

Sam Athey, 2021



Paige Green Photography, 2021



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Microfibers are a Macro Issue: Interagency Report on Microfiber Pollution October 17, 2024 - EPA Trash Free Waters Webinar Series

Krystle Moody Wood, Founder & Principal, Materevolve



Materevolve

AGENDA

Introduction to
Materevolve

The Microfiber Pollution
Issue

Updates on Domestic &
Global Research,
Science & Policy

Q&A

2024



Materevolv

Materevolve



Materevolve

Materevolve was founded in 2018 with the mission to develop and scale innovative regenerative textile systems through the lens of soil, sea and circularity by designing nature-forward experiential learning programs, providing technical consulting to leaders in many sectors, and fostering trail-blazing collaborations between science, industry, government, and non-profit.



Paige Green Photography, 2021

PROJECT TEAM

CAROLYNN BOX

Ocean Conservation Consultant

- 20 years ocean conservation
- 12 years of plastic pollution leadership
- 8 years microplastics research leadership including 5 Gyres/SFEI SF Bay Microplastics project
- 10 ocean expeditions
- Deep Microfiber Pollution & Textile Solutions Expertise
- Former Research Program Director of 5 Gyres
- Masters of Marine Affairs & Bachelors of Earth Science

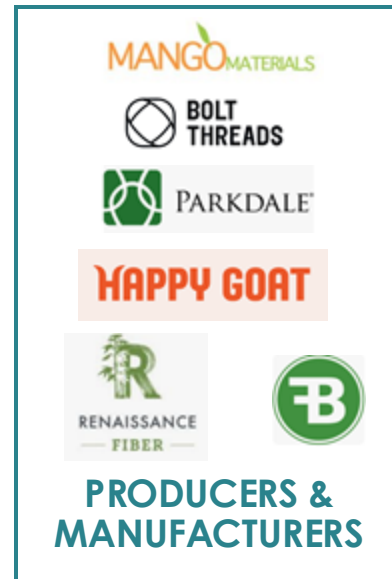


KRYSTLE MOODY WOOD

Founder & Principal Consultant

- 17 years sustainable textile & product development
- 10 years working in corporate materials innovation & development
- Deep Microfiber Pollution, Green Chemistry, & Regenerative Textile Solutions Expertise
- Has developed a wide range of textiles (new polymers, natural fibers, coatings, films, chemical finishes, from fashion to sportswear to outerwear)
- Bachelors of Textile Science

WHO WE WORK WITH



HISTORY IN MICROFIBER POLLUTION





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THE MICROFIBER POLLUTION ISSUE



