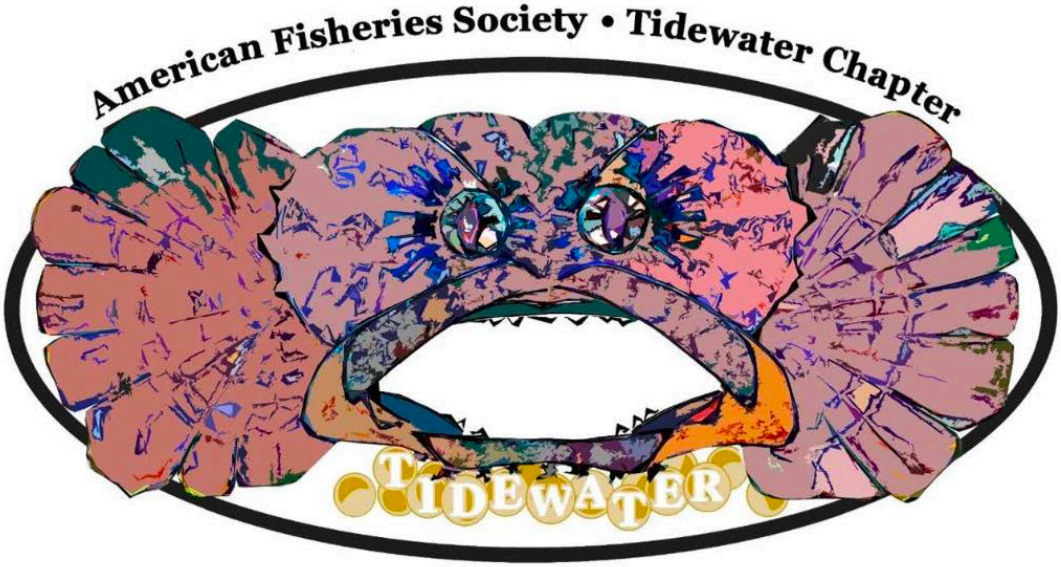
American Fisheries Society

39th Annual Tidewater Chapter Meeting



March 19-21st, 2026

Solomons, MD

Meeting Program Table of Contents

Meeting Sponsors

Additional Sponsors

Tina Berger

Johnna Brooks

Lael Collins

Maya Drzewicki

Sarah Houde

Sara Mirabilio

Olivia Pares

Sally Roman

Dave Secor

Ryan Woodland

…and a big thank you to

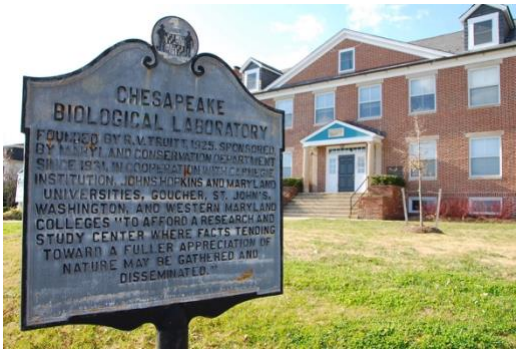
Stacey Hutchinson

The CBL Facilities Team

Meeting Venues

Chesapeake Biological Laboratory

Located where the Patuxent River meets the Chesapeake Bay, the Chesapeake Biological Laboratory (CBL) is the oldest publicly supported marine laboratory on the East Coast. Founded in 1925, it has been a national leader in fisheries, estuarine ecology, environmental chemistry and toxicology for more than 90 years. From advising state and national agencies on sustainable fisheries management and breaking new ground in understanding how chemicals move between the atmosphere, sediments, and water to renowned work on nutrient dynamics and the food web, the lab is developing new scientific approaches to solving the major environmental problems that face our world. This year's poster social will be held at CBL's newly opened Chesapeake Analytics Collaborative Building (CACB).



University System of Maryland at Southern Maryland Campus

University System of Maryland at Southern Maryland (USM-SM) focuses on providing highly developed and comprehensive academic and professional development educational opportunities at the graduate and upper undergraduate level to a workforce of knowledge workers engaged in technology, teaching, management, health and other professional services. The institution's guiding mission is to foster highly developed and comprehensive educational and research opportunities in the Southern Maryland region in order to provide citizens the means to achieve their potential and to advance the economic and social development of the region. All of this year's talks will be held at the USM-SM campus.

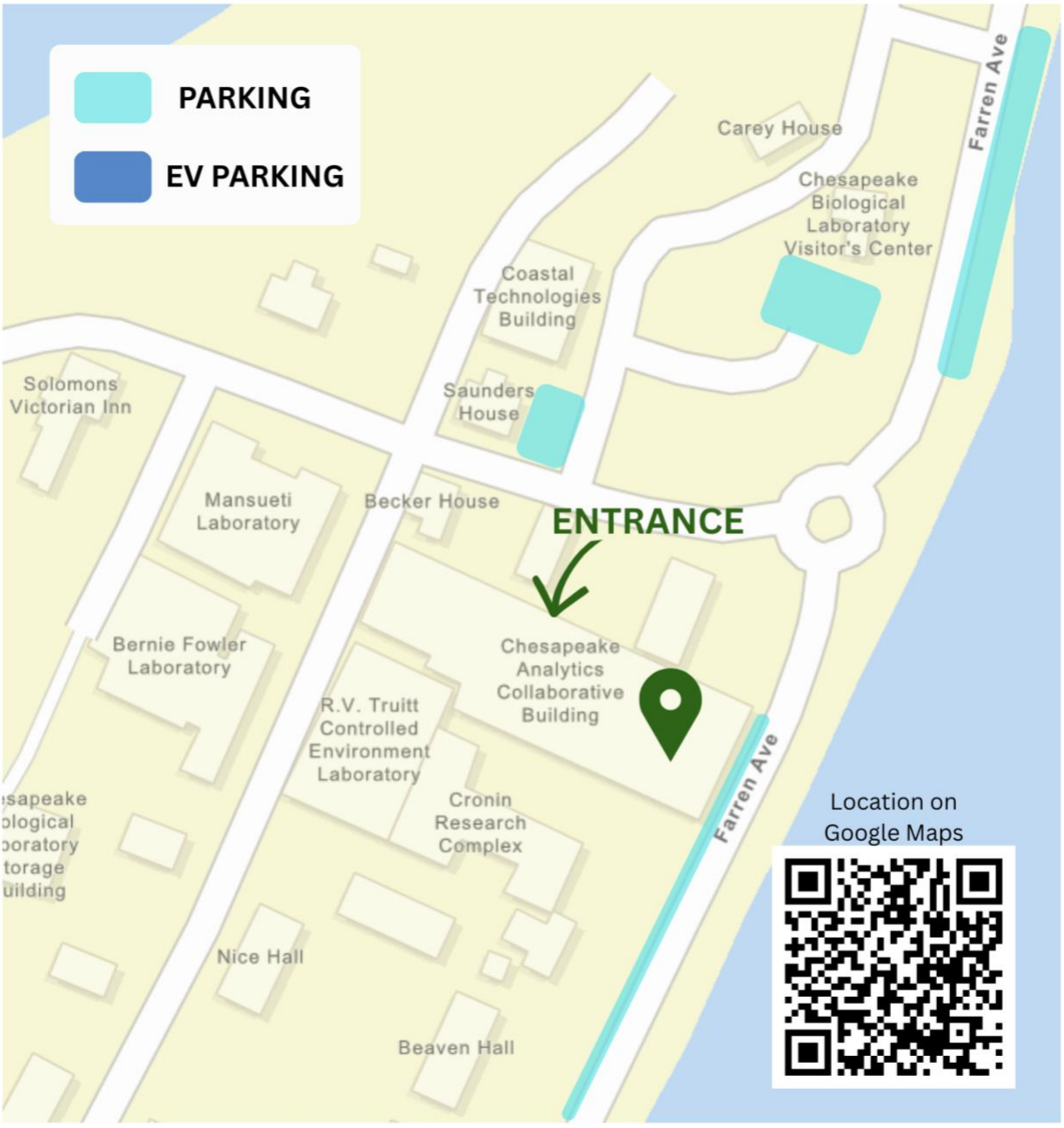
Calvert Marine Museum

The Calvert Marine Museum (CMM) is a museum located in Solomons, Maryland, which is uniquely focused on three main themes: paleontology of Maryland, estuarine life of the Patuxent River and Chesapeake Bay, and maritime history. The Calvert Marine Museum's mission is to inspire learning, discovery, and stewardship of the Chesapeake Bay and Southern Maryland's paleontology, estuarine life, and maritime history. This year's friday banquet will be held at the museum, which will be open for you to explore!

Parking

Thursday, March 19th at Chesapeake Biological Laboratory

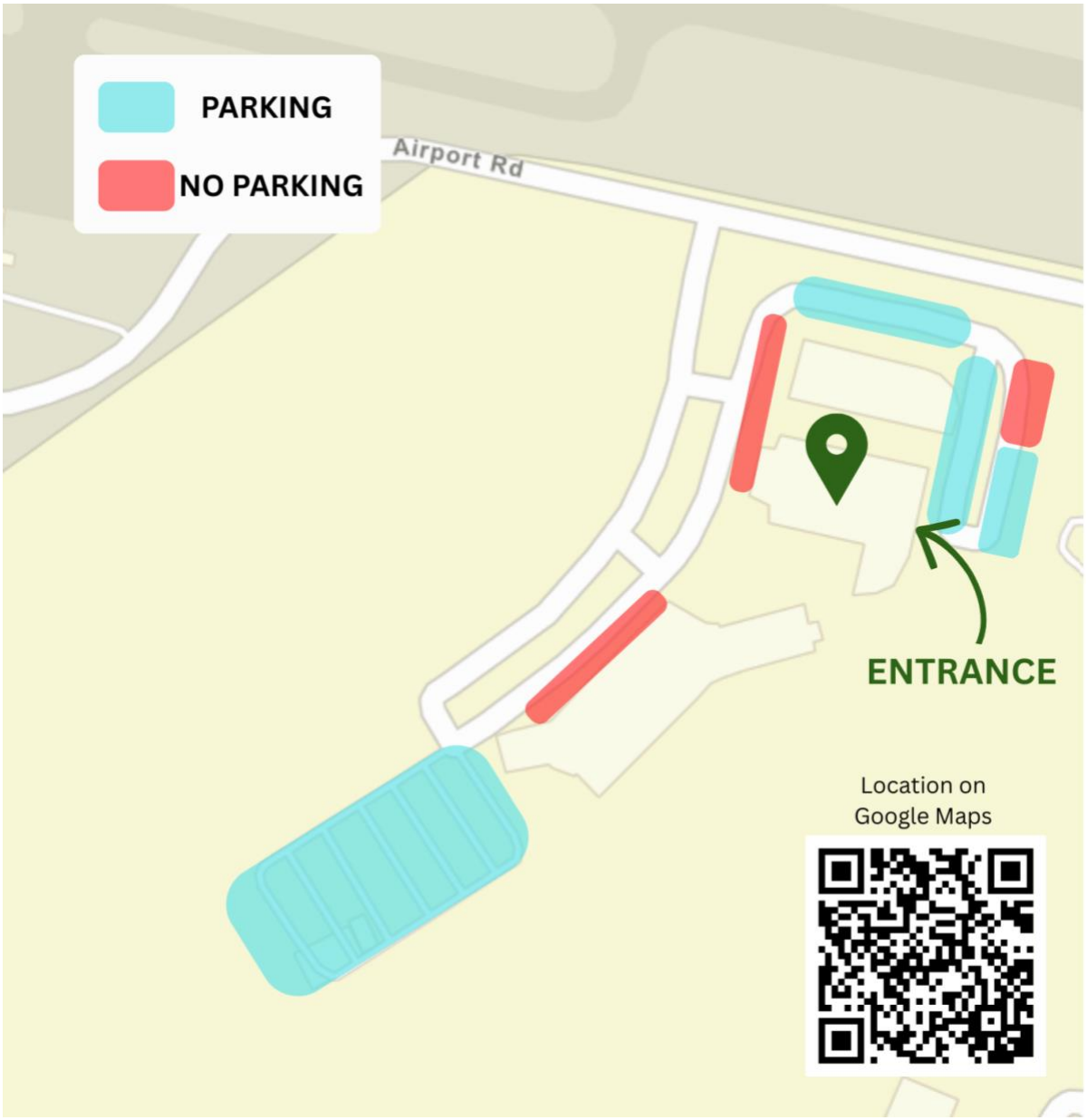
Address: 146 Williams St, Solomons, MD 20688



Parking

Friday, March 20th and Saturday, March 21st at USM-SM Campus

Address: 44219 Airport Road, California, MD 20619



Plenary Speakers

Dr. Dave Secor

Dave and his group study marine fish migration — research questions that are responsive to fisheries stewardship, threatened species, ecosystem management, and offshore wind development. This research occurs at large regional scales and employs pioneering approaches in animal biotelemetry and hard-part chemistry. Much of their work engages commercial and recreational fishers. In 2010, the University System of Maryland conferred the Regents Award for his contributions to international Atlantic bluefin tuna science and management. In 2015, Johns Hopkins published his book *Migration Ecology of Marine Fishes*, the first on the topic in 50 years. Dr. Secor has participated in numerous international, national, regional, and state advisory bodies, mostly concerning fisheries stewardship, threatened species, and ecosystem management. In these roles, he has helped derive water quality standards for Chesapeake Bay fishes, successfully petitioned NOAA to designate the Nanticoke River as critical sturgeon habitat, provided key science in managing trans-boundary stocks of striped bass, bluefin tuna and Atlantic mackerel; and supplied guidance on the impacts of offshore wind development on fishery resources.

Fred Tutman

Fred Tutman is a grassroots community advocate for clean water in Maryland's longest and deepest intrastate waterway and holds the title of Patuxent Riverkeeper, an organization that he founded in 2004. He also lives and works on an active farm located near the Patuxent that has been his family's ancestral home for nearly a century. Prior to Riverkeeping, Fred spent over 25 years working as a media producer and consultant on telecommunications assignments all over the globe. He has also taught courses in Environmental Law and Policy at Historic St. Mary's College of Maryland.

Friday Lunch Options On-Venue

On Friday, March 20th there will be local food trucks available during the lunch break at the USM at Southern Maryland Building.

Farm.Fork.Soul

Serving Southern MD since 2018, Farm.Fork.Soul serves locally sourced meet and produced cooked into all American favorites. Their menu features burgers, nachos, hot dogs, and quesadillas as well as their own lemonade.

Heidi's Eats and Sage's Treats

The only Korean and BBQ food truck in Southern MD! Their menu features Zing Chicken Wings, Pork Bulgogi, Chicken Nugget Basket, and the Korean BBQ Beef Meatballs w/ Shaved Parmezan Cheese.

Schedule at a Glance

Thursday, March 19th

Time	Event	Location
5:30 PM - 6:00 PM	Poster setup, on-site registration, presentation upload	**CACB at CBL** 146 Williams St. Solomons, MD 20688
6:00 PM - 9:00 PM	Poster social, on-site registration, presentation upload	

Friday, March 20th

Time	Event	Location
8:00 AM	Coffee and pastries	**USM at Southern Maryland** 44219 Airport Rd. California, MD 20619
8:15 AM	Opening remarks *Janet Nye & Ryan Woodland*	
8:30 AM	Plenary Speaker *Dave Secor*	
9:10 AM	Plenary Speaker *Fred Tutman*	
9:50 AM - 10:00 AM	Break	
10:00 AM - 10:35 AM	Student lightning talks	
10:35 AM - 12:05 AM	Student oral presentations	
12:05 PM - 1:30 PM	Lunch, Student-Mentor Lunch	On-site options available and encouraged!

