SNEC AFS 2026 SUMMER SCIENCE MEETING
Wednesday, June 17th, 2026
U.S. Fish and Wildlife Service, Hadley, MA

Welcome:

8:30 – 9:00	***Registration and Coffee***
9:00 – 9:10	**Opening Comments**. *Michael Burgess*, SNEC President

Plenary Presentation:

9:10 – 10:10	**Preparing for the sea: comparative physiological strategies in anadromous fish and implications for management.** McCormick, Stephen D.

10:10 – 10:20	***Break***

Oral presentations, Morning Session:

10:20 – 10:35	**Understanding impacts of changing environments and fishing pressure on the dolphinfish (*Coryphaena hippurus*).** Gosciminski, Corey, Wessley Merten, and Ben Galuardi.
10:35 – 10:50	**Between a rockpile and a hard pace: Mapping the folk hydronymy of southern New England.** Gilmore, Amanda.
10:50 – 11:05	**Microplastic exposure and antioxidant gene expression in wild estuarine killifish (*Fundulus* spp.).** ** Deesha, FNU, Christian W. Conroy, Alireza G. Senejani, and Eddie D. Luzik.
11:05 – 11:20	**Spatiotemporal patterns in elasmobranch community structure in Block Island coastal waters using Baited Remote Underwater Video (BRUVs).** ** Baldwin, Grace, David L. Taylor, Jake Beretta, Alex Korbobo, and Jon F. Dodd.
11:20 – 11:35	**Novel East Coast ladder design shows improved passage for American Shad (*Alosa sapidissima*) and Sea Lamprey (*Petromyzon marinus*).** ** Ryerson, Owen, Kevin Mulligan, Bjorn Lake, Nick Anderson, Alexander Haro, and Casey Brown.

11:35 – 12:15	***Awards and Business Meeting***

12:15 – 1:15	***Lunch***

Oral presentations, Afternoon Session I:

1:15 – 1:30	**Simulating change to the New England seafood system using a qualitative model of the groundfish supply chain.** ** Hope, Sarah, Madeleine Guyant, Kate Masury, and Gavin Fay.
1:30 – 1:45	**Energy content determination of Atlantic forage species through proximate composition analysis.** ** Capek, Rose and Kenneth Oliveira.
1:45 – 2:00	**Assessing river herring habitat after aquatic herbicide (fluridone) application.** Reusch, Caroline.

2:00 – 2:15	***Break***
2:15 – 2:45	***Networking Activity***

Oral presentations, Afternoon Session II:

3:00 – 3:15	**Exploratory analysis of long-term migration dynamics of American Shad (*Alosa sapidissima*) using fish passage data.** Savatorova, Viktoria, Loren Tardif, Michelle Kraczkowski, Kelli Mosca, and Jacqueline Benway.
3:15 – 3:30	**Microgeographic variation of eastern Blacknose Dace (*Rhinichthys atratulus)* populations.** ** Gerbi, Elizabeth, Michaela Somers, Timothy S. Earley, Antonio Machado, and Barry Chernoff.
3:30 – 3:45	**Abiotic and biotic drivers of declining flounder abundance, distribution, and condition in Long Island Sound, USA**. Zavell, Max, Katherine Helmer, Kelli Mosca, Matthew Gates, Kurt Gottschall, Paola Batta-Lona, Hannes Baumann, Sebastian Klarian, Eric T. Schultz.

3:45 – 4:00	**Closing comments,** *Max Zavell, SNEC President*

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ABSTRACTS

*** Denotes student presenter*

Plenary Presentation:

Preparing for the sea: comparative physiological strategies in anadromous fish and implications for management.

McCormick, Stephen D. [a b]

[a] Conte Anadromous Fish Research Center, US Geological Survey, Turners Falls, MA USA

[b] Department of Biology, University of Massachusetts, Amherst MA USA

Anadromous species must make the transition from freshwater to seawater at least once in their lifetime. Salmon undergo morphological, physiological and behavioral changes that are preparatory and adaptive for seawater entry and are collectively known as the parr-smolt transformation. Smolt development is regulated by environmental factors such as photoperiod and temperature and mediated by the neuroendocrine system. All anadromous species appear unable to survive in seawater early in ontogeny, and most undergo developmental increases in salinity tolerance. The diversity of physiological strategies and the timing of seawater entry will be presented for the native anadromous species of New England, and implications for their management will be discussed.

