The Rapids

US EPA's Trash Free Waters Monthly Update

November 2021

epa.gov/trash-free-waters

Introduction

Hello all,

I recently had the pleasure of authoring an article about the Trash Free Waters program in **ECO Magazine's Special Issue on Marine Pollution**. Please do read the article on pages 18-21.

There are a number of recently published reports you might be interested in reading, including the Environmental Investigation Agency's "**The Truth Behind Trash**" and Beyond Plastic's "**The New Coal: Plastics & Climate Change**." These studies provide new insights on the scale and impact of the international plastic waste trade and the relationship between plastic production and global greenhouse gas emissions, respectively. In addition, the UN Environment Programme recently produced the report "**From Pollution to Solution: A global assessment of marine litter and plastic pollution.**" This report details the impact of marine litter and plastic pollution and their effects on the health of ecosystems, wildlife, and humans.

Please continue to share any upcoming events with Layne Marshall (**marshall.layne@epa.gov**) so that the Trash Free Waters team can advertise these opportunities with all of you on the first Monday of each month.

Thanks,
Romell Nandi
US EPA
Trash Free Waters Program Lead

EPA Announcements

TFW Flow Newsletter Released

The October edition of the TFW Flow Newsletter was released on October 18th. This semi-annual newsletter provides a deep-dive on various ongoing stakeholder engagement initiatives, source reduction projects, trash capture efforts, and more.

Renewed MOU between EPA and UNEP

EPA and the United Nations Environment Programme (UNEP) signed a renewed five-year Memorandum of Understanding in early September. The agreement addresses key areas of collaboration to strengthen environmental governance, create healthy communities, transition towards green economies, and respond to climate change. The news release highlighted the successful history of collaboration between the two organizations on marine plastic pollution.

EPA's U.S.-Mexico Border 2025 Program Selects Environmental Projects for Implementation in the Border Region

EPA, in coordination with the North American Development Bank, has selected eight environmental and public health projects to be implemented on both sides of the U.S.-Mexico border. One pilot project will prevent dumping of garbage in overburdened communities in Tijuana and identify waste at its source. Another grant recipient will strengthen the Solid Waste Management Plan of the Kumiai Indigenous community of San Antonio Necua, located in the Guadalupe Valley in Baja California, Mexico. A third awardee plans on conducting a socio-environmental vulnerability and solid waste analysis in the forested area of the Alamar River to establish an environmental management plan for the cleanup, rehabilitation, and prevention of waste along the transboundary watershed.

Product Stewardship Institute Selected for EPA Funding

On October 4, EPA announced that the Product Stewardship Institute Inc. (PSI) was selected for $196,430 in Sustainable Materials Management (SMM) funding to establish infrastructure to reduce the St. Louis restaurant industry's reliance on single-use plastic. PSI will partner with St. Louis-based earthday365 to bring together stakeholders to focus on developing source reduction plans and expanding a reusable food container program in the city.

EPA Region 10 Healthy, Resilient and Sustainable Communities Grant Awardees Announced

EPA Region 10 office in Seattle announced the first round of its Healthy, Resilient and Sustainable Communities grant projects in early October. The $335,000 grant program will support seven local pollution prevention and sustainability projects aimed at making communities safer, healthier and more resilient by reducing the amount of any hazardous substance, pollutant, or contaminant from entering waste streams or otherwise released into the environment before recycling, treatment, or disposal.

Funding Opportunities

Sea Turtles & Plastics Program

The new Sea Turtles & Plastic Program provides funding for projects that help to clean plastic waste from sea turtle habitats and recycle that waste into products that support conservation efforts and local communities. Current funding priorities: Projects that both clean plastic from sea turtle habitats and recycle that waste into new products (required); support endangered or critically endangered species or populations (preferred); and have strong local community participation (preferred). Sea turtle organizations or nonprofits closely aligned with sea turtle conservation efforts are eligible to apply. Grants are only available in developing countries (US, Europe, Japan, & Australia are not eligible, although territories of these countries are.) Our maximum request at this time is US $5,000. **Applications should be sent to brad@seeturtles.org by November 17, 2021.**

