

# The Rapids: US EPA's Trash Free Waters Monthly Update November 2020

<https://www.epa.gov/trash-free-waters>

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## Introduction

Hello all,

I hope everyone is enjoying the fall season. I recently came across a paper in *Environment International* from Duke University's Nicholas School of the Environment that I thought many of you might find useful. The paper is entitled "Plastic Pollution Solutions: Emerging Technologies to Prevent and Collect Marine Plastic Pollution." I was especially interested in this article as EPA's Trash Free Waters program has been getting more involved specifically in trash capture technologies and projects; in fact, on November 5<sup>th</sup>, the Trash Free Waters program will be running a webinar called, "Experiences and Lessons Learned from Trash Capture Projects" (see below for details). The Nicholas School paper provides a listing of collection and prevention technologies with details about each and other useful information, and is accompanied by a searchable online database of these technologies. Search the Plastic Pollution Prevention and Collection Technology Inventory [here](#). I recommend you click [here](#) to read the paper as well.

Please continue to share any upcoming events with Layne Marshall ([marshall.layne@epa.gov](mailto: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

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## EPA Announcements

### **EPA Releases the U.S. Strategy to Preventing and Reducing Marine Litter**

On October 19, EPA Administrator Andrew Wheeler traveled to Florida Atlantic University in Boca Raton, Florida to announce the release of "The U.S. Federal Strategy for Addressing the Global Issue of Marine Litter," which can be read in its entirety [here](#). The strategy highlights the federal government's four pillars for tackling the issue of marine litter: (1) building capacity, (2) incentivizing the global recycling market, (3) promoting research and development, (4) promoting marine litter removal. Watch the full announcement, including speakers from the university, state government, NOAA, and the Alliance to End Plastic Waste, [here](#). To read a press release about the event, click [here](#).

### **EPA Releases Guide to Assist Developing Countries with Solid Waste Management**

The EPA's Best Practices for Solid Waste Management: A Guide for Decision-Makers in Developing Countries provides city-level decision makers in developing countries with

information and resources to help them improve solid waste management within their given context. EPA Administrator Andrew Wheeler was quoted saying “The best way to keep our oceans free of waste and litter is to prevent it from entering waterways in the first place. The U.S. is a leader in waste management and this guide will help many of our partners improve their waste management practices.” To read the full guide, click [here](#).

### **Choctaw Tribe Receives \$200K for Trash Capture**

At a press conference at the Mississippi Band Choctaw Indian (MBCI) Reservation, the U.S. EPA announced that it would be awarding the tribe with a \$200,000 grant to purchase a Bandalong litter trap. The trash capture device will be installed in Kentawka Canal to collect litter before it flows farther downstream. To read the full news release, click [here](#).

### **Draft National Recycling Strategy**

The EPA released the agency’s draft National Recycling Strategy last month, outlining strategic objectives and actions needed to create a stronger, more resilient, and cost-effective U.S. municipal solid waste recycling system. EPA is currently accepting public comment on the draft through December 4<sup>th</sup>. To read the draft strategy, click [here](#).

### **Proctor Creek Story Map Highlights Trash**

An EPA Story Map published in mid-October offers a deep dive into Atlanta’s Proctor Creek watershed. The tool highlights the intersection between aquatic trash, green infrastructure and the health of surrounding communities. Check out the “Flooding” tab of the story map for information about the water quality impacts associated with trash, the history of Trash Free Waters program involvement in the watershed, and current TFW trash capture project statistics. Click [here](#) to view the story map.

### **EPA Regional Administrator Touts Trash Capture**

EPA Region 4 Regional Administrator Mary Walker travelled to Birmingham, AL in early October where she touted the local “Comprehensive Trash Abatement Program for Two Central Alabama Watersheds” as an example of a successful Trash Free Waters project. A \$500K grant awarded earlier this year through the EPA Gulf of Mexico Program’s Waterway Trash Reduction Grant helped support the installation and maintenance of six Litter Gitters in the watershed. To read the full article, click [here](#).

