EPA-822-N-22-001

Spring 2022

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.

HECD Priorities in FY 2022: Mid-Year Update (presented by Ms. Elizabeth (Betsy) Behl, HECD/OST/OW/EPA) Ms. Behl described EPA OST/HECD's accomplishments since September 2021 including publishing the *Biological Condition Gradient for Puerto Rico and U.S. Virgin Islands Coral Reefs*, holding a public webinar on updated nutrient criteria for lakes and reservoirs, publishing the GenX chemicals final toxicity assessment, holding a national annual biosolids meeting, publishing draft updated toxicity assessments for PFOA and PFOS and mixtures approach for EPA Science Advisory Board (SAB) review, and holding a problem formulation meeting on aquatic life criteria for ions.

She described some of EPA OST/HECD's FY 2022 priorities for work both under the Clean Water Act and Safe Drinking Water Act including publishing

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).

final drinking water health advisories (HAs) for GenX chemicals and PFBS; developing Maximum Contaminant Level Goals (MCLGs) for PFOA and PFOS for the National Primary Drinking Water Regulation (NPDWR) of PFAS; moving quickly to update the HAs for PFOA and PFOS based on SAB recommendations; responding to comments on PFOA and PFOS draft aquatic life criteria and preparing for publication of final criteria at the end of 2022; supporting state-specific efforts to develop new nutrient criteria for lakes; providing technical support through N-STEPS for development of nutrient criteria for rivers and streams, estuaries, and coastal waters; developing biological condition gradients that address climate; reassessing toxicity of currently regulated chemicals for the Six Year Review of Drinking Water Standards; and holding an SAB review of biosolids risk assessment approaches.

Draft Fifth Contaminant Candidate List (CCL 5) (presented by Ms. Kesha Forrest and Ms. Nicole Tucker, OGWDW/OW/EPA) In their presentation, Ms. Forrest and Ms. Tucker provided the statutory and regulatory background for CCLs, the overall approach used for CCL 5, and the contaminants listed for the Draft CCL 5. They described the CCL 5 development process for both chemical and microbial contaminants, which includes building the universe, screening the universe, and classifying /selecting contaminants for listing. Ms. Forrest mentioned that the chemical contaminants included in the universe were evaluated and assigned screening points based on the available health effects and occurrence data elements. The top-scoring and nominated chemicals, excluding chemicals with recent and/or preliminary Regulatory Determinations, were included on the preliminary CCL (PCCL). These contaminants were then classified/selected for the Draft CCL 5 using all available information; including additional data from literature searches, calculated health concentrations, final hazard quotient, and attribute scores for prevalence, magnitude, potency and severity. Teams of EPA scientists evaluated the information and made recommendations for the inclusion of contaminants on the Draft CCL 5. Ms. Tucker mentioned that the microbial contaminants included in the initial universe selected for CCL 5 were screened using 12 criteria. The contaminants that screened through the criteria comprise the microbial PCCL 5. The microbial contaminants on the PCCL were then evaluated and scored based on waterborne disease outbreaks, occurrence, and health effects. The microbial contaminants with the highest scores are proposed for inclusion on the CCL 5. The Draft CCL 5 consists of 81 contaminants/groups (69 chemicals/3 chemical groups and 12 microbes).

Cumulative Impacts: Office of Research and Development (ORD) Research and Next Steps (presented by Ms. Susan Julius and Dr. Nicolle Tulve, CPHEA/ORD/EPA, and Ms. Sarah Mazur, SHC/ORD/EPA) Ms. Julius, Dr. Tulve, and Ms. Mazur mentioned that equity/environmental justice is a priority of the Biden administration and that EPA ORD is working to ensure its research portfolio aligns with these priorities. They noted that EPA ORD will integrate efforts across research programs to improve understanding of cumulative impacts and develop and apply the necessary models, methods, and tools to conduct real-world assessments that account for both adverse and beneficial health and environmental effects. Ms. Julius, Dr. Tulve, and Ms. Mazur described several examples of how EPA ORD is advancing the science of cumulative impacts, including systematic review of chemical and non-chemical stressors for children's health, chemical co-exposure monitoring, lead hotspots modeling, cumulative impacts of criteria air pollutants, and the equitable resilience builder tool. They noted that EPA released for external review and public comment a white paper that presented recommendations on how to strengthen the foundation for assessing cumulative impacts within EPA ORD. Ms. Julius, Dr. Tulve, and Ms. Mazur mentioned that next steps include finalizing the ORD white paper, developing FY23–26 Strategic Research Action Plans, reviewing proposed products focused on cumulative impacts and environmental justice, and collaborating across EPA to support agency efforts on these priority topics.

