EPA-820-N-23-001

Spring 2023

EPA United States Environmental Protection Agency

FSTRAC Newsletter

FEDERAL-STATE TOXICOLOGY RISK ANALYSIS COMMITTEE

What Is FSTRAC?

FSTRAC's mission is to strengthen relationships and cooperation among EPA, states and tribes through the exchange of technical information primarily regarding water-related human health and risk assessment and also share information on ecological effects related to water quality criteria. FSTRAC is composed of current representatives from governmental agencies (state, tribal, federal health and environmental agencies, and other regulatory authorities) and representatives from the Association of State Drinking Water Administrators (ASDWA) and the Association of Clean Water Administrators (ACWA). The goal of FSTRAC is to share information that supports the development of well-rounded, integrated approaches to effects assessment, risk assessment, risk management, risk communication, and standard-setting for drinking water, groundwater, and surface water contaminants. Specific objectives of FSTRAC include:

- To foster cooperation, consistency, and an understanding of goals and problems in human health and ecological risk assessment for contaminants in water.
- To allow the exchange of technical information, including toxicity/exposure data and analysis, and methodologies and assumptions related to the development and implementation of regulations, criteria, advisories, and other toxicity values under the Safe Drinking Water Act and the Clean Water Act, and other state and tribal rules and policies as applicable.
- To allow the exchange of information on research priorities and results.
- To share science policy concerns regarding water-related human health and ecological risk assessment.

Recent Webinars

FSTRAC holds several webinars each year to share information through presentations and discussions regarding human health risk analysis and water quality issues.

Spring 2023

Health and Ecological Criteria Division (HECD) Priorities in FY23 (presented by Ms. Colleen Flaherty, HECD/OST/OW/EPA). Ms. Flaherty described the responsibilities of EPA OST/HECD, including developing ambient water quality criteria (CWA §304(a)); biosolids biennial reviews, pollutant assessments, and standards/regulatory limits (Clean Water Act §405(d)); drinking water health effects assessments (Safe Drinking Water Act §1412(b)(1)(A)); and drinking water health advisories (Safe Drinking Water Act §1412(b)(1)(F)). EPA OST/HECD recently developed a proposed National Primary Drinking Water Regulation for Per- and Polyfluoroalkyl Substances (PFAS), updated health effects assessments for perfluorooctanoic acid (PFOA)

The purpose of this newsletter is to update Federal-State Toxicology and Risk Analysis Committee (FSTRAC) members on current developments in toxicology, risk analysis, and water quality criteria and standards. This newsletter also provides information on recent FSTRAC webinars and upcoming events. Please share this newsletter with those who may be interested in these topics. If you are interested in joining FSTRAC, please contact the FSTRAC Co-Chairs, Dr. Shamima Akhter (Akhter.Shamima@epa.gov) or Ms. Katie Fallace (Katie.Fallace@state.mn.us).

and perfluorooctane sulfonate (PFOS), developed a draft framework to assess health risks associated with PFAS mixtures, prepared a draft risk assessment framework for biosolids for Science Advisory Board (SAB) review, and provided support for state-specific nutrient criteria development projects for lakes and reservoirs, rivers and streams, and estuaries and coastal marine waters. EPA OST/HECD's upcoming priorities for FY 2023 are to finalize aquatic life criteria for PFOA and PFOS; develop human health criteria for PFOA, PFOS, and other PFAS; prepare biosolids risk assessments for PFOA and PFOS; address SAB comments on the draft risk assessment framework for biosolids; continue to provide support for state-specific nutrient criteria development projects; and form an EPA National Harmful Algal Bloom Program.