1:30 PM – 2:30 PM	Student oral presentations	**USM at Southern Maryland** 44219 Airport Rd. California, MD 20619
2:30 PM – 2:45 PM	Break	
2:45 PM – 3:45 PM	Student oral presentations	
3:45 PM – 4:30 PM	Business Meeting	
6:00 PM – 9:00 PM	Banquet	**Calvert Marine Museum** 14200 Solomons Island Rd. Solomons, MD 20688

Saturday, March 21st

Time	**Event**	**Location**
8:00 AM	Coffee and pastries	**USM at Southern Maryland** 44219 Airport Rd. California, MD 20619
8:10 AM	Welcome Back *Ryan Woodland*	
8:20 AM - 9:50 AM	Professional Presentations	
9:50 AM - 10:00 AM	Break	
10:00 AM - 12:00 PM	Professional Presentations	

Directions for Presenters

Poster Presentations

Posters will be presented on Thursday, March 19th at the new Chesapeake Analytics Collaborative Building (CACB) on the Chesapeake Biological Laboratory campus. The poster social will run from 6:00 – 9:00 pm, but presenters will be allowed to set up posters starting at 5:30 pm. We encourage that posters are made to fit a 30 x 40 inch space. This size will allow you to use one of our provided poster-boards and easels. We will provide the necessary supplies for mounting posters and you will receive a poster number indicating which location to use.

Student Lightning Talks

All student lightning talks will be given consecutively on Friday, March 20th at the University System of Maryland at Southern Maryland (USM-SM) campus. Lightning talks are given in 5-minute time slots. However, 30 seconds are reserved for changing speakers. We recommend that students plan for a 3-minute presentation, allowing for 1.5 minutes for questions. You are free to use that time however you wish. Typically, lightning talks involve one, or a few, PowerPoint slides. Lightning talks are not eligible for best student talk awards.

Oral Presentations

Student oral talks will be given on Friday, March 20th and talks from faculty and professionals will take place on Saturday, March 21st, both at the USM-SM campus. Oral presentations are given in 15-minute time slots. We recommend that speakers plan for a 12 talk, in order to allow 2.5 minutes for questions.

Uploading Presentations

Please upload your poster presentations to our poster Dropbox folder by Monday, March 16th if you would like your poster eligible for student awards. For talk slides, please label them with your last name first and upload your presentation to our talk presentation Dropbox folder no later than the evening of Thursday, March 19th. ***Please bring USB drives containing your presentation as a backup, just in case***. You may check your slides in the morning, at the break and before your session begins if you want to review your slides.

Poster Dropbox:
https://www.dropbox.com/scl/fo/mmmlli4gi4y9wfgen1bju/AOGor8_NS6L2hOFhbggrTEI?rlkey=mumauwczhg61gsq4nc5xeovic&st=q9522i06&dl=0

Oral Presentation Dropbox:
https://www.dropbox.com/scl/fo/ko9fzp14limfz4i0ts2ch/APvYHBASsFPUmv9BLloUgkg?rlkey=hvmi3vly5zc4xg0j2o0wctvu9&e=1&st=mk3vlfqx&dl=0

Poster Presentations

Thursday, March 19th
Chesapeake Biological Laboratory, Chesapeake Analytics Collaborative Building

Poster	Presenter (S = Student)	Title
P1	Aguilar, R.	Ray-diation and migration: acoustic telemetry addresses the management objectives and research needs for Atlantic Cownose Ray *Rhinoptera bonasus* in the eastern US.
P2	Anderson, E.	MarineGEO Upper Chesapeake Bay
P3	Aponte, R.	Resource monitoring for Black Sea Bass (*Centropristis striata*) at the Coastal Virginia Offshore Wind Commercial site
P4	Brooks, M. (S)	Giving Goose Creek a grade for its health – a FIBI review
P5	Brumfield, A. (S)	No Escape from Parasites: Trematode Infection of the Invasive Shrimp Palaemon elegans
P6	Collins, L.	Unraveling the complex outcomes of oyster restoration
P7	Cook, L.	Carbon production and metabolic rates of Atlantic menhaden (*Brevoortia tyrannus*)
P8	DeFeyter, E. (S)	Fish Egg Species Composition Along a Cross-shelf Transect between Cape Fear, North Carolina and the Gulf Stream
P9	Fenwick, A. (S)	Gut analysis of the invasive Blue Catfish in the Potomac and St. Mary's River

P10	Flamenco, R. (S)	A Proposed Research Framework: Laying the Groundwork for 6PPD-Q Research in Maryland Ecosystems
P11	Gonzalez, K. (S)	The use of environmental DNA (eDNA) to characterize presence and habitat use of the Atlantic sturgeon (*Acipenser oxyrinchus*)
P12	Grady, J.	Spatiotemporal modeling of Atlantic Sturgeon occurrence along the U.S. Atlantic coast using acoustic telemetry and inferred absences
P13	Hancock, G. (S)	Determining the relationship between activity level and the vulnerability of Chesapeake Bay fishes to heat stress
P14	Henthorn, L. (S)	Stable vs. fluctuating temperature impacts on landlocked and sea-run populations of Atlantic salmon (*Salmo salar*) fry thermal limits
P15	Hong, J. (S)	Assessing Predation as a Potential Driver of Blue Crab Decline in North Carolina
P16	Jenks, K. (S)	Linking mercury and food web structure in a large reservoir: an initial assessment in Deep Creek Lake, MD
P17	Richie, K.	The Atlantic Cooperative Telemetry Network: a key link on the migration highway
P18	Lawrence, P. (S)	Assessing Juvenile Habitat Contributions to Age-1+ Spot Through Stable Isotope Analysis of Eye Lenses
P19	McGeady, E. (S)	Evaluating Localized Food Web Response to Oyster Restoration Using a 3D Multispecies Individual-Based Model
P20	Miller, J. (S)	Investigating the Impacts of Hurricanes on Larval Fish Densities in Coastal North Carolina Fish Populations Across Two Spatial Scales Utilizing Fisheries-Independent Data

P21	Miller, W. (S)	Describing the identity and impacts of shell blister in Atlantic sea scallops
P22	Muñoz, A. (S)	Using DNA Metabarcoding to Refine Our Understanding of the Diet and Feeding Ecology of the Atlantic Sea Scallop, *Placopecten magellanicus*
P23	Murphy, T. (S)	Evaluating fine-scale spatiotemporal patterns of mysid density in a shallow, estuarine environment
P24	Papavasilis, E. (S)	The Science of Shipwrecks: Diving into Shipwreck Ecology of the Graveyard of the Atlantic
P25	Ponte, M.	Response of White Perch to development in a long-term monitoring study of the Tred Avon River
P26	Provenzano, G. (S)	Effects of Ocean Currents on the Movements of Male Blacktip Sharks (*Carcharhinus limbatus*)
P27	Rufo, K. (S)	Understanding how a widespread freshwater fish is influenced by a changing world
P28	Roemer, R. (S)	Movement and otolith microchemistry of river herring in a changing Chesapeake Bay climate
P29	Veith, C. (S)	Artificial Reefs as Climate Refugia: Can Human-Made Habitat Positively Affect Spawning Phenology and Distribution for Groupers and Snappers in a Changing World?

Friday Student Talk Schedule

Friday, March 20th
University System of Maryland at Southern Maryland Campus

Time	Presenter	Title
8:00 AM		Coffee and pastries
8:15 AM	Janet Nye & Ryan Woodland	Opening remarks
8:30 AM	Dave Secor *UMCES-CBL*	Maryland's sturgeon up a creek: Advancing natural history and complex science in the town square
9:10 AM	Fred Tutman *Patuxent Riverkeeper*	22 Years of Patuxent Activism explained in 30 minutes or less
9:50-10:00 AM	**COFFEE BREAK**	
STUDENT LIGHTNING TALKS		
10:00 AM	Aileen McDonald *VIMS*	Assessing common metrics for measuring spatial overlap and encounter rates of Blue Catfish and native fishes in Chesapeake Bay
10:05 AM	Ronita Sequeira *UMBC*	Effect of constructed wetlands on fish abundance and diversity
10:10 AM	Kiersten Jewell *GMU*	Understanding the parasite Didymozoidea within Atlantic Mackerel (*Scomber scombrus)*
10:15 AM	Kaitlynn Wade *UNC-CH*	Using species distribution modeling to predict river herring bycatch in the Atlantic Herring and Atlantic Mackerel fisheries in the U.S. Atlantic

10:20 AM	Derek Jackson *VIMS*	Movement ecology of channeled whelk *Busycotypus canaliculatus* during the development of an offshore wind lease site
10:25 AM	Nolen Vinay *UNCW*	Stable isotope insights into the trophic ecology of an expanding population of Blue Catfish in Albemarle Sound
10:30 AM	Riley Moreau *GMU*	Long-term trends in a tidal freshwater ecosystem before and after Northern Snakehead (*Channa argus)* introduction
STUDENT FULL TALKS		
10:35 AM	Gabrielle Shay *UNCW*	Life in the bypass lane: an alternative passage route for migratory fishes in the Cape Fear River
10:50 AM	Madison Sholes *UMCES-CBL*	Effects of Blue Catfish on Blue Crab abundance in Chesapeake Bay during 1990-2023
11:05 AM	Matt Stefanak *UMCES-CBL*	Trophic niche of the emerging penaeid shrimp assemblage and potential food web consequences in the Chesapeake Bay region
11:20 AM	Naomi Jainarine *ECU*	Investigating predator-prey and environmental dynamics of larval fish in a changing estuary, Beaufort Inlet, North Carolina USA
11:35 AM	Andrew McMains *ECU*	Habitat value of oyster aquaculture within estuarine landscapes for finfish and crustaceans
11:50 AM	Ryan Tharp *NCSU*	Using fine-scale acoustic telemetry to estimate mortality rates of gag in the Southeast U.S. Atlantic
12:05- 1:30 PM	**LUNCH BREAK**	
1:30 PM	Nina Santos *UMCES-CBL*	Assessing the potential for hypoxia-induced shifts in trophic dynamics for mysids in the Chesapeake Bay region
1:45 PM	Bethany Wager *NCSU*	Identifying drivers of fish communities at natural and artificial reefs during changing ocean conditions

2:00 PM	Nicole Firing *GMU*	Using baited remote underwater videos to determine the elasmobranch community assemblage in nearshore habitats of St. Barthélemy, West Indies
2:15 PM	Quinn Girasek *VIMS*	Characterization of the diet of Roundscale Spearfish (*Tetrapturus Georgii*) using morphology and molecular based approaches and comparisons to White Marlin (*Kajikia Albida*)
2:30-2:45 PM	**COFFEE BREAK**	
2:45 PM	Ray Mroch *UMCES-CBL*	Linking observer and logbook data to evaluate discard estimates in Gulf reef fish fisheries
3:00 PM	Madison Griffin *VIMS*	Big shells, bigger data: cohort analysis of Chesapeake Bay *Crassostrea virginica* reefs
3:15 PM	Cambria Miller *ECU*	Invasive appetite: Blue Catfish diet and distribution threaten Albemarle Sound biodiversity
3:30 PM	Rachel Kelmartin *GMU*	Testing short-term externally attached acoustic tags for estimating release mortality
3:45-4:30 PM	**BUSINESS MEETING**	
6:00-9:30 PM	**BANQUET – CALVERT MARINE MUSEUM**	

Saturday Professional Talk Schedule

Saturday, March 21st
University System of Maryland at Southern Maryland Campus

Time	Presenter	Title
8:00 AM		Coffee and light breakfast
8:10 AM	Ryan Woodland	Welcome back!
PROFESSIONAL FULL TALKS		
8:20 AM	Geneviève Nesslage *UMCES-CBL*	Quantifying linked rare events in fish and environmental Chesapeake Bay time series
8:35 AM	Rebecca Asch *ECU*	Assessing the spawning migration history of southern flounder (*Paralicthys lethostigma*) based on otolith microchemistry
8:50 AM	Allie Blanchette *SERC*	Horseshoe crab movement in the upper Chesapeake Bay
9:05 AM	Jeffrey Horne *MD-DNR*	Practicality of using eDNA to assess anadromous Herring stream spawning habitat
9:20 AM	Ming Sun *VIMS*	Offshore wind development's impact on Mid-Atlantic fisheries stock assessments
9:35 AM	Wilmelie Cruz-Marrero *NOAA*	Using collaboration and secondary telemetry data to understand fish movement in the Chesapeake Bay
9:50-10:00 AM	**COFFEE BREAK**	

10:00 AM	Katrina Lohan *SERC*	Parasites infecting and consumed by Striped Bass (*Morone saxatilis*) vary spatially and ontogenetically in the Chesapeake Bay
10:15 AM	Matt Zink *NC-DMF*	Spatiotemporal index standardization of multiple fishery-independent surveys in North Carolina estuaries
10:30 AM	Shannon Moorhead *MD-DNR*	Exploring the role of zooplankton abundance in the recent failure of Striped Bass year-classes in a Chesapeake Bay tributary
10:45 AM	Brendan Runde *TNC*	Omnidirectional sonar increases catch efficiency in a pelagic sportfishing tournament
11:00 AM	Mike O'Brien *UMCES-CBL*	Real-time iterative forecasting of an Atlantic sturgeon spawning run with acoustic telemetry
11:15 AM	Maya Drzewicki *UMCES-CBL*	Development of a sex- and length-structured stock assessment model for Chesapeake Bay Blue Crabs
11:30 AM	Caroline DeVries *UNCW*	Rising to the occasion: archival depth data indicate offshore spawning rise behavior in southern flounder
11:45 AM	Matt Damiano *NC-DMF*	Demonstrating the robustness of dynamic spawning potential ratio reference points to recruitment nonstationarity: a Southeast United States case study
12:00 PM	Gabriel Stephenson *SERC*	Uncovering hot topics in the ACT Network

Poster Presentation Abstracts

P1. Ray-diation and migration: acoustic telemetry addresses the management objectives and research needs for Atlantic Cownose Ray Rhinoptera bonasus in the eastern US.

Authors: **R. Aguilar,** C. Bangley, M.B. Ogburn, K.D. Richie

Presenter Affiliation: Smithsonian Environmental Research Center

The Atlantic Cownose Ray Rhinoptera bonasus is a large, charismatic batoid ray native to the northwestern Atlantic, which is known for its expansive schools of coastal migrants and seasonal occurrences in many estuarine systems. Unfortunately, this species faces numerous threats across its entire range, some linked to susceptibility of overharvest (late age at maturity, low reproductive output), but also public perception. Cownose Rays are often viewed as a nuisance to commercial/recreational fisheries, and although later refuted, they were erroneously attributed to the decline of commercially important bivalves, a factor driving the "Save the Bay, Eat a Ray" campaign, subsidized commercial Virginia Cownose Ray fishery (2007–2014), and occurrence of unregulated Chesapeake Bay bowfishing tournaments. As a result, in early 2026, Maryland released its first Cownose Ray Fishery Management Plan, which identified several management objectives and research needs related to habitat use and geographic connectivity. To that aim, we describe the migratory patterns of adults and juveniles tagged with acoustic transmitters over the course of more than a decade, primarily in Chesapeake Bay, but also in New York, North Carolina, and Florida. Tagged rays in the wider mid-Atlantic region generally left estuarine systems in the fall, overwintered off the eastern coast of Florida and returned to northern estuaries in the spring with minor differences between life-stages and sexes. Conversely, the majority of rays tagged in Florida did not migrate northward. These data will increase our understanding of Cownose Ray ecology and aid in the development of a responsible ecosystem-based management framework.

P2. MarineGEO Upper Chesapeake Bay.