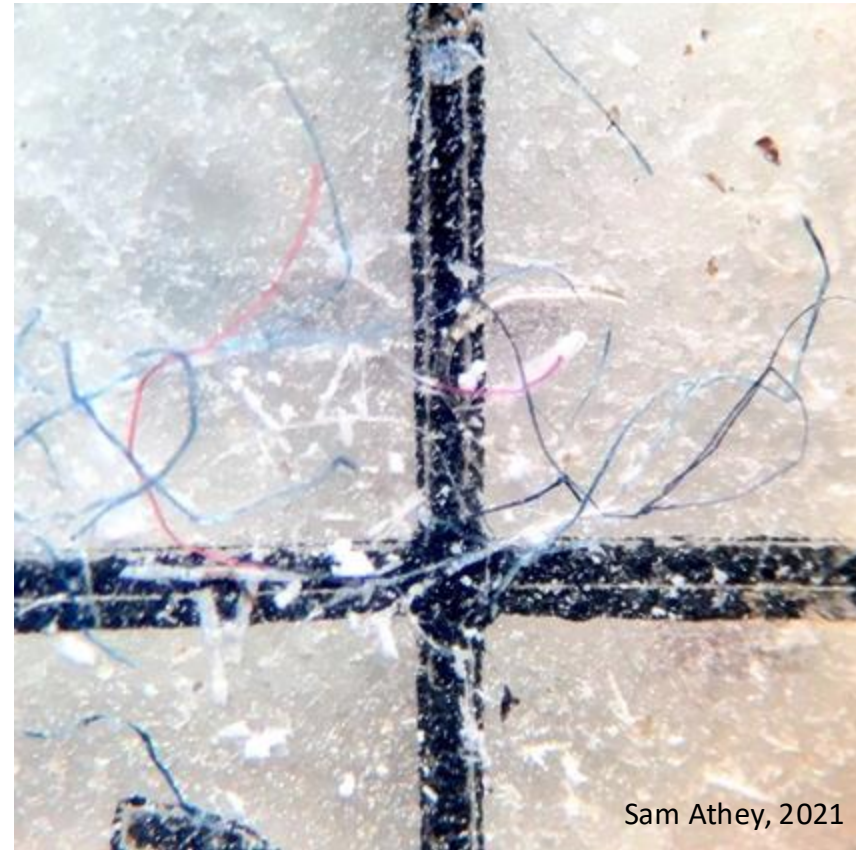
MICROFIBER SOURCES

- Apparel
- Bedding
- Upholstery
- Footwear
- Carpet
- Facemasks
- Fishing gear
- Building materials
- Agro- & geo-textiles

- Cigarette butts
- Fiber-based vehicle parts (i.e., tires, brake pads, belts, etc)
- Personal care (i.e., 'flushable' wet wipes, etc)
- Diapers

MICROFIBER POLLUTION
DEFINITION IS NOT WIDELY
ADOPTED ... Yet!

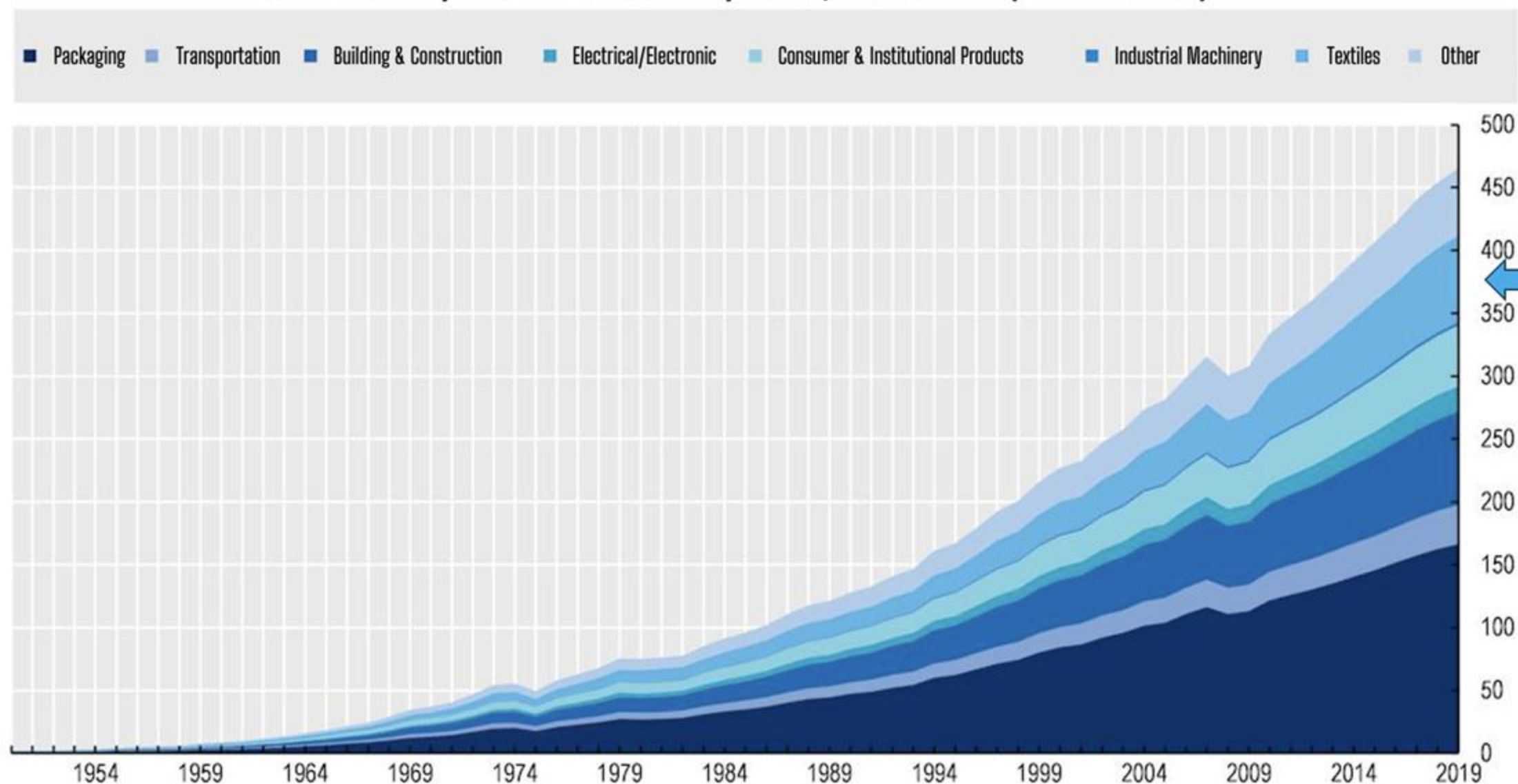
And it's complicated.