Understanding impacts of changing environments and fishing pressure on the dolphinfish (*Coryphaena hippurus*)

Merten, Wessley [a], Corey Gosciminski [a], and Ben Galuardi [b]

[a] Beyond Our Shores Foundation, Newport, RI

[b] Greater Atlantic Regional Fisheries Office, NOAA National Marine Fisheries Service, Gloucester, MA

A citizen-science driven multi-faceted data collection effort is ongoing to examine how Dolphinfish (*Coryphaena hippurus*), an iconic game fish and important commercial seafood, is reacting to changing environments and increased fishing pressure in the western central Atlantic Ocean (WCA). A combination of conventional and satellite tagging with the public as well as analysis of historical movements and oceanographic and meteorological datasets is leading to the development of seasonal Markovian movement matrices in order to validate the percent of movement of the species in the WCA. This approach is compared to historical exploitation patterns as well as ongoing vessel catch and effort records compiled with volunteers based in Puerto Rico, the Dominican Republic, and along the U.S. East Coast. This project combines the historical results of 25-years of tagging data (40,000 tag deployments, 900 recaptures, 19 satellite tags) with ongoing field work whereby 17 offshore outings over the last 18 months with the public has led to 308 tagged Dolphinfish including 18 satellite tag deployments between the Mid-Atlantic Bight, Puerto Rico, and St. Croix. Additional outings with the public to deploy at least 12 more satellite tag deployments are scheduled for the next year. Results will be used to improve management of Dolphinfish as part of the Caribbean Fishery Management Council's pelagic fishery management plan as well as provide additional guidance for an ongoing Management Strategy Evaluation being conducted by NOAA Fisheries with the South Atlantic Fishery Management Council.

Between a Rockpile and a Hard Place: Mapping the Folk Hydronymy of Southern New England

Gilmore, Amanda [a]

[a] University of Rhode Island, South Kingstown, RI

Fishermen in Southern New England (SNE) utilize a wide variety of place-names to delineate areas of significance on the open ocean. This information provides new revelations not just about the way fishermen navigate the ocean, but also insight about overlaps between Local Ecological Knowledge (LEK) and Fishermen's Ecological Knowledge in the historically prolific fishing sector of Southern New England. Prior to this study, this collection of vernacular place names on the water, or folk-hydronymy, had never been documented or analyzed, as it was held almost entirely in cognitive maps and proliferated through communication with other fishermen. This project's goal was to map the folk-hydronymy of fishermen working in Southern New England, explore the role of narrative in preserving hydronym history, and assess the relationship between place naming and FEK. A total of 113 unique hydronyms were mapped, categorized and analyzed, revealing a large quantity of Descriptive and Associative place names and the use of vernacular and story-telling to transfer FEK between and amongst generations. In addition to the informally-held nature of this dataset, external factors like graying of the fleet, advancements in navigational technology and changes in bathymetric contours on nautical charts all threaten to disrupt the proliferation of folk-hydronymy in SNE.

Microplastic exposure and antioxidant gene expression in wild estuarine killifish (*Fundulus* spp.)

** Deesha, FNU [a], Christian W. Conroy [a], Alireza G. Senejani [a], and Eddie D. Luzik [b]

[a] Department of Biology and Environmental Science, University of New Haven, West Haven, CT

[b] Department of Chemistry and Chemical & Biomedical Engineering, University of New Haven, West Haven, CT

Microplastics are now ubiquitous in the estuarine environment, raising concerns about their biological impacts on organisms. Killifish (*Fundulus*) play a key role in estuarine food webs and commonly serve as sentinel species in studies on anthropogenic impacts. In this study, wild *Fundulus* were collected from five different sites in the lower Quinnipiac River (upstream and downstream). Livers and stomachs were digested using 10% KOH and vacuum filtered, and the isolated microplastics were quantified. Preliminary results indicate that microplastics were detected in fish from all sites, with spatial variability in abundance which reflects the differences in local pollution sources and habitat characteristics. To understand how microplastic exposure affects cellular and molecular changes related to killifish health, we measured changes in stress-related genes involved in antioxidant defense (SOD and CAT) using quantitative PCR, with gene expression normalized to the housekeeping gene Î²-actin. Additionally, polymers were identified by Raman spectroscopy to infer potential sources. We hypothesized that higher microplastic burden increases antioxidant gene expression in *Fundulus*. These findings provide insights into microplastic accumulation in wild estuarine fish populations and associated physiological responses, highlighting the importance of monitoring and managing microplastic pollution in estuarine ecosystems.