Authors: **E.R. Anderson,** M. Ogburn

Presenter Affiliation: Smithsonian Environmental Research Center

Climate change and biodiversity loss pose existential challenges to the health of marine ecosystems and the people who depend on them. Yet our scattered knowledge of marine life hampers our ability to effectively address them. The Marine Global Earth Observatory (MarineGEO) is a unique network of partners around the world dedicated to tracking the vital signs of coastal marine life, diagnosing the causes of change, and informing science-based solutions to build coastal resilience using standardized, coordinated methods. MarineGEO research addresses how and why biodiversity is changing, how that influences ecosystem processes important to people, and how to use this knowledge to better inform management for resilient marine ecosystems. The Upper Chesapeake Bay MarineGEO site is based in Edgewater, Maryland at the Smithsonian Environmental Research Center (SERC). MarineGEO research at SERC is underpinned by over four decades of research on estuaries and adjoining watersheds, including time-series of benthic and mobile fish and invertebrate communities. Our research focuses on oyster reef, soft sediment bottom, submerged aquatic vegetation, course woody debris, and human-built (docks) habitats. Fieldwork is accomplished in collaboration with many of SERC's research labs and builds upon our strong foundation

of long-term studies and experiments. Here we present preliminary data from our monitoring programs on subtidal Maryland oyster reefs.

P3. Resource monitoring for Black Sea Bass (Centropristis striata) at the Coastal Virginia Offshore Wind Commercial site.

Authors: **R. Aponte,** D. Rudders, S. Roman, A. Scheld

Presenter Affiliation: Virginia Institute of Marine Science

The Coastal Virginia Offshore Wind site, located off Virginia Beach, will contain 176 turbines upon completion. Historically, this area has supported both commercial and recreational black sea bass (Centropristis striata) fisheries. Given the fisheries' spatial overlap with the area, as well as this species' affinity for structured habitat, it is critical to investigate and understand changes from offshore wind development. VIMS developed a project to characterize and monitor the resource over two-years, collecting the data needed to assess future impacts. Monthly trips occurred from July 2023 to June 2025. Sea bass pots were set in lease and control areas, with a 48-hour soak duration. Strings were set within three distance bands to collect data as a function of distance from future turbine locations. Data collected included black sea bass catch rates, total length (mm), and biological information. As expected during the preconstruction period, no significant difference was detected in the catch rate of black sea bass between the lease and control areas (p-value = 0.81). Catch per unit effort and catch at-length were significantly different across sampling events (CPUE: p-value < 0.01; length: p-value < 0.01), with higher catch rates primarily in spring and larger individuals caught in the winter. Aged black sea bass predominantly represented fish from one to five years old (mean age = 2, SD ±0.98). This study reflects the state of the black sea bass resource before construction is completed, representing the first phase in understanding the impact of offshore wind development.

P4. Giving Goose Creek a grade for its health – a FIBI review.

Authors: **M. Brooks,** T.R. Nelson

Presenter Affiliation: George Mason University

Fish communities can change drastically not only when traversing further up from the mouth to the headwaters of a creek/watershed, but also with the surrounding land cover and land use. When looking at Goose Creek, a tributary of the Potomac River and the main drainage system of Loudoun County, Virginia, it has a history of agriculture inputs. Many of these inputs have resulted in heavy siltation into the creek. This has had an impact on the fish community structure and now some areas of the watershed are now also undergoing urbanization. This now requires effort to monitor and record the changes to the community structure throughout the creek. Through electrofishing and eDNA sampling of 6 varied sites along Goose Creek, the health of the creek was assessed using a very preliminary FIBI, modified from the MBSS, to record what sites have been most affected and what sites may have been most affected by the change in land cover/land use. eDNA was collected to see if a rapid assessment version of a FIBI could be completed based on presence/absence of key species to attain a general idea if species have been extirpated or supplement the FIBI if species were missed from shocking efforts.

P5. No Escape from Parasites: Trematode Infection of the Invasive Shrimp Palaemon elegans.

Authors: **A. Brumfield,** A. Fowler, A. Blakeslee

Presenter Affiliation: George Mason University

Parasites play critical roles in regulating host population dynamics, and many introduced species may owe their invasion success partly to parasite loss during the introduction process. *Palaemon elegans*, the rockpool shrimp, is an invasive intertidal crustacean native to the Northwest Atlantic with introduced populations only found in MA in the Northeast Atlantic. This past summer, I collected shrimp using minnow traps and nets from 7 haphazardly selected locations throughout the Isles of Shoals, off the coast of NH and ME, to determine which shrimp species were present. I expected to see native shrimp, such as *Palaemonetes vulgaris*, but all of the over 600 individuals were *P. elegans*. Additionally, between 6.5 and 43.1% of shrimp from each island were infected with trematode cysts (overall infection of 120/616). The number of cysts increased with shrimp length, with a maximum of 19 cysts in a single shrimp. We recently genetically documented these cysts as *M. similis*. This is the first report of *M. similis* using *P. elegans* as a host, even from the native range of the shrimp – where *M. similis* also occurs. Together, these findings suggest that the invasion of *P. elegans* has not resulted in complete escape from parasitism, but instead may be facilitating novel host–parasite associations that have implications beyond this system. The use of *P. elegans* by *M. similis* highlights how invasive hosts can become rapidly integrated into local parasite life cycles, potentially altering transmission pathways, host population dynamics, and community structure in invaded ecosystems.

P6. Unraveling the complex outcomes of oyster restoration.

Authors: **L. Collins,** K.M. Pagenkopp Lohan, M. Ogburn, A. Colden, J. Leuecke, M. Jonston, J. Baxter, O. Caretti

Presenter Affiliation: Smithsonian Environmental Research Center

Despite providing important ecosystem services such as water filtration, habitat structuring, and shoreline protection, global oyster abundance is declining. To replenish the systems impacted by this loss in oysters, restoration efforts are implemented, but typically with the focus being on the biology of the introduced oysters – and less attention paid to the biodiversity outcomes of the restoration. The purpose of this study is to track the changes in restored oyster reefs and attribute these changes to restoration activity. Three reefs of the South River Oyster Sanctuary in Edgewater, Maryland were selected to represent restored habitats and compared to three sampled reefs outside of the sanctuary. Pre-restoration sampling took place in 2022, with post-restoration sampling done in 2023, 2024, and 2025 to examine how restoration impacts the richness and composition of associated microbes and macrofauna. From each sampling event, oyster tissue, sediment, and water were collected to generate metabarcode libraries using the 16S gene (bacterial) on all sample types and the COI gene (metazoans) for water and sediment samples. We hypothesize that the restored reefs would yield higher species richness and abundance across trophic levels for both macrofauna and microfauna. We also expect to see a core set of microbes across water, sediment, and oyster tissue, with greater richness and compositional variation in water and sediment samples compared to oyster tissues. This evaluation may aid in future management and restoration efforts of these important habitats.

P7. Carbon production and metabolic rates of Atlantic menhaden (*Brevoortia tyrannus*)

Authors: **L.K. Cook,** M. Hashim, A.V. Subhas, M. Schwarz, S. Urick, G.K. Saba

Presenter Affiliation: St. Mary's College of Maryland

Forage fish are potentially significant contributors to coastal carbon cycling given their abundance and seasonal migratory behavior. Understanding their biogeochemical role in coastal regions is a growing informational need for ecosystem-based fisheries management, especially as fishing companies prepare to meet net-zero carbon emissions goals. Even though marine fish are thought to contribute to approximately 16% of carbon flux out of the euphotic zone, the uncertainty on this estimate is large, and carbon release data for forage fish are practically nonexistent. To constrain this estimate, we quantified a full carbon production suite for Atlantic menhaden (*Brevoortia tyrannus*), including measurements of respiratory CO2 release from resting metabolic rate (RMR) and active metabolic rate (RMR) using intermittent group respirometry. Dissolved organic carbon production was negligible under our experimental conditions, and new calcium carbonate production was lower than expected. Fecal pellets from Atlantic menhaden sank on the order of hundreds to thousands of meters per day, and under foraging conditions, aerobic respiratory CO2 production approximately quadrupled. The latter portions of this carbon production suite could be significant contributors to carbon cycling in coastal systems.

P8. Fish Egg Species Composition Along a Cross-shelf Transect between Cape Fear, North Carolina and the Gulf Stream

Authors: **E. DeFeyter,** R. Asch

Presenter Affiliation: East Carolina University

North Carolina has been the location of ichthyoplankton surveys since the early 1970s, but no regular monitoring program has been established in offshore waters. This is despite the fact that most other regions of the United States have long-term ichthyoplankton monitoring programs, and North Carolina is a known site for climatic expansion of marine invasive species. To address this gap, a new sampling initiative called the Transect Expedition to Assess Land-to-Sea Habitats via Interdisciplinary Process Studies (TEAL-SHIPS) is undergoing a series of eight seasonal cruises from 2025 to 2026. Our goal is to use ichthyoplankton and environmental data collected by TEAL-SHIPS to examine how water masses impact fish egg species composition. We also intend to examine whether fish eggs of prominent species display electivity (i.e., the higher or lower frequency of occurrence at certain oceanic conditions than would be expected based on habitat availability) via quotient curve analysis. DNA barcoding will be conducted to identify fish eggs to the finest feasible taxonomic resolution. Species richness, evenness, and Shannon-Weiner Diversity index will be used to quantify fish egg biodiversity. Cluster analysis will be performed using temperature, depth, density, and salinity to determine the water masses present in the study area and the characteristic taxa found in them. This thesis research will help elucidate what species of fish spawn in North Carolina waters and how this varies with season, distance from shore, and across water masses. This will help identify oceanic conditions associated with spawning habitat of selected species, enhancing understanding of how fish ranges can be influenced by climate change.

P9. Gut analysis of the invasive Blue Catfish in the Potomac and St. Mary's River.

Authors: **A. Fenwick**

Presenter Affiliation: St. Mary's College of Maryland

Blue catfish (*Ictalurus furcatus*) are an invasive species that originate in river basins in the southern and central areas of the United States. They have since invaded the Chesapeake Bay watershed by being originally introduced into the James River, Virginia for trophy fisheries. They have now reached nearly all major tributaries in the watershed such as the Potomac and St. Mary's Rivers while continuing to expand in population. Other than being omnivorous and opportunistic feeders there is little known about the diet of the blue catfish in these rivers. The purpose of this study is to determine what the blue catfish are feeding on in southern Maryland rivers. To observe the diet of the blue catfish a gut analysis is being conducted through dissection. All prey items removed from the digestive tract are being identified to form a broad scale diet analysis. Due to the diverse ecosystem in the Potomac River it is expected that the blue catfish will have a wide variety of prey items in their diet. It is important to understand the diet of the blue catfish to protect native species and the environment. Having more knowledge on the diet of a large ecosystem impact will allow for more insight in creating legislation.

P10. A Proposed Research Framework: Laying the Groundwork for 6PPD-Q Research in Maryland Ecosystems.

Authors: **R. Flamenco,** R.J. Woodland, C. Mitchelmore, A. Heyes

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Over the past few years, exposure to N-(1,3-Dimethylbutyl)-N′-phenyl-1,4-phenylenediamine (6PPD), has been identified as responsible for annual coho salmon (*Oncorhynchus kisutch*) kills occurring throughout the state of Washington for decades. The source of this chemical is from automobile tires. Once released into the environment 6PPD it is oxidized into 6PPD-Q, and washes into water bodies during rainfall events. Its universal presence in tires has caused concern around the globe and resulted in significant ecotoxicological research efforts. Studies have since investigated its formation, distribution, transport, fate, and toxicity in some fishes, particularly salmonids in the Pacific Northwest, finding that toxicity occurs quickly following exposure and is irreversible. While a number of acute toxicity studies have been conducted, there is still much to understand about its environmental occurrence, sublethal toxicity, and specific mode(s) of action for exposed fish, especially on the East Coast. Furthermore, there is little known about the many alternatives to 6PPD. My proposed dissertation project will consist of field, lab, and experimental methods to further our understanding of environmental concentrations, toxicological mode of action, and potential hotspots of 6PPD-Q and 6PPD alternatives in Maryland fishes. These outcomes have myriad management implications for water quality, fisheries, and land management practices.

P11. The use of environmental DNA (eDNA) to characterize presence and habitat use of the Atlantic sturgeon (*Acipenser oxyrinchus*).

Authors: **K. Gonzalez,** J. McDowell, D. Adkins, J. Hunt, A. Dichiera

Presenter Affiliation: Virginia Institute of Marine Science

Atlantic sturgeon (*Acipenser oxyrinchus*) are endangered across their native range, and despite ESA protection from overfishing, stocks are still considered depleted. One challenge to sturgeon repopulation efforts is lack of suitable habitat in natal rivers. A distinct population segment (DPS) of Atlantic sturgeon in Chesapeake Bay utilizes at least four of its tributaries for spawning migrations, including the James River. However, effectively monitoring population status can be challenging with an endangered and highly migratory species. Our understanding of Chesapeake Bay DPS habitat use is limited by high effort monitoring strategies, and lack of habitat information on upper tributaries. To address these challenges, the aim of this study is to characterize Atlantic sturgeon's presence and habitat use in the Chickahominy River, an offshoot of the James River, using environmental DNA (eDNA). eDNA provides a low effort and highly sensitive alternative to traditional monitoring strategies. Water samples have been collected once a month starting in August 2025 and will continue to be collected until July 2026 to gain an understanding of seasonal presence. Quantitative PCR will be used to quantify relative abundance of Atlantic sturgeon CytB-gene. Once sample collection is complete, generalized linear models (GLMs) will determine if habitat quality measurements (temperature, dissolved oxygen, and salinity) and/or time of year are predictors of eDNA abundance. We predict that Atlantic sturgeon eDNA will be detected in the Chickahominy River and detection will be higher in spring and fall indicating spawning aggregations.

P12. Spatiotemporal modeling of Atlantic Sturgeon occurrence along the U.S. Atlantic coast using acoustic telemetry and inferred absences.

Authors: **J. Grady,** M. Oliver, M. Shatley, M. Breece

Presenter Affiliation: St. Mary's College of Maryland

Atlantic Sturgeon (*Acipenser oxyrinchus*) are federally endangered, and reducing incidental mortality from fisheries, dredging, and other human activities requires knowing where and when individuals occur. However, aggregated telemetry data often lack the deployment records needed to confirm absences, limiting species distribution modeling applications. We developed and validated methods to infer absences from telemetry records, using the interval between an individual's first and last detections at a station to classify non-detections as true absences. We calibrated this approach using data from Delaware Bay, where deployment logs provided confirmed absences. Models built with inferred absences performed comparably to models using true absences. We then applied these methods to detection data to predict sturgeon occurrence as a function of day of year, depth, sea surface temperature, and chlorophyll absorption (a443). sdmTMB models using inferred absences (AUC 0.92) outperformed presence-only MaxEnt (AUC 0.87) and matched true-absence models. Our results will be used to create realtime forecasts of high-use areas and seasonal windows when sturgeon are most likely present, information that can inform spatially and temporally explicit management measures to reduce human–sturgeon conflict. In addition, our absence-inference framework extends the utility of historic telemetry records for species distribution modeling where deployment metadata are unavailable.

P13. Determining the relationship between activity level and the vulnerability of Chesapeake Bay fishes to heat stress.

Authors: **G. Hancock,** K. Gonzalez, S. Masters, A. Dichiera

Presenter Affiliation: Virginia Institute of Marine Science

Heatwaves in coastal aquatic environments are becoming increasingly frequent and intense. These extreme climate events can have detrimental effects on every level of ecosystem function in estuaries such as Chesapeake Bay and the eastern shore's coastal bays. Understanding how different species respond to heat stress is critically important in predicting climate change "winners" and "losers" in these vulnerable environments. Activity level (or a fish's lifestyle) has been hypothesized to be an indicator of vulnerability due to activity level's intrinsic connection to the energy budgets or aerobic scope of fish. The compression of a fish's aerobic scope has direct negative impacts on its ability to cope with stressors, so with activity level correlated with aerobic scope, it could be an effective tool for predicting tolerance. Research has shown fish with lower activity levels demonstrated higher stress tolerances in both intraspecific (Atlantic salmon) and interspecific (Amazonian fishes) comparisons. To elucidate the relationship between activity and environmental stress tolerance, eight local estuarine fish species of varying trophic levels were characterized for their vulnerability to temperature stress using critical thermal maxima (CTmax). Tissue samples and morphometric indices were taken to determine swim capability, trophic position, and aerobic and anaerobic capacity. Fish with higher predicted activity and higher trophic position are expected to have a lower thermal tolerance compared to their low-activity counterparts. Importantly, these data will inform whether a trend between energy levels and stress tolerance exists and determine climate change "winners" or "losers" across these estuarine fishes.

