United States Environmental Protection Agency

Fish and Shellfish Program NEWSLETTER

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In This Issue

https://www.epa.gov/fish-tech

Recent Advisory News

MDHHS Continues Precautionary Consumption Guideline for Lake Superior Smelt Due to PFAS

As of March 21, 2022, the Michigan Department of Health and Human Services (MDHHS) continues to recommend that people eat no more than one serving per month of smelt from Lake Superior due to elevated levels of perfluorooctane sulfonate (PFOS), a per- and poly-fluoroalkyl substance (PFAS).

MDHHS Eat Safe Fish serving sizes are based on a person's weight. For someone who weighs 180 pounds, a serving size is eight ounces. Recommended serving sizes for children are 2 ounces for a child weighing 45 pounds and 4 ounces for a child weighing 90 pounds. For every 20 pounds less than those weights, subtract 1 ounce; for every 20 pounds more than those weights, add 1 ounce.

This precautionary fish consumption guideline was first issued by MDHHS on March 24, 2021. The guideline was created due to data shared by the Wisconsin Department of Natural Resources (WDNR) that showed elevated PFOS in Lake Superior rainbow smelt. At the time, MDHHS did not have data on PFOS levels in Lake Superior smelt but chose to match WDNR's guidance and issued a consumption guideline as a precautionary measure. MDHHS recommended the guideline stay in effect until there was enough data to reevaluate.

In 2021, the Michigan Department of Environment, Great Lakes, and Energy along with other partners collected smelt from several locations in Lake Superior and its related watershed. Early results from the MDHHS PFAS analysis indicate that PFOS levels in smelt collected in Michigan are similar to those in smelt collected in Wisconsin.

Analysis of the smelt for other contaminants of concern is still underway. Until all data is available, MDHHS recommends that the guideline of one serving per month remain in place for smelt from Lake Superior. When all data is available, MDHHS will update the guidelines for smelt.

MDHHS makes Eat Safe Fish guidelines to help Michiganders make safer choices when it comes to choosing and eating fish.

For more information, contact Lynn Sutfin at 517-241-2112, visit the Eat Safe Fish program website, or call 800-648-6942.

Source: https://www.michigan.gov/mdhhs/inside-mdhhs/newsroom/2022/03/21/mdhhs-continues-precautionary-consumption-guideline-for-lake-superior-smelt-due-to-pfas

EPA News

National PFAS Datasets

As part of EPA's PFAS Strategic Roadmap, the United States Environmental Protection Agency (EPA) is compiling and integrating a collection of data that can be used to evaluate what is known about PFAS reporting, testing, and occurrences in communities. EPA is integrating data available nationally with other information from states and localities that are testing for PFAS pursuant to their own regulatory initiatives. The National PFAS Datasets included in EPA's Enforcement and Compliance History Online (ECHO) website have a wide range of location-specific data.

Most of the resources referenced on the ECHO webpage have been downloaded or transferred from public information repositories. Where useful information is not readily accessible from identified information sources, static files and hyperlinked references may be presented so that analysts can retrieve, review, and possibly incorporate this information into their work. As the EPA and states accelerate efforts to collect and share PFAS data, the amount of information within these files will continue to increase – leading to a more complete picture of PFAS occurrence.

How are PFAS Identified in the National PFAS Datasets?

PFAS are identified using the EPA's CompTox Chemicals Dashboard, which contains a list of PFAS both with and without explicit chemical structures. Together, these two lists contain greater than 12,000 substances and were last updated in August 2021. View the list of PFAS with explicit structures and the list of PFAS without explicit structures for more information on how the lists were assembled.

The EPA's CompTox Chemicals Dashboard provides other chemical lists and sources for PFAS inventories. In curating these datasets, EPA has attempted to include the widest definitions of PFAS so analysts can have the largest possible dataset to begin their research. Note that the definitions used for the EPA's CompTox Chemicals Dashboard may not be identical to the definitions used for a particular reporting resource included on the National PFAS Datasets in ECHO.