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## **Funding Opportunities**

### **NOAA FY2021 Marine Debris Research Grants Notice**

The NOAA Marine Debris Program invites applications for field, laboratory, and modeling research that investigates and identifies the critical input pathways for marine debris introduction into the coastal zone, including evaluation of appropriate simultaneous pathways of riverine transport downstream, surface runoff, stormwater discharge, and wind-driven transport, and degradation and fragmentation of debris during transport. Funding of up to \$2,000,000 is expected to be available, while typical awards range from \$150,000 - \$300,000. A pre-proposal Letter of Intent must be submitted via email to [grants.marinedebris@noaa.gov](mailto:grants.marinedebris@noaa.gov) (as an attachment) no later than 11:59pm ET, November 5, 2020. If invited per the instructions in the announcement, full proposals must then be submitted through and validated by Grants.gov by February 8, 2021. Read more about this opportunity [here](#).

### **Pensacola & Perdido Bays Mini Grant Program**

Pensacola & Perdido Bays recently announced a mini grant program for Northwest Florida, of which aquatic trash/marine debris is one eligible project category. Under the category, applicants can propose projects which identify innovative strategies to remove, reduce, and/or eliminate trash from the environment. Projects must be located within the Perdido and/or Pensacola watershed within Escambia, Santa Rosa, and/or Okaloosa counties. The deadline to apply is November 6<sup>th</sup> and projects must be completed by June 2021. To learn more about how to apply, click [here](#).

#### **NOAA RESTORE Science Program: Planning for Actionable Science**

The NOAA RESTORE Science Program recently released its next funding opportunity. This competition will provide natural resource managers, researchers, and other stakeholders with funding to plan a research project that informs a specific management decision impacting natural resources in the Gulf of Mexico. All natural resources and decisions associated with them are eligible. \$2.5 million is expected to be made available through this funding opportunity. The minimum and maximum individual award amount is approximately \$25,000 and \$125,000, respectively. The application period closes on December 15, 2020. For updates, check [here](#).

#### **USDA's Solid Waste Management Grant Program**

The USDA's Solid Waste Management (SWM) Grant Program was established to assist communities through free technical assistance and/or training provided by the grant recipients. Qualified organizations will receive SWM grant funds to reduce or eliminate pollution of water resources in rural areas, and improve planning and management of solid waste sites in rural areas. The estimated total program funding is \$4 million. Applications are due December 31, 2020. Read more about the funding opportunity, "SWMFY2021" on Grants.gov [here](#).

#### **Alliance to End Plastic Waste: Request for Proposals (RFP)**

The Alliance to End Plastic Waste is now accepting project proposals on the implementation of infrastructure to eliminate leakage of plastic waste through collection and containment. This RFP prioritizes support to cities in Asia, Africa and Latin America. In partnership with organizations that directly work with cities, they hope to shape high-quality submissions that ultimately deliver against the goal of driving investments in much-needed infrastructures. The first window for submission of Concept Papers closes December 31, 2020. To submit your proposal, please visit the [Plastic Free Waste Cities page](#).

#### **US Department of Agriculture Rural Development Water & Waste Disposal Loan & Grant Program**

This program provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas. Applications are reviewed on a rolling basis. Full details, including requirements and registration, can be found [here](#).

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### **Save the Dates/Calendar**

#### **November 3<sup>rd</sup> (6AM EDT): Plastic Waste Production Since 1990 & the Coastal Plastic Reservoir**

This Ocean Plastic Webinar encourages ocean plastic scientists from any field (biologists, physicists, chemists, economists, etc.) to share research and collaborate internationally. This webinar will feature a 30 minute presentation by Charlotte Laufkötter of the University of Bern, Switzerland and will be followed by a 30 minute Q&A session. Watch the webinar live [here](#).

**November 4<sup>th</sup> (12PM EDT): Microplastinar 1- The Natural and Social Sciences Dimension of Plastic Pollution**

First in an interactive webinar series hosted by the EU project LimnoPlast, this series will take a closer look at the wicked problem of plastic pollution and microplastics. Speakers are experts in plastic pollution and have diverse backgrounds in academia, policy making, civil society and beyond. They will provide unique perspectives on the causes and impacts of the problem and discuss solutions. This event's speakers include Richard Thompson, Professor of Marine Biology and the University of Plymouth and Sabine Pahl, Professor of Applied Social Psychology at the University of Vienna. Register for the webinar [here](#).