P14. Stable vs. fluctuating temperature impacts on landlocked and sea-run populations of Atlantic salmon (*Salmo salar*) fry thermal limits.

Authors: **L. Henthorn,** G. Schwieterman, J. Kocik

Presenter Affiliation: University of North Carolina at Chapel Hill

Atlantic Salmon (*Salmo salar*) are culturally and commercially valuable, with historic range extending from Connecticut to arctic Canada, and diverse life histories with both migratory sea-run populations and freshwater landlocked forms. Southern populations have been extirpated, and, in the US, only eight sea-run populations remain–all in Maine. Warming rivers and oceans contributed to these losses, but recent research suggests not all populations respond similarly to this threat. To study differences among non-endangered populations, we chose to compare fish from landlocked (Enfield Hatchery, Maine) and sea-run fish (Kensington Hatchery, Connecticut). Original broodstock from both hatcheries were from Maine. Alongside river warming, greater diel temperature fluctuations have been observed in rivers due a less stable and warming climate. We studied how fry from these two groups responded to fluctuating temperatures by evaluating their critical upper thermal limits (CTMax). Fish were divided into two temperature treatments: stable (22.5°C) and fluctuating (diel thermocycle of 20-25°C), and allowed to acclimate for at least two weeks before experimentation. The fluctuation treatment is representative of Maine rivers during summer. CTMax trials were performed on 20 fry at a time, using a heating rate of 0.3°C per minute. Temperatures were increased until the fish exhibited a loss of equilibrium. We expect the sea-

run salmon, and the fluctuating temperature treatment will have the highest CTMax. These results will provide baseline information to inform future studies with endangered populations.

P15. Assessing Predation as a Potential Driver of Blue Crab Decline in North Carolina.

Authors: **S.J. Hong,** J. Nye, J. Cao

Presenter Affiliation: University of North Carolina at Chapel Hill

Blue crab (*Callinectes sapidus*) is an important estuarine prey species and one of North Carolina's most economically valuable fisheries, supporting upper trophic level productivity and harvests statewide. This study examines whether predation may play a significant role in the decline and lack of recovery of the blue crab stock in North Carolina despite management actions. Predator species were selected using diet composition from an Ecopath model for Pamlico Sound, NC, to identify predators of blue crab. Annual, system-wide abundance indices for blue crab and selected predators were estimated by integrating data from three fisheries-independent surveys using the tinyVAST spatiotemporal modeling framework). These abundance indices were combined with species-specific catch time series in the Schaefer surplus production models to estimate biomass trajectories for blue crab and each predator . Predator biomass estimates were then used, together with diet composition and consumption parameters, to evaluate predation mortality on blue crab. Results indicate a rapid decline in blue crab biomass during 2012–2013,but our estimates of predation mortality do not support predation as the primary driver of this decline. These results point to alternative mechanisms—such as environmental stressors, recruitment variability, or the influence of invasive predators (e.g., blue catfish)—as priorities for future investigation.

P16. Linking mercury and food web structure in a large reservoir: an initial assessment in Deep Creek Lake, MD.

Authors: **K. Jenks,** A. Heyes, R.J. Woodland

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Deep Creek Reservoir is a popular recreational destination in western Maryland that requires substantial ongoing maintenance by the state, including stocking fishery species, controlling invasive *Hydrilla*, and erosion mitigation. Long-term monitoring has suggested an increase in the methylmercury (MeHg) concentrations in young-of-the-year Largemouth bass (YOY-LMB) in the reservoir and there is concern that erosion and associated dredging activities may exacerbate Hg cycling, increase the bioavailability of MeHg, and enhance MeHg in fish. Despite long-term MeHg increases in YOY-LMB, data on other species is very sparse and there is uncertainty about how Hg is transferred through the food web. We conducted a pilot study to analyze Hg content across a range of fish species and investigate food web structure by combining mercury measurements with gut contents and stable isotope analysis (carbon [δ^{13}C], nitrogen [δ^{15}N]) of fish and prey. Trophic analysis indicate the reservoir supports an approximately 4-trophic level food web with the upper trophic position predators having the highest mercury concentrations although there was substantial variability among individuals in certain species. Species or individuals with both high δ^{15}N and intermediate δ^{13}C values displayed the highest MeHg concentrations, suggesting that those predators occupying the highest trophic positions are also coupling multiple trophic pathways in the system.

In concert with the limited historical data, it does not appear that MeHg concentrations have increased in upper predators. The observed increase in YOY-LMB, but not other species, suggests conditions in shallow water habitats specifically may be evolving to enhance mercury uptake into the food web.

P17. The Atlantic Cooperative Telemetry Network: a key link on the migration highway.

Authors: **K.D. Richie,** M. Ogburn

Presenter Affiliation: Smithsonian Environmental Research Center

The Atlantic Cooperative Telemetry (ACT) Network is a community sharing acoustic telemetry data among researchers in the northeast and mid-Atlantic United States, from Maine to North Carolina. The network started in 2005 and adopted the Ocean Tracking Network (OTN) database structure in 2020. Since then, the network has been managed by the Smithsonian Environmental Research Center in collaboration with MARACOOS, NERACOOS, the US Animal Telemetry Network, and other partners. The ACT Network database, ACT_MATOS, has 233 users representing more than 100 institutions and agencies. Researchers have reported 17,135 tags in 92 different species, and 3,857 acoustic receiver stations within the region. Efficiently sharing tag detections at a continental scale makes for a stronger more effective animal tracking community and improved data for informing management and conservation.

P18. Assessing Juvenile Habitat Contributions to Age-1+ Spot Through Stable Isotope Analysis of Eye Lenses.

Authors: **P.E. Lawrence,** R.J. Woodland, M.P. Stefanak, C.L. Goethel

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Stable isotope analysis (SIA) of carbon and nitrogen (δ13C and δ15N) composition of eye lenses can provide a retrospective means to analyze spatial life history trends in estuarine-associated fish species. Although Chesapeake Bay is well known as a vital nursery for many fish species, recent evidence indicates that the inner continental shelf of the Mid-Atlantic Bight also provides nursery habitat for some of the same species. This study aimed to investigate whether intra-individual patterns in the δ13C and δ15N of sequential eye lens layers of Spot (*Leiostomus xanthurus*) can be used to identify individuals that used coastal shelf habitats, as opposed to estuarine habitats, as nurseries. A total length (TL, mm) to eye lens diameter (mm) relationship was established (N = 100) to allow reconstruction of Spot body size at the time of lens laminae layer formation. Juveniles from estuarine (n =14, δ13C= -20.37 ± 1.48 ‰, δ15N = 15.19 ± 2.25 ‰) and coastal (n = 12, δ13C= -16.14 ± 1.19 ‰, δ15N = 12.55 ± 1.53 ‰) habitats were analyzed to verify isotopic difference between these habitats and provide baselines for comparison. Isotopic profiles from age-1+ individuals (N = 6) obtained from Mid-Atlantic Bight coastal waters revealed significant variability in both inter- and intra-individual isotopic life history trends. This study provides evidence that SIA of eye lenses can help resolve juvenile habitat use of adult Spot and supports the hypothesis that the inner continental shelf may serve as an alternative nursery habitat for this species.

P19. Evaluating Localized Food Web Response to Oyster Restoration Using a 3D Multispecies Individual-Based Model.

Authors: **E. McGeady,** K. Rose, M. Gray, R. Lavaud

Presenter Affiliation: University of Maryland Center for Environmental Science, Horn Point Laboratory

Large-scale oyster restoration in the Chesapeake Bay aims to improve water quality through biofiltration, and extensive filtration may alter the structure and dominant energetic pathways of the local food web. Such alterations may cascade up to key forage and top predator fish species. As large-scale oyster restoration increases, consequences for estuarine food webs should be assessed for the potential trade-off between improved water quality and fish growth. Current mechanistic models that assess food web responses to oyster restoration take aggregate approaches, simplifying predator-prey interactions with lumped parameter representations. These aggregate approaches do not consider fine-scale individual-level dynamics such as movement decisions, size-dependent vulnerability to gape-limited predators, and foraging patch selection that can influence consumer dynamics. To address this gap, an agent-based multispecies model was developed that simulates the direct and indirect effects of oyster filtration on individuals at relatively fine temporal and spatial scales. Here, model development for a Chesapeake Bay version is described, including the spatially explicit, three-dimensional domain, linked dynamic energy budget and water quality models, biological and physiological processes, movement algorithms, and the framework for representing multi-species predator-prey interactions. Planned simulation experiments are also described. This individual-based approach aims to quantify species and stage-specific energetic trade-offs and tracks how oyster filtration may cascade through pelagic and benthic pathways to affect growth, reproduction, survival, and energy transfer across the Chesapeake Bay food web.

P20. Investigating the Impacts of Hurricanes on Larval Fish Densities in Coastal North Carolina Fish Populations Across Two Spatial Scales Utilizing Fisheries-Independent Data.

Authors: **J.N. Miller,** R.G. Asch

Presenter Affiliation: East Carolina University

In eastern North Carolina, sparse research into the effects of storm events on coastal fish populations has produced limited and often contradictory results across different time scales. This study aims to evaluate population-level responses of fishes to hurricanes within state waters at both short-term (days to weeks) and long-term (annual to interannual) scales by integrating a fisheries-independent ichthyoplankton dataset from Beaufort, NC combined with publicly available meteorological and streamflow data. To investigate the impact of hurricanes on larval fish abundance and environmental drivers of change, we selected six abundant, native species (Atlantic croaker *Micropogonias undulatus*, pigfish *Orthopristis chrysoptera*, summer flounder *Paralichthys dentatus*, spotted seatrout *Cynoscion nebulosus*, and weakfish *Cynoscion regalis*) to assess individually and combined. Since fish species native to eastern North Carolina have evolved in an ecosystem that historically experiences regular storm disruption, we hypothesize that hurricanes will not produce significant differences in larval fish abundance at either temporal scale. Preliminary results indicate the presence of hurricanes impacted in the short-term on the densities of all species combined ($t=-2.097$, $df=42$, $p=0.042$), while only pigfish exhibited long-term response ($t=2.318$, $df=25.44$, $p=0.029$). When the storms impacts were analyzed by Saffir-Simpson categories, summer flounder showed a significant change in response to storm strength at the short-term scale ($F=3.628$, $df=3$,

p=0.024), while the combined species group exhibited no significant impact at either scale (F=0.528, df=3, p=0.528). If successful, this approach may provide valuable insights to support ecological assessments and the fundamental resilience of coastal ecosystems that experience seasonal storm activity.

P21. Describing the identity and impacts of shell blister in Atlantic sea scallops.

Authors: **W. Miller,** S. Roman, D. Rudders, J. McDowell

Presenter Affiliation: Virginia Institute of Marine Science

The occurrence of shell blister in the Atlantic sea scallop (*Placopecten magellanicus*) in the Mid-Atlantic region poses a challenge to the fishery by impacting the growth and marketability of affected individuals. This condition is typically associated with boring polychaetes that penetrate the shell, leading the scallop to secrete a nacreous blister over the opening. These blisters may become filled with detritus and can increase in size and severity over time. The blister can also foul the adductor muscle directly. Despite its persistent prevalence in wild populations, the identity of the boring parasite responsible for shell blister across this region, as well as the potential for multispecies interaction on blister presence, remains poorly characterized. Visual morphological identification, Sanger sequencing and environmental DNA assays were used to determine the identity of the blister-associated polychaetes across the Mid-Atlantic and Georges Bank and to identify species presence in bottom water samples collected in surveyed regions. Morphometric analyses of affected shells were conducted to quantify the relationship between blister severity and shell deformation, and the association between species presence in the water column and blister severity. Preliminary results indicate a potential multispecies contribution to blister severity, involving both boring and non-boring polychaetes. These findings provide insight into the drivers and consequences of shell blister in the Atlantic sea scallop.

P22. Using DNA Metabarcoding to Refine Our Understanding of the Diet and Feeding Ecology of the Atlantic Sea Scallop, *Placopecten magellanicus.*

Authors: **A. Muñoz,** J. McDowell, D. Rudders

Presenter Affiliation: Virginia Institute of Marine Science

The success of the U.S. Atlantic sea scallop, *Placopecten magellanicus* (Gmelin), fishery has been largely attributed to the adaptive management of the resource, which incorporates considerations of sea scallop biology and ecology. Though sea scallop diet and feeding ecology have been studied, a refined understanding of these biological and ecological factors may further our comprehension of their roles in habitat suitability, reproductive success, and productivity. Previously, a study of the Yesso scallop (*Mizuhopecten yessoensis*) correlated prey availability during gonadal development to spatfall density, suggesting that it could be a predictor of subsequent recruitment and an important consideration for both spatial management of the resource and the development of a stock enhancement program. Developing a fine-scale perspective of sea scallop diet and food availability and an efficient method to provide the necessary data is especially important given the ongoing environmental changes occurring throughout the sea scallop range. These changes have been shown to affect the primary producers, phytoplankton, that sea scallops consume. This study established a DNA metabarcode sequencing approach for the identification of prey diversity in the digestive glands of sea scallops collected throughout the Mid-Atlantic Bight and

Georges Bank. Environmental DNA (eDNA) from sediment and water samples collected concurrently with scallop samples were also sequenced to investigate potential prey selectivity and how prey availability varies across sampling sites and years. The relationships between the compositions of diet and food availability and both environmental and biological parameters (e.g., depth, water temperature, shell height, gonadosomatic index) were also analyzed.

P23. Evaluating fine-scale spatiotemporal patterns of mysid density in a shallow, estuarine environment.

Authors: **T.E. Murphy,** R.J. Woodland

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Mysids are cryptic, shrimp-like crustaceans and important components of estuarine food webs. Given their unique ecology as omnivorous, diel-migrating zooplankton, mysids serve as a trophic link between benthic and pelagic food webs and a significant food source for many consumers, including valuable fisheries species. While mysids are generally understudied in most coastal areas, a long-term survey of mysid density at the Chesapeake Biological Lab's research pier will be analyzed to support a novel analysis of mysid temporal abundance and environmental habitat associations. The year-round mysid survey started in 2022 and is conducted weekly with an epi-benthic sled. Habitats sampled within this shallow-water system cover a variety of depths and physical conditions. Coupled with continuous monitoring of physical, biological, and chemical conditions, this survey design allows for a comprehensive investigation into the bottom-up controls on fine-scale patterns of mysid densities. While preliminary, results show that mysids exhibit dynamic behaviors spatially and temporally over daily-to-seasonal timeframes. Understanding controls on mysid movements and species dynamics will help support development of mysid population models, further contribute to our understanding of estuarine food web controls, and build our capacity to better integrate forage into ecosystem-based fisheries management.

P24. The Science of Shipwrecks: Diving into Shipwreck Ecology of the Graveyard of the Atlantic.

Authors: **E. Papavasilis,** R.G. Asch, A. Blakeslee

Presenter Affiliation: East Carolina University

Artificial reefs are important because they are structurally complex, providing habitats for numerous marine organisms. North Carolina's artificial reefs host high biomasses of reef fish, supporting elevated abundances of top predators and facilitating tropical fish at the edge of their ranges. This study aims to understand how artificial reef community composition and biodiversity are influenced by proximity to the Gulf Stream, temperature, and depth. Artificial reef community composition and biodiversity were investigated using diver surveys where reef fish were identified in the field and documented using Reef Environmental Education Foundation (R.E.E.F.) protocols. This study demonstrated that inshore and offshore artificial reefs are different based on their community composition and were influenced by depth and bottom temperature. Inshore reefs,such as the USS Indra and the Ario, had greater biodiversity than offshore wrecks because they likely had higher nutrient rich water than offshore wrecks. Offshore reefs, such as the Atlas and the W.E. Hutton, had closer proximity to the Gulf Stream which could influence the occurrence of more

pelagic and tropical species inhabiting these reefs. This study could help ecosystem managers for making decisions about where to place future artificial reefs to facilitate fisheries management goals, such as supporting commercially important fish species in North Carolina waters.