About the National PFAS Datasets

The EPA resource includes multiple data files that are regularly updated and may be useful in analysis or assist in identifying locations for fish or shellfish PFAS sampling. Example datasets include:

- Ambient Environmental Sampling for PFAS
- Superfund Sites with PFAS Detections
- Facilities with Clean Water Act Discharge Monitoring for PFAS
- Spills/releases of PFAS as determined by National Response Center Incident Reports

- Facilities Manufacturing or Importing PFAS
- Facilities Generating or Receiving PFAS Waste

The Water Quality Portal (WQP) is a dataset containing PFAS samples for dozens of fish species that were collected from multiple agencies over the past 20 years. The WQP is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations, and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality. As of early 2021, the WQP contained the results and metadata associated with over 80,000 PFAS samples of water, soil, sediment, and biota (e.g., tissue).

To submit ambient sampling data to the Water Quality Exchange (WQX, the system receiving sampling data that is published via the WQP), an organization or individual must first have or set up user accounts with both the EPA's Central Data Exchange (CDX) and WQX. Before setting up new accounts, check with your colleagues as many state agencies and environmental research organizations have accounts as well as staff with experience with the data exchange processes. Users can submit project and sampling data via Water Quality Data (WQX) web interface or custom Extensible Markup Language (XML) data uploads. The commercial EQUIS™ platform, used for storing data from contaminated sites and field investigations, has an export template designed for upload to WQX. Detailed instructions can be found at WQX. If your organization has ambient water quality measurements, soil testing, sediment testing, air testing, or biota testing, that data will appear in the WQP PFAS Data Download if your organization submits data through the WQX/WQP.

Caveats and Limitations: EPA did not conduct sampling or testing of a majority of the data in the WQP PFAS dataset. EPA can only ensure the accuracy and completeness of the EPA data from projects like the National Aquatic Resource Survey. Quality Assurance Project Plans (QAPPs) and the approving agency of the QAPP may be included in WQX, if a QAPP is entered.

For more information on the analytical capabilities available to U.S. Government Agencies through Enforcement and Compliance History Online (ECHO) Gov, visit: https://echo.epa.gov/trends/pfas-analytics.

For assistance in creating an ECHO Gov user ID or accessing government-only material please visit: https://echo.epa.gov/help/login-and-access#echogov.

For more information, contact Nicholas Spalt at Spalt.Nicholas@epa.gov.

Source: https://echo.epa.gov/tools/data-downloads/national-pfas-datasets

Other News

Engineers Studying How PFAS Interact with Environment

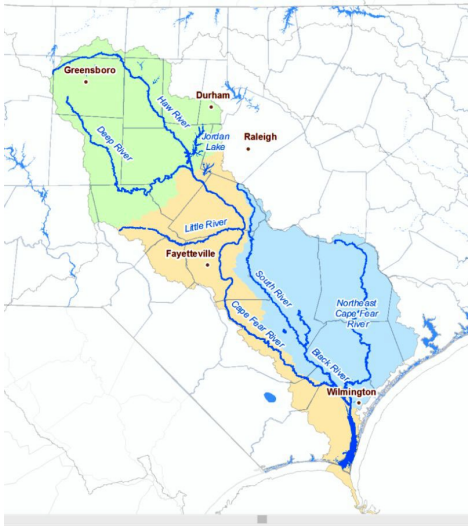
Improved Understanding is First Step Toward Remediation

Environmental engineer Detlef Knappe was surveying water quality in North Carolina watersheds in 2013 when his team found something surprising in the Cape Fear River Basin: high levels of a group of human-created chemicals called "PFAS" that are linked to a host of health issues, including cancer.

PFAS have been used worldwide since the 1940s to make a wide range of consumer products, including food packaging, personal care products, nonstick cookware, stain-resistant fabrics and paint. Airports, industrial sites, and military installations also contribute to higher PFAS levels in water, soil, and air.