Spatiotemporal patterns in elasmobranch community structure in Block Island coastal waters using Baited Remote Underwater Video (BRUVs)

** Baldwin, Grace [a], David L. Taylor [a], Jake Beretta [b], Alex Korbobo [b], and Jon F. Dodd [b]

[a] Department of Marine Biology, Roger Williams University, Bristol, RI

[b] Atlantic Shark Institute, South Kingstown, RI

Block Island elasmobranch community structure was examined using non-invasive tools assessing spatiotemporal patterns in species occurrence, abundance and diversity. BRUVs were deployed at five sites from June-October during 2021-2025 (n = 179 deployments); each deployment treated as an independent sample.

Twelve elasmobranch species were observed, five sharks (Great White, Sand Tiger, Sandbar, Smooth Dogfish, and Spiny Dogfish) and seven batoids (Barndoor Skate, Clearnose Skate, Little Skate, Winter Skate, Bullnoses Eagle Stingray, Cownose Stingray, and Roughtail Stingray). Batoid community showed limited spatial variation (site: $p = 0.13$), but was dynamic temporally; Highest abundances June-August and declines September-October (year: $p < 0.001$, month: $p < 0.05$). In contrast, shark community structure remained consistent across all parameters ($p = 0.10$-0.62).

Smooth Dogfish, the dominant group, appeared across wide temperature ranges (10.9 to 24.6 °C), but mostly in warmer water (xÌ„ = 20.3 ± 2.6), whereas skates and Spiny Dogfish also had broad ranges (10.9 to 23.2 °C), but occupied cooler waters (xÌ„ = 18.0 ± 5.0 °C), while rays and large sharks were found in the warmest temperatures (16.0 to 24.6 °C, xÌ„ = 20.8 ± 2.0 °C).

These findings illustrate species-specific habitat use and reflect temporal shifts associated with environmental conditions, migration, and prey availability. As BRUVs monitor biodiversity and detect changes in species occurrence and community structure, they serve as potential early indicators of ecosystem change in Northwest Atlantic waters.

Novel East Coast Ladder design shows improved passage for American Shad *(Alosa sapidissima*) and Sea Lamprey (*Petromyzon marinus*)

** Ryerson, Owen [a], Kevin Mulligan [b], Bjorn Lake [c], Nick Anderson [d], Alexander Haro [b], and Casey Brown [a]

[a] Department of Civil and Environmental Engineering, University of Massachusetts, Amherst, MA

[b] Eastern Ecological Science Center at the S.O. Conte Research Laboratory, U.S. Geologic Survey, Turners Falls, MA

[c] Inter Fluve, Cambridge MA

[d] NOAA Fisheries

We present a novel baffle fish ladder design, the East Coast Ladder (ECL), that is tailored to the swimming abilities of East Coast fish species. We propose the ECL as a potential replacement for the ubiquitous Denil ladder, the most common type of volitional fishway in the Northeast United States. The Denil ladder was designed for salmonids and remains standard in the eastern United States despite substantial evidence showing reduced passage performance for non-salmonid species. The new ECL consists of wall-mounted vertical quarter-cylinder baffles designed to reduce velocities. Unlike the Denil ladder, where velocities increase significantly with flow depth, velocities in the ECL remain constant as depth increases due to the vertically uniform design. To evaluate the ECL design, flume experiments were conducted with American Shad (*Alosa sapidissima*, n = 278) and Sea Lamprey (*Petromyzon marinus*, n = 144) in both ECL and Denil ladders. Passage trials were conducted in the USGS Eastern Ecological Science Center S.O. Conte Laboratory in large open-channel flume during the 2025 migration season. Shad and Lamprey were collected from the Connecticut River and used as subjects in volitional entry ECL and Denil ladder trials. Cox proportional-hazards models were used to assess passage efficiency. Both Shad and Lamprey show significant passage efficiency gains in the ECL compared to the Denil ladder across flow depth and temperature conditions. The most substantial improvements were observed in Shad, where the ECL significantly outperformed the Denil ladder in total passage success.