P25. Response of White Perch to development in a long-term monitoring study of the Tred Avon River.

Authors: **M. Ponte,** J. Horne, S. Moorhead, J. Uphoff

Presenter Affiliation: Maryland Department of Natural Resources

Continuous summer fish community and water quality monitoring have been conducted on the Tred Avon River since 2006, coinciding with major urban development at the headwaters. This watershed is on the cusp of transitioning to suburban development. Increased development in mesohaline subestuaries, such as Tred Avon River, has been found to cause a decline in fish abundance and presence, due to increased hypoxia in deeper channel habitat. White Perch, a recreationally important panfish, spawn in the upper Choptank River and migrate to Tred Avon River as juveniles and adults. Over the past 20 years, adult White Perch presence has declined significantly in Tred Avon River, correlating with increased development. There were no associations found between YOY White Perch presence and levels of development or channel oxygenation. An evaluation of the larger watershed indicated that YOY White Perch observed during the Striped Bass Program Juvenile Abundance Index (JAI) surveys in the Choptank River correlated with YOY White Perch presence in Tred Avon River. However, adult White Perch presence in Tred Avon River showed a downward trend rather than pairing with 2-year lagged YOY White Perch from the Choptank JAI. White Perch in the Tred Avon River are subject to numerous habitat suitability changes due to development that impact the predictive relationship between YOY and adult populations.

P26. Effects of Ocean Currents on the Movements of Male Blacktip Sharks (*Carcharhinus limbatus*).

Authors: **G. Provenzano,** M.E. Bowers, R.G. Asch, M. Muglia

Presenter Affiliation: East Carolina University

Seasonal changes in ocean currents can alter prey availability, modify conditions in pelagic habitats, and shift the migratory behavior of marine organisms. Many species may exhibit northward movements and habitat shifts in response to changes in oceanographic conditions, yet the utilization of ocean currents by large migratory marine species is not well understood. This project investigates the relationship between ocean currents and the migratory speed of blacktip sharks, a coastal shark species, from 2014 to 2021 for the spring, summer, and autumn months. Using acoustic telemetry data, these sharks can be tracked across their entire migratory range (from Florida to New York). It is hypothesized that seasonal changes in ocean currents, particularly shifts in position, direction, and strength, will influence the migratory patterns and habitat use of male blacktip sharks within their migratory range. Initial exploratory analysis examined shark swim speeds to characterize trends in speed at yearly and monthly time scales by calculating the distance between consecutive detections over days. Using daily averages of acoustic detections, initial results show consistent seasonal patterns and acceleration within spring and fall months, with speeds increasing substantially between April and May. By exploring how oceanographic variables correspond with shark presence and movements during migration, we can better understand how future changes in ocean currents

may impact the movements and habitat use of coastal migratory species. This can also have broader implications for the species to prevent the overfishing of blacktip sharks if their migratory range were to expand outside of managed fishing areas.

P27. Understanding how a widespread freshwater fish is influenced by a changing world.

Authors: **K. Rufo,** Z.D. Zbinden

Presenter Affiliation: University of Maryland Center for Environmental Science, Appalachian Laboratory

In a world experiencing rapid changes in both climate and land use, it is important to understand, monitor, and protect the remaining diversity of our native species. One group under particular threat is freshwater fishes, facing direct and indirect alterations to their riverine habitats through droughts, dams, and non-native fish stocking. To better understand these dynamics, we use genomic and environmental data to assess how fish populations are distributed across the riverscape and identify factors affecting genetic diversity and connectivity among these populations. The White River watershed in the Ozark Highlands (central US) is an ideal location to assess these objectives because it encompasses a variety of different land use areas and environmental gradients. We sampled Rainbow Darter (*Etheostoma caeruleum*), a widespread fish species within this system, providing a representative number of samples and distribution of sites across the study system. We used double digest restriction-site associated DNA sequencing of single nucleotide polymorphisms (ddRAD-seq SNPs) which allow us to look at variable locations across the entire genome and determine genetic similarity, diversity, connectivity, and adaptation. Results are forthcoming, but will include a suite of genetic diversity measures, individual assignment to populations and genetic clusters, genetic population structure and connectivity analysis, as well as looking at how environmental variables influence these patterns. Understanding how fish populations vary across the landscape is vital for management and conservation, to identify and protect areas that support diverse, well- connected populations as well as focus on areas of concern to effectively use the limited resources available to managers.

P28. Movement and otolith microchemistry of river herring in a changing Chesapeake Bay climate.

Authors: **R. Roemer,** E.M. Greenheck, J. Ryan, H.D. Legett, R. Aguilar, M.B. Ogburn, T.R. Nelson.

Presenter Affiliation: George Mason University

“River herring”, Blueback Herring (*Alosa aestivalis*) and Alewife (*Alosa pseudoharengus*), are two species of anadromous fish that undergo long-distance coastal-Atlantic migrations, returning to freshwater only to spawn during spring months. These two species have been intertwined with the human ethos for hundreds of years, sustaining indigenous peoples and providing rationale for several U.S. maritime accords. My dissertation will conduct the most detailed and holistic study of river herring migration ecology to date, by investigating the movement ecology of river herring from multiple spawning locations across their full migration cycle. River herring were tagged via internal V7 acoustic transmitters in the first two years of the project within the Patapsco, Potomac, and Rappahannock rivers. During year 1, 50 Blueback Herring from each river were tagged and in year 2, 50 Alewife were tagged, with an additional year utilized for passive acoustic monitoring. I plan to pursue additional funding for year 3, where both species (n = 25/species) will be tagged with a predation transmitter, that changes frequency when consumed by an aquatic predator. An

additional 50 Blueback Herring and 50 Alewife from each river system will be collected concurrently with acoustic tagged individuals. Otoliths will be aged and analyzed in a laser ablation inductively coupled plasma mass spectrometer (LA-ICPMS) to quantify lifetime chemical profiles. While this project is in its infancy, this collaborative research initiative will reveal important life history characteristics of both Blueback Herring and Alewife and delineating zones of importance to these species within Chesapeake Tributaries.

P29. Artificial Reefs as Climate Refugia: Can Human-Made Habitat Positively Affect Spawning Phenology and Distribution for Groupers and Snappers in a Changing World?

Authors: **C. Veith,** R.G. Asch

Presenter Affiliation: East Carolina University

Groupers and Snappers (families Epinephelidae and Lutjanidae) serve as important mesopredators in reef environments and support iconic fisheries. Spawning individuals are more thermally sensitive and vulnerable to climate change than non-spawning adults due to the energetic costs of reproduction amplifying environmental stressors. Previous studies have shown that these families' fish spawning aggregations (FSAs) are vulnerable to climate change-induced habitat loss, but such work focused only on natural reefs. Since artificial reefs also serve as FSA sites for several species, this study investigated if these man-made habitats can serve as climate refugia. This study used a Non-Parametric Probabilistic Ecological Niche (NPPEN) model to evaluate whether artificial reefs in the Southeast U.S. and Caribbean influence spawning habitat projections for two focal species under two climate models (GFDL ESM4.1, IPSL CMA6-LR) and two emissions scenarios (SSP2-4.5, SSP3-7.0). These species were Goliath Grouper (*Epinephelus itajara*) and Cubera Snapper (*Lutjanus cyanopterus*). I hypothesized that artificial reef inclusion would mitigate spawning habitat loss and suitable spawning habitat would shift poleward. The results did not support these hypotheses. For all model outputs, both species lacked significant differences in integrated habitat suitability (IHS) changes between the habitat types, also, core spawning habitat shifted southeast. Compared to natural reefs, artificial reefs possess a limited spatial footprint. These spatial mismatches with future spawning hotspots mean they may not be able to fully substitute for natural reefs under varying climate projections. Taken together, these findings highlight the complexity of interactions between spawning behavior, climate exposure, and artificial reef utility.

Lightning Talk Abstracts

L1. Assessing Common Metrics for Measuring Spatial Overlap and Encounter Rates of Blue Catfish and Native Fishes in Chesapeake Bay.

Authors: **A.H. McDonald,** M.C. Fabrizio, G.S. Chiu
Presenter Affiliation: Virginia Institute of Marine Science

Invasive blue catfish are a top predator first introduced into the Virginia tributaries in the 1970s and 1980s to create a recreational fishery. Since then, blue catfish have expanded their range, making it important to understand their impact on native fish populations in the Chesapeake Bay. We investigated 10 indices commonly used for measuring the spatial overlap and encounter rates of predators and their prey, and assessed their suitability for our overarching goal: to understand the impact of blue catfish on native fishes across time and space. Different indices are preferred depending on the type of data available (biomass or abundance), the species of study, and the questions being asked. For example, the biomass-weighted overlap index uses biomass estimates to express the degree of interaction between predator and prey, while the asymmetric alpha index uses the proportion of predator and prey to estimate predation pressure. We compared the performance of these commonly used indices on 8 distinct hypothetical spatial scenarios that reflect a variety of potential spatial overlaps between predator and prey. Output values for some indices ranged from 0 to 1, while others included negative values and ranged from negative to positive infinity. We found that vastly different spatial scenarios could lead to similar results for many indices, suggesting that it is crucial to verify that the selected index will produce outcomes that are meaningful and relevant to management of the species of interest.

L2. Effect of constructed wetlands on fish abundance and diversity.

Authors: **R. Sequeira**, E. Schott

Presenter Affiliation: University of Maryland Center for Environmental Science, Institute for Marine & Environmental Technology

Urban estuaries are increasingly using constructed and restored wetlands to address shoreline erosion, sea level rise, and habitat loss, while also enhancing ecological, economic, and aesthetic value for surrounding communities. Although these projects are designed to improve environmental conditions, many are not regularly monitored to evaluate how fish communities respond to restoration. This study examines fish abundance, species richness, and evenness near constructed wetland habitats in an urban estuary and compares them to nearby non-restored reference sites. Fish communities were sampled seasonally at six sites using traps to estimate abundance and basic community patterns. In addition, water samples were collected concurrently for environmental DNA (eDNA) analysis to detect species that may be underrepresented or missed by traditional trapping methods. Using both approaches provides a more comprehensive view of fish community structure in a highly urbanized estuarine system, where methods such as seining or trawling are often not feasible. Preliminary analyses of trapping data indicate differences in fish abundance, richness, and diversity between constructed wetland sites and reference sites, with patterns varying across seasons. These results suggest that constructed wetlands may influence how fish use restored habitats in urban estuaries. Environmental DNA analyses are ongoing and are expected to further refine species detection and community patterns. Overall, this study highlights the importance of monitoring fish communities to better understand the ecological value of shoreline restoration projects and to inform future management and restoration decisions in Mid-Atlantic estuaries.

L3. Understanding the parasite Didymozoidea within Atlantic Mackerel (*Scomber scombrus*).

Authors: **K. Jewell,** A. Blakeslee, O. Nichols, A. Fowler

Presenter Affiliation: George Mason University

Parasites play essential ecological roles in marine food webs and can serve as indicators of ecosystem health, yet their impacts on some commercially important fish species remain understudied. Atlantic mackerel (*Scomber scombrus*) in the western North Atlantic host trematode parasites resembling members of the Didymozoidea, a group with complex multi-host life cycles. Published records of Didymozoidea in western Atlantic mackerel are lacking despite high infection proportions in local collections. This study aimed to characterize parasite development and infection patterns in fish from the Gulf of Maine. Between June and August 2025, mackerel were collected from Massachusetts and Maine waters. Fish were measured, weighed, sexed, and examined for didymozoid cysts in the mouth, operculum, and associated structures. Individual worms were extracted, measured, and scored for egg maturity, and a subset was massed to generate a length– mass index. High infection intensity (mean 6.26 cysts per fish) was observed across samples. A significant positive relationship was found between fork length and infection, while a negative relationship was observed between condition factor and infection. Infection was most frequently observed on the opercula and pharyngeal teeth; however, worms in the pharyngeal teeth were larger and more mature, suggesting this structure may represent the primary infection site. No secondary or tertiary infections occurred without concurrent infection at these locations, indicating infection likely occurs through digestive pathways. Genetic analyses are underway to confirm parasite species identity. This study provides some of the first data on host–parasite interactions of a didymozoid infecting the western stock of Atlantic mackerel.

L4. Using species distribution modeling to predict river herring bycatch in the Atlantic Herring and Atlantic Mackerel fisheries in the U.S. Atlantic.

Authors: **K.J. Wade,** K.E. Roberts, J.A. Nye

Presenter Affiliation: University of North Carolina at Chapel Hill

River herring (*Alosa pseudoharengus* and *aestivalis*) were historically important commercial species until declines in their abundances led to fishery moratoria persisting over several decades. Despite research and restoration efforts, river herring populations have remained low, and one of the suspected reasons is due to large bycatch events in Atlantic herring (*Clupea harengus*) and Atlantic mackerel (*Scomber scombrus*) fisheries. To try to mitigate river herring bycatch events, regulations including area closures and bycatch caps have been enforced; however, bycatch events still occur as the overlap among these highly migratory species varies in time and space. Therefore, we were tasked to operationalize a product for the midwater trawl fishery that would forecast the bycatch of river herring one week in advance. The first objective was to create spatial-temporal species distribution models (SDMs) for each species separately using presence-absence data from the Northeast Fisheries Science Center (NEFSC) bottom trawl surveys and generalized additive models (GAMs). The second objective was to forecast the SDMs for each species by one week using temperature from the European Centre for Medium-Range Weather Forecasts (ECMWF). The best SDMs for all three species had area under the curve values that ranged 0.80 - 0.92. The forecast maps created each week included individual species distributions as well as a joint distribution map that identifies areas with a high encounter probability for targeted species and low encounter probability for river herring. We have shared these forecasts (https://www.rhapcast.org/) with fishers to develop a useful product to help reduce bycatch of river herring.

L5. Movement ecology of channeled whelk *Busycotypus canaliculatus* during the development of an offshore wind lease site.

Authors: **D.N. Jackson,** B.J. Runde, K. Wilke, A. Lipsky, E.T. Methratta, R.V. Van Hoeck, A. Smith, S.M. Van Parijs, D.B. Rudders

Presenter Affiliation: Virginia Institute of Marine Science

Offshore wind development often overlaps with existing ocean uses, including commercial fisheries. Along coastal Virginia, the development of the Coastal Virginia Offshore Wind (CVOW) lease area may impact commercial fishers targeting the marine gastropod, channeled whelk (*Busycotypus canaliculatus*). Channeled whelk is a commercially valuable yet relatively understudied species in the region, and the impacts of industrial development on this organism remain unknown. This species is presumed to have limited mobility and may be susceptible to anthropogenic disturbances. Understanding the drivers — whether anthropogenic or abiotic— of whelk behavior could inform future marine spatial planning decisions that seek to balance ocean development with sustainable fisheries. To investigate these dynamics, 15 channeled whelks were tagged with acoustic transmitters and released into a fine-scale receiver array at the CVOW pilot turbines. The movements of these tagged individuals were monitored from April to early October 2024, which encompassed a period of active construction (of the adjacent CVOW Commercial project) and varying environmental conditions. A hidden Markov model was then applied to examine how anthropogenic factors (i.e., pile driving) and abiotic factors (i.e., temperature, wave height, time of day, and lunar phase) influenced whelk movement and behavioral states. This presentation explores the findings of this research and demonstrates the utility of acoustic telemetry for tracking a commercially important marine gastropod in the context of offshore energy development.

L6. Stable Isotope Insights into the Trophic Ecology of an Expanding Population of Blue Catfish in Albemarle Sound.

