

The Rapids

US EPA's Trash Free Waters Monthly Update

January 2024

epa.gov/trash-free-waters

Introduction

Hello all,

Happy New Year!

[The Plastics and Climate Project](#) recently launched, in partnership with World Resources Institute, Scripps Institution of Oceanography and University of Toronto. This two-year project aims to figure out the extent plastics and the chemicals used to make them are associated with climate change. Researchers will look into what data exists or is lacking, recommend research and policies needed to fill data gaps and convene global leaders to bring attention to this issue.

Disposable foodware makes up over half of the litter that enters San Francisco Bay. To help address this problem, the City of Oakland [passed](#) a [Reusable Foodware Policy](#) in December, which will require food establishments to serve dine-in customers with reusable dishware and utensils. Businesses must also accept customers' clean reusable cups and containers for take-out. In addition, city facilities, events and large venues will be required to use reusable cups and make water refill stations available instead of selling or distributing single-use plastic bottles.

Please share any upcoming events with me at nandi.romell@epa.gov so that the Trash Free Waters Team can advertise these opportunities.

Romell Nandi
US EPA
Trash Free Waters National Program Lead

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EPA Announcements

[EPA Takes Action to Protect People from PFAS that Leach from Plastic Containers into Pesticides and Other Products](#)

On December 1, the EPA issued orders to Inhance Technologies LLC directing it to not produce polyfluoroalkyl substances (PFAS), chemicals created in the production of its fluorinated plastic containers. The PFAS in these containers have contaminated the products the containers hold, and the chemicals eventually leach into drinking water sources. Taken under the authority of the Toxic Substances Control Act, this action by the EPA will help reduce PFAS contamination in waterways.

[EPA Begins Process to Prioritize Five Chemicals for Risk Evaluation Under Toxic Substances Control Act](#)

On December 14, the EPA announced that it is beginning the process to prioritize five chemicals for risk

evaluation under the Toxic Substances Control Act, including vinyl chloride. Vinyl chloride is primarily used in the manufacturing and processing of plastic materials and was also the chemical involved in the Norfolk Southern train derailment in East Palestine, Ohio. Vinyl chloride is a known carcinogen and is also associated with other human health impacts.

Funding Opportunities

[Keep America Beautiful Great American Cleanup Grants](#)

Keep America Beautiful is accepting applications for Great American Cleanup Grants—the largest community improvement program to beautify communities across the country each spring. Grantees may choose to clean litter and debris from roadsides, highways, shorelines and waterways; plant trees, flowers and gardens; install art in communities; lead recycling efforts; and clean or restore recreation areas. Awards will range from \$500 to \$2,500. **The application deadline for this funding opportunity is January 19, 2024.**

[Keep America Beautiful Cigarette Litter Prevention Program](#)

Keep America Beautiful is offering grants to reduce and recycle cigarette pollution in public spaces and waterways. Grantees must implement Keep America Beautiful's field-tested cigarette litter prevention strategy in their community, and proposals that are interested in the program as a clean water strategy will be prioritized. Funding is open to Keep America Beautiful Affiliates, nonprofits, and community organizations, although non-Keep America Beautiful Affiliates are encouraged to apply in partnership with an Affiliate. Grants will range from \$5,000 to \$20,000. **The application deadline for this funding opportunity is February 15, 2024.**

[Healthy and Resilient Gulf of Mexico 2023 Bipartisan Infrastructure Law](#)

The EPA Gulf of Mexico Division is seeking applications for projects that address at least one of the four Gulf of Mexico Division Priority Areas: Water Quality Improvement; Protect, Enhance, or Restore Habitat; Environmental Education; and Strengthen Community Resilience. Applicants must partner with at least four other organizations, including at least two small, community-based organizations. Additional geographic requirements are detailed further in the funding announcement. The EPA plans to award five grants of up to \$6,000,000 each. **The application deadline for this funding opportunity is April 4, 2024.**

Upcoming Events

[Material Reuse Forum 5: Reuse in Climate Action Plans](#)

January 9, 2024 (1-3 pm ET), virtual

This webinar, hosted by Northeast Recycling Council, will discuss the growing trend of incorporating reuse practices into climate action plans. The forum will feature: Amanda Jordan, Circular Economy Project Manager for the City of Phoenix; Gary Feinland, Waste Reduction & Recycling Outreach and Education Section Supervisor for New York State Department of Environmental Conservation; Julianne Sammut, Climate Change Coordinator for EPA Region 1; and Kate Bartelt, Resources Sustainability and Resiliency Lead at Henningson, Durham & Richardson, Inc.