Investigation of Chloramines, Disinfection Byproducts, and Nitrification in Chloraminated Drinking Water Distribution Systems (presented by Dr. David Wahman, CESER/EPA). Dr. Wahman described the 2016 EPA Regional Applied Research Effort project that focused on understanding the impacts and meaning of maintaining detectable disinfection residuals in chloraminated drinking water distribution systems (CDWDSs). Project objectives included performing full-scale quarterly sampling at four CDWDSs, evaluating a simple method to estimate inorganic versus organic chloramines, and performing laboratory hold studies using CDWDS water samples. Results from the full-scale CDWDS sampling indicated that minimum residual and disinfection byproduct (DBP) compliance was generally maintained and there were no clear seasonal patterns for residual loss or DBPs. Also, as water age increased from entry point (EP) to maximum residence time (MRT), monochloramine decreased while trihalomethanes and haloacetic acids initially increased and then stabilized or slightly decreased. The simple method to estimate inorganic versus organic chloramines was validated based on pH adjustment. In comparison to estimates from EPA's web-based application (https://usepaord.shinyapps.io/Unified-Combo/), residual loss in the EP hold study samples (HSS) were similar and residual loss in the MRT-HSS were faster. Nitrification occurred in MRT-HSS and accelerated chloramine loss. Also, the percentage of organic chloramines increased with decreasing chlorine residual in EP-HSS and MRT-HSS. For more information, refer to the published article for this study: https://doi.org/10.1061/(ASCE)EE.1943-7870.0002062.

PFAS in Ground Water from Wastewater Treatment Sludge (presented by Ray Holberger, South Carolina Department of Health and Environmental Control). Mr. Holberger presented findings from a case study from the Galey & Lord Superfund Site, which was a facility that specialized in textile dying, as well as stain removal and waterproofing treatments. He mentioned that the facility had extensive water treatment facilities and it had a National Pollutant Discharge Elimination System permit to directly discharge into the Pee Dee River in South Carolina. Mr. Holberger mentioned that the facility closed in 2019 and it was proposed for the National Priorities List in 2021. He noted that this site is a priority for clean up because PFAS continues to run off from the wastewater treatment outfalls during rain events. Mr. Holberger mentioned that the facility also had been permitted to land apply sludge which caused a secondary but substantial concern for environmental exposure. The South Carolina Department of Health and Environmental Control (SC DHEC) identified the fields in Darlington County to which sludge from this facility had been applied and confirmed that the soils in these areas contained PFAS. SC DHEC informed the local residents about this situation and offered to collect and test their well water. He noted that many of the well water results were higher than the Regional Screening Levels (RSLs). EPA immediately provided bottled water to residents with wells that had PFAS levels above the RSLs and had installed granular activated carbon units for these residents. SC DHEC is working with Darlington County to use EPA State Revolving Funds to extend the water utility service lines to as many affected houses as possible.

A Machine Learning Model to Estimate Toxicokinetic Half-Lives of PFAS in Multiple Species (presented by Dr. John Wambaugh, ORD/EPA). Dr. Wambaugh mentioned that most machine learning (ML) technologies require a training set in which examples are annotated with descriptors. He mentioned that there were

approximately one dozen PFAS half-life ($t½$) measurements available in the training set, but that $t½$ varied greatly across species and in some cases sex. A set of 119 chemical and physiological (species) descriptors were assembled as potential predictors of $t½$ in the ML model. Chemical structure descriptors included protein binding, physico-chemical, transport/re-uptake analogs, and similarity of "defluorinated" PFAS to endogenous ligands as surrogates for transporter affinity. Physiological descriptors included transport/re-uptake analogs and physiological descriptors, including kidney structural features as surrogates for renal transporter expression. Categorical descriptors included sex and route of dose administration. Dr. Wambaugh mentioned that a four-bin model was selected in which chemicals were grouped into half-life bins (0–12 hours, > 12 hours to 1 week, > 1 week to 60 days, and > 60 days), which has an accuracy of 86.4% across chemicals, species, and sex. He noted that toxicokinetic predictions can now be made for approximately 900–4,000 PFAS with no other data, and that the majority (56%) of these PFAS are predicted to be in the longest $t½$ category in humans. Dr. Wambaugh also described the model's limitations, including that the training set included most of the data available and that the chemicals in need of $t½$ predictions were much more diverse than the training set. He noted that model building scripts and predictions are available at: https://github.com/USEPA/CompTox-PFASHalfLife.

