail flounder, wolffish, windowpane, ocean pout, offshore, red, and white hake, monkfish, Atlantic herring, salmon, skates (seven species), red crab, sea scallop
- **Additional Atlantic States Marine Fisheries Commission (ASMFC):** Eel, lobster, croaker, menhaden, striped bass, Atlantic sturgeon, black drum, cobia, horseshoe crab, Jonah crab, northern shrimp, red drum, shad and river herring, Spanish mackerel, spot, spotted seatrout, tautog, weakfish, coastal sharks
- **Highly migratory with Habitat Areas of Particular Concern (HAPC) designations:** Sandbar shark, dusky shark

Assessment Products at a Glance

Data inventory

- Catch data from state and federal fisheries-independent surveys; including comparison table
- Environmental datasets (used as model covariates)
- Gathered habitat data sets (oysters, SAV, etc.) but not displayed
- One page metadata document for each survey or data set

Habitat use

- Species profiles: Summarize life history and habitat use for each focus species
- Stage-based, single species and joint species distribution models (SDMs)
- Inshore Habitat Report

Climate vulnerability - Species-Habitat Crosswalk

- Species-habitat matrix and climate vulnerability narratives

Fish Habitat data visualization and decision support tools

- NRHA Data Explorer: R-Shiny application used to show trends in species distribution and abundance at state and regional scales, and to share other products and documentation
- Working with partners at Mid-Atlantic Ocean Data Portal, Northeast Ocean Data Portal, and possibly NOAA DisMAP to share selected products

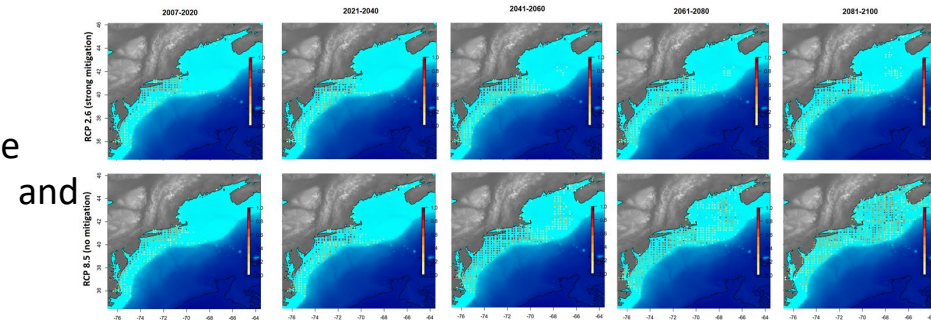
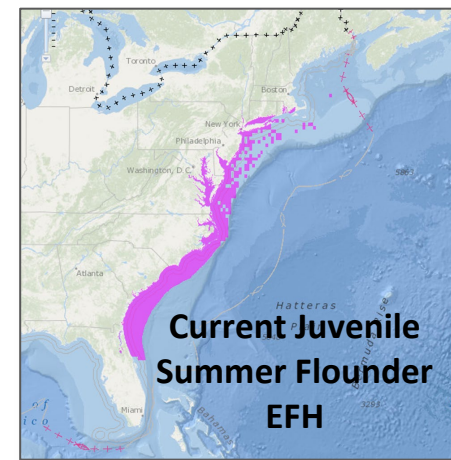
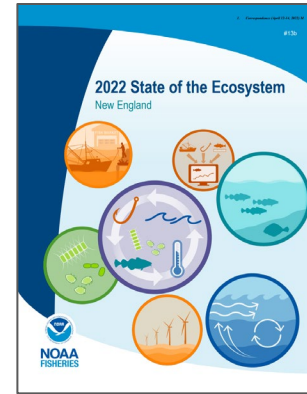
Scientific publications/reports

- Community-level Basis Function Modeling methods paper, R package; Optical paper in development

Selected applications for NRHA products

Applications for NRHA Products

- **Essential Fish Habitat:** NRHA provides more specificity on which environmental factors influence species distribution
 - EFH text descriptions and maps
 - Habitat area of particular concern (HAPC) designations
 - Potential for shifts due to climate change and adaptive approach with automated updates
- **State of the Ecosystem Reports:** NRHA provides habitat and climate change information on managed species
- **Single Species Assessments:** Addresses Ecosystem TORs (e.g. butterflyfish 2022)
 - NRHA provides historic distributions and projected distributions due to climate change
 - Links between environmental drivers stock health and recruitment



Publicly Available Data Portals

- Intent is to make NRHA products as widely available as possible
- Northeast Ocean Data Portal
- Mid-Atlantic Ocean Data Portal (MARCO)
- NMFS Distribution Mapping and Analysis Portal (DisMAP)
- NRHA Data Explorer (R-Shiny)