Sam Athey, 2021

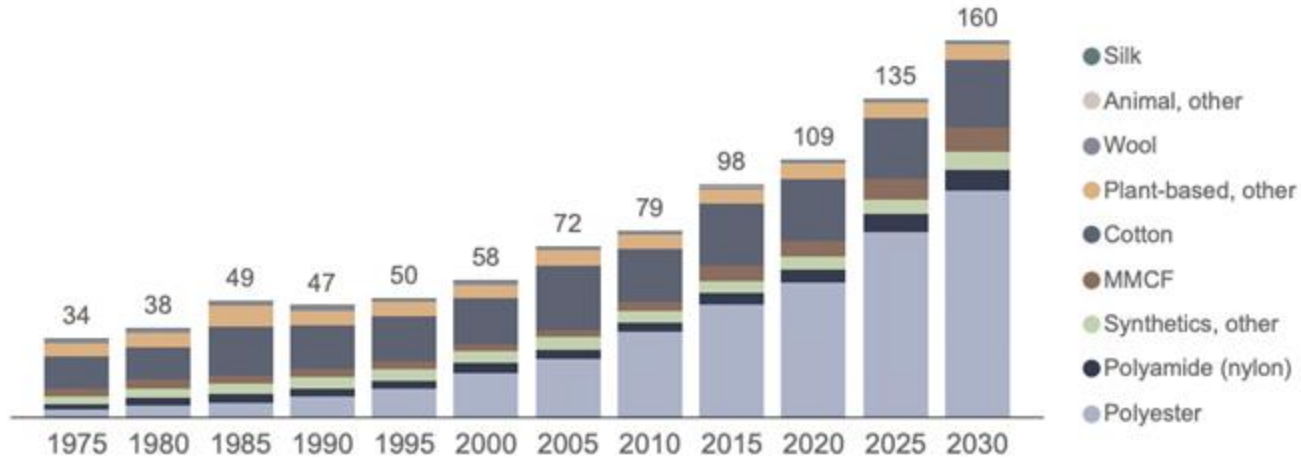


Global Primary Plastics Production by Sector, 1950 to 2019 (million tonnes)



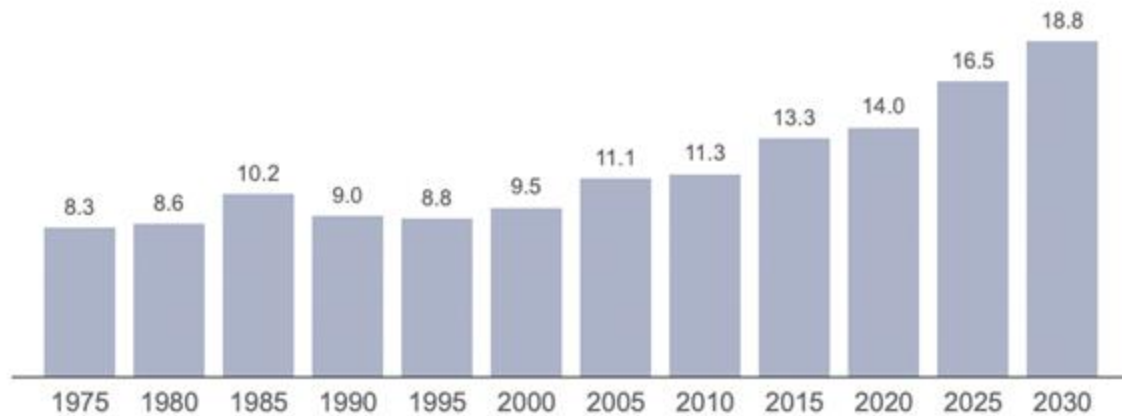
Source: OECD (2021), Update by the authors of (Geyer, Jambeck and Law), 2017