EPA Environmental Education Local Grants Program

Under the Environmental Education Grants Program, EPA seeks grant applications from eligible applicants to support environmental education projects that promote environmental awareness and stewardship and help provide people with the skills to take responsible actions to protect the environment. Applications must address at least one of the EPA's Educational Priorities and one of the Administrator's Environmental Priorities to be considered eligible. EPA will award three to four grants in each of EPA's 10 regions, for no less than $50,000 and no more than $100,000 each, for a total of 30-35 grants nationwide. **All applications must be submitted to Grants.Gov by December 6, 2021.**

USDA Solid Waste Management Grant Program

The Solid Waste Management Grant Program was established to: Evaluate current landfill conditions to determine threats to water resources; help communities reduce the solid waste stream; and/or provide

technical assistance and/or training to enhance operator skills or educate operators of landfills which are closed or will be closed in the near future with the development and implementation of closure plans, future land use plans, safety and maintenance planning, and closure scheduling within permit requirements. **The deadline for submissions in December 31, 2021.**

Other opportunities...

Take Care of Texas Student Video Contest

The Take Care of Texas Video Contest is a fun way for young people to learn about protecting the environment and come up with creative ways to share this knowledge with others. Students film a 30-second video that shows positive ways to Take Care of Texas. The students that submit the best videos can win great prizes, awarded by the contest sponsor, Waste Management of Texas, Inc. Students residing in Texas and enrolled in the 6th through 12th grade can participate. **Entries must be uploaded on or before 4PM Central Time (CT) on December 3, 2021.**

World of 7 Billion Student Video Competition

Through the World of 7 Billion student video contest, hosted by Population Connection, middle and high schoolers are given the platform to think critically about global challenges related to population and share what they think we should do to fix it. Each entry must focus on one of following global challenges as it relates to population growth: Ocean Health, Urbanization, or Agriculture and Food. The maximum video length is 60 seconds. **The deadline for submissions is 5PM ET February 22, 2022.**

BoatUS Foundation Grassroots Grants Program

The BoatUS Foundation is looking for creative and innovative projects that promote safe and clean boating on local waterways. Nonprofit organizations, boating clubs, student groups, chapters of national organizations, and other groups are eligible. Past topics have included hands-on education about the effects of marine debris. Applications are **reviewed on a rolling basis**, and up to $10,000 is available.

Upcoming Events

Coastal and Estuarine Research Federation Biennial Conference

November 1st-4th and 8-11th

CERF 2021, hosted by the Coastal and Estuarine Research Federation, will virtually bring together hundreds of scientists and researchers in discussions surrounding the collective goals of preserving coastal and estuarine habitats, resources, and heritage. One session will discuss Microplastics in Coastal Ecosystems: Biological Consequences of an Emerging Contaminant.

Simplify the Holidays

November 2nd (2-3PM ET)

The Center for Biological Diversity is holding a webinar about simplifying the winter holidays through waste reduction. Speakers include: Kelley Dennings, Campaigner with the Center for Biological Diversity; Sarah Baillie, Organizer with the Center for Biological Diversity; Cindy Chan, Assistant Professor of Marketing at the UTSC Department of Management and Rotman School of Management at the University of Toronto; and Michelle Daniels, Assistant Professor of Marketing at the University of Alabama. A certificate for submission to continuing education certification programs will be provided.

National Recycling Congress

November 3rd-4th

The National Recycling Congress is a two-day educational and networking event organized by the National Recycling Coalition. This event will bring together local, state, and national experts to discuss best practices and the latest developments on national legislation; climate change; market development; circularity; waste prevention, reuse, recycling, and composting; and justice, equity, diversity and inclusion.

74th Gulf and Caribbean Fisheries Institute Conference

November 8-12th

This year's conference will bring together regional stakeholders to share experiences and present success stories from around the Gulf and Caribbean. This conference features a technical session on marine litter science and management, as well as a special session on addressing Abandoned, Lost and Otherwise Discarded Fishing Gear (ALDFG). In addition, there will be a Regional Caribbean Best Practice ALDFG Cross-Sectoral Solutions Workshop Hosted by the Global Ghost Gear Initiative, Gulf Caribbean Fisheries Institute, and Caribbean Node of the Global Partnership on Marine Litter.