[Strengthening Routing and Collection for Improved Waste Management](#)

January 10, 2024 (8-9:15 am ET), virtual

The U.S. Agency for International Development's Clean Cities, Blue Ocean program is hosting this virtual training on how cities can improve waste collection systems to use resources and prevent waste from entering waterways more efficiently. The webinar will provide an overview of the program's suggested approach and examples from implementation experiences in Peru and Sri Lanka.

The Pollution Pandemic in the Deep Ocean

January 17, 2024 (10 am ET), virtual

The Deep-Ocean Stewardship Initiative is hosting a webinar series to celebrate their 10th anniversary. This webinar is the third of the six-webinar series and focuses on the perils of plastic pollution in the deep ocean. Panelists include: Agnes Wangui Muthumbi from University of Nairobi, Rufino Varea from Pacific Islands Development Program and João Miguel Pereira from University of the Azores.

Plastic-Free Resolutions: Protecting Your Health in 2024

January 18, 2024 (5-6 pm ET), virtual

Plastic Pollution Coalition's first webinar of the year will offer tangible solutions for reducing plastic in everyday life. Panelists include: Queer Brown Vegan Isaias Hernandez; Zero Waste Farmer Manju Kumar and Co-Owner & Co-Founder of Life Without Plastic Jay Sinha. The conversation will be moderated by MADE SAFE Founder Amy Ziff.

Save the date for future months...

Microplastics? Macro Problems: Human and Environmental Health Impacts of Microplastics

February 7, 2024, (9 pm ET) virtual

This webinar is part of the City of Sunnysvale's Sustainability Speaker Series. Dr. Imari Walker-Franklin, research scientist at Research Triangle International, and an expert on microplastics, will discuss how microplastics impact the environment and human health.

2024 REMADE Circular Economy Technology Conference & Summit

April 10-11, 2024, Washington, D.C.

The REMADE Institute, in partnership with the Ellen MacArthur Foundation and supported by the U.S. Department of Energy, is hosting the second annual Circular Economy Technology Conference & Summit. The conference will feature experts highlighting new technologies and research and aims to advance the national conversation on how a circular economy and sustainable manufacturing can help the U.S. meet its energy, environmental and economic goals. Registration is open.

Solid Waste Association of North America SOAR Conference

April 15-18, 2024, Phoenix, AZ

The Solid Waste Association of North America's 2024 SOAR conference is focused on "Technical Solutions for Resource Management." The conference will feature trainings, lectures, an exhibit hall and networking opportunities. Professionals in Collection & Transportation; Communication, Education & Marketing; Landfill Gas & Biogas; Landfill Management; Planning & Management; Sustainable Materials Management; and Waste Conversion & Energy Recovery are encouraged to attend. Registration is open.

Beyond Plastic Pollution Virtual Class

April 17 – May 29, 2024 (7-9 pm ET, weekly on Wednesdays), virtual

The founder of Beyond Plastics, Judith Enck, is teaching a 7-week virtual course through Bennington College's Center for the Advancement of Public Action. This in-depth masterclass will cover all things related to plastic pollution and will emphasize public action. The class is open to the public and may be taken for college credit or as an audited course.

In case you missed it...

Vinyl Chloride and the EPA: The Urgent Case for Action

Beyond Plastics hosted an educational webinar discussion on the dangers posed by the chemical vinyl chloride and its toll on human health. In 1974, the EPA banned the chemical as an aerosol propellant, and is now considering adding vinyl chloride to its list of chemicals to reassess for a ban or restriction due to its toxicity. Guests included experts David Rosner, Ph.D., MPH, of Columbia University and Jess Conard, the Appalachia Director of Beyond Plastics.