The high stability of these chemicals makes them resistant to processes that normally break chemicals down in the environment, which is why they are called "forever chemicals." They persist and can build up in a person's bloodstream and organs — by some estimates, everyone in the United States has PFAS in their blood.

In 2002, the United States began phasing out production and use of some PFAS, but thousands of others remain in production, and new ones are still being developed. Even phased-out PFAS can still be found in the environment, and in food and drinking water.



The Cape Fear River Basin, where NSF-supported researchers found PFAS, is the source of drinking water for more than 1 million people in North Carolina. (*Photo courtesy of North Carolina Department of Environmental Quality*)

Tracking PFAS in North Carolina

Knappe, a professor at North Carolina State University in Raleigh, and his students, with support from two U.S. National Science Foundation (NSF) grants, spent several years investigating PFAS chemicals, including GenX, found in the Cape Fear River Basin, a drinking water source for up to 1.5 million people in North Carolina. The team wanted to better understand where the chemicals were originating and where the contamination was spreading. Their findings sparked a movement to clean up the Cape Fear River watershed. "There was a very immediate outcry from public officials and community members," Knappe said. The North Carolina Department of Environmental Quality ordered The Chemours Company, a chemical company spun off from DuPont in 2015, to stop discharging into the river and collect their processed wastewater. As a result, PFAS and GenX levels downstream of the plant have decreased. The state is now monitoring for PFAS and has set goals to limit the amount of chemicals found in drinking water.

Reducing Contamination from PFAS

"The persistence of PFAS in the environment is the challenge," said Jeanne VanBriesen, division director of NSF's Division of Chemical, Bioengineering, Environmental and Transport Systems. "It's one of a class of chemicals that are famous because of how they remain in the environment a long time. Natural processes that would degrade or break down other chemicals don't work on these. Understanding the fundamental questions of where these chemicals go and what controls their movement can give us insights on effective ways to remove it from our drinking water."

PFAS are largely impervious to today's conventional water treatment methods. In the last few years, NSF research has explored development of new filtration systems, including an ongoing material science project involving Knappe to see if a combination of environmentally friendly graphene oxide and cyclodextrin can selectively capture PFAS. The study will contribute to the fundamental understanding of the molecular interactions of PFAS and provide information for the development of sustainable strategies for PFAS remediation.

In 2021, NSF invested more than $4.1 million in nine fundamental research projects to create new strategies to remove PFAS from the environment. Researchers are using a range of approaches, from capturing the chemicals to changing them into benign products. This research is co-funded by NSF's Environmental Engineering program in the Division of Chemical, Bioengineering, Environmental and Transport Systems, and DuPont de Nemours Inc.

"This research investigates how to remove PFAS from water and soil, and how to transform PFAS into chemicals that can be broken down in the environment," VanBriesen said. "The new remediation methods must be feasible, effective, and sustainable.

"What we learn with PFAS may be extended to other chemicals – ones we know about today, and ones we don't know about yet. The new techniques and deeper understanding of these chemicals in the environment should help us in the future."

Source: https://beta.nsf.gov/science-matters/engineers-studying-how-pfas-interact-environment

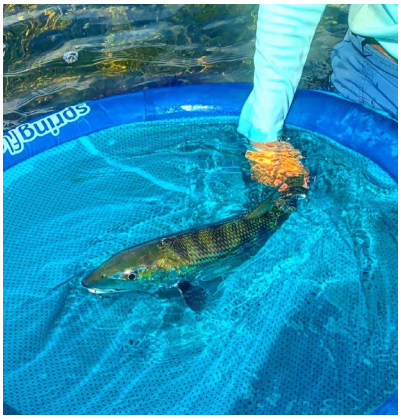
Pharmaceutical Contaminants Discovered in South Florida Bonefish

A three-year study by Florida International University (FIU) and Bonefish & Tarpon Trust (BTT) has discovered pharmaceutical contaminants in the blood and other tissues of bonefish in Biscayne Bay and the Florida Keys.