New York State Association for Reduction, Reuse, and Recycling (NYSAR3) Annual Recycling Conference

November 3rd-4th and 9-10th

The 32nd Annual NYSAR3 Conference will be a hybrid event, offering both virtual and in-person attendance options. NYSAR3 will provide attendees with an in-depth look on targeted discussions involving recycling, composting, market development, and much more at the New York/Northeast level.

California Ocean Litter Strategy Bi-Annual Update Webinar - November 2021

November 10th (1-3PM ET)

The California Ocean Litter Strategy Project, coordinated by NOAA's Marine Debris Program and the California Ocean Protection Council, outlines actions that stakeholders can take to prevent and reduce ocean litter in California. This webinar will include updates from California leaders, California Ocean Litter Prevention Strategy partners, workgroup leads, agency updates, and legislative developments in California.

America Recycles Day!

November 15th

Working with Restaurants to Reduce Plastic: A NOAA Seminar on Challenges & Successes

November 15-16th (2-4PM ET both days)

You are invited to join other environmental professionals from around the country to learn more about working with restaurants to reduce their plastic use. The NOAA Marine Debris Program is hosting current and past grantees who will share their challenges and lessons learned around how to approach restaurants, how to work with restaurants on plastic reduction, maintaining long-term relationships and momentum with the restaurant industry, and lastly to share resources that are available to help others who are exploring similar projects. **You must register by November 1 to be able to attend.**

Technology Recycling Conference: "Critical Elements for Recycling in a Circular Economy"

November 16th (11AM-4PM ET)

The Institute of Scrap Recycling Industries, Inc. and Information Technology Industry Council have teamed up for the first annual Technology Recycling Conference "Critical Elements for Recycling in a Circular Economy." This conference aims to keep attendees updated on the latest environmental requirements for recycling, repair, and the circular economy, featuring conversations on the Basel Convention, circular economy, recycling standards, repair mandates, and more.

SEA of Solutions 2021: Accelerating Solutions to Reduce Plastic Waste

November 16-18th
This year's theme calls upon plastic value chain stakeholders to engage and unite in "Accelerating solutions to reduce plastic waste" by exploring policies, partnerships, innovative technologies, and financing that help address present challenges and mitigate the potential impacts of future disruptive global events like the pandemic. Specifically, the event will: Discuss challenges and opportunities in implementing regional, national, and local strategies on plastic waste prevention and disposal; Explore innovative financing; Feature the latest digital technologies, tools, and incentive models; and Promote consumer advocacy and outreach to beat plastic pollution.

Webinar: America Recycles Week 2021 - Recycling Beyond the Plastic Bag
November 17th (12-1PM ET)
Join Stephanie Hicks, Materials Sourcing Manager at the Trex Company in Winchester, VA, to learn about recycling beyond the plastic bag at home through a webinar hosted by the EPA's Sustainable Materials Management Program. Trex collects recycled materials from all over the country in places like Kroger, Tom Thumb, Winco, and Albertsons grocery stores and Kohls. Topics will include: Decking manufactured from recycled plastic film and plastic bags, impacts of contamination, what can be recycled, where to recycle, and how schools and community organizations can participate.

One Integrated Marine Debris Observing System for a Clean Ocean
November 17-19th
This event is organized by a consortium of 14 international ocean experts and is hosted by GEO Blue Planet and Mercator Ocean International as an official satellite activity of the UN Ocean Decade Clean Ocean Laboratory. We will discuss the current state of the marine debris system, our knowledge about it, and ways forward for implementing the Integrated Marine Debris Observing System (IMDOS). We aim to learn about recent advancements in observational techniques and technologies as well as to enhance cooperation among diverse communities of stakeholders.

Save the dates for future months...

Extended Producer Responsibility (EPR) Coffee Hour
December 3rd (2PM ET)
Join Beyond Plastics, Conservation Law Foundation, National Stewardship Action Council, UPSTREAM, and Break Free From Plastic US for a free informal "coffee hour" conversation to talk about the latest EPR proposals and what to look for to make sure the goals are achieved.

National Zero Waste Virtual Conference
December 8-9th
The National Zero Waste Conference is the annual two-day virtual educational and networking event organized by Zero Waste USA in partnership with the National Recycling Coalition. Zero Waste Business will be the focus on Wednesday, December 8 and Zero Waste Communities on Thursday, December 9. The conference will feature local, national and international experts discussing Zero Waste and high diversion best practices and latest developments.