Will Climate Warming Enhance Mercury Bioaccumulation in Lake Fishes by Inducing Deep-Water Anoxia? (presented by Dr. Stephen Jane, Cornell Atkinson Center for Sustainability). Dr. Jane mentioned that when mercury enters aquatic systems, it is converted by microorganisms to the organic form (methylmercury) in anoxic environments. He further noted that the warming surface temperatures of lakes have indirect effects on deep water oxygen concentrations that are increasing the amount of anoxic water. Dr. Jane mentioned that he evaluated whether warming would enhance mercury bioaccumulation in lake fishes in a study of 16 lakes in the Adirondacks with little or no development in the surrounding areas. In this study, dissolved oxygen and temperature were measured every 10 minutes at various depths in each lake from mid-June through mid-October 2021 using high frequency loggers. He noted that there was a good range of conditions in these lakes, with some lakes being more than half anoxic and others having no anoxia. Brook trout were also collected from each lake during this time period and analyzed for mercury. Dr. Jane noted that preliminary results from this study suggest that the presence of anoxia can contribute to bioaccumulation of mercury in fish, but other conditions need to be co-occurring. For example, the presence of predominantly thermally unsuitable habitats for fish near a lake's surface could drive fishes to seek thermal refuge in deeper, anoxic portions of a lake containing higher concentrations of methylmercury. He is currently processing data from a second field season to further explore these potential mechanisms.

The Upper Great Lakes Fish Consumption Collaborative (presented by Meghan Williams, Wisconsin Department of Natural Resources, Angela Preimesberger, Minnesota Department of Health, and Caren Ackley, Great Lakes Indian Fish & Wildlife Commission). Ms. Williams and Ms. Preimesberger emphasized that fish consumption rates are a vital part of calculating water quality standards (WQS) and assessing public health measures. They noted that the default rates currently used for WQS in the upper Midwest reflect average consumption and they do not represent subsistence populations. Great Lakes state and tribal agency staff members formed the Great Lakes Fish Consumption Collaborative to gain an improved understanding of the fish consumption patterns of high-consuming or vulnerable populations in the upper Midwest and to implement changes, as appropriate, to protect these populations from exposure to fish contaminants. The Great Lakes Fish Consumption Collaborative members have begun to identify high-consuming populations and to collect and summarize existing data. Next steps include identifying data gaps, identifying ways to fill the data gaps, producing a technical report, and implementing changes as appropriate.

Information from EPA, States, and Tribes Developing Guidance for Specific Chemicals

Criteria Values

Report on the 2nd Five-Year Review of the Recreational Water Quality Criteria

On May 25, 2023, EPA released the final *Report on the 2nd Five-Year Review of EPA's Recreational Water Quality Criteria*. This report represents EPA's second five-year review of the agency's current Recreational Water Quality Criteria (RWQC), fulfilling the requirement under the Clean Water Act (CWA) to review its RWQC every five years. Each five-year review includes an assessment of the new science since the previous review of the RWQC. An important goal of the review is to determine whether revisions to the current national recommended RWQC are necessary. Based on the scientific advances since the last five-year review, EPA is making three recommendations to improve the public health protection of its RWQC:

1. EPA plans to develop new quantitative polymerase chain reaction (qPCR)-based RWQC that better protect the health of young children, the age group most sensitive to the risks of swimming in contaminated waters;
2. EPA plans to expand its recommended RWQC, which currently include two culturable fecal indicator bacteria and two groups of cyanotoxins, by developing RWQC to protect humans from exposure to viruses as well; and
3. EPA plans to explore new methods to better determine whether a waterbody is contaminated with human feces, as this type of contamination presents the greatest risk of illness in recreational waters.

These recommendations for revisions to EPA's current RWQC are intended to improve the public health protection of people with primary recreational water contact at freshwater and marine beaches and in waters from exposure to water-borne pathogens.

