

# HOLLINGS MARINE LAB

## Quarterly Highlights

January – March 2026

**Hollings Marine Lab Mission:** Provide science and biotechnology applications to sustain, protect, and restore coastal ecosystems with emphasis on links between environmental condition and the health of marine organisms and humans



**Hollings Marine Lab Vision:** Hollings Marine Laboratory is the leading institution for research and science for understanding and preserving community health and coastal ecosystems.

## Hollings Marine Lab Partner Updates

### All Partners

### NOAA

- **NCCOS PFAS Research Yields Two New Publications:**
  - Per- and polyfluoroalkyl substances (PFAS) are ubiquitous, persistent, and toxic pollutants in aquatic systems. The National Centers for Coastal Ocean Science (NCCOS) has been conducting laboratory and mesocosm experiments to study the impact of PFAS in the coastal zone. NCCOS scientists recently published a NOAA Technical Memorandum on the fate and effects of PFAS in a saltmarsh ecosystem. The report describes the results of a mesocosm experiment involving two PFAS compounds: perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). After 28 days, the team measured the chemical partitioning of these common PFAS compounds into water, sediment, marsh grass, fish, shrimp, clams, snails, amphipods, and periphyton, along with assessments of organism health and survival. The results showed species-specific sensitivities. Fish and mud snails were resilient to PFOS and PFOA, with no significant survival effects. Grass shrimp were more sensitive to PFOS, whereas amphipods and clams were more sensitive to PFOA. PFAS fate analysis showed that both PFOS and PFOA partitioned from water into biota and sediment. PFOS demonstrated greater sediment accumulation and biotic uptake compared to PFOA. Fish had greater uptake of PFOS than PFOA, whereas amphipods took up more PFOA than PFOS. This study helps managers understand where these persistent chemicals will be found in estuarine habitats and the risk they pose to coastal communities.
    - Pennington, P.L, Ferguson, R.E, Key, P.B, Wirth, E.F., Chung, K.W., Pisarski, E.C, Crescent, S.S., Tanabe, P., Wenclawiak, J.T, Pinckney, J.L., DeLorenzo, M.E. 2026. Fate and Effects of PFOS and PFOA Individually and in Mixture in Simulated Saltmarsh Ecosystems. NOAA Technical Memorandum NOS NCCOS 368. Silver Spring, MD. 83 pp. DOI: <https://doi.org/10.25923/sxnk-sw51>.
  - Few studies have characterized PFAS toxicity for estuarine and marine fishes, or investigated how environmental changes such as temperature influence PFAS toxicity.

College of Charleston Marine Biology graduate student, Anna Thornton, and NCCOS scientists recently published results of a laboratory [study](#) of the interactive effects of PFOS and elevated temperature in two estuarine fish species in the journal *Environmental Toxicology*. A standard toxicity test species (*Cyprinodon variegatus*, sheepshead minnow) and a recreational fishery species (*Sciaenops ocellatus*, red drum) were exposed to PFOS under two different temperatures (20°C and 30°C) for 96 hours. Fish survival, PFOS uptake, thyroid function, oxidative stress, and metabolic rate were measured. The results indicate that elevated temperature and PFOS act together to exacerbate toxicity in these estuarine fish, with species specific differences in respiration and gene expression responses. This study supports fisheries management by improving our understanding of how PFOS alters fish physiology and interacts with temperature in estuarine species.