Authors: **N. Vinay,** J.W. Morley, F.S. Scharf

Presenter Affiliation: University of North Carolina at Wilmington

Blue catfish (*Ictalurus furcatus*) were first introduced to the Atlantic drainages of North Carolina in 1966 and their range has since expanded throughout the state. A high salinity tolerance has enabled blue catfish to expand into brackish water ecosystems, such as the Albemarle Sound, which has experienced rapid increases in blue catfish abundance in the past 10-15 years. The potential for predatory impacts by blue catfish on commercially valuable species, such as blue crab, American shad, river herring, and striped bass are unknown. Traditional stomach content analysis was complemented by bulk stable isotope analysis ($\delta^{15}N$, $\delta^{13}C$, and $\delta^{34}S$) of muscle and liver tissues to examine spatial, seasonal, and size-based variation in trophic habits of blue catfish in the Albemarle Sound ecosystem. Trophic position was inferred from $\delta^{15}N$ enrichment, while $\delta^{13}C$ and $\delta^{34}S$ were assessed to evaluate trophic pathways and the relative contribution of marine and freshwater prey resources. We quantified foraging patterns by evaluating isotopic niche overlap among body sizes and between groups of fish collected in different regions of the Albemarle Sound system. Observed patterns of diet composition based on stomach contents, including predator–prey size ratios, were paired with isotopic signatures to link short and longer-term feeding habits. We also examined differences in isotope signatures between liver and muscle tissues to examine shifts in diet and trophic position across different time frames. Findings will contribute to the first comprehensive study of the trophic ecology of blue catfish in the Albemarle Sound ecosystem and is a key first step toward understanding predatory impact.

L7. Long-term trends in a tidal freshwater ecosystem before and after Northern Snakehead (*Channa argus)* introduction.

Authors: **R. Moreau,** J. Odenkirk, T.R. Nelson

Presenter Affiliation: George Mason University

Estuaries are vital habitats that support economically and culturally valuable fisheries. Tidal freshwater nurseries are especially valuable for anadromous fishes such as imperiled river herring (blueback herring and alewife) that have remained depleted despite restoration efforts, and economically valuable striped bass that are currently experiencing poor recruitment. Introduced piscivores consume juvenile fishes, directly contributing to population declines and poor recruitment in these imperiled and economically valuable species. The degree to which introduced piscivores are impacting local fish assemblages and anadromous fishes seen through tidal freshwater ecosystems remains unclear, despite substantial evidence of predation on native fishes by established populations. Using a 40-year dataset sampling fishes in Gunston Cove, a freshwater embayment of the Potomac River, we quantified species assemblage changes throughout the introduction of a new piscivore, the Northern Snakehead (*Channa argus)*. Sampling was performed utilizing beach seines, otter trawls, and electro-fishing equipment sampling a diversity of habitat types within Gunston Cove. Long-term survey data shows positive abundance changes across species with increases in Banded Killifsh (*Fundulus diaphanus*), White Perch (*Morone americanus*), Spottail Shiner (*Notropis hudsonius*), Striped Bass (*Morone saxatilis*), and Blue Catfish (*Ictalurus furcatus*). Interestingly, Northern Snakehead showed initial population increases, but recent survey data has shown this increase has largely plateaued. These results indicate that despite piscivore introduction, with many prey items exhibiting steady population increases. Therefore, while introduced species are commonly implicated in population declines regionally, this trend is not consistent here, underscoring the complexity of population level impacts of invasive species in intricate ecosystems like estuaries.

Student Full Talk Abstracts

ST1. Life in the bypass lane: an alternative passage route for migratory fishes in the Cape Fear River.

Authors: **G. Shay,** A. Bunch, J. DeMeester, T. Farmer, F. Scharf

Presenter Affiliation: University of North Carolina at Wilmington

Despite the construction and subsequent modification of a nature-like fishway at the lowermost lock and dam (LD1) in the Cape Fear River, upstream passage efficiencies of striped bass (*Morone saxatili*s) remain substantially below those achieved through historical locking procedures. Recently, a network of naturally occurring bypass channels north of the fishway was identified as a potential alternate route around the dam during elevated flow conditions. During the 2024 – 25 spring spawning seasons, fish movements and passage were monitored using a fixed acoustic receiver array that included receivers within the bypass channels and gates positioned upstream and downstream of LD1. Trail cameras were deployed at two upstream locations where bypass channels reconnect to the main river to assess the effects of flow conditions on bypass channel inundation. Confirmed striped bass passages via the bypass channel numbered 10 in 2024 and 8 in 2025, all occurring during high-flow events. In 2025, 81.6% (n = 133) of 163 striped bass available for passage were detected in the bypass channels at least once before successful upstream passage or downstream retreat. Many individuals repeatedly moved between the bypass channel and area below the fishway, with peak daily occupancy of the channels during moderate to high flow conditions. Results indicate strong attraction of striped bass to the bypass channel and demonstrate facilitation of upstream passage during high flow conditions. Future modifications to the upstream connections with the main river may also enable these channels to serve as an effective complementary passage route during lower flow conditions.

ST2. Effects of Blue Catfish on Blue Crab Abundance in Chesapeake Bay Tributaries during 1990-2023.

Authors: **M. Sholes,** M.C. Fabrizio, T.D. Tuckey, G. Davis, D. Liang, M. Wilberg

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Invasive Blue Catfish (*Ictalurus furcatus*) are found in every major tributary in the Chesapeake Bay and are thought to contribute to the declines of native species. Chesapeake Bay blue crab (*Callinectes sapidus*) abundance has recently declined, but the contribution of Blue Catfish predation to this decline is unknown. Our objectives were to estimate the relationship between Blue Catfish and blue crab, and potential future and recent effects of Blue Catfish on blue crabs in Chesapeake Bay. Catch per unit effort (CPUE) of blue crab and Blue Catfish were calculated for the James, York, Rappahannock, and Patuxent rivers for 1990-2023, and the relationship between blue crab CPUE and Blue Catfish CPUE was estimated for low salinity waters using data from the Virginia Institute of Marine Science and Maryland Trawl Surveys. Additionally, the fraction of blue crab that were vulnerable to Blue Catfish predation was quantified using a Chesapeake Bay-wide blue crab survey for 1995-2023. Blue crab CPUE decreased 90.4%, on average, with a Blue

Catfish increase of 40,000 fish/km^2. If Blue Catfish become as abundant in all low salinity areas of Chesapeake Bay as observed in the James and Rappahannock rivers, blue crab abundance may decline by about 13.7%, on average. In years when the blue crab population significantly overlaps with Blue Catfish, the decline could be as high as 42%. However, Blue Catfish were estimated to have a relatively small effect on blue crab abundance (-2.8%, on average) in Chesapeake Bay during 1995-2023.

ST3. Trophic niche of the emerging penaeid shrimp assemblage and potential food web consequences in the Chesapeake Bay region.

Authors: **M.P. Stefanak,** J. Gartland, R.J. Woodland

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

The abundances of White Shrimp (*Penaeus setiferus*) and Brown Shrimp (*Penaeus aztecus*) have been increasing in Chesapeake Bay and the mid-Atlantic Bight, particularly in Virginia waters, over the past several decades. Given this significant proliferation, an experimental Virginia fishery was initiated in 2017, which has grown steadily despite commercial fishing being restricted to two regions in the coastal ocean. While the potential economic impact of a novel penaeid shrimp fishery is notable, the associated ecological effects of a sustained northern range shift by these species has not been investigated. White and Brown Shrimp represent two mobile epibenthic omnivores that may occupy similar trophic niches to extant Chesapeake Bay consumers. In this study, we collected White and Brown Shrimp from lower Chesapeake Bay and the Virginia inner shelf in Fall 2022, and to a lesser extent in 2023 and 2024. Co-occurring fish and both benthic and epibenthic macroinvertebrates were collected during the period. Suspended particulate organic matter (pelagic), and benthic particulate organic matter (benthic) were collected to provide trophic baselines for stable isotope modeling. All samples were analyzed for $\delta^{13}C$ and $\delta^{15}N$ signatures using an EA-IRMS. The relative proportion of pelagic and benthic contribution to each species diet will be estimated using Bayesian mixing models. Trophic position will be compared on a size- and species-specific basis between shrimp and resident species. Ecologically similar species will be compared to penaeid shrimp using stable isotope-based niche metrics to quantify potential niche overlap. The results of this study will elucidate any potential trophic consequences of penaeid shrimp abundance increases to resident species within Chesapeake Bay and the adjacent shelf.

ST4. Investigating predator-prey and environmental dynamics of larval fish in a changing estuary, Beaufort Inlet, North Carolina USA.

Authors: **N. Jainarine,** R. Asch

Presenter Affiliation: East Carolina University

As North Carolina experiences unprecedented changes throughout its coastal marine habitats, it is important to understand how changes in lower trophic levels may impact higher trophic levels and how these changes may be further influenced by environmental variables. This is especially important for the ichthyoplankton

of economically and ecologically important fish species and their zooplankton prey. In partnership with NOAA's Beaufort Inlet Ichthyoplankton Sampling Program (BIISP), the Asch laboratory has concurrently sampled zooplankton in Beaufort from 2017-2022, providing a unique opportunity to assess predator-prey dynamics between larval fishes and zooplankton. This analysis uses Generalized Additive Modeling (GAM) to assess how the density of estuarine larval fishes are influenced by prey density with time lags, the Schoener's D Index of species overlap, temperature, salinity, wind strength and direction, and the North Atlantic Oscillation (NAO) Index. The species selected for this analysis include *Leiostomus xanthurus, Lagodon rhomboides*, *Brevoortia tyrannus*, and *Paralichthys* spp. Copepods were analyzed as prey due to their dominance in the holoplankton assemblage. Preliminary results have shown that temperature is the strongest predictor of larval fish abundance across all species. Copepod density was only a significant predictor variable for *L. rhombhoides*, while the Schoener's D Index was a significant predictor for all other species. This suggests that both temperature and overlap between predators and prey play a significant role in the abundance of larval fishes. Exploring these relationships further and how they relate to successful recruitment can contribute to both ecosystem-based management and fisheries-based management.

ST5. Habitat value of oyster aquaculture within estuarine landscapes for finfish and crustaceans.

Authors: **A. McMains,** M. Dowden, M. McMains, C. Taylor, J. Fodrie, J. Morley

Presenter Affiliation: East Carolina University

As oyster aquaculture continues to expand in prevalence, it is important to understand how it may impact habitat availability for estuarine species. An oyster aquaculture lease typically involves the conversion of an area of open bottom into a highly structured environment. We sampled 18 commercial oyster leases matched with 18 adjacent control plots across North Carolina estuaries to investigate differences in fish community and size structure between the paired sites. Gillnets, minnow traps, and crab pots were used to quantify the nekton community, whereas a kayak-mounted DIDSON acoustic imaging sonar was used to estimate differences in the abundance and length distribution of fish between leases and controls. In total we collected 4,547 individuals with net and trap sampling and recorded 24,517 individuals with the DIDSON. Community metrics (e.g. abundance, richness) from the net and trap sampling did not show any significant differences between paired lease and control sites. However, a significant difference in species composition was observed between floating and bottom aquaculture gear using NMDS and PERMANOVA. A size-spectra analysis of the DIDSON data showed that fish abundance was consistently higher in the oyster lease across all sizes of fish compared to adjacent controls. This work demonstrates the importance of considering sampling gear biases when designing an experiment and supports the hypothesis that oyster aquaculture enhances fish habitat across a broad array of species.

ST6. Using fine-scale acoustic telemetry to estimate mortality rates of gag in the Southeast U.S. Atlantic.

Authors: **R.M. Tharp,** N.J. Hostetter, J.A. Buckel

Presenter Affiliation: North Carolina State University

Gag *Mycteroperca microlepis* is a highly valued recreational and commercial grouper species in the Southeast U.S. Atlantic (SEUS) with a stock status of overfished and overfishing. Despite its importance, empirically-derived estimates of natural (*M*) and discard mortality (*D*) were not available in recent SEUS stock assessments; current *M* estimates are indirectly estimated using longevity and size-based methods and estimates of *D* are from the Gulf of Mexico fishery. Since April 2024, we have tagged 108 gag (mean TL = 517 mm) at two artificial reefs near Cape Lookout, NC. Gag were captured via hook and line and tagged with a pressure sensing acoustic transmitter and high reward internal anchor tags. Tagged fish have been tracked continuously for 6-18 months using fine-scale acoustic telemetry arrays. We assigned fates to each individual and used a known-fate Bayesian multistate model to estimate seasonal *M*, fishing mortality (*F*), and *D*. Estimated annual instantaneous rates of *M* ranged from 0.06 to 0.19 with the highest seasonal rates from summer to fall and fall to winter; our annual *M* estimates are less than the value used in recent assessments of similarly sized gag (*M* = 0.33). Estimated annual rates of *F* ranged from 0.04 to 0.07 with the highest rates from spring to summer, corresponding with the recreational season. Estimated annual rates of *D* ranged from 0.01 to 0.06 with the highest rates from summer to fall following the recreational season. Our estimates of *M* and *D* will be relevant to upcoming SEUS gag stock assessments.

ST7. Assessing the potential for hypoxia-induced shifts in trophic dynamics for mysids in the Chesapeake Bay region.

Authors: **N.R. Santos,** L.W. Cooper, K.-H. Shin, K.W. McMahon, R.J. Woodland

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Environmental change from anthropogenic stressors on a global basis is degrading biological communities and impacting trophic structures. Animals that are well-adapted to naturally fluctuating conditions, such as hypoxia, can serve as models for understanding organismal responses to anthropogenic forcing in coastal ecosystems. For example, bottom-water hypoxia may lead to habitat compression, making some typical habitats inaccessible. Mysids, which are small omnivorous crustaceans, engage in vertical and horizontal migrations on sub-daily to seasonal timescales. This mobility, along with their role as prey for benthic and pelagic predators, makes mysids a conduit for energy transfer in estuarine ecosystems. In this Chesapeake Bay-based study, we tested the hypotheses that: 1) localized hypoxia decouples mysids from benthic trophic pathways, 2) a shift to pelagic pathways reduces mysid trophic position, and 3) these hypoxia-induced changes associate with shifts in basal resources fueling mysid growth. Mysids were sampled and analyzed for the stable isotope composition of bulk tissues ($\delta^{15}N$ and $\delta^{13}C$) and compound-specific amino acid $\delta^{15}N$ and $\delta^{13}C$ values (CSIA-AA). Together, we investigated how hypoxia impacted mysid trophic position (CSIA-AA $\delta^{15}N$), benthic vs. pelagic trophic pathways (bulk $\delta^{13}C$ and $\delta^{15}N$), and basal carbon resource

utilization (CSIA-AA $\delta^{13}C$). Understanding the trophic responses of mysids to hypoxia provides insight into the role of eutrophication in reshaping food web structure and energy fluxes in coastal ecosystems.

ST8. Identifying drivers of fish communities at natural and artificial reefs during changing ocean conditions.

Authors: **B.L. Wager,** A.B. Paxton, J.A. Buckel

Presenter Affiliation: North Carolina State University

Climate change has caused shifts in marine fish distributions and migration patterns, but the drivers of these shifts vary. In the southeastern United States (SEUS) Atlantic region, key habitats for reef fish include natural hardbottom and artificial reefs (e.g., sunken vessels, shipwrecks, and concrete structures). We evaluated the differences in fish community composition at natural and artificial reefs in the SEUS Atlantic region to determine if changing ocean conditions differentially influence those habitats. Existing data sources including species- level abundance, environmental, species traits, and phylogenetic data spanning 1975 – 2024 were utilized to perform hierarchical modeling of species communities. The fish communities were examined in relation to several drivers, including age of the artificial reefs, depth, temperature, reef type, and reef material. Results from this study provide a biological baseline for future climate change studies and a better understanding of the biotic and abiotic drivers of reef fish community assembly processes at both natural and artificial reefs. By identifying what species traits are impacted by environmental factors such as warming temperatures, fisheries managers can better understand what groups of fishes are more vulnerable to climate change and if those vulnerabilities differ by habitat type. This information is timely, as development in the coastal ocean, including artificial reef deployments and offshore wind farms (a form of artificial reef), continue to increase in scope and scale.