**November 5<sup>th</sup> (11AM -2PM EDT): Sustainable Ocean Alliance- Ocean Solutions Accelerator Demo Day**

Join the Sustainable Ocean Alliance network for a virtual Demo Day, featuring our global, cross-industry cohort and their solutions to preserve our ocean's health. Demo Day will include startup's pitches, virtual demo tables, networking, and an inspiring keynote speaker. Register [here](#).

**November 5<sup>th</sup> (12PM EDT): Microplastics in invasive mussels (*Dreissena* sp.) of Lake Michigan: Patterns across sites and relationship to chemical pollutants**

This OneNOAA Science Seminar, presented by Dr. Timothy Hoellein, an Associate Professor at Loyola University in Chicago, will discuss a recent microplastics publication. Invasive zebra and quagga mussels (*Dreissena* sp.) in the Great Lakes of North America serve as biomonitors for chemical contaminants, but are also exposed to microplastics (< 5mm). This study measured microplastics and contaminant concentration in mussels from Milwaukee Harbor (Lake Michigan, USA) spanning a gradient from reference (i.e., clean water) conditions to sites influenced by wastewater and urban river discharge. Tune in to hear how this study will be used to inform our understanding of the spatial distribution of microplastics in urban freshwaters, the role of dreissenid mussels in plastic budgets, and models for the fate of plastic contaminants in the Great Lakes and elsewhere. Register [here](#).

**November 5<sup>th</sup> (1PM EDT): EPA Trash Free Waters Webinar – Experiences and Lessons Learned from Trash Capture Projects**

Trash capture devices can be an effective trash management intervention, particularly in areas with heavy trash loads in municipal runoff. However, there are many considerations that must be taken into account when determining whether a trash capture project is an appropriate intervention for a given area and when designing, implementing, and maintaining the project. The EPA TFW Program's next webinar will bring together experts who have planned and implemented trash capture projects in watersheds across the country. Join us on November 5th for a discussion of lessons learned from their experiences. Please click [here](#) to register and email [Gabriella Neusner](mailto:Gabriella.Neusner@epa.gov) if you would like to be added to the mailing list for future webinar invitations.

**November 9-10<sup>th</sup>: Plastic Free World Virtual Conference**

Plastic Free World Virtual Summit 2020 will feature over 200 expert speakers and presentations, more than 25 panel discussions, a fully interactive exhibition, and dedicated networking sessions to share the latest in-depth industry knowledge to help the world tackle the rising issue of waste plastic in the environment. The five main agenda themes include: 1) Retail, Consumer Goods, and Packaging, 2) Food and Beverage, 3) Fashion and Textiles, 4) Bio-based Materials for Manufacturing Industries, and 5) Closing the Loop. Click [here](#) to view the agenda and register for the conference.

**November 12<sup>th</sup> (8PM EDT): The Role of Innovation in Changing Behavior Towards a Circular Economy Webinar**

By 2030 plastic waste is expected to increase by more than 50% to 330 million tons per annum if business continues as usual. This hour-long GreenBiz webinar will explore how innovation and new business models can help transform the relationship between people and waste, redefining value and driving a circular economy. The event will be moderated by the Director & Senior Analyst of Circular Economy at GreenBiz and feature the following speakers: Jacob Duer, President & CEO, Alliance to End Plastic Waste; Jeff Kerscher, Founder & CEO, Litterati; John C. Warner, Distinguished Research Fellow, Exploration and Discovery, Zymergen Corporation; and Natalie Hallinger, Behavior Change Advisor, Lecturer. Register for the event [here](#).