Exploratory Analysis of Long-Term Migration Dynamics of American Shad (*Alosa sapidissima*) Using Fish Passage Data

Savatorova, Viktoria [a], Loren Tardif [b], Michelle Kraczkowski [b], Kelli Mosca [c], and Jacqueline Benway [c]

[a] Central Connecticut State University, Department of Mathematical Sciences, New Britain, CT

[b] Central Connecticut State University, Biology Department, New Britain, CT

[c] Connecticut Department of Energy and Environmental Protection Marine Fisheries Program, Old Lyme, CT

American Shad (*Alosa sapidissima*) is an anadromous fish that is a migratory native to the Connecticut River. Their migration in the lower part of Connecticut River has been monitored for decades through daily fish passage counts at the Holyoke Dam in Holyoke, Massachusetts. We present an exploratory analysis of long-term migration patterns using historical fish lift records and environmental data. The trends provide insight into the relationships and changes in these variables over time. We analyzed full seasonal migration curves to characterize interannual variability in timing and run structure among years. The analysis identified two dominant trends. The first primarily represented earlier versus later migration timing, while the second reflected differences in migration synchronization and fragmentation among various years. Mean river discharge during the migration season was associated with migration timing, with higher-flow years tending to exhibit later migration progression. Repeated extreme-flow disturbances were associated with more prolonged or fragmented run structure. Several anomalous years were not fully explained by broad hydrologic or temperature summaries, suggesting that additional factors such as fish lift operations, stream flow rate and discharge, short-term environmental variability, or changes in population structure may also influence observed migration patterns. By examining the full seasonal pattern of annual fish passage, this approach provides additional insight into long-term variation in American Shad migration at Holyoke Dam.

Simulating change to the New England seafood system using a qualitative model of the groundfish supply chain

** Hope, Sarah [a], Madeleine Guyant [a], Kate Masury [b], and Gavin Fay [a]

[a] School for Marine Science and Technology, University of Massachusetts, Dartmouth, MA

[b] Eating with the Ecosystem, Wakefield, RI

Seafood supply chains are complex social-ecological systems that are impacted by ecological, social, and economic changes such as species population fluctuations, management decisions, and market dynamics. Collaborating with a seafood industry advisory group, we identified vulnerabilities, characteristics, and relationships between components in New England seafood supply chains, and developed 19 qualitative models for species and groups of interest. Using groundfish as a case study, we simulated the net effects of two scenarios by conducting a loop analysis and press perturbation analysis on the supply chain model. The model was validated by responses that were mostly consistent with the advisory group, but simulations produced some variation suggesting that fluctuations of ex-vessel price of haddock and landings volume may trigger complex interactions within the system which impact supply chain components. The results indicate that the Groundfish supply chain is particularly sensitive to fluctuations in landings, ex-vessel pricing, and imports and that these components are important to growing our understanding of vulnerabilities to the fishery. This study demonstrates the value of qualitative models co-produced with industry knowledge-holders in assessing systemic change to New England fisheries supply chains and identifying opportunities to build resilience and maintain market stability.

Energy Content Determination of Atlantic Forage Species through Proximate Composition Analysis

** Capek, Rose [a], and Oliveira Kenneth [a]

[a] University of Massachusetts Dartmouth, Dartmouth, MA

Energy density data can give a comprehensive view of a species's condition as well as their predators. Energy moves through an ecosystem and is constantly changing. It fluctuates due to metabolic processes but also external factors such as seasonality and location. Estimating energy density for a species is possible when it is plotted against percent dry weight; however, in fishes, energy data is still not widely studied, especially for small forage fish that are not a part of the larger ecosystem surveys. Our study estimates the energy density of a small forage fish, and presents the relationship of energy density against percent dry weight over a one-year period. Samples were collected from locations along the southeast coast of Massachusetts from 2023-2024. Proximate composition analysis was completed on each specimen to achieve energy density (kJ/g). The percent dry weight and energy density relationship was developed along with a month-by-month distribution of energy for the species. The plotted energy density-percent dry weight curve was confirmed to be a reliable predictor of energy density. Seasonal trends were consistent with breeding periods but wavered in locational symmetry. This standard relationship can be used to estimate the energy density of an individual of their species as well as when their energetic content peaks. This study shows when it would be advantageous for predators to consume this species and could provide insight into predator condition and further management strategies.