"Coastal fisheries face increasing threats associated with human-based contaminants," said Jim McDuffie, BTT President and Chief Executive Officer (CEO). "Pharmaceuticals are an often overlooked dimension of water quality and their presence in South Florida bonefish is cause for concern. These contaminants pose a significant threat to the flats fishery, an important part of Florida's recreational saltwater fishery, which has an annual economic impact of $9.2 billion and directly support over 88,500 jobs."

Since the study began in 2018, FIU scientists and BTT research associates, in partnership with Sweden's Umeå University and the University of Agricultural Sciences (SLU), have sampled 93 fish in South Florida, finding an average of seven pharmaceuticals per bonefish, and 17 pharmaceuticals in a single fish. The list includes blood pressure medications, antidepressants, prostate treatment medications, antibiotics, and pain relievers. Researchers also found pharmaceuticals in bonefish prey — crabs, shrimp, and fish — suggesting that many of Florida's valuable fisheries are exposed.

Lead researcher Jennifer Rehage, a coastal and fish ecologist and associate professor at the FIU Institute of Environment, presented the study's findings at a BTT panel event in Tallahassee, Florida.



Bonefish to be sampled for pharmaceutical contaminants in South Florida *(Photo courtesy of FIU).*

"These findings are truly alarming," Rehage said. "Pharmaceuticals are an invisible threat, unlike algal blooms or turbid waters. Yet these results tell us that they are a formidable threat to our fisheries and highlight the pressing need to address our longstanding wastewater infrastructure issues."

Approximately 5 billion prescriptions are filled each year in the United States, yet there are no environmental regulations for the disposal of pharmaceuticals worldwide. Pharmaceutical contaminants originate most often from human wastewater and are not sufficiently removed by conventional water treatment. They remain active at low doses, can be released constantly, and exposure can affect all aspects of fish behavior, with negative consequences for their reproduction and survival. Pharmaceutical contaminants have been shown to affect all aspects of the life of fish, including their feeding, activity, sociability, and migratory behavior.

For more information, contact Angela Nicoletti at anicolet@fiu.edu or Nick Roberts at nick@bonefishtarpontrust.org.

Source: https://news.fiu.edu/2022/pharmaceutical-contaminants-discovered-in-south-florida-bonefish

Recently Awarded Research

NSF Invests in Engineering Research to Remove PFAS from the Environment

On August 10, 2021, the U.S. NSF funded nine fundamental research projects to create new strategies to remediate PFAS in the environment. PFAS persist and accumulate in soil, water, and living organisms, and they can lead to adverse health effects.

"NSF has long supported research on the prevention, mitigation and remediation of environmental pollution to protect the health of people and the planet," said Richard Dickinson, division director of the NSF Division of

Chemical, Bioengineering, Environmental and Transport Systems. “With these new studies, NSF hopes to enable effective, feasible and sustainable technologies to remedy PFAS contamination across the Nation.”

What makes PFAS endure are the strong bonds between carbon and fluorine. PFAS have many fluorine atoms to create their desired properties. PFAS include perfluorooctanoic acid (PFOA), PFOS, perfluorobutane sulfonic acid (PFBS), GenX and other chemicals. While some early PFAS chemicals have been phased out in the United States, they, as well as later replacements, can still be found in the environment, food, and drinking water.

With more than $4.1 million in combined funding, the new research projects will use a variety of approaches to treat PFAS contamination, whether by capturing the chemicals or by breaking their carbon-fluorine bonds to turn PFAS into benign products. Researchers will investigate biological technologies, chemical catalysis technologies, photolytic technologies, and physical treatment technologies.

“Remediation of PFAS has been a difficult engineering challenge due to their unique environmental properties,” said Karl Rockne, who coordinated the NSF Environmental Engineering program. “They have both water-repelling and water-soluble properties, which makes separating these compounds from water and soil efficiently very challenging. Once captured, their extreme chemical stability makes them very difficult to degrade.”