**November 16<sup>th</sup> (1-5PM EDT): EPA's 2020 America Recycles Virtual Innovation Fair**

The America Recycles Innovation Fair showcases recent advances in recycling technology, product development, and materials usage. Exhibitors will display new recyclable products, goods made from recycled content, innovative education and communication methods, or materials that promote more effective recycling, recycling and manufacturing research, and new technologies that are advancing recycling today and into the future. This year, the America Recycles Innovation Fair plans to showcase exhibitors both online (via a virtual exhibit hall) as well as in person (dependent on Washington, DC's guidance related to the ongoing COVID-19 pandemic). Visit the EPA site [here](#) for more info about what organizations will be participating in the virtual exhibit hall.

**November 17<sup>th</sup> (1PM EDT): EPA's 2020 America Recycles Summit**

The annual America Recycles Summit brings together organizations and individuals who are interested in making a difference in recycling in the United States. EPA held its first America Recycles Summit in 2018 with a goal to address the major challenges facing the U.S. recycling system. In 2020, EPA is hosting a virtual event from 1:00 p.m. - 6:30 p.m. on November 17, 2020. EPA plans to announce national recycling goals, provide an overview and facilitate dialogue about its draft national recycling strategy, as well as facilitate public and private sector engagement and discussions across the country. Check back [here](#) to register for the free event.

**November 17-19<sup>th</sup>: Great Lakes Commission Annual Meeting**

This year's Great Lakes Commission Meeting will focus on collaboration toward a resilient Great Lakes future and offer an opportunity for Great Lakes stakeholders to convene with colleagues and learn about important issues impacting the watershed. The meeting agenda outlines a number of topics and features external speakers including a representative from Hoola One Technologies, a company providing innovative trash collection tech. To view the agenda and register, click [here](#).

**November 18<sup>th</sup> (12PM EDT): Microplastinar 2- Plastic Pollution as a Toxic Problem**

Second in an interactive webinar series hosted by the EU project LimnoPlast, this series will take a closer look at the wicked problem of plastic pollution and microplastics. This event's speaker is Tamara Galloway, a British marine biologist and Professor of Ecotoxicology at the University of Exeter. Register for the webinar [here](#).

**November 23-27<sup>th</sup>: MICRO2020 International Conference- Fate and Impacts of Microplastics: Knowledge and Responsibilities**

MICRO's biannual international conference will be held during the originally planned dates of November 23-27, 2020, but it will be substantially online-based with several in-person meeting nodes. The goals of this conference are to: (i) identify the research challenges; (ii) facilitate open access to the breadth of ongoing research; and (iii) contribute a collaborative effort to our continuously expanding community. Read more about the conference [here](#).

*Save the dates for future months...*

**December 1<sup>st</sup> (2PM EDT): Revolutionizing Ocean Data to Mitigate Climate Change, Overfishing, and Pollution**

More data were collected on the oceans in 2018 alone than in the entire twentieth century. Please join Annie Brett, a professor at the University of Florida Levin School of Law, for a discussion on the impact of new technologies and data on ocean management. This webinar will present ways we need to revolutionize the collection, sharing, and accessibility of ocean data to address climate change, overfishing, and pollution. To register, please click [here](#).

**December 2<sup>nd</sup> (12PM EDT): Microplastinar 3- Plastic Pollution as a Material/Design Problem**

Third in an interactive webinar series hosted by the EU project LimnoPlast, this series will take a closer look at the wicked problem of plastic pollution and microplastics. This event's speakers include Seema Agarwal, Professor at the University of Bayreuth in the field of macromolecular chemistry and Jan Leyssen, founder and CEO of Regenerative Design. Register for the webinar [here](#).

**December 2-4<sup>th</sup>: Human Health and the Ocean: In a Changing World International Symposium**

The purpose of the "Human Health and Ocean Symposium" is to provide an update on the various risks human activities expose the oceans to, and the threats that those activities and the resulting ocean degradation pose to human health, but also to consider the various benefits that the Ocean can bring to the health and wellbeing of populations. The symposium, held in Monaco, will offer keynotes, mini-reviews by internationally renowned speakers and short communications open to researchers in the field. To view the full symposium agenda, click [here](#).