Global fiber production (million tonnes)¹



Source: Textile Exchange based on data from CIRFS, FAO, ICAC, IVC, IWTO, Maia Research, and its own modeling

Global fiber production (kilograms per person)²



Source: Textile Exchange based on UN data and global data compilation

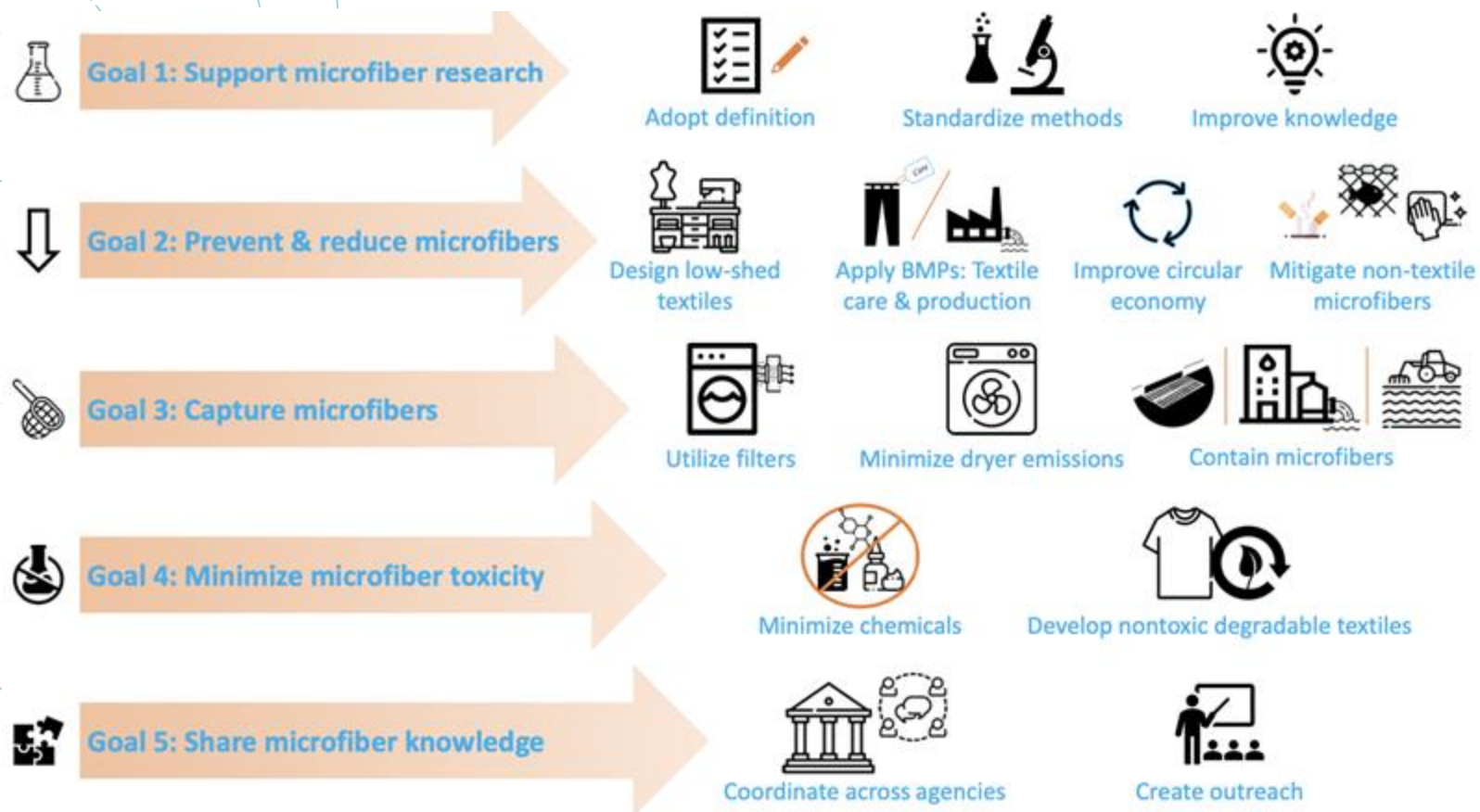
GLOBAL
FIBER
PRODUCTION IS
FOLLOWING
THE SAME
TREND AND
PLASTIC FIBERS
ARE THE HIGHEST
VOLUME.