While EPA works to develop updated national recommended RWQC, the agency encourages states and Tribes, especially those with beach advisory programs, to begin using or expanding their use of qPCR methods. The benefits of using qPCR are improved prediction of health risk and increased speed of results, allowing states and Tribes to notify the public about the water quality and related health risk at local beaches more quickly.

For more information on the Report on the 2nd Five-year Review of the Recreational Water Quality Criteria, visit EPA's website at: https://www.epa.gov/wqc/five-year-reviews-epas-rwqc

Proposed PFAS National Primary Drinking Water Regulation

On March 14, 2023, EPA announced the proposed National Primary Drinking Water Regulation (NPDWR) to establish legally enforceable levels, called Maximum Contaminant Levels (MCLs) for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA, commonly known as GenX Chemicals), perfluorohexane sulfonic acid (PFHxS), and perfluorobutane sulfonic acid (PFBS). EPA is also proposing health-based, non-enforceable Maximum Contaminant Level Goals (MCLGs) for these six PFAS.

The proposed rule would also require public water systems to:

- Monitor for these PFAS
- Notify the public of the levels of these PFAS
- Reduce the levels of these PFAS in drinking water if they exceed the proposed standards.

The proposed PFAS NPDWR does not require any actions until it is finalized. EPA anticipates finalizing the regulation by the end of 2023. EPA expects that if fully implemented, the rule will prevent thousands of deaths and reduce tens of thousands of serious PFAS-attributable illnesses.

For additional information, refer to EPA's webpage on Proposed PFAS National Primary Drinking Water Regulation.

Promulgation of Tribal Baseline Water Quality Standards Under the Clean Water Act

On April 27, 2023, the EPA Administrator signed a proposed rule to promulgate federal baseline water quality standards (WQS) for waters on over 250 Indian reservations that do not have WQS in effect under the Clean Water Act (CWA). This proposed rulemaking would extend the same framework of water quality protection to these tribal waters that currently exists for most other waters of the United States. The baseline standards would safeguard water quality until tribes adopt their own WQS for these waters under the CWA.

EPA conducted tribal engagement and consultation on the concepts reflected in this proposed rule between June and September 2021, prior to drafting the proposed rule. EPA is currently inviting continued consultation and coordination to provide tribes an opportunity to share input and comments with EPA on the proposed rule. The tribal consultation and coordination period will end on **August 1, 2023**. All verbal and written tribal consultation comments must be received by the end of the 90-day public comment period on August 3, 2023. For more information on the tribal consultation and coordination process, including information on upcoming tribal listening sessions, refer to the following webpage: https://www.epa.gov/wqs-tech/tribal-consultation-and-coordination-epas-proposed-federal-baseline-water-quality.

The 90-day public comment period closes on **August 3, 2023**. EPA will accept public comments at regulations.gov (Docket ID No. EPA-HQ-OW-2016-0405).

EPA is holding two public hearings so that interested parties may provide oral comments on EPA's proposed rule. All attendees for the public hearings listed must register in advance.

- **REGISTER**: Tuesday, June 27, 2023, from 2:00 to 4:00 PM Eastern Time
- **REGISTER**: Wednesday, July 12, 2023, from 2:00 to 4:00 PM Eastern Time

EPA will consider all oral comments provided during the hearings along with written comments submitted via the docket for this rulemaking (available at Docket ID No. EPA-HQ-OW-2016-0405).

Hawaii Soil and Groundwater Environmental Action Levels (EALs) for PFASs Updated in April 2023

The Hawaii Department of Health made the following updates to its Soil and Groundwater EALs in April 2023:

- Toxicity factors and EALs for ammonium 4,8-dioxa-3H-perfluorononanoate (ADONA) have been added (EALs for 20 compounds now presented);
- The method used to calculate tapwater action levels has been revised to reflect the proposed approach for calculation of EPA MCLs and MCLGs, including use of a target noncancer Hazard Quotient of 1 and PFAS-specific water ingestion rates;
- A section added to discuss calculation of cumulative, noncancer hazard for drinking water resources impacted by multiple PFASs;
- A discussion of volatile PFASs added, although toxicity factors for the subject compounds (primarily fluorotelomer alcohols) are not currently available.