**December 8<sup>th</sup> (6AM EDT): Towards a Global Monitoring of Marine Litter**

This Ocean Plastic Webinar encourages ocean plastic scientists from any field (biologists, physicists, chemists, economists, etc.) to share research and collaborate internationally. This webinar will feature a 30 minute presentation by French oceanographer and project manager at IFREMER, Francois Galgani, and will be followed by a 30 minute Q&A session. Watch the webinar live [here](#).

**December 16<sup>th</sup> (12PM EDT): Microplastinar 4- Plastic Pollution as a Chemical Problem**

Fourth in an interactive webinar series hosted by the EU project LimnoPlast, this series will take a closer look at the wicked problem of plastic pollution and microplastics. This event's speaker is Jane Muncke, Managing Director and CSO of the Food Packaging Forum. Register for the webinar [here](#).

**January 13<sup>th</sup> (12PM EDT): Microplastinar 5- Plastic Pollution as an Ecosystem Problem**

Fifth in an interactive webinar series hosted by the EU project LimnoPlast, this series will take a closer look at the wicked problem of plastic pollution and microplastics. This event's speaker is Nicola Beaumont, Professor and Head of Science for Sea and Society at Plymouth Marine Laboratory. Register for the webinar [here](#).

**February 9<sup>th</sup> (2PM EDT): Building a State Plan to Monitor and Assess Marine Litter: Lessons Learned**



Marine litter monitoring programs are essential to determining and promoting feasible and effective actions to combat marine litter, but consistent long-term programs are scarce worldwide. To address this gap, a statewide plan to assess marine litter was developed for São Paulo, Brazil. The plan introduces a set of suggested indicators that can be applied by a wide group of stakeholders and in a variety of locations and contexts. Speakers include Carla Elliff, Mariana M. de Andrade, Natalia M. Grilli, and Vitória Scrich of the Oceanographic Institute of the University of São Paulo, Brazil. To register, click [here](#).

### **February 10-12<sup>th</sup>: North Carolina Marine Debris Symposium**

Mark your calendars for the 8<sup>th</sup> Annual North Carolina Marine Debris Symposium at the Duke University Marine Lab and virtually worldwide. Meeting themes include: holistic solutions to marine debris prevention, new or expanded marine debris research, policy and advocacy updates, optimizing regional and global solution-based partnerships, and creative virtual outreach. To submit a proposal to present, please email [lisar@coastalcarolinariverwatch.org](mailto:lisar@coastalcarolinariverwatch.org) by December 1, 2020. Learn more about the event, click [here](#).

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## **In Other News...**

### **The [Scripps-Rady Ocean Plastic Pollution Challenge](#)**

The Scripps-Rady Ocean Plastic Pollution Challenge is a unique 6-month accelerator program focused on identifying effective, evidence-based approaches that will curb the flow of plastic into the ocean, with a specific focus on marine conservation and marine cultural preservation areas along California's coast. The program runs January - June, 2021, and participants will engage in a series of virtual short courses, virtual team-based research, and a final two-day challenge to pitch solutions to an expert panel.

The Scripps-Rady Ocean Plastic Pollution Challenge will emphasize the application of several strategies to address gaps in finding effective solutions, such as changing human behavior, evaluating solutions, and data mapping. This multi-stage program provides skills in solving complex problems, space for participants to build a systems perspective of the plastic pollution problem, and interdisciplinary teams to develop new strategies.

We are seeking students, professionals, and entrepreneurs with an interest or background in relevant topics such as ocean and coastal sciences, behavioral sciences, data science, economics, engineering, policy, resource management, community engagement, and more. International applications are welcome.

**Applications are due by November 13, 2020, 5PM PST.** There are **no fees** to apply or to participate in the Challenge. Please visit the website for more information on the program's format, speakers, and how to apply: <https://cmhc.ucsd.edu/plastic-challenge-2021/>

The program is a partnership between the [Center for Marine Biodiversity and Conservation](#) at Scripps Institution of Oceanography, UC San Diego, and the [Rady School of Management](#) at UC San Diego.