Materials Market Report 2024, Textile
Exchange



Paige Green Photography, 2023

UPDATES ON DOMESTIC & GLOBAL RESEARCH, SCIENCE & POLICY



SETAC Poster for “The United States Federal Plan to Address Microfiber Pollution” (March 2023)

A RANGE OF SOLUTIONS FOR MICROFIBER POLLUTION



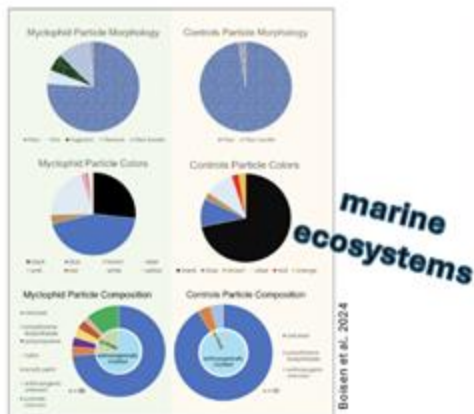
Improve knowledge



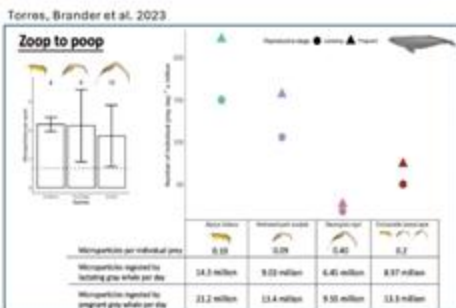
Minimize chemicals



Utilize filters



Zooplankton, like lantern fish, at the base of the marine food webs, are often exposed to high levels of microfibers.



Baleen whales eat millions of zoops daily, putting them at risk of high levels of microfiber and microplastic ingestion, which was detected in their feces.

For more about these studies and our lab's work, take a peek at the QR code or the website below!

<https://branderlab.net/>
@prwmicroplastic



Microfibers: Occurrence, effects, and mitigation

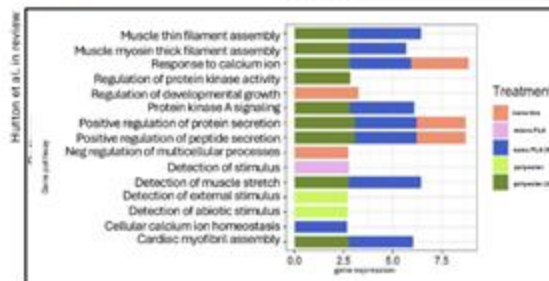
Dr. Susanne Brander

susanne.brander@oregonstate.edu

Oregon State University

mechanisms of toxicity

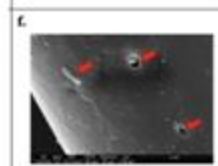
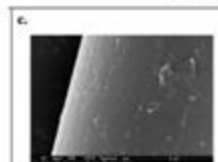
Weathered polyester and nanoplastics cause changes in genes that affect muscle function.



After 21 days of exposure, polyester microfibers caused a bigger decrease in fish growth than other micro and nanoplastic types.



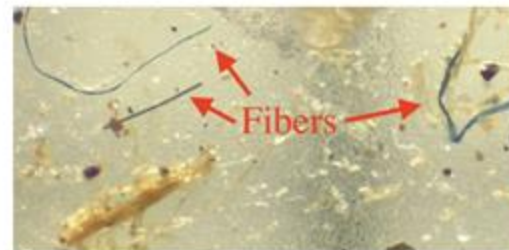
new



weathered

Like microplastics, weathered polyester microfibers break into smaller pieces. This can cause changes in gene expression that are similar to nanoplastics.

Scanning electron microscope image of new and weathered polyester ...



Humans are exposed to microfibers indoors and emit them from their homes. This is an image of particles captured from wastewater generated in Oregon, the majority are fibers.

what about humans?