Accelerating Public Health Protections by Identifying Per- and Polyfluoroalkyl Substances (PFAS) Categories (presented by Mr. Tim Watkins, SHC/ORD/EPA) Mr. Watkins mentioned that managing and addressing the public health risk from exposure to PFAS is one of the most pressing challenges facing EPA and its partners. He noted that because there are thousands of

PFAS, it would be extremely time consuming and resource intensive to assess and manage their risk on a chemical-by-chemical basis; however, treating the entire class of PFAS as a single group would also be problematic due to differences in chemical/physical properties. Mr. Watkins noted that EPA is working to categorize PFAS into smaller categories based on similarities across defined parameters, such as chemical structure, physical and chemical properties, and toxicological properties. He mentioned that EPA ORD is developing PFAS categories for hazard assessment using tiered toxicity and toxicokinetic testing and chemical read-across approaches. He noted that this ongoing research has been applied in developing the National PFAS Testing Strategy that EPA is using to identify and select PFAS for which the agency will require testing using Toxics Substances Control Act authorities to inform and refine categories for hazard assessment. Mr. Watkins also noted that developing PFAS categories for removal and treatment will enable EPA to identify the full set of PFAS that are expected to be removed/treated when establishing technology-based regulations.

New Jersey Drinking Water Quality Institute Maximum Contaminant Level Recommendation for 1,4-Dioxane (presented by Dr. Gloria Post, NJDEP) Dr. Post mentioned that 1,4-dioxane is a synthetic organic chemical and historically, a major use was as a stabilizer for chlorinated solvents, particularly 1,1,1-trichloroethane. She mentioned that 1,4-dioxane was included in EPA's Unregulated Contaminant Monitoring Rule 3 (UCMR 3) in 2013–2015, and it was detected above the minimum reporting level of 0.07 µg/L and above EPA's Health Risk Concentration for 10^{-6} cancer risk of 0.35 µg/L in 45.9% and 17.2% of New Jersey's public water systems monitored for UCMR 3, respectively. Dr. Post mentioned that the New Jersey Drinking Water Quality Institute (NJDWQI) is an advisory body established by the New Jersey Safe Drinking Water Act that is charged with recommending MCLs to NJDEP. She noted that in December 2018, the NJDEP Commissioner requested that the NJDWQI recommend an MCL for 1,4-dioxane. Dr. Post mentioned that the primary focus of the NJDWQI Health Effects Subcommittee Evaluation was on carcinogenicity and mode of action studies. She described the calculation and considerations used by the NJDWQI to determine the recommended MCL value of 0.33 µg/L for 1,4-dioxane. Dr. Post mentioned that the NJDEP Commissioner has accepted the DWQI MCL recommendation for 1,4-dioxane, but NJDEP has not yet proposed an MCL.

Information from States Developing Guidance for Specific Chemicals

Criteria Values

Minnesota Department of Health

The Minnesota Department of Health (MDH) has recently completed water guidance for n-hexane and perfluorohexanoic acid (PFHxA). Chemicals currently under full toxicology review include: chlorothalonil and degradate 4-hydoxychlorothalonil and 1,2-dibromomethane. MDH has also completed a re-evaluation of perfluorobutane sulfonic acid (PFBS) existing water guidance values. More detailed information on MDH water guidance values can be found on MDH's Human Health-Based Water Guidance Table website at https://www.health.state.mn.us/communities/environment/risk/guidance/gw/table.html.

Risk Assessment

EPA Integrated Risk Information System Assessments

The EPA ORD's Health and Environmental Risk Assessment (HERA) Program is designed to develop and apply state-of-the-science research to characterize impacts on human and ecological systems—whether they result from exposure to single, complex, or multiple physical, chemical, or biological stressors—to support and improve EPA's risk assessment and risk management decisions. Integrated Risk Information

System (IRIS) assessments fall under HERA's Science Assessment Development Research Area, which is focused on producing high quality, transparent, consistent, and scientifically defensible assessment products to meet EPA's diverse statutory and policy needs. For more information about HERA, visit EPA's HERA Website.

IRIS Toxicological Review of PFHxA and Related Salts (Public Comment and External Review Draft)

In February 2022, EPA released the draft "IRIS Toxicological Review of Perfluorohexanoic Acid (PFHxA) and Related Salts" for a 60-day public comment period and external peer review. The deadline for public comments was April 4, 2022. The IRIS assessment of PFHxA will undergo an independent external scientific peer review. Following the external peer review meeting, the assessment will be revised, taking into consideration all public and external peer review comments received. To view the draft toxicological review document, refer to EPA's PFHxA Website.