Rockne continued, “These nine projects will employ novel, cutting-edge strategies that address the twin engineering challenges of separation and destruction and that hold high potential for developing breakthrough technologies.”

The nine projects for engineering research to advance solutions for environmental PFAS are funded through 13 awards:

- **A "concentrate-and-destroy" technology for treating per- and polyfluoroalkyl substances using a new class of adsorptive photocatalysts**: Auburn University, award 2041060; and University of Maryland, Baltimore County, award 2041059
- **Development of quantitative tools to assess the mechanisms and full potential of UV-ARPs for the treatment of PFASs in water**: Texas A&M University, award 2050934; and California State University, Long Beach, award 2050882
- **Electrocatalytic hydrodefluorination of PFAS using molecular, metal-free catalysts**: University of Cincinnati, award 2051260
- **Mechanistic investigation of thermal decomposition of poly- and perfluoroalkyl substances in the soil environment**: University of North Dakota, award 2047062
- **Microbial electrochemical defluorination of PFAS using bioaugmented *Acidimicrobium* sp. Strain A6**: Princeton University, award 2055015
- **Nickel and palladium single-atom electrocatalysts for selective capture and destruction of PFAS in complex water matrices**: Yale University, award 2120418; and Clarkson University, award 2120452
- **Remediation of per- and polyfluoroalkyl substances in wastewater using anaerobic membrane bioreactors**: SUNY at Buffalo, award 2112201; and University of Southern California, award 2112651

- **Tunable vacuum-ultraviolet irradiation systems with highly polarized redox environment for treatment of per- and polyfluoroalkyl substances**: University of California, Riverside, award 2131745
- **Understanding the surface-active properties of PFAS for enhanced removal by bubbling-assisted water treatment processes**: SUNY at Stony Brook, award 2052772

This new research on the treatment and remediation of PFAS is co-funded by the Environmental Engineering program in the NSF Division of Chemical, Bioengineering, Environmental and Transport Systems, and an unrestricted gift to the NSF from DuPont de Nemours Inc.

More information on the investment can be found on the NSF website.

Source: https://www.nsf.gov/news/news_summ.jsp?cntn_id=303258&org=CBET&from=news

Tech and Tools

Cyanobacteria Assessment Network Application (CyAN app)

Make Faster Decisions Related to Cyanobacterial Algal Blooms

The EPA's Cyanobacteria Assessment Network mobile application (CyAN app) is an easy-to-use and customizable app that provides access to cyanobacterial bloom satellite data for over 2,000 of the largest lakes and reservoirs across the United States. EPA scientists developed the app to help local and state water quality managers make faster and better-informed management decisions related to cyanobacterial blooms.

Compatibility and Availability

The CyAN app is available as two versions: CyANWeb app and the CyAN Android™ app. Both are free apps that require an internet connection and provide the same information using different platforms. The CyANWeb app is a web browser-based interface available on the EPA's website that will work with any operating system and is compatible with most devices. The CyAN Android™ app is available for download on Google Play™ and is designed for use on Android™ devices; it is compatible with versions 4.2-9.0 (Application Programming Interface (API) levels 18-26).

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Capabilities and Applications

Capabilities: The CyAN app provides an easy to use, customizable interface to scan water bodies for changes in cyanobacteria occurrence without requiring computer programming expertise. It provides water quality managers a user-friendly platform that reduces the complexities associated with accessing satellite data to allow fast and efficient initial assessments across water bodies that are roughly 1 kilometer wide or greater. Users can view information about cyanobacteria concentrations on a national-scale or can zoom in to single-out data for a lake or reservoir. Because states and localities may address harmful algal blooms (HABs) differently, users can determine their own thresholds for cyanobacteria concentrations. Users can also compare multiple water bodies at once, allowing for better-informed decisions based on recent changes at specific locations.