Technical Information

Hawaii Department of Health

- Ongoing study of PFAS in WWTP influent, effluent and biosolids;
- Compilation of toxicity studies initiated for fluorotelomer alcohols (used to coat food wrappers and containers) and fluorotelomer thioether amido sulfonates (used in modern AFFF);
- Review of potential use of total oxidized precursor (TOPs) data to estimate weighted toxicity of a mixture of unknown PFASs or PFASs that otherwise lack published toxicity factors.

Implementation Guidance for the Idaho Arsenic Criteria for Human Health

The Idaho Department of Environmental Quality (DEQ) is in the process of reviewing the second draft of the Implementation Guidance for Idaho's Human Health Water Quality Criteria for Arsenic. When finalized, this document will provide guidance to Idaho DEQ's staff, the regulated community, and the general public for implementing arsenic statewide human health water quality criteria in Idaho for surface waters. The criteria reflect the latest Idaho-specific arsenic surface and fish tissue monitoring data. For additional information, please contact Dr. Norka Paden (Norka.Paden@deq.idaho.gov).

Risk Assessment

Drinking Water

EPA's Fifth Unregulated Contaminant Monitoring Rule (UCMR 5)

UCMR 5 (86 FR 73131) specifies monitoring by certain public water systems (PWSs) for 29 per- and polyfluoroalkyl substances (PFAS) and lithium. The five-year UCMR 5 cycle spans from 2022 through 2026, with preparations in 2022, sample collection between January 1, 2023, and December 31, 2025, and completion of data reporting in 2026. Starting mid-2023, UCMR 5 monitoring results will be published quarterly to the public through the National Contaminant Occurrence Database (NCOD). EPA hosted two webinars in February 2023 to review reporting requirements for PWSs and data review functionality in EPA's web-based Safe Drinking Water Accession and Review System (SDWARS) for large PWS (i.e., serving more than 10,000 people), small PWS (i.e., serving 10,000 or fewer people), and State users. The presentation also included available health-based reference value information for the UCMR 5 contaminants (i.e., reference concentrations and reference doses [RfDs]), provided the plan for sharing specific preliminary PFAS results from small PWSs with States, and highlighted risk communication resources from EPA and other stakeholders. The presentation is posted to the Meetings and Materials webpage. For additional context around monitoring results in relation to EPA established minimum reporting levels (MRLs), the Health-Based Reference Values for UCMR 5 document is available on EPA's UCMR website.

Minnesota Department of Health's Unregulated Contaminant Monitoring Project

The Minnesota Department of Health (MDH) tested for unregulated contaminants and chemicals of emerging concern (CECs) in drinking water sources across the state. The data gathered provide insight on how the presence and levels of some of the CECs detected in drinking water were affected by treatment, nearby land uses, and local geology. The project tested for a wide spectrum of CECs, but only a fraction of them were detected in drinking water with very few detections that were above guidance values. More information and the final report can be found here: https://www.health.state.mn.us/communities/environment/water/unregcontam.html

EPA's Sixth Contaminant Candidate List (CCL6)

EPA is beginning the development of the Sixth Contaminant Candidate List (CCL 6). The CCL is a list of contaminants that are currently not subject to any proposed or promulgated national primary drinking water regulations but are known or anticipated to occur in public water systems. Contaminants listed on the CCL may require future regulation under the Safe Drinking Water Act (SDWA).

On February 17, 2023, EPA requested nominations of chemicals, microbes, or other substances for consideration on the Draft CCL 6. The public was able to nominate contaminants by following the instructions contained in the Federal Register notice for CCL 6 nominations. The deadline for submitting nominations was April 18, 2023 and is now closed. EPA will be evaluating the nominations and other contaminant data and information to consider inclusion on the Draft CCL 6 for public review and comment.

For more information, please refer to EPA's Federal Register Notice: Drinking Water Contaminant Candidate List 6 - Nominations.