Draft IRIS Toxicological Review of Perfluorobutanoic Acid (PFBA) and Related Salts (External Peer Review Report)

In August 2021, EPA released a report titled "IRIS Toxicological Review of Perfluorobutanoic Acid (PFBA) and Related Salts." The PFBA IRIS assessment underwent a 60-day public comment period and independent external peer review. Following the external peer review meeting that was held on February 22–23, 2022, the assessment is being revised, taking into consideration all public and external peer review comments received. In June 2022, EPA released the final peer review report. To view the draft toxicological review document, as well as the final external peer review report, visit the EPA PFBA Website.

Drinking Water

Minnesota Department of Health

As part of the Statewide PFAS Monitoring Project, MDH has launched a web-based dashboard for the public to access information about PFAS monitoring in public water systems. The dashboard is an interactive web mapping tool, similar to the State of Ohio PFAS Action Plan Interactive Dashboard and Map. MDH will update the dashboard as it makes progress towards its long-term goal of sampling all community water systems for 29 PFAS compounds. More information about the Statewide PFAS Monitoring Program is available on MDH's website at https://www.health.state.mn.us/communities/environment/water/pfas.html and more information about the dashboard is available at https://www.health.state.mn.us/communities/environment/water/pfasmap.html.

Clean Water

Minnesota Department of Health

Earlier this year, MDH released a white paper providing guidance on what to consider from a public health perspective when approaching stormwater reuse in Minnesota. It gives an overview of potential health risks from stormwater reuse, presents a quantitative assessment of microbial risk with Minnesota data, and describes a risk-based framework that could be one approach to managing risks. The report is available on MDH's Water Reuse website at https://www.health.state.mn.us/waterreuse.

Treatability Issues for Contaminants

Use of Biochar to Reduce Lead Toxicity

In May 2022, the results of an EPA Region 10 Regional Applied Research Effort (RARE) project were published in the journal Chemosphere. The project focused on samples collected at the Bunker Hill Mining and Metallurgical Complex (Lower Coeur d'Alene Basin, Idaho). This research identified that different analytical methods and sampling handing (i.e., oxic versus anoxic conditions) can have a large impact on the percent of lead (Pb) that is considered bioaccessible. This information can help improve future monitoring efforts by helping project managers identify the most relevant analytical method to

assess bioaccessibility based on local conditions and biological receptors. This research also showed that the application of biochar amendments to Pb contaminated soils/sediments may only result in modest decreases in bioaccessibility (≤ 10%); however, the effectiveness of the amendments may vary depending on extraction techniques, lead speciation, and soil characteristics. Overall, the largest impact on Pb bioaccessibility was related to changes in redox conditions during the experiments and sample processing. For materials that are typically anoxic (e.g., sediments submerged under water), the impact of air-drying the samples prior to analysis resulted in oxidation of the sediment and a large increase in the measured Pb bioaccessibility. Therefore, air-drying the samples prior to analysis has the potential to greatly overestimate Pb bioaccessibility in sediments that would normally be found under anoxic field conditions. Maintaining anoxic conditions during the sampling processing could result in a more accurate representation of the Pb bioaccessibility that may be encountered in the field. The observation that air-drying sediment samples increases the Pb bioaccessibility highlights the important role that redox conditions have on impacting Pb contaminated soils/sediments. These results suggest that remediation strategies, water level management actions, and climate change impacts that result in anoxic sediments being exposed to the air/oxidized can increase Pb bioaccessibility.

The research conducted as part of this RARE project has been subject to internal EPA review and external journal peer review and has been published:

> Plunkett, S.A., C.S. Eckley, T.P. Luxton, and M.G. Johnson. 2022. The effects of biochar and redox conditions on soil Pb bioaccessibility to people and waterfowl. *Chemosphere* 294:13367. https://doi.org/10.1016/j.chemosphere.2022.133675

For additional information about this project, please contact Julius Nwosu (nwosu.julius@epa.gov), EPA Region 10.