Assessing River Herring habitat after aquatic herbicide (fluridone) application

Caroline Reusch [a]

[a] Bridgewater State University, Bridgewater, MA

Invasive aquatic plants (IAPs) disrupt freshwater ecosystems globally by modifying physical and chemical conditions, reducing habitat suitability for diadromous fish such as River Herring. Populations of River Herring in Massachusetts have declined in part due to IAPs, yet the indirect ecological effects of aquatic herbicides used to manage them remain poorly understood. This study examined the impacts of the aquatic herbicide fluridone on juvenile River Herring habitat in eight lakes in southeastern Massachusetts between June and August 2024. Four lakes were treated with fluridone and four served as untreated reference lakes.

Zooplankton abundance increased in treated lakes, driven by nutrient enrichment and oxygen depletion, while richness and Shannon diversity remained stable. Dissolved oxygen (DO) and pH shifts altered community structure, potentially constraining prey quality and habitat suitability for River Herring. Substrate conditions varied across lakes without consistent treatment effects, reflecting site-specific and scale-dependent dynamics. These findings highlight the complexity of short-term ecological responses to IAP management. Incorporating zooplankton dynamics into habitat assessments will improve understanding of how herbicide treatments, like fluridone, influence freshwater ecosystems and the recovery of diadromous fish."

Microgeographic variation of Eastern Blacknose Dace (*Rhinichthys atratulus*) populations

** Gerbi, Elizabeth [a], Michaela Somers [b], Timothy S. Earley [b], Antonio Machado [b], and Barry Chernoff [a b]

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Fragmentation and isolation of populations within a species may lead to genetic and morphometric differences between populations. This divergence can be the result of several factors, including genetic drift, phenotypic plasticity, and rapid evolution. Recently, such differentiation among populations has been found across geographic scales much smaller than previously thought, possibly driven by differences in flow regime, predation, human impact, or surrounding habitat differences. *Rhinichthys atratulus*, the Eastern Blacknose Dace, is a wide ranging minnow found throughout the Eastern United States. Previous evidence suggests population-level genetic divergence among R. atratulus populations within the region. Here we examined morphometric variation of R. atratulus populations among six sites within a 1km section of Allyn Brook in Durham, CT. Approximately thirty fish per population were collected and scanned and sixteen homologous landmarks were digitized for each specimen. The raw coordinates were then Procrustes transformed. We used PCAs and MANOVAs to test null hypotheses of homogeneity of shapes and allometries among populations, and found significant differences in body shape among three site groupings. These results suggest strong microgeographic variation within a small section of Allyn Brook lacking physical barriers to gene-flow among populations.

Abiotic and biotic drivers of declining flounder abundance, distribution, and condition in Long Island Sound, USA

Zavell, Max [a], Katherine Helmer [b], Kelli Mosca [c], Matthew Gates [c], Kurt Gottschall [c], Paola Batta-Lona [d], Hannes Baumann [d], Sebastian Klarian [e], and Eric Schultz [b]

[a] School for Marine Science and Technology, University of Massachusetts Dartmouth

[b] Department of Ecology and Evolution, University of Connecticut

[c] Marine Fisheries Division, CT DEEP

[d] Department of Marine Sciences, University of Connecticut

[e] Universidad Andres Bello

Concurrent anthropogenic changes have restructured marine community assemblages and trophic dynamics in Long Island Sound (LIS, between Connecticut and New York, USA). Among the affected taxa are species of flatfishes such as Winter Flounder (*Pseudopleuronectes americanus*) and Summer Flounder (*Paralichthys dentatus*). Winter Flounder populations have collapsed throughout southern New England, and although adult populations of Summer Flounder have remained stable, their recruitment has recently declined. Both species have been designated as "species of greatest conservation need". To quantify potential drivers affecting Winter and Summer Flounder population dynamics we analyzed over forty years of Long Island Sound Trawl Survey (LISTS) data to assess changes in environmental variables (substrate, temperature, depth, salinity, dissolved oxygen) and species composition (competitors and prey) in LIS and how these changes might affect population dynamics of these species. Further, we developed predictive models that will inform management responses for flatfish species under continued abiotic and biotic change. Between 1990 and 2024, mean Winter Flounder abundance decreased by ~97%, while mean Summer Flounder abundance decreased by ~69% and remained stable through 2024. Mean competitor species abundance increased by ~295% while prey species abundance decreased by ~74% between 1995 and 2024. Initial analysis suggests that both species preferentially occupy habitats at depths < 20 meters. Declines in the abundance of both species are associated with warmer bottom water temperatures and increases in competitor abundance. Abiotic and biotic change will have an ongoing effect on flatfish habitat usage and abundance.