ST9. Using baited remote underwater videos to determine the elasmobranch community assemblage in nearshore habitats of St. Barthélemy, West Indies.

Authors: **M.N. Firing,** K. Questel, T.R. Nelson

Presenter Affiliation: George Mason University

Sharks and rays are key apex and meso-predators in coastal Caribbean ecosystems; however, their community structure in nearshore waters of Saint Barthélemy, French West Indies, remains under-characterized, despite having an established Marine Protected Area (MPA, Le Reserve Naturelle). We deployed 27 baited remote underwater video surveys (BRUVS) in relatively shallow (<8m depth) nearshore habitats (<250m from shoreline) to determine community assemblage and relative use of elasmobranchs within these areas. Across these 27 surveys, we sampled a total of 19 randomly selected sites with four sites (two within the MPA and two outside the MPA) sampled three times each, to compare differences within and outside the MPA. We systematically analyzed each video and recorded species identity, number of individuals, time in frame, approach behavior, feeding posture, and interactions with the bait cage. MaxIND was utilized over MaxN to better assess true population defined in these surveys. This preliminary data will

be analyzed to compare surveys inside and outside the MPA, and to identify patterns across the island. These results increase our understanding of MPA function and elasmobranch community structure within nearshore Caribbean habitats, while providing essential data to the local natural resource management agency.

ST10. Characterization of the diet of Roundscale Spearfish (*Tetrapturus Georgii*) using morphology and molecular based approaches and comparisons to White Marlin (*Kajikia Albida*).

Authors: **Q.L. Girasek,** J.R. McDowell

Presenter Affiliation: Virginia Institute of Marine Science

Istiophorid billfishes are highly migratory apex predators inhabiting coastal and pelagic ecosystems where they consume a variety of fishes and invertebrates. In the United States, there is a 250-fish US recreational quota for Atlantic billfishes, which includes roundscale spearfish, *Tetrapturus georgii*, blue marlin, *Makaira nigricans*, and white marlin, *Kajikia albida*, limiting sampling opportunities. *T. georgii* is a relatively rare, data-deficient istiophorid billfish. The lack of knowledge is at least partially due to its morphological similarity to the more commonly encountered *K. albida*. Thus, *T. georgii* has historically been recorded as "white marlin" in commercial and recreational records. To better understand the diet preferences of *T. georgii*, stomachs were sampled from fish landed at recreational tournaments along the east coast of the United States in 2024 and 2025. Morphological and molecular methods were used to identify prey items. For morphological identifications, billfish stomachs were dissected, and prey taxa were sorted and identified to the lowest taxonomic level possible. Stomach contents and cloacal swabs were used for molecular-based identifications. DNA was extracted from both sample types and metabarcoded using the cytochrome c oxidase 1 (COI) and hypervariable gene region of the 18S ribosomal DNA (V9) gene. Results from the different approaches were compared, and the diets of *T. georgii* and *K. albida* were compared. Advancing the understanding of the *T. georgii* diet is important for the management and conservation of this data-poor species.

ST11. Linking observer and logbook data to evaluate discard estimates in Gulf reef fish fisheries.

Authors: **R. Mroch,** M. Wilberg

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Assessing human impacts on marine ecosystems is essential for fisheries management. One potentially large impact is discards of non-target species. Discard estimation relies on surveys with inherent tradeoffs. Observer programs collect high-quality but resource-intensive, whereas discard logbooks provide broad coverage inexpensively while being considered less reliable. This study evaluated discard logbook (DLP) and observer (RFOP) data for six focal reef fish species: blueline tilefish (*Caulolatilus microps*), black sea bass (*Centropristis striata*), yellowedge grouper (*Epinephelus flavolimbatus*), red grouper (*Epinephelus morio*), red snapper (*Lutjanus campechanus*), vermilion snapper (*Rhomboplites aurorubens*). This was done

linking trips across datasets and comparing discard occurrence and intensity. Discard logbook and commercial logbook (CFLP) trips were linked using normalized schedule numbers, achieving 99.5% linkage. Observer trips were linked using vessel identity, landing date, gear type, and region, with candidate matches scored and resolved to retain one-to-one linkages (36.1% linkage). Discard logbooks from trips without observer coverage reported zero focal-species discards in 49% of cases, compared to 23% of reported discard logbooks with an observer onboard, indicating differences in discard occurrence between observed and unobserved fishing activity. At the trip level, significant differences in total discard counts were detected for *E. morio* and *R. aurorubens*, while other species showed no significant differences. These findings indicate that discard logbooks provide broadly comparable estimates of discard intensity within matched trips, while differences in discard occurrence between observed and unobserved trips highlight the importance of improving trip linkage and reporting consistency to support reliable discard estimation.

ST12. Big shells, bigger data: cohort analysis of Chesapeake Bay *Crassostrea virginica* reefs.

Authors: **M. Griffin,** G. Chiu, R. Mann, M. Southworth, J. Thomas

Presenter Affiliation: Virginia Institute of Marine Science

Oysters in Virginia Chesapeake Bay reefs are “age-truncated”, possibly due to a combination of historical overfishing, disease epizootics, environmental degradation, and climate change. Research has suggested that oysters exhibit resilience to environmental stressors; however, that evidence is based on a limited understanding of oyster lifespan. Until this paper, the Virginia Oyster Stock Assessment and Replenishment Archive (VOSARA), a spatially and temporally expansive dataset (222 reefs across 2003-2023) of shell lengths (SL, mm), had yet to be examined comprehensively to assess resilience. We developed a novel method using Gaussian mixture modeling (GMM) to identify age groups in each reef using yearly SL data, then linked those age groups over time to identify cohorts and estimate their lifespans. Sixty-four reefs (29%) met criteria for “sufficient” data (at least 300 oysters sampled for a minimum of 8 consecutive years). We fit univariate GMMs for each year (t) and reef (r) to estimate 1) the mean and 80^{th} quantile of shell length for each (r,t)th age group, and 2) the percentage of the (r,t)th population in each age group. We compared the (r,t)th estimates to river-level GMM estimates. We developed an algorithm that linked age groups into cohorts while preventing shell length shrinkage when an (r,t)th group becomes an (r,t+1)th group. This method showed promise in age estimation and oyster cohort identification solely using SL data. Results showed signals of resiliency in almost all river systems: oyster cohorts lived longer yet grew smaller in the mid-to-late 2010s compared to the early 2000s.

ST13. Invasive appetite: Blue Catfish diet and distribution threaten Albemarle Sound biodiversity.

Authors: **C. Miller,** N. Vinay, R. Delvillar, A. McMains, F. Scharf, J. Morley

Presenter Affiliation: East Carolina University

Aquatic invasive species can severely disrupt ecosystems by outcompeting or consuming native species, reducing biodiversity, and causing economic losses to fisheries. Blue catfish (*Ictalurus furcatus*), native to

the Mississippi River Basin, were introduced to Atlantic coast drainages to enhance recreational fishing, but have since become invasive. This study examines their invasion extent and effects on native organisms in the Albemarle Sound, NC. Dietary habits were investigated through stomach content analysis of blue catfish collected by gill netting and electrofishing. Additionally, long-term fisheries-independent survey data were analyzed to assess spatial and temporal patterns. Blue catfish were the second most frequently captured species in gill nets, with over 800 individuals captured, surpassed only by white perch in catch per unit effort. Individuals ranged from 164 to 771 mm in total length and were found broadly throughout the Albemarle Sound system. Generalized additive models confirmed their rapid expansion since the early 2000s, with salinity as the primary environmental constraint on distribution. Diet analysis (n > 2000 stomachs) revealed that filter-feeding bivalves, including clams (*Corbicula fluminea* and *Rangia cuneata*) and mussels (*Mytilopsis leucophaeata*), were primary prey. Larger individuals consumed more fish prey, and mean clam size increased with catfish size. Other economically important species including blue crabs, shrimp, and river herring were also consumed. These findings suggest that invasive blue catfish might be contributing to the shifting ecosystem state in the Albemarle Sound, one with reduced productivity of traditional fisheries and increased frequency of harmful algal blooms.

ST14. Testing short-term externally attached acoustic tags for estimating release mortality.

Authors: **R. Kelmartin,** E. Greenheck, T.R. Nelson

Presenter Affiliation: George Mason University

Acoustic telemetry has bettered fisheries conservation and management by allowing researchers to remotely monitor fish in space and time and answer diverse questions regarding post-release mortality. For *in situ* studies, external tagging can be preferable over implantation as surgery may confound estimation and be a poor mimic of angling practices. Additionally, it is crucial to consider the various methods of fish tagging to further minimize negative effects without impacting data quality or introducing bias. To reduce tag burden, we expand upon the Spaghetti method by adding dissolvable sutures between the polyethylene and acoustic tag cap to create a “timed release” function, relieving the fish of the tag post data collection. We compared the dissolution rate of USP 4/0, 2/0, 0 Polyglactin and Polydioxanone, and USP 0 Chromic Gut and Plain Gut in warm (28°C) and cold (15°C) mesohaline (13 ppt) waters over 70 days in a controlled lab study. Undissolved sutures were subjected to a force test (kg) to determine how they compared to sutures not exposed to water. Polyglactin USP 0 had the greatest difference in dissolution rates (~10.9kg/15°C and 0.35kg/28°C), therefore it was further evaluated in a temperature-controlled (28°C) study to assess its dissolution rate every seven days for 56 days. This confirmed Vicryl 0’s ability to maintain structural integrity through the lifespan of the tag for retainment, while still allowing post-study tag release. These results highlight the importance of suture choice in field studies to determine the best material for the study to improve fish welfare.

Professional Talk Abstracts

PT1. Quantifying linked rare events in fish and environmental Chesapeake Bay time series.

Authors: **G. Nesslage,** V. Lyubchich, G. Davis, E. Durell, M. Fabrizio, M. Friedrichs, J. Gartland, R. Latour, R. Lipcius, J. Reichert-Nguyen, P. St-Laurent, T. Tuckey, B. Versak

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Climate change is associated with increased occurrence of rare weather events, which can generate extreme environmental conditions that may enhance or hinder fish and shellfish productivity and abundance. Climate impacts are often assessed using predetermined definitions for biologically meaningful anomalies that may or may not apply if baselines are shifting and animals are adapting. We adopted a comprehensive, objective approach to identifying linked rare events by allowing statistical and machine learning-based approaches to inform their definition. We analyzed two long-term environmental time series and eight long-term fish/shellfish monitoring time series from the Chesapeake Bay to identify rare events in environmental conditions (e.g., extreme high and low air and water temperature, precipitation, etc.) and juvenile and adult catch-per-unit-effort for eight native fish and shellfish species (Atlantic striped bass, Atlantic menhaden, blue crab, bay anchovy, summer flounder, black sea bass, red drum, and cobia) and one invasive species (blue catfish). Rare events were identified using data-driven statistical identification of extremes with isolation random forest, a pure machine learning method. Correspondence analysis with time series lags identified linkages among biological and environmental rare events. PCA quantile regression was used to generate predictive models that quantify the impact of rare environmental events (e.g., extreme high and low air and water temperature, precipitation, etc.) on rare high or low catch-per-unit effort events in fish/shellfish surveys. Insights gained from this study will support the development of climate indicators for enhanced ecosystem-based fisheries management in the Chesapeake Bay region.

PT2. Assessing the spawning migration history of southern flounder (*Paralicthys lethostigma*) based on otolith microchemistry.

Authors: **R.G. Asch,** J. Mitchell, P. Harris, J. Luczkovich, R.A. Rulifson

Presenter Affiliation: East Carolina University

Southern flounder (*Paralichthys lethostigma*) historically has been among the most valuable finfish fisheries in North Carolina but, following years of low recruitment, this species was classified as overfished. While southern flounder is estuarine dependent as a juvenile, it migrates offshore to spawn. Little is known about the extent of the spawning migration, resulting in questions about the appropriate spatial scale for management. Evidence from the Gulf of Mexico population suggests that skip spawning and/or partial migration may be common, but no information is available on this behavior for the South Atlantic stock. To better understand the migration history of this population, we analyzed otolith microchemistry of 297 specimens from four estuarine and offshore locations to track exposure to marine conditions. When examining the

distal edge of sagittal otoliths, we could differentiate between locations where specimens were collected on a multivariate basis and when solely considering ^{88}Sr:^{44}Ca ratios. When averaged across sampling events, ^{88}Sr:^{44}Ca ratios explained 68% of variance in salinity, allowing us to use ^{88}Sr:^{44}Ca as a biomarker of previous exposure to oceanic salinities and trace the migration histories of individual fish. Among age 2+ flounder captured in commercial pound nets in estuaries, nearly two-thirds had never traveled offshore to spawn based on the ^{88}Sr:^{44}Ca proxy. Among age 3-4 fish, only 33-42% of individuals displayed evidence of offshore migration, indicating that partial migration or delayed spawning may occur. Overall, managers should carefully assess escapement in the estuarine fishery since most fish caught may not have previously traveled offshore to reproduce.

PT3. Horseshoe crab movement in the upper Chesapeake Bay.

Authors: **A. Blanchette,** R. Aguilar, K. Richie, M. Ogburn

Presenter Affiliation: Smithsonian Environmental Research Center

The Atlantic horseshoe crab (*Limulus polyphemus*) is an ecologically and economically important species in the Chesapeake Bay. Extensive research and conservation efforts have focused on horseshoe crabs in the Delaware Bay and along the Atlantic coast, however surprisingly little is known about the ecology of horseshoe crabs within the upper Chesapeake Bay. To better understand the movement of horseshoe crabs in this region, we acoustically tagged and monitored 16 horseshoe crabs from 2016-2024, originally released in the Rhode River at the Smithsonian Environmental Research Center in Edgewater, Maryland. The tagged horseshoe crabs exhibited small-scale space-use, as they were never detected more than 20km from their release site. Additionally, they were not detected within 200km of the mouth of the Chesapeake Bay, supporting previous research that suggested a lack of connectivity between the upper Chesapeake Bay and other coastal and Delaware Bay populations. Seasonally, there were four times more days with detections in warmer months (May-September) than in winter (December-February). While the horseshoe crabs were most likely spawning in early summer (April-June), they potentially retreated to deeper waters or buried within the sediment in the winter. Overall, in comparison to better-studied populations of horseshoe crabs, the individuals in this study exhibited similar seasonal variation in movement, but smaller-scale space-use and greater isolation from the coast.

PT4. Practicality of using eDNA to assess anadromous Herring stream spawning habitat.

Authors: **J. Horne,** S. Moorhead, M. Ponte, M. Topolski, Z. Galvan, J. Uphoff

Presenter Affiliation: Maryland Department of Natural Resources

We looked at the practical application of eDNA for assessing anadromous Herring spawning habitat in the nontidal portion of Mattawoman Creek and the effects of development and conductivity. Stream ichthyoplankton (IP) sampling with fine mesh nets have been the standard to collect presence-absence data on Hickory Shad, Alewife, and Blueback Herring ("Herring") eggs and larvae. Identification of eggs and larvae to species is difficult and time-consuming, so the combined presence of all three species is used to determine percent presence of Herring eggs or

larvae in samples (P_{herr}) as a spatiotemporal index of spawning that is negatively related with development (impervious surface) and conductivity. Stream IP and eDNA samples were collected in unison in Mattawoman Creek in the Spring of 2025. Estimates of P_{herr} from stream IP samples were similar to the average and weighted average P_{herr} from eDNA of the three species combined. In addition, we examined the relative abundance and site utilization of the three species in Mattawoman Creek. Alewife migrated furthest upstream, followed by Hickory Shad, and Blueback Herring. P_{herr} depicted a negative response to elevated conductivity between 2024 and 2025 which was supported by historical sampling. Stream IP and eDNA estimates of P_{herr} in 2025 were lower than P_{herr} in 2024, reflecting high and low conductivity, respectively.