Advancing Climate Change Mitigation Goals through Improved Solid Waste Management

In recognition of the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change, the United States Agency for International Development's Clean Cities, Blue Ocean program—the Agency's flagship program to address ocean plastic pollution under the Save our Seas Initiative—hosted this webinar about sustainable, climate-smart waste management practices being implemented by the program and its partners, such as disposal site remediation, improved waste collection and routing and advancing the 3Rs (reduce, reuse, recycle).

The Microplastics Breakdown

POTENTIAL MICROPLASTIC REDUCTION METHODS

The Digestive System of a Cricket Pulverizes Polyethylene Microplastics Down to the Nanoplastic Scale

Marshall W. Ritchie, Jennifer F. Provencher, Jane E. Allison, Matthew J. Muzzatti, Heath A. MacMillan

The researchers explored whether a species of cricket (*Grylloides sigillatus*) would ingest and break down microplastics in their food. The crickets were fed a range of concentrations of fluorescent polyethylene microplastics mixed into their standard diet and then dissected to analyze ingested microplastics. Researchers found about a 1000-fold reduction in plastic size occurred during passage through the cricket's digestive system, which resulted in particles that were almost nanoplastic in size (i.e., less than 1 μm) and then excreted back into the environment. The team asserted their findings suggest that the crickets can act as agents of plastic transformation in their environment when encountering microplastics. **Read the full abstract:**

<https://www.sciencedirect.com/science/article/pii/S026974912302170X>

Fiber-Shed Test Method Pioneered by Under Armour Now Available to the Textiles Industry

[Home Textiles Today Staff](#)//News & Commentary//December 13, 2023

This article centers on a recent announcement by the Under Armour sportswear company of a fiber-shed test method available for purchase by the public through James Heal (a precision testing solutions supplier). This method was developed to help the textile industry address microfibers and microplastic pollution and is part of the company's goal for 75% of the fabrics in its products to be made of low-shed materials by 2030. Under Armour has provided complimentary test kits to high-volume textile mills in its global supply chain to encourage early intervention. The company is exploring techniques to redevelop high-shed fabrics, such as mechanical finishes and yarn formations that can support reduced shedding. **Read the full abstract:**

<https://www.hometextilestoday.com/innovation-inspiration/fiber-shed-test-method-pioneered-by-under-armour-now-available-to-the-textiles-industry/>

MICROPLASTICS FATE AND TRANSPORT

A Review on Microplastics in Landfill Leachate: Formation, Occurrence, Detection, and Removal Techniques

Ashish Dehal, Archana Prajapati, Mahendra P. Patil, A. Ramesh Kumar

Based on their consideration of the scientific literature, the authors observed that while landfills serve as receptacles for the accumulation of plastic waste, landfill leachate as a potential source of microplastics in the environment has not gained considerable attention. They reviewed papers focused on leachate as a source of microplastics, the formation of microplastics from plastic waste in landfills, associated environmental risks and detection techniques for microplastics in landfill leachate. Possible solutions for addressing microplastics in leachate, including recent technical advances in microplastic removal from landfills and the associated challenges, and potential future management solutions were also discussed. **Read the full abstract:**

<https://www.tandfonline.com/doi/full/10.1080/02757540.2023.2290183?scroll=top&needAccess=true>

Low Numbers of Large Microplastics on Environmentally-Protected Antarctic Beaches Reveals No Widespread Contamination: Insights into Beach Sedimentary Dynamics

Caik O DE Miranda, Carlos Ernesto G R Schaefer, José João LL De Souza, Luciano M Guimarães, Paulo Victor S Maia, Juliana A Ivar Do Sul

Microplastics are more abundant in the coastal areas of Antarctica and can be influenced by sedimentary dynamics. This study evaluated microplastic contamination in beach environments from two Antarctic Specially Protected Areas, with the goal of identifying the relationships between microplastic numbers and sedimentological parameters on beach sediments. Low numbers of microplastics were found and researchers found no evidence of widespread contamination in the study areas. The low numbers of microplastics impaired statistical comparison. Given their study limitations, they suggested additional research and encouraged the development of specific and periodic monitoring strategies, while acknowledging the challenge of identifying the most effective methods to sample and identify microplastics in the Antarctic continent. **Read the full abstract:**