- The Northwest Fisheries Science Center (NWFSC) Marine Forensic Laboratory successfully partnered with the Society for Wildlife Forensic Science (SWFS) to organize the biennial SWFS conference. In a challenging year for travel, the conference drew about 85 participants from 13 countries for science presentations, workshops, and networking at the Francis Marion Hotel in downtown Charleston. The next SWFS meeting will be in Sydney, Australia!
- NWFSC staff participated in a NOAA Office of Law Enforcement (OLE) operation at the port of Houston, TX. OLE personnel took samples from tuna and salmon at air cargo facilities to beta test two presumptive field testing technologies. One was a lateral flow strip (akin to a COVID test) for Atlantic Salmon, developed by iCatch. The second, developed by Dr. Diego Cardeñosa of Florida International University, was a qPCR-based High Resolution Melt analysis for detection of four tuna species, similar to one he developed for [sharks](#). NWFSC staff followed up by ground-truthing the presumptive results with DNA sequencing. Testing such assays under field conditions helps developers hone the technology, and informs OLE about the practicality of implementing them. Successful presumptive tests aim to allow correctly-labeled seafood to continue into commerce without delay while also limiting laboratory submissions to just those with questionable results. The laboratory also reported 19 cases to the NOAA OLE, with results spanning seven taxonomic orders. Contact: [Kathy Moore](#)
- The NCCOS scientists recently received a surface plasmon resonance (SPR) analytical module from collaborators at the Monterey Bay Aquarium Institute (MBARI). NCCOS has partnered with MBARI since the inception of the third generation Environmental Sample Processor (3G-ESP) and created toxin sensor chips for previous deployments, but MBARI has retained responsibility for deploying the analytical module. Going forward, NCCOS will prepare and connect this embedded SPR analytical module for deployment on the 3G-ESP autonomous surface vehicle or autonomous underwater vehicle (ASV/AUV). Over the next few months, we will prepare and optimize microcystin sensor chips for the embedded SPR system, integrating them with sample collection and processing on the 3G-ESP. We will deploy the sensors we prepared with other NOAA collaborators in Lake Huron in July. Another upcoming effort will advance the development of a saxitoxin sensor for this system, with a planned field deployment next year in Nome, Alaska.
- The NOAA Fisheries Southeast Regional Office and Duke Energy have begun their first full year of passing fish above the Blewett Falls Dam on the Yadkin River near Rockingham, NC. For more than 100 years, the dam blocked American shad and other fishes from accessing their historical spawning grounds. During 2025, the fishway, operated as a trap-and-transport facility, underwent testing and passed approximately 1500 shad. So far in 2026, over 2000 shad have been passed upstream, and the fishway is expected to operate at least another 6 weeks.
- Recent publications:
  - Stock Identity of Stranded Tamanend's Bottlenose Dolphins (*Tursiops erebennus*) With Evidence of Fisheries Interaction in Virginia, North Carolina, and South Carolina, 1996–2019. Kim W. Urian, ... Wayne E. McFee, ... Andrew J. <https://doi.org/10.1111/mms.70147>
- The Coral Health and Disease Lab is conducting a long-term turbidity exposure experiment with ESA-listed coral, *Acropora cervicornis*, commonly called staghorn coral. This study builds on several years of prior turbidity research, comparing biological responses to sediment collected from Port Everglades versus calcium carbonate media, serving as "clean" sediment with no organic material associated with it, to evaluate differences in experimental outcomes.

## South Carolina Department of Natural Resources

- South Carolina Department of Natural Resources (SCDNR) coordinated and led a workshop on the application of genetic tools in stock enhancement and restoration programs in collaboration with North Carolina Wildlife Resources Commission at the Southern Division AFS meeting.
- SCDNR assessed 10 years of accumulated Red Drum genetic data from Charleston Harbor system collections (Ashely, Cooper, Wando, and Harbor) to assess trends in genetic health and hatchery contributions from the stocking program. Results indicate genetic diversity has not changed during the last 10 years and individual year class hatchery contributions have remained stable as those fish are assessed across multiple years.
- SCDNR has moved larger juvenile red drum out of the HML 121 system to the SCDNR tank pad that was refurbished last year. Collaborating with Carl Miller (on contract to NCCOS) to install new pumps at the point has enabled the system to be fully operational, with additional pumps as back-ups expected to be online soon.
- SCDNR has stocked 1,162,648 larval Southern Flounder into the Ashley River to evaluate the potential of using larval releases in the new stock enhancement program. Additionally, 32,954 20-dph (pre-metamorphosis) and 45,300 50-dph (post-metamorphosis) fish have been released into the Murrell's Inlet estuary and 25,000 50-dph fish were released into the Ashley River to explore size, season, and location of release questions.
- Recent SCDNR Publications:
  - Vinyard, E.A., Portnoy, D.S., Driggers, W.B., Gelsleichter, J., Hendon, J.M., Higgs, J.M., Natanson, L.J., and Frazier, B.S. Age and growth of spinner sharks, *Carcharhinus brevipinna*, in the western North Atlantic Ocean. *Environ Biol Fish* 109, 17 (2026). <https://doi.org/10.1007/s10641-025-01772-x>.
  - Lasco, H.L., Close, H.G., Hoenig, R., Gillette, P.R., Benetti, D.D., & Stieglitz, J.D. (2026). Evaluation of native macroalgae species of the southeast U.S. and Caribbean for use in integrated multi-trophic aquaculture (IMTA). *Aquaculture International* 34:70. <https://doi.org/10.1007/s10499-026-02441-1>.
  - Low, J.G., Wyanski, D.M., Klibansky, N., Henley, W., Shertzer, K.W., Cimino, J., Spanik, K.R., Schmidtke, M.A., Wong, C., & Jiao, Y. (2026). Maturity, spawning seasonality, sex ratios, and gonadosomatic indices of United States Atlantic blueline tilefish. *Marine and Coastal Fisheries*. 18:vtaf046. <https://doi.org/10.1093/mcfafs/vtaf046>.