Pinniped Entanglement Prevention and Response Workshop - Sharing Best Practices to Improve Safety and Success
December 12th (8:30AM-5:30PM ET)
This in-person workshop will be held in advance of The Society for Marine Mammalogy 24th Biennial Conference on the Biology of Marine Mammals in Palm Beach, FL. The event is intended to bring together pinniped researchers, managers, and practitioners interested in reducing global pinniped entanglements and interactions with active fishing gear. Attendance preference will be given to those

registered for the conference and non-conference registrants will have to pay a non-registrant participant surcharge.

In case you missed it...

Right to Repair Movement and Accessibility
The West Coast Climate & Materials Management Forum hosted a webinar on September 30th providing an overview of the "Right to Repair" movement, dedicated to breaking down the barriers to extending the useful life of products and equipment.

State of the Science: "The Dirt on Plastic"
The 5Gyres Institute hosted a conversation with scientists Timnit Kefala and Ezra Miller about the potential impacts of microplastics and chemicals on soil and plants.

Marine Litter and Plastic Pollution in Latin America and the Caribbean ***(Spanish)***
This webinar is fifth in a series titled "Marine litter: legal tools to address the crisis," hosted by the UN Environment Programme. It aims to be an informative platform to facilitate dialogue across Latin America and the Caribbean with info-sharing on regional and international initiatives and a high-level discussion addressing the entire lifecycle of plastics, from production to disposal. The webinar is in Spanish.

The Available Measuring Techniques for Marine Debris – A Review
Originally held on October 5th, this Ocean Plastic Webinar featured guest speaker Professor Rene Garello and a discussion around various techniques and approaches to marine debris measurement.

Microplastics Monitoring Subcommittee Kickoff Meeting
The California Water Quality Monitoring Collaboration Network and the Trash Monitoring Workgroup held a Microplastics Monitoring Subcommittee Kickoff Meeting on September 30. This meeting had a diverse group of featured guests, including representatives from EPA, San Francisco Estuary Institute, Southern California Coastal Water Research Project, and others.

Recent Legislation

Reducing Waste in National Parks Act
The "Reducing Waste in National Parks Act" was introduced in the Senate on October 7 by Senator Jeff Merkley. If passed, the legislation would allow national parks to voluntarily ban the sale of single-use plastic water bottles and other disposable plastic materials (including bags and utensils). This is seen as an expansion of a similar bill introduced in 2019 by fellow bill sponsor Representative Mike Quigley which focused on single-use plastic water bottles only.

The Microplastics Breakdown

MICROPLASTIC POLLUTION MANAGEMENT AND POLICY

Challenges and Opportunities in Sustainable Management of Microplastics and Nanoplastics in the Environment

Binoy Sarkar, Pavani Dulanj, Dissanayake, Nanthi S. Bolan, Jaffer Yousuf Dar, Manish Kumar, Md Niamul Haque, Raj Mukhopadhyay, Sammani Ramanayaka, Jayanta Kumar Biswas, Daniel C.W. Tsang, Jörg Rinklebe, Yong Sik Ok

This article is based on the premise that sustainable plastic waste management techniques are vital for achieving Goal 12 of the U.N.'s Sustainable Development Goals: "Responsible consumption and production," which included the targets of: managing chemicals and all waste categories in their life cycles and reducing waste to minimize the negative impacts on the ecosystem. The authors pointed out that existing reviews focused on the occurrence and impact of micro- and nanoplastics (MNPs), have only provided limited coverage of the management of MNPs, and they proposed to help fill this gap in this review. They found that plastic production is linked to the growth and development of a country. The authors suggested the evaluation of hazards and fate of primary MNPs, and the implementation of appropriate standards for environmentally safe limits. The need for stringent environmental regulations and the development of appropriate infrastructure and economically sound, environmentally sustainable, and socially acceptable plastic waste management strategies as being critical to reduce the threat of MNPs in the environment was highlighted. The article identified issues that need to be addressed when developing a policy for sustainable plastic waste management: (1) Enforcement of robust legislation on plastic reuse and recycling, (2)Additional investment in plastic waste recycling industries, (3) Focus on generating value-added products through a waste-to-wealth program, (4) Establishing environmentally suitable structures for plastic dumping, (5) Raising public awareness through education, conversation, social campaigns on plastic use, and proper waste disposal, and (6) Producing high-quality materials through recycling and using more biodegradable products (e.g., cloth, leaves) instead of plastics.