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## **The Microplastics Breakdown**

The section below only includes a selection of notable, recent microplastics study summaries. If you would like to receive the complete Microplastics Breakdown, please contact [Bathersfield.Nizanna@epa.gov](mailto:Bathersfield.Nizanna@epa.gov)

### [MICROPLASTICS IN WASTEWATER](#)

#### **Microplastics Mitigation in Sewage Sludge through Pyrolysis: The Role of Pyrolysis Temperature**

*Bing-Jie Ni, Zhuo-Ran Zhu, Wei-Hua Li, Xiaofang Yan, Wei Wei, Qiuxiang Xu, Zhaohui Xia, Xiaohu Dai, Jing Sun*

The authors examined the effects of pyrolysis on microplastics reduction in sewage sludge via a lab-scale study in part to determine the effectiveness of this method on microplastics control in sludge. Through their analysis using micro-Raman spectroscopy they found that microplastics concentrations in sludge residues decreased significantly with the pyrolysis temperature at 500 °C, and no microplastics sized 10–50 µm remained. Polyethylene and polypropylene, the two most abundant microplastics in sewage sludge, were found to be entirely degraded when the pyrolysis temperature reached 450 °C. However, during the pyrolysis process, new plastic polymers could be produced through the reaction between original microplastics with organics in sludge, and heavy metals in sludge can also be combined. The authors concluded that to avoid potential environmental risks related to incomplete pyrolysis, a minimum pyrolysis temperature of 450 °C should be reached. Read the full abstract [here](#).

### [MICROPLASTICS IN AQUATIC ORGANISMS](#)

#### **First report from North America of microplastics in the gastrointestinal tract of stranded bottlenose dolphins (*Tursiops truncatus*)**

*F. M. Battaglia, B. A. Beckingham, W. E. McFee*

This study investigated the occurrence of MPs sized 125 µm–5 mm in the gastrointestinal tracts (GIT) of seven bottlenose dolphins (*Tursiops truncatus*) stranded off the South Carolina coast from 2017 to 2018. This is the first study from North America to quantify MPs in a small coastal cetacean outside Arctic waters and the first specifically in bottlenose dolphins. Microplastics, mostly fibers, were detected in all of the dolphins' GITs. Total suspected MPs ranged between 123 and 422 particles/individual; this was determined to be in the high range as compared to other studies. The authors note that the differences to other study results likely reflects differences in both methods and location. Read the full abstract [here](#).

#### **Microplastics in beach sediments and cockles (*Anadara antiquata*) along the Tanzanian coastline**

*Bahati S. Mayoma, Christina Sørensen, Yvonne Shashoua & Farhan R. Khan*

This study investigated the prevalence, abundance and characterization of microplastics (MPs) along the Tanzanian coastline, specifically evaluating microplastics in beach sediments at 18 sites and in cockles (*Anadara antiquata*) at eight sites. The sample sites represented differing levels of anthropogenic activities from marine protected areas and park reserves to industrialized ports. The study found MPs present in the sediments of all 18 sampling sites along the Tanzanian coast (14,681 individual MPs in total), but there was considerable spatial variation. MPs were found in cockles from all sites from which they were collected with 48% of all cockles analyzed found to contain MPs. A total of 138



MPs were recovered from cockle tissue. The largest quantity of MPs in both sediments and cockles was found at Mtoni Kijichi Creek, an industrial port. But overall, the study found no strong correlation between environmental and biotic concentrations. Read the full abstract [here](#).

## HUMAN EXPOSURE TO MICROPLASTICS

### **Development and Application of a Mass Spectrometry Method for Quantifying Nylon Microplastics in Environment**

*Chu Peng, Xuejiao Tang, Xinying Gong, Yuanyuan Dai, Hongwen Sun and Lei Wang*

This study used a method based on acid depolymerization–liquid chromatography–tandem mass spectrometry (LC–MS/MS). After removing the background monomer compounds, the quantity of two kinds of nylon microplastic polymers: PA6 and PA66, were calculated. Both types of microplastics were widely detected in indoor dust, sludge, marine sediment, freshwater sediment, fishery sediment, and fish guts and gills. Extremely high concentrations of PA66 MPs were detected in indoor dust and fish guts and gills. The authors concluded that the study results indicate an unequivocal risk of human exposure through dust ingestion and dietary exposure. Read the full abstract [here](#).