Minnesota Department of Health (MDH) and U.S. Environmental Protection Agency (EPA) Screening Collaboration

The Minnesota Department of Health's (MDH) Health Risk Assessment scientists, working in collaboration with scientists from EPA's Office of Research and Development, recently published findings from a project that looked at using an automated workflow to review chemical exposure data. The Contaminants of Emerging Concern program in Minnesota currently uses a standardized process where exposure data is manually reviewed by MDH scientists, one chemical at a time, to identify potential contaminants in water. MDH and EPA scientists worked together to develop a workflow that automates this process, incorporating the standardized process MDH currently uses, to review thousands of chemicals at once using exposure information from multiple data sources. The project found that exposure scores generated by the automated process were similar to the manually produced exposure scores. With further development, the automated process will help MDH screen a broader range of chemicals and prioritize those with high concern for exposure.

The results of the project are published here: Screening for drinking water contaminants of concern using an automated exposure-focused workflow | Journal of Exposure Science & Environmental Epidemiology (nature.com)

Clean Water

EPA Science Advisory Board Biosolids Panel's Review of the Draft Biosolids Draft Standardized Framework for Sewage Sludge Chemical Risk Assessment

Refer to the following webpage for information on the EPA's Science Advisory Board Biosolids Panel's review of the draft Standardized Framework for Sewage Sludge Chemical Risk Assessment: https://sab.epa.gov/ords/sab/f?p=100:18:743531932320 4:::RP,18:P18_ID:2610

Additional information on the risk assessment of pollutants in biosolids is available at: https://www.epa.gov/biosolids/risk-assessment-pollutants-biosolids

Treatability Issues for Contaminants

Identifying the Potential for Wetland Vegetation Management as a Strategy to Decrease Methymercury Production

Mercury (Hg) is a pollutant of concern primarily due to the microbial production of the more toxic bioaccumulative organic form—methylmercury (MeHg). MeHg concentrations in biota are often the primary risk driver at Superfund Sites where Hg is a contaminant of concern.

The Black Butte Mine Superfund Site is an abandoned Hg mine located in Lane County Oregon. Fish in Cottage Grove Reservoir (Operable Unit 3 of the Site) contain fish well above criteria levels for MeHg. Wetlands located downstream of the mine have been identified as "hot spots" of MeHg production and are a source of MeHg to the Reservoir. The wetlands are dominated by highly invasive reed canarygrass (see **Figure 1**), which generate large amounts of organic material that can enhance the microbial activity and MeHg concentrations.

In 2021, EPA Region 10 and Office of Research and Development (ORD) were awarded a Superfund Extramural Grant to conduct research on the impacts of reed canarygrass on MeHg production at Black Butte Mine. The objective of this study was to determine if removing reed canarygrass could be an effective strategy for decreasing MeHg production—and ultimately MeHg concentrations in fish.

There are two main components of the study: 1) conducting controlled experiments in mesocosms containing different wetland vegetation communities (**Figure 2**); and 2) conducting measurements from wetlands that have undergone reed canarygrass removal and native vegetation restoration (**Figure 3**).

Figure 1. Example of reed canarygrass dominated wetland areas surrounding the Cottage Grove Reservoir downstream of the Black Butte Mine Superfund Site.

Figure 2. Collecting porewater samples for Hg and MeHg analysis at the ORD PESD greenhouse.