<https://pubmed.ncbi.nlm.nih.gov/38088640/>

EXPOSURE TO MICROPLASTICS AND POTENTIAL EFFECTS

Insights into the Shape-Dependent Effects of Polyethylene Microplastics on Interactions with Organisms, Environmental Aging, and Adsorption Properties

Ula Rozman, Barbara Klun, Aleksandra Kuljanin, Tina Skalar, Gabriela Kalčíková

The researchers investigated how the shape of polyethylene microplastics (spheres, fragments, and films) affected samples of an aquatic plant, duckweed *Lemna minor*. The particle shape was found to have had no effect on the plants' growth rate or chlorophyll content. The research team also examined the development of biofilm.[1] They observed that the most biofilm developed on microplastic films. The biofilm on spheres were found to have contained significantly less photosynthetic microorganisms but twice as much extracellular polymeric substances as on fragments and films. This result suggested the attachment of microorganisms to spherical particles is limited and therefore more intensive production of extracellular polymeric substances is required for stable biofilm formation. The research team concluded the shape of microplastics significantly affects not only ecotoxicity but also other environmentally relevant processes. **Read the full abstract:** <https://www.nature.com/articles/s41598-023-49175-1>

[1] A biofilm is defined as a community of microorganisms attached to an inert or living surface by a self-produced polymeric matrix or an assemblage of microbial cells associated with a surface and enclosed in a matrix of primarily polysaccharide material. <https://www.sciencedirect.com/topics/materials-science/biofilms#:~:text=A%20biofilm%20is%20defined%20as,matrix%20of%20primarily%20polysaccharide%20material>

Is the Application of Organic Fertilizers Becoming an Undeniable Source of Microplastics and Resistance Genes in Agricultural Systems?

Tianhao Li, Shiyu Tao, Mengjie Ma, Shiwei Liu, Maocai Shen, Huijuan Zhang

The authors asserted that the application of organic fertilizers is a significant pathway for microplastics and **antibiotic resistance genes** to enter agricultural soils. The complex microbial activity resulting from the application of these fertilizers transfers antibiotic resistance genes and their host bacteria to agricultural products and then throughout the food chain. The control of microplastic abundance in organic fertilizers is currently only achieved through pre-composting selection and other methods. The high-temperature composting of organic waste effectively reduces the presence of microplastics and antibiotic resistance genes in organic fertilizers. The authors recommend considering the potential spread of antibiotic resistance genes in the residual antibiotic resistant bacteria that might remain in the soil. The authors highlighted current research on biotechnologies and proposed that further investigation is needed to improve the development and practical implementation of technologies aimed at reducing soil microplastics and antibiotic resistance genes. **Read the full abstract:**

<https://www.sciencedirect.com/science/article/pii/S0048969723082013#s0075>

Microplastics as Carriers of Toxic Pollutants: Source, Transport, and Toxicological Effects

Nazifa Rafa, Bushra Ahmed, Fatema Zohora, Jannatul Bakya, Samiya Ahmed, Shams Forruque Ahmed b, M. Mofijur, Ashfaque Ahmed Chowdhury, Fares Almomani

The research team goal was to present key conclusions from recent literature centered on: (i) microplastics' source, types, and transport; (ii) occurrence of microplastics in various environmental compartments; (iii) affinities of microplastics to carry certain pollutants; (iv) sorption mechanisms and factors affecting sorption; and (v) harmful effects on living organism, to help guide policy action focused on minimizing the risk of microplastics on the environment and health. The authors found that microplastics' physicochemical properties, such as size, structure and functional groups, and environmental compartment properties, such as pH, temperature and salinity, influence the sorption of pollutants by microplastics. They also found microplastics influence the growth and metabolism of organisms. The team identified several obstacles to microplastic research, including inadequate methods for collection and analysis of environmental samples, lack of replication of real-world settings in laboratories, and a lack of understanding of the sorption mechanism and toxicity of microplastics. The authors recommend a strong scientific understanding and cooperation with pertinent international, national and regional statutory authorities and legislative frameworks are essential and will assist in ensuring the successful negotiation and implementation of a global legally binding treaty to manage microplastic pollution. **Read the full abstract:** <https://www.sciencedirect.com/science/article/pii/S0269749123021929>