PT5. Offshore wind development's impact on Mid-Atlantic fisheries stock assessments.

Authors: **M. Sun,** K. Braid, J. Blaylock, D. Hennen, S. Truesdell, Y. Chen

Presenter Affiliation: Virginia Institute of Marine Science

Rapid expansion of offshore wind development along the U.S. Mid-Atlantic shelf presents new challenges for fisheries surveys and stock assessments, particularly where survey operations may be spatially constrained or ecological processes are altered within wind energy areas. While these issues are widely recognized, their consequences for survey indices, assessment performance, and management advice remain poorly quantified. This talk presents modeling approaches to examine offshore wind impacts on stock assessment, progressing from survey indices to assessment outcomes and, finally, to altered spatial abundance distributions using historical survey data and simulation experiments. First, the effects of survey preclusion and effort redistribution on bias and variability in abundance indices are evaluated. Second, these altered indices are propagated through stock assessment models to assess impacts on assessment outputs and performance. Finally, offshore wind development-induced spatial abundance changes are evaluated for their consequences on survey indices and assessment when observed. Applications span multiple Mid-Atlantic species and surveys, including NEFSC bottom trawl and dredge surveys, and encompass both integrated and index-based assessment approaches. Results show that assessment sensitivity to offshore wind impacts is highly stock- and model-dependent. In some cases, assessments are robust to survey disruption, whereas in others, retrospective bias and uncertainty increase markedly, particularly when survey loss coincides with spatial redistribution. Overall, the developed frameworks provide a standardized way to diagnose where and why offshore wind development matters for stock assessment, and highlights opportunities for mitigation through survey design, index construction, and assessment strategy in a changing seascape.

PT6. Using collaboration and secondary telemetry data to understand fish movement in the Chesapeake Bay.

Authors: **W. Cruz-Marrero,** M. Whitmore, B.W. Vogt, K.D. Richie, M.B. Ogburn, R. Aguilar, C.B. Bangley, M. Balazik, D.H. Secor, M. O'Brien, I. Park, E. Simpson, K.C. Weng, D. Crear, M. McGrath, E. Hilton, S. Eyler, K. Wilkinson, K. Hart, F. Scharf, E. Hale, A. Carlisle, B. Marsaly, C. Stence, A.E. Horne, B. Runde, K. Lyons, J. Wyffels, K. Dodge, J. Buckel, J. Merrell, N.B. Furey

Presenter Affiliation: National Oceanic and Atmospheric Administration, Chesapeake Bay Office

Passive acoustic telemetry allows researchers to track fish movements across large arrays of receivers, providing insights into how various species utilize the Chesapeake Bay. While most telemetry studies focus on a single species and specific objectives, our project involved collaboration with 50 principal investigators, whose tagged animals were detected on the Chesapeake Bay backbone array from 2020 to 2024. The combined dataset encompassed 795 individuals across 21 species. By integrating secondary-use telemetry detections, we evaluated seasonal occupancy, habitat connectivity, and multi-species overlap at an ecosystem level. We observed a strong increase in detection during spring and early summer, followed by a decline in late summer detections. Species such as Atlantic sturgeon, striped bass, cobia, red drum, and cownose rays were detected across the upper, mid, and lower regions of the Bay, demonstrating significant spatial overlap. Using network analysis, we quantified connectivity among tributaries and the mainstem, identifying key movement corridors used by multiple species. These patterns became apparent only when datasets were combined. This work highlights the importance of collaboration and the Chesapeake Bay Backbone array infrastructure. By leveraging secondary-use telemetry data, we enhance the value of individual tagging efforts and generate insights that support fisheries management without the need for additional field effort.

PT7. Parasites infecting and consumed by Striped Bass (*Morone saxatilis*) vary spatially and ontogenetically in the Chesapeake Bay.

Authors: **K.M. Pagenkopp Lohan,** H. Brunelle, A.A. Davinack, P. Santos-Ciminera, R. DiMaria, M.B. Ogburn, R. Aguilar, E.M. Palmer

Presenter Affiliation: Smithsonian Environmental Research Center

Relatively little is known about importance of parasites in predator-prey interactions across age classes and linkages between diet and infection. To examine these linkages, we dissected young-of-year (YOY) to adult striped bass to assess the prevalence and abundance of parasites infecting individuals. Then, we used amplicon-based high throughput sequencing to assess the parasites in the stomach contents. Of the 570 *M. saxatilis* dissected, 73% were infected with an average parasite richness of 1.12 ± 0.88 (SD; Range: 0–4). Parasitic arthropods in the Ergasilidae were the most prevalent (59.6%), followed by Nematoda (27.5%) and Acanthocephala (20.4%). For the diet analyses, we found that between 27.6% and 11.4% of the stomach contents contained parasite taxa. The two genetic markers provided complementary, yet distinct results, with the 18S marker amplifying more taxa, while the COI marker provided greater taxonomic resolution of the parasites identified. While 45.3% of parasites found infecting the striped bass typically use trophic transmission, only 10.4% of the striped bass stomach contents contained parasitic taxa that typically use trophic transmission. Instead, 41.8% of stomach contents contained parasites that typically utilized fecal-oral transmission. Our data provides an update on prevalence and diversity of parasites of striped bass, while providing novel insight regarding the role of parasites in the diet of this recreationally and commercially important species, with likely extensions to a broader functional diversity of parasites involved in food webs.

PT8. Spatiotemporal index standardization of multiple fishery-independent surveys in North Carolina estuaries.

Authors: **M. Zink,** M. Damiano

Presenter Affiliation: North Carolina Division of Marine Fisheries

Applications of spatiotemporal models to standardize combined survey data is a practice that is still in its infancy. North Carolina Division of Marine Fisheries (NC DMF) is responsible for several fishery-independent survey programs that operate at different spatial and temporal scales. These programs collect catch, effort, biological, and environmental data, which are used to generate indices of relative abundance for NC DMF stock assessments. Historically, NC DMF generated indices by fitting generalized linear models to survey data. Assessment models would be fit to numerous indices, often with conflicting trends, which produced concerning residual patterns in model fits. These patterns likely resulted from unresolved spatial and/or temporal autocorrelation within and among surveys. We used sdmTMB spatiotemporal modeling software to standardize data from multiple survey programs and generate a single combined index of relative abundance for NC blue crab (*Calinectes sapidus*) and southern flounder (*Paralichthys lethostigma*), respectively. We fit sdmTMB models to three survey datasets combined to estimate species density over space and time. Each model treated the survey as a factor-level covariate to account for differences in fishing power among gear types used in sampling. Results for southern flounder show a modest increase in abundance following strict harvest reductions in 2020, while results for blue crab show a consistent declining trend in abundance. We recommend using spatiotemporal models to combine survey data avoid both information loss via model selection and introducing model conflict to stock assessment a priori.

PT9. Exploring the role of zooplankton abundance in the recent failure of Striped Bass year-classes in a Chesapeake Bay tributary.

Authors: **S. Moorhead,** J. Horne, M. Ponte, A. Park, J. Uphoff

Presenter Affiliation: Maryland Department of Natural Resources

Poor year-class success of Striped Bass during 2019-2024 in Maryland's four major Chesapeake Bay spawning areas has become a primary management concern. To investigate whether feeding success on zooplankton could play a significant role in this series of year-class failures, we estimated Striped Bass postlarval feeding incidences on primary zooplankton prey, and their associations with daily instantaneous mortality rates (Z), from seven 1980s Choptank River surveys (including both low and high Z and a range of poor to strong year-classes) to establish criteria to evaluate 2023-2024 collections. Feeding incidences of first-feeding Striped Bass postlarvae on copepods in the Choptank River during 2023-2024 were high; feeding incidence on cladocerans was also high in 2024. Estimates of a proxy index for postlarval Z during 2023 and 2024 were low. However, year-class success was dismal during 2023 and low in 2024. High feeding incidence of first-feeding Striped Bass postlarvae on zooplankton and low mortality did not always translate to better year-class success during the 1980s and 2023-2024. Although this feeding investigation did not encompass the entire 2019-2024 drought in recruitment, there was

no indication from 2023-2024 that poor postlarval feeding success played a consistent, prominent role in the recent Striped Bass year-class failures.

PT10. Omnidirectional sonar increases catch efficiency in a pelagic sportfishing tournament.

Authors: **B.J. Runde,** P.J. Rudershausen, J.A. Buckel

Presenter Affiliation: The Nature Conservancy

Technological advances in fisheries often lead to increased catch efficiency and have the potential to cause overexploitation. One popular and emerging technology in pelagic sportfishing is omnidirectional sonar, which can be used to identify and target individual fish. We analyzed catch data from two consecutive years of a sportfishing tournament from North Carolina, USA to investigate differences in catch success between vessels with omnidirectional sonar and those without it. In this tournament, vessels target six pelagic species, including three Istiophorid billfishes, dolphinfish *Coryphaena hippurus*, wahoo *Acanthocybium solandri*, and yellowfin tuna *Thunnus albacares*. A Bayesian generalized linear model of combined-billfish-species catch rates revealed that vessels with sonar caught 67% (95% CI: 31%, 112%) more fish than vessels without sonar, when accounting for vessel length and year of the tournament. A chi-square test of independence showed that the numerical catch of prize-winning (by weight) non-billfish species differed by sonar presence, with sonar-equipped vessels winning more than the expected number of prizes. The finding that omnidirectional sonar increases catch rates for these pelagic species has implications for fishery managers aiming to ensure the sustainability of pelagic stocks in the face of emerging fishing technologies.

PT11. Real-time iterative forecasting of an Atlantic sturgeon spawning run with acoustic telemetry.

Authors: **M. O'Brien,** D.H. Secor

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

Migrations of marine and coastal fauna are often monitored by archival receivers, which record animal presence, placed along migration pathways. Due to the expense of recovery and difficulty in transmitting data across the water-air boundary, data are not retrieved from the receivers for months; receivers thus represent nodes in a network with month-long latency. While cabled receivers allow data to traverse the water-air interface, data transmission and cataloguing are left to ecologists with little training in cyberinfrastructure, curtailing near-real-time migration forecasting. In an attempt to lower this barrier, we leveraged GitHub Actions' HTTP-based REST API to create a basic, free, open-source back-end infrastructure which can be extended to near-real-time iterative modelling. We present a pilot study utilizing this system, a cellular-connected Raspberry Pi, and acoustic biotelemetry to create near-real-time nowcasts of federally-endangered Atlantic sturgeon.

PT12. Development of a sex- and length-structured stock assessment model for Chesapeake Bay Blue Crabs.

Authors: **M. Drzewicki,** D. Liang, T. Miller, M. Wilberg

Presenter Affiliation: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

The Blue Crab (*Callinectes sapidus*) is an iconic species in the Chesapeake Bay and supports the region's most valuable commercial fishery, but fishery catches have declined by about 50% since 2016. The last stock assessment was conducted in 2011, and it found that the stock was not overfished nor experiencing overfishing at the time. Our objective was to develop a novel stock assessment model for Blue Crab that was sex- and length-structured. Our model estimated abundance, biomass and fishing mortality for three sex categories (males, mature females, and immature females) during 1994—2023. The model included sex-specific growth, sex- and maturity-specific fishing mortality, and operated on a monthly time step. The data inputs included multiple survey indices of abundance, fishery catches from several fleets, and proportion-at-sex and length for each data source. Preliminary results indicated that seasonal growth differs by sex, with the fastest growth during spring. Estimated fishing mortality, recruitment, and abundance changed over time and differed among sex categories. Estimated fishing mortality on mature females declined in response to management changes in 2008. However, recruitment and abundance of mature females has also decreased since 2010. The model will be used in the Chesapeake Bay Blue Crab stock assessment to inform management that reflects current stock status.

PT13. Rising to the occasion: archival depth data indicate offshore spawning rise behavior in southern flounder.

Authors: **C. DeVries,** M. Collins, A. Markwith, M.S. Loeffler, F.S. Scharf

Presenter Affiliation: University of North Carolina at Wilmington

Several flatfish species have been found to migrate from warmer, shallow inshore water to deeper, cooler offshore waters, with spawning periods often occurring while offshore. Additionally, depth analyses of flatfish during spawning periods have indicated spawning rise behavior, where individuals rapidly ascend from depth to spawn before descending back to depth. Southern flounder (*Paralichthys lethostigma)* are a flatfish species found in both estuarine and coastal waters of the southeastern U.S. Atlantic and the Gulf of Mexico. Previous ichthyoplankton surveys have found southern flounder larvae in North Carolina outer shelf waters, suggesting that spawning aggregations may occur in deep, offshore waters. In this study, 35 southern flounder were tagged with miniPAT satellite archival tags in estuarine sites across the North Carolina coastline in 2021 and 2022. Archival depth data were utilized to estimate offshore migration and residence time, characterize offshore habitat use, as well as investigate potential spawning rise behavior in southern flounder. Contrary to previous studies indicating outer shelf spawning habitat, archival depth data revealed depths more indicative of mid-shelf waters. Additionally, analysis of depth-time series data showed putative spawning rises, including time-of-day and day-of-year temporal

clustering. We suggest future research confirm the association of these depth patterns with spawning events and further characterize factors influencing spawning depth, location, and timing.

PT14. Demonstrating the robustness of dynamic spawning potential ratio reference points to recruitment nonstationarity: a Southeast United States case study.

Authors: K. Shertzer, **M. Damiano,** R. Methot, E. Williams

Presenter Affiliation: North Carolina Division of Marine Fisheries

Scientific advice from stock assessment models typically quantifies a harvest control rule (HCR) used by fisheries managers. These HCRs are informed by estimates of target and/or limit biological reference points from the assessment model based on quantities related to maximum sustainable yield (MSY) or a proxy. Increasingly, dynamic biological reference points have been adopted to ensure HCRs incorporate recent changes in stock productivity in projections. In the southeast United States Atlantic (SEUSA), stock assessments have predicted a reduction in average recruitment for multiple reef-associated species since 2010. Although it remains unclear whether a regime shift has occurred, the prolonged period of reduced productivity indicates nonstationarity in recruitment for numerous stocks. We conducted a series of simulations to test the performance of a dynamic implementation of a typical SEUSA HCR under stationary and nonstationary recruitment conditions, including abrupt and gradual increases and decreases in mean recruitment, and cyclic recruitment dynamics. The HCR was comprised of a target rate of fishing mortality, 60%, 75%, or 90% F (40%), the rate that reduces the spawning potential ratio (SPR) to 40% of its unfished size, and a biomass limit. We found that, across stationary and nonstationary scenarios, the HCR maintained a constant but low probability of overfishing when assessments were more frequent (< every 6 years), and a generally negligible risk of the stock being overfished. These results demonstrate the robustness of dynamic SPR proxy reference points to recruitment nonstationarity for SEUSA reef fishes and highlight the importance of more frequent stock assessment to prevent overfishing.

PT15. Uncovering hot topics in the ACT Network.

Authors: **G. Stephenson,** M.B. Ogburn, M.E. Bowers, K.D. Richie

Presenter Affiliation: Smithsonian Environmental Research Center

The Atlantic Cooperative Telemetry (ACT) Network brings together researchers from Maine to North Carolina, USA, who track animals using acoustic telemetry. We assessed how these data inform management and conservation by: 1) quantifying the number of species studied, peer-reviewed publications, and collaborations, and 2) comparing the topics of published research and active projects. The number of species tagged and papers published annually increased over time, resulting in a broad research scope. We applied topic modeling to publication and project titles and abstracts to identify 12 themes for each, six of which overlapped including the most common theme: sturgeon. Publications emphasized taxon-related and ecological themes, whereas projects emphasized geographic and applied themes. We created a network plot linking together organizations that collaborated on an ACT Network publication. The network plot shows a high degree of connectivity between 118 organizations within and beyond the ACT Network, indicating a high degree of collaboration for acoustic telemetry studies.