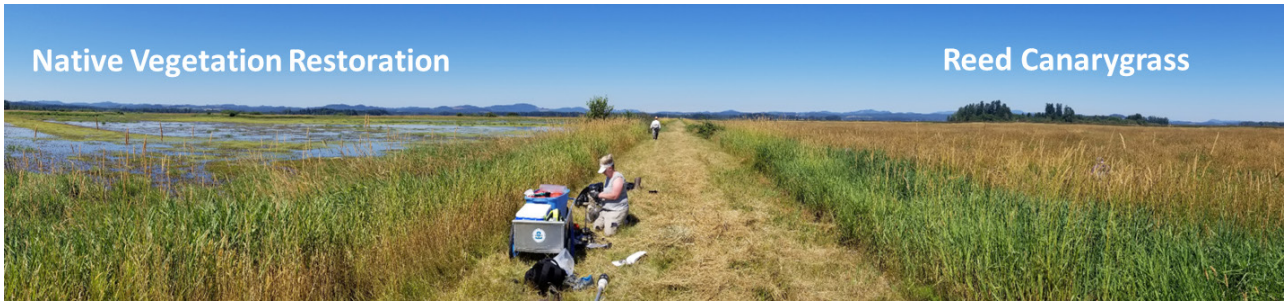

Figure 3. Collecting sediment and porewater samples for Hg and MeHg from restored wetlands and wetlands dominated by invasive reed canarygrass.

For the first component of the study, 18 mesocosms were created at the ORD Pacific Ecological Systems Division (PESD) greenhouse in Corvallis, OR. The mesocosms included six different treatments (all run in triplicate): one treatment was devoid of vegetation to act as an experimental control, one contained reed canarygrass, and four had different types of native wetland vegetation. This project is currently ongoing, with the final sampling occurring in the summer of 2023.

Results from the field sampling component of the study show that the native vegetation restored wetlands had significantly less total-Hg (THg) and MeHg in the porewater compared to a proximate reed canarygrass wetlands (**Figure 4**). Ancillary data indicate that the restored wetlands had much lower organic carbon levels and a higher oxidation-reduction potential, both of which are less conducive to the microbial communities involved in generating MeHg.

A full summary of the project results should be available in fall of 2023.

For additional information, please contact Dr. Chris Eckley (Eckley.Chris@epa.gov), Laboratory Services and Applied Science Division, EPA Region 10, Seattle, Washington.

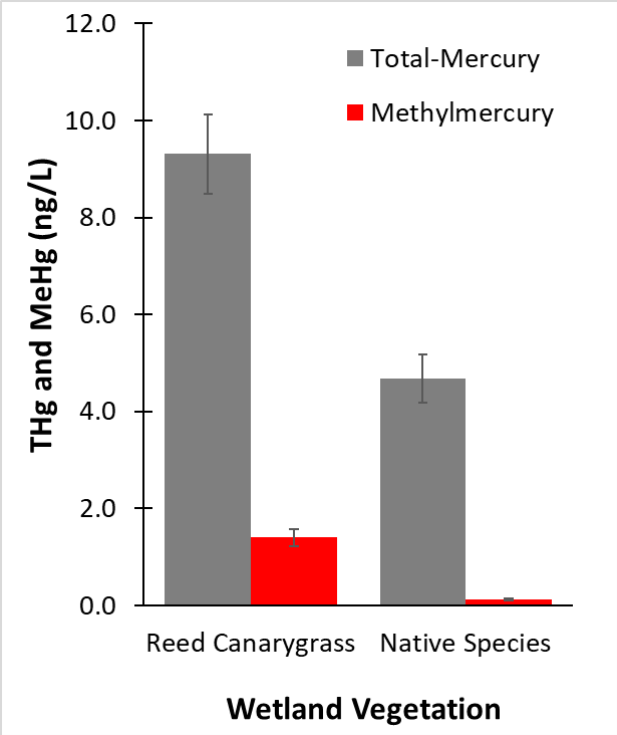

Figure 4. Mean total-mercury (gray bars) and methylmercury (red bars) concentration (± standard error) measured in wetlands dominated by reed canarygrass and wetlands that have been restored to native species.

Publications

EPA's Biosolids Biennial Report No. 9 (Reporting Period 2020–2021)