Publications

New Drinking Water Health Advisories for PFAS Chemicals

As part of EPA's commitment to safeguard communities from per- and polyfluoroalkyl substances (PFAS), EPA has issued final health advisories for hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt (together referred to as "**GenX chemicals**") and perfluorobutane sulfonic acid and its related compound potassium perfluorobutane sulfonate (together referred to as "**PFBS**"), and interim updated drinking water health advisories for perfluorooctanoic acid (**PFOA**) and perfluorooctane sulfonate (**PFOS**). The interim health advisories for PFOA and PFOS are intended to provide information to states and public water systems until the National Primary Drinking Water regulation for PFAS takes effect. All four of these health advisories provide drinking water system operators, and state, tribal, and local officials who have the primary responsibility for overseeing these systems, with information on the health risks of these chemicals, so they can take the appropriate actions to protect their residents. To help communities on the front lines of PFAS contamination, EPA has also announced $1 billion in fiscal year 2022 grant funding through the Bipartisan Infrastructure Law Emerging Contaminants in Small or Disadvantaged Communities Grant Program.

Press release: https://www.epa.gov/newsreleases/epa-announces-new-drinking-water-health-advisories-pfas-chemicals-1-billion-bipartisan

More information on the health advisories: https://www.epa.gov/sdwa/epa-non-regulatory-health-based-drinking-water-levels

EPA ORD's Draft Strategic Research Action Plans for Fiscal Years 2023–2026

EPA ORD's strategic research planning ensures a collaborative, transparent, and highly coordinated research program that delivers the data and information that EPA program and regional offices need, while also providing a suite of innovative models, interactive dashboards, tools, and other resources that help tribes, states, local communities, and other

partners protect their environment, safeguard public health, and increase human well-being. EPA ORD's planning aligns the following six national research programs to collectively target the science and engineering needed to provide the scientific foundation for EPA to execute its mandate to protect human health and the environment:

- Air, Climate, and Energy (ACE)
- Chemical Safety for Sustainability (CSS)
- Health and Environmental Risk Assessment (HERA)
- Homeland Security (HS)
- Safe and Sustainable Water Resources (SSWR)
- Sustainable and Healthy Communities (SHC)

EPA ORD's draft Strategic Research Action Plans for fiscal years 2023–2026 for these six national research programs are available on EPA's Strategic Research Planning Website.

EPA Region 10's Upcoming Publication on *Daphnia magna* Transcriptomics for Water Quality Monitoring

With the presence of complex and dynamic contaminant mixtures in surface waters, a major challenge is accurately and sufficiently measuring chemical exposures and biological effects. Dr. Mark Jankowski in EPA Region 10 and his team examined the performance of the *Daphnia magna* transcriptome to detect distinct responses in laboratory (well) waters, wetland waters, and stormwaters in Minnesota. This publication from Dr. Mark Jankowski in EPA Region 10 will be released in the coming weeks.

Jankowski, M.D., D.J. Fairbairn, J.A. Baller, B.M. Westerhoff, and H.L. Schoenfuss. In press. *Daphnia magna* transcriptomics for water quality monitoring using the *Daphnia magna* transcriptome to distinguish water source: wetland and stormwater case studies. *Environmental Toxicology and Chemistry*.

Minnesota Department of Health

MDH staff co-authored a quantitative microbial risk assessment (QMRA) using data from a 2-year pathogen occurrence study conducted in public water supply wells in Minnesota. Risk estimates indicate that annual risk for all pathogens combined was relatively high, however, the average daily doses of individual pathogens were low.

Burch, TR., J.P. Stokdyk, N. Rice, A.C. Anderson, J.F. Walsh, S.K. Spencer, A.D. Firnstahl, and M.A. Borchardt. 2022. Statewide Quantitative Microbial Risk Assessment for Waterborne Viruses, Bacteria, and Protozoa in Public Water Supply Wells in Minnesota. *Environmental Science & Technology*. 56(10): 6315-6324. https://doi.org/10.1021/acs.est.1c06472.

Burkhardt, J., N. Burns, D. Mobley, J. Pressman, M. Magnuson, and T. Speth. 2022. Modeling PFAS removal using granular activated carbon for full-scale system design. *Journal of Environmental Engineering*. 148(3):04021086. https://doi.org/10.1061/(ASCE)EE.1943-7870.0001964.

Montagnino, E., D. Lytle, J. Rose, D. Cwiertny, and A. Whelton. 2022. School and childcare center drinking water: copper chemistry, health effects, occurrence, and remediation. *AWWA Water Science* 4(2):e1270. https://doi.org/10.1002/aws2.1270.

Pfaller, S., D. King, J. Mistry, and M. Donohue. 2022. Occurrence revisited: *Mycobacterium avium* and *Mycobacterium intracellulare* in potable water in the USA. *Applied Microbiology and Biotechnology*. 106:2715–2727. https://doi.org/10.1007/s00253-022-11849-7.