## College of Charleston

- A Seal AA5000 automated nutrient analyzer was installed in mid-Jan in Room D-112. The instrument will be ready for running samples in May, 2026. A nominal number of samples can be run for free for HML partners. Larger sample numbers will be run at a reduced rate for HML partners. The instrument will analyze samples as part of the NOAA grant entitled "Land to Sea: Assessing Urban Impacts on Coastal Water Quality in Charleston, South Carolina". Project summary can be found at: [Land to Sea: Assessing Urban Impacts on Coastal Water Quality in Charleston, South Carolina - NCCOS - National Centers for Coastal Ocean Science](#).
- The manuscript "A Pan-Arctic Pigment Database for Phytoplankton and Sea-Ice Algae" (Heidemann et al.) was submitted and is currently in review at *Earth System Science Data*, <https://doi.org/10.5194/essd-2026-144>

## National Institute of Standards and Technology

- The National Institute of Standards and Technology (NIST) celebrated its 125<sup>th</sup> Anniversary on March 3, 2026.
- *Metabolomics* journal featured NIST scientist, Tracy Schock in the February cover story "Women in Metabolomics", celebrating influential female leaders in the field.
- Aquaculture America (February 16-19) in Las Vegas, NV. NIST scientist, Carolyn Burdette attended.
- Society for Wildlife Forensic Science meeting (March 20-27) in Charleston, SC. NIST scientist, Ashley Boggs attended.

- NIST scientist presented “Mapping the Unseen” as an invited speaker for the National Academy of Sciences’ thirty-sixth annual Frontiers of Science symposium March 2026. Contact Jessica Reiner
- NIST scientists attended a workshop March 9-12 in which NIST scientist, Clay Davis presented Metrology for Multi-Omics Measurements.
- New paper [“Blood proteomics: insights from public data”](#) coauthored by NIST scientist, Ben Neely.
- New publication coauthored by HML partners:
  - Kelsey Blevins, Jessica Reiner, Aaron M. Watson, Michael Janech, **Ashley S.P. Boggs** (2026) [Per- and polyfluoroalkyl substances \(PFAS\) in aquaculture feeds and potential dietary exposure to and from aquaculture fish](#). Food and Chemical Toxicology 212.
- NIST released SRM 1947a Great Lakes Fish Tissue at the beginning of the year. This reference material is designed to support the measurement of various contaminants, including per- and polyfluoroalkyl substances (PFAS), in environmental, public health, and aquaculture monitoring. The availability of SRM 1947a allows researchers and state and federal agencies to validate new testing methods, such as the recently expanded EPA Method 1633, for both wild-caught and aquaculture fish.
- To support the exposure science community, NIST in collaboration with the Centers for Disease Control and Prevention (CDC) recently released (February 2026) the next generation of two materials, SRM 3672a Organic Contaminants in Smokers’ Urine and SRM 3673a Organic Contaminants in Nonsmokers’ Urine, that are essential for ensuring the validity and comparability of routine health care measurements and long-term population studies. This most recent update includes over 100 analytes for the smokers’ material and more than 80 analytes for the nonsmokers’ material, including modern metabolites that reflect the exposures of contemporary society such as pesticide residues, personal care product metabolites, and replacement chemicals for compounds deemed unsafe in recent years. NIST worked with CDC to add four new classes of modern contaminants to the second-generation materials and updated the certificates and SP260 in February to include organophosphate esters, glyphosate, neonicotinoids, DEET and other pesticide residues, increasing the analytical breadth of both materials.
- New NIST Internal Report, The National Marine Mammal Tissue Bank Specimen Inventory Report, National Institute of Standards and Technology, Gaithersburg, MD, <https://doi.org/10.6028/NIST.IR.8606>. Contact Jennifer Ness.
- NIST scientist, Amanda Moors presented, ‘Alaska Marine Mammal Tissue Archival Project (AMMTAP); Collection Protocol Updates, Access Policy, and Inventory’ at the Alaska Marine Science Symposium, Anchorage, AK (Jan 2026) and provided an in-person sample collection training to specimen contributors in the Alaska Region for the AMMTAP.
- NIST scientist presented an update on the National Marine Mammal Tissue Bank collection to stakeholders at the Marine Mammal Stranding Network’s West Coast Regional meeting on February 2, 2026. Contact Debra Ellisor
- NIST scientists began production of Reference Material (RM) 8470 Metabolite Extract from Human Liver and RM 8471 Lipid Extract from Human Liver. Contact Debra Ellisor, Tracey Schock, and Clay Davis
- NIST scientists received and processed seabird eggs as part of NIST’s Seabird Tissue Archival and Monitoring Project (STAMP) (n=15 eggs, 330 aliquots). Laysan and black-footed albatross eggs were collected from Midway Atoll by longstanding collaborators at the USFWS and Hawaii Pacific University. Contact Jennifer Hoguet
- NIST scientist continues to participate in a multi-national effort to provide an updated Arctic Monitoring and Assessment Programme report on time trends of persistent organic pollutants/chemicals of emerging Arctic concern. Contact Jennifer Hoguet
- Researchers from the National Marine Mammal Foundation collaborated with NIST to aid in the processing of bottlenose dolphin dart biopsy samples at the NIST Biorepository. Contact Amanda Moors
- NIST participated in numerous meetings of ISO TC334 WG10 Reference Material Terms and Definitions to finalize the most recent draft of ISO/DIS 33400 for submission. She also submitted draft text for inclusion in ISO/TR79 Reference Materials-Examples of reference materials for qualitative purposes, as part of ISO TC334 WG 13 Qualitative Reference Materials. Contact Debra Ellisor