HUMAN AND ECOSYSTEM EXPOSURE TO MICROPLASTICS

Assessing the Role of Polyethylene Microplastics as a Vector for Organic Pollutants in Soil: Ecotoxicological and Molecular Approaches

Carmen Fajardo, Carmen Martín, Gonzalo Costa, Sebastián Sánchez-Fortún, Casilda Rodríguez, Jose Juliode Lucas Burneo, MarNande, Gerardo Mengs, Margarita Martín

This study used bioassays and molecular methods to evaluate the impacts on different soil organisms associated with a mixture of three types of polyethylene (PE) microbeads: white (W), blue (B), and fluorescent blue (FB), and their interactions with other pollutants (OCs), including ibuprofen (IB), sertraline (STR), amoxicillin (AMX) and simazine (SZ). "Standard" soil supplied as field-fresh with active microflora and provided by the Agricultural Investigation and Research Institute (LUFA Speyer, Germany) was contaminated with OCs and MPs (alone or combined with OCs) then incubated for 30 days and evaluated for impacts on soil organisms and on the germination of *Zea mays* (maize) seeds. They found that the microplastic PEs exhibited different abilities for the adsorption of each OC: W selectively adsorbed higher amounts of SZ, whereas B and FB preferably retained AMX. According to the authors, their results indicated that MPs and their capability to act as pollutant carriers affect soil biota. Additionally, the inhibition of leaf growth in *Zea mays* was detected, but this negative effect declined over time, while the inhibition of root growth increased with increasing levels of OCs and MIX. They concluded that MPs alone or associated with OCs negatively impact plants and the soil bacterial community. One of their key final points was that considering that the maintenance of healthy ecosystems relies largely on the key role of plant and microbe interactions, particular attention should be paid to agricultural systems as the base of the food chain; therefore, further studies should be carried out with different types of MPs to establish their respective interactions with organic compounds, their bioavailability and how long it takes for leaching of these organic pollutants into different organisms and/or ecosystems.

Marine Microplastics and Seafood: Implications for Food Security

Anne-Katrine Lundebye, Amy L. Lusher, and Michael S. Bank
This chapter in *Microplastic in the Environment: Pattern and Process* focuses on the food safety concerns related to plastic particles in seafood species which are commonly consumed by humans, such as bivalves, gastropods, cephalopods, echinoderms, crustaceans, and finfish. The objectives of this chapter were described as: (1) outlining the major sources, fate, and transport dynamics of microplastics in marine ecosystems, (2) providing a critical assessment and synthesis of microplastics in seafood taxa commonly consumed by humans, (3) discussing the implications of microplastics with regard to human health risk assessments, and (4) suggesting future research priorities and recommendations for assessing microplastics in marine ecosystems in the context of global food security and ocean and human health. The authors found that lower trophic-level organisms may be at the highest risk of contamination from microplastics. However, they found that there is a lack of information on which to conduct realistic and meaningful human health risk assessments. The authors also highlighted the importance of standardized and harmonized methods for effective biomonitoring of farmed and wild seafood species including bivalves and finfish. One of their main conclusions was that the effects of microplastics on food security are still largely unknown, and further research and robust biomonitoring efforts on seafood are required to clarify potential impacts.