Speth, T., M. Crimi, Z. Chowdhury, E. Dickenson, J. Guelfo, D. Knappe, J. Liu, and A. Leeson. 2022. PFAS are forever? The state of the science and research needs for analyzing and treating PFAS-laden water. *AWWA Water Science* 4(2):e1276. https://doi.org/10.1002/aws2.1276.

Upcoming Events and Conferences

Upcoming FSTRAC Webinar

The next FSTRAC Webinar is scheduled for fall 2022. Additional details, including the date of the next FSTRAC Webinar, will be provided to FSTRAC members in the coming weeks.

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

SETAC will be holding its 43rd annual North America meeting on November 13–17, 2022 in Pittsburgh Pennsylvania. Additional information is provided on the SETAC website: https://pittsburgh.setac.org/

SOT Annual Meeting – Society of Toxicology

SOT will be holding its 62nd Annual Meeting and ToxExpo in Nashville, Tennessee on March 19–23, 2023. Additional information is provided on the SOT website: https://www.toxicology.org/events/am/AM2023/index.asp

SRA Annual Meeting – Society for Risk Analysis

SRA will be holding its 2022 annual meeting in Tampa, Florida from December 4–8, 2022. Additional information is provided on the SRA website: https://www.sra.org/events-webinars/annual-meeting/

ASM Microbe – American Society for Microbiology

ASM Microbe will be holding its annual meeting in Houston, Texas, on June 15–19, 2023. Additional information will be provided on the ASM website: https://asm.org/Events/ASM-Microbe/Home

ECOS – Environmental Council of the States

The ECOS will be holding its 2022 ECOS Fall Meeting on September 19–21, 2022. Additional information is provided on the ECOS website: https://www.ecos.org/events/.

ITRC Webinar – Interstate Technology Regulatory Council

ITRC will be holding a webinar on Soil Background and Risk Assessment (SBR) on June 23, 2022. Additional information is provided on the ITRC website: https://clu-in.org/conf/itrc/SBR/

Minnesota Department of Health

Each year the Health Risk Assessment Unit's Contaminants of Emerging Concern (CEC) Initiative hosts a stakeholder meeting to discuss and solicit input on CEC activities. This year the meeting will be held virtually on Wednesday, August 24, 2022, at 3 p.m. (CST). The meeting is open to the public. Details regarding registration and a preliminary agenda will be coming soon to MDH's CEC website at https://www.health.state.mn.us/cec.

Children's Environmental Health: A Workshop on Future Priorities for Environmental Health Sciences

The National Academies of Sciences, Engineering, and Medicine's Board on Population Health and Public Health Practice, Board on Environmental Studies and Toxicology, and Board on Children Youth and Families are organizing a virtual public workshop to discuss the state of science and knowledge about Children's environmental health. This virtual workshop will take place on August 1–4, 2022, with half-day sessions starting mid-day Eastern Time. Additional information is provided on the National Academies website.

EPA ORD Upcoming Events

EPA New Approach Methods (NAMs) Training Program

The NAMs training program outlined in the NAMs work plan to create courses and workshops for interested stakeholders is well underway. The NAMs Training website is online with a wealth of easily searchable information and training materials about EPA NAMs research and tools.

EPA Water Research Webinar Series

EPA is hosting this bimonthly webinar series to share information on its Safe and Sustainable Water Resources Research Program. For more information, refer to the Online Schedule and Registration webpage.

EPA ORD/OW Small Water Systems Monthly Webinar Series

EPA ORD's Safe and Sustainable Water Resources Research Program and the Office of Water (OW) are hosting this monthly webinar series to communicate current small drinking water systems research along with agency priorities. For more information, refer to the Online Schedule and Registration webpage.

EPA ORD/OW Annual Drinking Water Workshop: Small Systems Challenges and Solutions

This free annual workshop is a collaboration between ORD and OW in partnership with the Association of State Drinking Water Administrators (ASDWA). The 19th Annual EPA Drinking Water Workshop will be held on August 29, 2022–September 1, 2022. Refer to Information on 19th Annual (2022) Workshop.

EPA Computational Toxicology Communities of Practice Webinars

Monthly Computational Toxicology Communities of Practice webinars are held at EPA's RTP campus on the fourth Thursday of the month from 11:00 a.m.–12:00 p.m., Eastern Time. For more information, refer to the Computational Toxicology Communities of Practice webpage.

EPA Tools and Resources Training Webinar Series

EPA ORD hosts this public webinar series to provide in-depth overviews and step-by-step tutorials on popular EPA science-based models and tools. These webinars are typically held bimonthly on the first Thursday from 3:00–4:00 p.m., Eastern Time. For more information, refer to the EPA Tools and Resources Webinar Series webpage.