### **Microplastics in the Edible Tissues of Shellfishes Sold for Human Consumption**

*Damaris Benny Daniel, P Muhamed Ashraf, Saly N Thomas, K T Thomson*

This study investigated the presence of microplastics (100 µm - 5 mm) in the edible tissues of four species of shellfishes - two species of shrimp, *Metapenaeus dobsoni* and *Fenneropenaeus indicus*; one species of crab, *Portunus pelagicus*; and one species of squid *Uroteuthis (Photololigo) duvaucelii* -all bought from fishing harbours of Kerala, India. No microplastics were found in the edible tissues of the shrimp. The squid *U. (P) duvaucelii* had the highest microplastic content found in edible tissue, followed by the crab, *P. pelagicus*. The study is the first of its kind to report the detection of microplastics in edible tissues of a squid species. The authors conclude that the study results suggest an annual dietary intake of about  $13 \pm 58$  microplastic particles per year by shellfish consumers, which can vary based on the species, quantity, and extent of gut removal of seafood consumed. Read the full abstract [here](#).

### **No evidence of spherical microplastics (10–300 µm) translocation in adult rainbow trout (*Oncorhynchus mykiss*) after a two-week dietary exposure**

*Joel Kim, David G. Poirier, Paul A. Helm, Malak Bayoumi, Chelsea M. Rochman*

The authors of this study investigated the amount and distribution of fluorescent polyethylene microspheres (10–300 µm) in the gut, liver, fillets and gonads of adult rainbow trout after a two-week dietary exposure. Fish were fed food pellets dosed with up to ~9,800 microspheres per gram of food. Total exposures over the entire experiment ranged from ~80,000–850,000 microspheres per fish. They did not find any particles in the fillets, liver, or gonads of any fish, suggesting that translocation of spherical microplastics of this size range does not occur in adult rainbow trout. The quantity of microplastics found in the gut was also low or absent after a 24-hour period, indicating effective excretion. The study concluded that the results suggest that the consumption of fish fillets may not be a significant exposure pathway for microspheres >10 µm in size to contaminate humans. Read the full abstract [here](#).

## [MICROPLASTICS FATE AND TRANSPORT](#)

### **Sources, Fate, and Impact of Microplastics in Aquatic Environment**

*Sukanya Mehra, Khushboo Sharma, Geetika Sharma, Mandeep Singh and Pooja Chadha*

This article is a literature review focused on identifying the properties and sources of microplastics, its impact on environment, the bioaccumulation and trophic transfer of microplastics and its impact on living biota. The authors' goal was to assist in the development and implementation of risk management strategies for managing the disposal of microplastics. The review indicated that the weathering-related fracturing and surface embrittlement of plastics in beach environments is a root cause of generation of microplastics but industrial waste also constitute a major source. The authors found that only small fraction of the microplastics present in aquatic body imposes a serious threat to aquatic life. However, they also concluded that since aquatic species constitute the very foundation of the aquatic food web, any threat to these can have serious and far-reaching effects in the world oceans. They found that there is an urgent need to quantify the magnitude of these potential outcomes and assess the future impact of increasing microplastics levels on the world's aquatic bodies. Read the full abstract [here](#).

### **Modelling the Accumulation and Transport of Microplastics by Sea Ice**

*Alethea Sara Mountford, Miguel Angel Morales Maqueda*

This study uses the numerical model, Nucleus for European Modelling of the Ocean (NEMO), to explore the accumulation and transport of positively and neutrally buoyant microplastics in both Arctic and Southern Ocean sea ice. The authors describe sea ice as a potentially important seasonal sink for microplastics pollution in both the Arctic and the Antarctic. The model result indicated that positively buoyant microplastics dominate in Arctic sea ice, whereas in the Southern Ocean, neutrally buoyant plastics, which arrive in the region through deep water transport, appear to be dominant. The overall distribution of microplastics in the Arctic was found to be consistent with the current literature. The authors concluded that there is a need for further observational data in the Southern Ocean to elucidate both the transport mechanisms and accumulation of microplastics in Southern Ocean sea ice. Read the full abstract [here](#).

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