MICROPLASTICS FATE AND TRANSPORT

Microplastics in Agricultural Drainage Water: A Link between Terrestrial and Aquatic Microplastic Pollution
Moritz Bigalke, Milo Fieber, Alexandra Foetisch, Julien Reynes, Peter Tollan
The authors of this study analyzed drainage water samples from agricultural soils in eleven sites in the Seeland, an area they described as a heavily drained agriculturally intensive area in Switzerland for its microplastics (MPs) concentration and composition. The study results indicated the presence of what the authors characterized as considerable amounts of MPs in the drainage water. The polymers found were mainly polyamide (PA) and polyethylene (PE), and the size distribution showed an exponential increase with decreasing particle size. PA was found to be the most abundant polymer in the smallest size range (100–150 μm) and PE being the most abundant in the size range 150–300 μm. According to the authors, the results imply a transport of MP in soils down to the drainage pipes; they proposed that MP leaching from soil can be a significant source of MP to aquatic ecosystems. Such a contribution should be considered when dealing with MP cycling on a local to global scale. They recommended that drainage water be considered when assessing MP fluxes to surface waters. Additionally, they suggested that future research is needed to confirm our findings with a higher number of samples from different locations worldwide.

Plastic Pollution: Paint Flakes Most Abundant Microplastic Particles After Fibres, Study Finds
Oceanographic Magazine, Ocean Newsroom
This short article summarized the main findings of a study published in the journal, *Science of the Total Environment,* titled "Occurrence and chemical characteristics of microplastic paint flakes in the North Atlantic Ocean." As reported in this article, the University of Plymouth and the Marine Biological Association (MBA) conducted several surveys across the North Atlantic Ocean and collected more than 3,600 samples. Based on this work, they estimated that each cubic meter of seawater contained an average of 0.01 paint flakes, a finding that suggested that paint flakes are the second largest type of microplastic particles found in the ocean after microplastic fibres which has an estimated concentration of 0.16 particles per cubic meter. An additional source of threat to the ocean and the species living in it if they ingest the particles could be from the content of some of the paint flakes, which the study findings indicated had high quantities of lead, iron as well as copper due to them having antifouling or anti-corrosive properties. Therefore, paint flakes require closer scientific attention as the full effect of the metallic additives on the ocean and its species is not yet fully understood.

Separation of Microplastics from Water - What Next?

Thuhin K.Dey, Mamun Jamal

This article focused on the question of what happens to microplastics (MPs) that are separated from water, with the goal of providing a favorable method of recycling these extracted MPs into commercially valuable products and ensuring sustainable MPs handling methods as well as the feasible disposal of such pollutants without jeopardizing environmental safety. The authors provided an overview of some of the currently available detection methods, including discussion of their limitations (e.g., Raman Spectroscopy; thermoanalytical techniques). As part of their discussion of the "hypothesis of microplastics recovery" they highlighted the fact that research focused on MPs separation is being conducted to develop standard separation technologies with the highest output. Work on post-separation methodologies was also discussed, including approaches that employed graphene oxide. They also described yarn preparation from MPs as a potential viable option in terms of MPs recycling strategy. Authors noted that other MPs derivatives should also be investigated to determine their suitability for garments preparation. The article concluded with the question of whether the most commonly used methods for separating MPs from water: adsorption, coagulation, membrane filtration, oxidation, and microbial degradation, will ultimately be effective in addressing the distribution and impacts of plastics pollution in the environment.

Warming, Temperature Fluctuations and Thermal Evolution Change the Effects of Microplastics at an Environmentally Relevant Concentration

Mengjie Chang, Chao Zhang, Mingyang Lia Junyu Dong, Changchao Li, Jian Liu, Julie Verheyen, Robby Stoks

The authors observed that studies focused on microplastics (MPs) are conducted under standard thermal conditions and thereby ignore the impacts of higher mean temperatures (MT), and especially daily temperature fluctuations (DTF) under global warming. Furthermore, they suggested that an evolutionary perspective may further benefit the future risk assessment of MPs under global warming. This study investigated the effects of two generations of *Daphnia magna* of exposure to a concentration of polystyrene that was determined to be environmentally relevant under six thermal conditions. The results indicated that the standard ecotoxic thermal conditions (constant 20 °C) MPs almost had no effect except for a slight reduction of the heartbeat rate; whereas at the challenging more realistic thermal conditions (higher MT and/or DTF), MPs affected each tested variable and caused an earlier maturation, a higher fecundity and intrinsic growth rate, a decreased heartbeat rate, and an increased swimming speed. These effects may be partly explained by hormesis and/or an adaptive response to stress in *Daphnia*. According to the authors, these results highlighted that global warming should be considered in the ecological risk assessment of MPs.

If you'd like to see your posting in this email, please email Marshall.Layne@epa.gov with any suggestions!