Algal bloom. *(Photo courtesy of EPA)*

Applications: Because the CyAN app uses satellite data to map the location of cyanobacterial blooms in fresh and coastal waters across the United States, it can be used to quickly inform decisions regarding recreational and drinking water safety. Lake managers, for example, could use the CyAN app on a daily or weekly basis to monitor lakes in their region. At a quick glance of their computer or mobile device, they could pinpoint potential problem areas and focus their attention and resources. The data might prompt them to manually collect water samples from certain lakes for more information or issue a public advisory to close local shores to recreation.

Note: The CyAN app is an experimental mobile application and provides provisional satellite derived measures of cyanobacteria, which may contain errors and should be considered a research level tool. The primary satellite sensor collecting data is the European Space Agency's Copernicus Sentinel-3 Ocean and Land Colour Instrument.

Background and Research Collaboration

Most species of algae are not harmful, but sometimes certain types bloom in excessive amounts and can cause harm to human and pet health, aquatic ecosystems, and local economies. Referred to as HABs, they are usually associated with algae that have the ability to produce toxins and can cause environmental and health problems.

Even though they are classified as bacteria, cyanobacteria—sometimes referred to as blue-green algae—exhibit characteristics of algae and are associated with HABs. Cyanobacterial HABs, which can appear in water bodies across the country, are an indicator of poor water quality and can potentially cause serious environmental concerns, including human and aquatic health effects. When blooms occur in recreational waters or source waters used for drinking, the toxins that may be released can cause respiratory or skin irritation and even illness in humans, domestic animals, and wildlife.

Historically, monitoring cyanobacteria blooms has been labor intensive and limited due to cost, time, and logistical constraints. EPA researchers are looking for ways to eliminate or reduce the negative effects of HABs on human health and the environment. Their efforts include the development of both versions of the CyAN app. The research that led to the development of the CyANWeb app and the CyAN Android™ app was conducted in collaboration with the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration

(NOAA), and the U.S. Geological Survey (USGS). Both versions were tested separately for over one year and the functionality and satellite data were successfully validated and published in multiple peer-reviewed publications.

For more information, contact the CyAN Project at CyAN@epa.gov.

Source: https://www.epa.gov/water-research/cyanobacteria-assessment-network-application-cyan-app

Recent Publications

Journal Articles

The list below provides a selection of research articles.

- Fish Consumption for the Adult Population of Hawai'i, Collected with a Self-Reported Household Survey
  Baker, K.K., C.A. Watters, J.E. Dannemiller, S.T. Iwamura, and B.A. Brooks. 2022. Fish Consumption for the Adult Population of Hawai'i, Collected with a Self-Reported Household Survey. *Hawai'i Journal of Health & Social Welfare* 79(2):51-59.

- Environmental Health Literacy for Anishinaabe (Great Lakes Native American) Fish Consumers: A Randomized Control Trial
  Dellinger, M.J., N. Pingatore, T. Chelius, A. Visotcky, R. Sparapani, and M. Ripley. 2022. Environmental Health Literacy for Anishinaabe (Great Lakes Native American) Fish Consumers: A Randomized Control Trial. *Environmental Research* 212:113335.

- Fish Consumption and Advisory Awareness in the Great Lakes Basin
  He., X., M. Raymond, N. LaHue, C. Tomassalo, H. Anderson, and J. Meiman. 2022. Fish Consumption and Advisory Awareness in the Great Lakes Basin. *Science of the Total Environment* 827(5):153974.

- Persistent and Toxic Chemical Pollutants in Fish Consumed by Asians in Chicago, United States
  Li, A., Q. Tang, K.E. Kearney, K.L. Nagy, J. Zhang, S. Buchanan, and M.E. Turyk. 2022. Persistent and Toxic Chemical Pollutants in Fish Consumed by Asians in Chicago, United States. *Science of the Total Environment* 81(10):152214.