Section 405(d) of the Clean Water Act (CWA) requires EPA to review sewage sludge regulations every two years to identify any additional pollutants that might occur in biosolids and to set regulations for those pollutants if sufficient scientific evidence shows they could harm, or present a risk to, human health or the environment. Biennial reviews help EPA in fulfilling the CWA Section requirement to identify additional toxic pollutants that may occur in sewage sludge. In December 2022, EPA published Biosolids Biennial Review Report No. 9 for the reporting period of 2020–2021 in accordance with CWA Section 405(d)(2)(C) requirements. During the 2020–2021 biennial review process, EPA searched publicly available peer-reviewed academic publications for newly identified pollutants during the literature search timeframe (2020–2021) and collected data on pollutants that were identified in three previous EPA national sewage sludge surveys and in eight previous biennial reviews. Information was collected on the occurrence, fate, and transport of these pollutants in the environment and their effects on human health and ecological receptors. The data gleaned from the biennial review process may be used to assess risk from chemicals found in biosolids. EPA's Biosolids Biennial Report No. 9 is available here: https://www.epa.gov/system/files/documents/2022-12/2020-2021-biennial-report.pdf.

IRIS Toxicological Review of Perfluorohexanoic Acid (PFHxA) and Related Salts

EPA has finalized the IRIS Toxicological Review of Perfluorohexanoic Acid (PFHxA) and Related Salts. This assessment addresses the potential cancer and

noncancer human health effects from exposure to perfluorohexanoic acid and related salts. EPA's program and regional offices may use this assessment to inform decisions to protect human health.

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Upcoming Events and Conferences

Upcoming FSTRAC Webinar

The next FSTRAC Webinar is scheduled for fall 2023. Additional details, including the date of the next FSTRAC Webinar, will be provided to FSTRAC members in the coming weeks.

20th Annual EPA Drinking Water Workshop: Small System Challenges and Solutions

EPA ORD and OW, in partnership with the Association of State Drinking Water Administrators (ASDWA), will be celebrating the 20-year anniversary of the Drinking Water Workshop on September 11–14, 2023. Primarily designed for tribal, state, and territory personnel responsible for drinking water regulations compliance and treatment technologies permitting, the workshop will provide current information, resources, and training needed to help in building systems capacity and sustainably and with providing equitable access to drinking water. Additional information is provided on EPA's website: https://www.epa.gov/water-research/20th-annual-epa-drinking-water-workshop-small-system-challenges-and-solutions.

SETAC North America Annual Meeting – Society of Environmental Toxicology and Chemistry

SETAC will be holding its 44th annual North America meeting on November 12–16, 2023 in Louisville,

Kentucky. Additional information is provided on the SETAC website: https://www.setac.org/events/EventDetails.aspx?id=1514446.

SOT Annual Meeting – Society of Toxicology

SOT will be holding its 63rd annual meeting on March 10–14, 2024 in Salt Lake City, Utah. Additional information is provided on the SOT website: https://www.toxicology.org/events/am/AM2024/session-proposals.asp#

SRA Annual Meeting – Society for Risk Analysis

SRA will be holding its 2023 annual meeting in Washington, D.C. from December 10–14, 2023. Additional information is provided on the SRA website: https://www.sra.org/events-webinars/annual-meeting/.

ECOS – Environmental Council of the States

The ECOS will be holding its 2023 ECOS Fall Meeting in Boulder, Colorado on August 28–30, 2023. Additional information is provided on the ECOS website: https://www.ecos.org/event/2023-ecos-fall-meeting/.

The ECOS will be holding its 2024 ECOS Spring Meeting in Austin, Texas on March 25–27, 2024. Additional information is provided on the ECOS website: https://www.ecos.org/event/2024-ecos-spring-meeting/.

ITRC Webinar – Interstate Technology Regulatory Council

ITRC is holding the following trainings in late 2023:

- October 5: Harmful Cyanobacterial Blooms (HCBs): Strategies for Preventing and Managing
- October 12: Harmful Cyanobacterial Blooms (HCBs): Benthics
- November 7: Microplastics
- November 9: 1,4-Dioxane: Science, Characterization & Analysis, and Remediation

Additional information is provided on the ITRC website: https://itrcweb.org/events/calendar

EPA ORD Upcoming Events

EPA Research Webinar Series

EPA ORD hosts several webinar series dedicated to providing the latest information and training on cutting-edge scientific research activities and results in order to provide assistance and solutions to environmental and public health issues. The webinars are free of charge and open to the public. Additional information, schedules, and registration can be found on the individual webinar series webpages here.