- NIST attended and participated in four ISO/TC 276/WG2 Biotechnology virtual meetings that began the review of ISO/DIS 20387: Biotechnology-Biobanking – General Requirements of Biobanks. Contact Jennifer Ness and Rebecca Pugh
- NIST attended and presented, ‘The Utility of Reference Materials for Authentication of Goods, Using NIST Seafood RMs’, at the Society for Wildlife Forensics Science conference, March 23-26, 2026 in Charleston, SC. Contact Debra Ellisor

## MUSC

- New MUSC Publications:
  - Menny M. Benjamin, Cody F. Dickinson, Jared S. Wood, R. Thomas Williamson, George S. Hanna, Ahmed S. Alford, Robert P. Stone, Gerald R. Hoff, Abhi R. Samala, Fayaj A. Mulani, Qibin Zhang, Mark T. Hamann\*. *Fragment-Based Online OzESI-MS, NMR, and Computational DP4+/DFT Approaches to the Characterization of the Putative, Biosynthetic Lipid Precursors of Atkamine from Alaskan Latrunculia Sponges*. ACS Omega. 2026; 11(9), 14797-14805. <https://doi/full/10.1021/acsomega5c11024>.
  - Cody F. Dickinson\*, Abhay Potluri, Alison M. Bland, Samuel M. Flipse, George S. Hanna, Ryan T. Wagner, Keith D. Robertson, Thai H. Ho, Daniel J. Sprague, Gerald R. Hoff, Robert P. Stone, Marcus A. Tius, Dean J. Tantillo and Mark T. Hamann\*. *On the Discorhabdins Leading to the Aleutianamine Ring System: A One-Step in Situ Transformation Characterized Through Computational and Experimental Studies and its Implications on Biosynthesis, Synthesis and Pharmacology*. *Angewandte Chemie International Edition*. 2026, e7864883. <https://doi.org/10.1002/ange.7864883>. **Cover Art Featured Publication**
  - Cody F. Dickinson\*, Samuel M. Flipse, Jared S. Wood, Erika Bistran, Alison M. Bland, Daniel J. Sprague, Angelina M. DeJohn, Yeun-Mun Choo, George S. Hanna, Wesley Y. Yoshida, R. Thomas Williamson, Marcus A. Tius, and Mark T. Hamann\*. *Aleutianamine B, A Novel Chiral Sulfoxide Isolated from Latrunculia spp. and Generated via Semi-Synthesis, Exhibits Selectivity for Ovarian Cancer Cells*. *Journal of Natural Products* 2026, 89, 1, 73-81. <https://doi.org/10.1021/acs.jnatprod.5c01094>. **Cover Art Featured Publication.**

### More Questions?

#### Current Science Board Member Contact Information

**NOAA:** Mike Denson (HML Director) – [michael.denson@noaa.gov](mailto:michael.denson@noaa.gov); Jeff Guyon – [jeff.guyon@noaa.gov](mailto:jeff.guyon@noaa.gov)

**NIST:** Rebecca Pugh - [rebecca.pugh@nist.gov](mailto:rebecca.pugh@nist.gov); Jessica Reiner - [jessica.reiner@nist.gov](mailto:jessica.reiner@nist.gov)

**SCDNR:** Tanya Darden - [dardent@dnr.sc.gov](mailto:dardent@dnr.sc.gov); Rich Harrington - [HarringtonR@dnr.sc.gov](mailto:HarringtonR@dnr.sc.gov)

**CofC:** Jack DiTullio - [ditullioj@cofc.edu](mailto:ditullioj@cofc.edu); Mike Janech - [janechmg@cofc.edu](mailto:janechmg@cofc.edu)

**MUSC:** Mark Hamann (SB Chair) - [hamannm@musc.edu](mailto:hamannm@musc.edu); Jessica Hartman - [hartmanj@musc.edu](mailto:hartmanj@musc.edu)