- Assessing Exposures to Per- and Polyfluoroalkyl Substances in Two Populations of Great Lakes Basin Fish Consumers in Western New York State
  Liu, M., M. Nordstrom, S. Forand, E. Lewis-Michl, W.A. Wattigney, K. Kannan, W. Wang, E. Irvin-Barnwell, and S. Hwang. 2022. Assessing Exposures to Per- and Polyfluoroalkyl Substances in Two Populations of Great Lakes Basin Fish Consumers in Western New York State. *International Journal of Hygiene and Environmental Health* 240:113902.

- Spatiotemporal Trends of Polychlorinated Biphenyls (PCBs) in Surface and Suspended Sediments from the Lake Ontario Canadian Nearshore 1994–2018: A Fish Consumption Advisory Perspective
  Long, T., N. Benoit, T. Howell, L. Richman, and S.P. Bhavsar. 2022. Spatiotemporal Trends of Polychlorinated Biphenyls (PCBs) in Surface and Suspended Sediments from the Lake Ontario Canadian Nearshore 1994–2018: A Fish Consumption Advisory Perspective. *Journal of Great Lakes Research* 48(2):300-314.

- Effects of Harmful Algal Blooms on Fish and Shellfish Species: A Case Study of New Zealand in a Changing Environment
  Rolton, A., L. Rhodes, K.S. Hutson, L. Biessy, T. Bui, L. MacKenzie, J.E. Symonds, and K.F. Smith. 2022. Effects of Harmful Algal Blooms on Fish and Shellfish Species: A Case Study of New Zealand in a Changing Environment. *Toxins* 14(5):341.

- Microplastics as Emerging Food Contaminants: A Challenge for Food Safety
  Rubio-Armendáriz, C., S. Alejandro-Vega, S., Paz-Montelongo, A.J. Gutiérrez-Fernández, C.J. Carrascosa-Iruzubieta, and A. Hardisson-de la Torre. 2022. Microplastics as Emerging Food Contaminants: A Challenge for Food Safety. *International Journal of Environmental Research and Public Health* 19(3):1174.

- Associations Between Time-Weighted Postnatal Methylmercury Exposure from Fish Consumption and Neurodevelopmental Outcomes Through 24 Years of Age in the Seychelles Child Development Study Main Cohort
  Thurston, S.W., G. Myers, D. Mruzek, D. Harrington, H. Adams, C. Shamlaye, and E. van Wijngaarden. 2022. Associations Between Time-Weighted Postnatal Methylmercury Exposure from Fish Consumption and Neurodevelopmental Outcomes Through 24 Years of Age in the Seychelles Child Development Study Main Cohort. *NeuroToxicology* 91:234-244.

- Risk Assessment for Seafood Consumers Exposed to Mercury and Other Trace Elements in Fish from Long Island, New York, USA
  Ye, X., C. Lee, O.N. Shipley, M.G. Frisk, and N.S. Fisher. 2022. Risk Assessment for Seafood Consumers Exposed to Mercury and Other Trace Elements in Fish from Long Island, New York, USA. *Marine Bulletin* 176:113442.

Upcoming Meetings and Conferences

American Fisheries Society Annual Meeting
August 21-25, 2022
Spokane, WA

Small Pelagic Fish: New Frontiers in Science and Sustainable Management
November 7-11, 2022
Lisbon, Portugal

115th Annual Meeting of the National Shellfiseries Association (NSA)
March 26-30, 2023
Baltimore, MD

Additional Information

This monthly newsletter highlights current information about fish and shellfish.

For more information about specific advisories within the state, territory, or tribe, contact the appropriate state agency listed on EPA's National Listing of Fish Advisories website at https://fishadvisoryonline.epa.gov/Contacts.aspx.

For more information about this newsletter, contact Sharon Frey (Frey.Sharon@epa.gov, 202-566-1480).

Additional information about advisories and fish and shellfish consumption can be found at https://www.epa.gov/fish-tech.