Arriola et al. in prep

mitigation and regulation

Installation of in-line filters on washing machines can significantly reduce microfiber emissions to wastewater treatment plants.



Efforts are underway at the UN to enact a global plastics treaty with broad and ambitious goals, including potentially reducing chemicals used in textiles and other plastics.



The Microfibre Data Portal

A pivotal tool for scaling research into root causes of fibre fragmentation to support greater data analysis and onward dissemination of learnings.



Standardize methods



Improve knowledge



Design low-shed
textiles



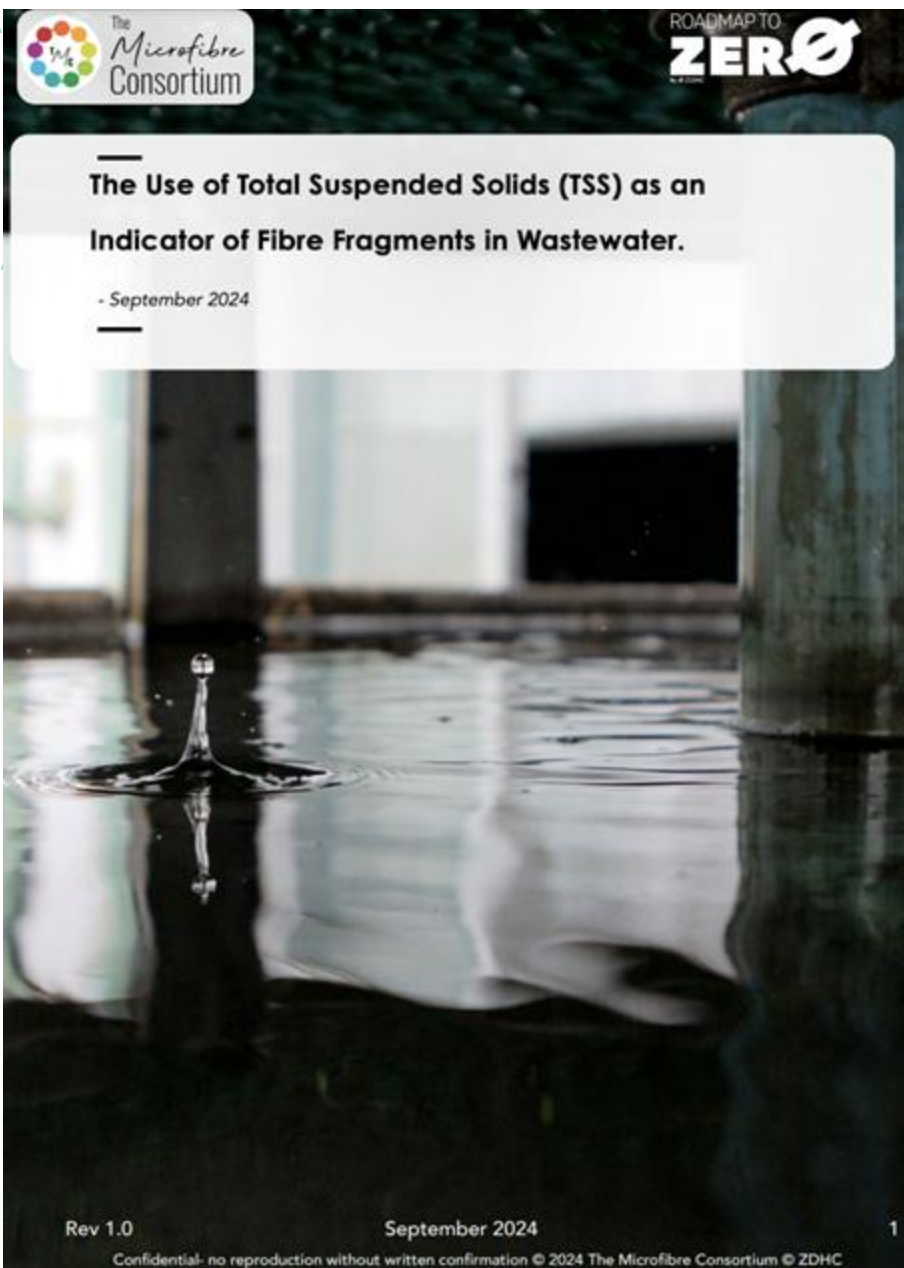
Did you know?

The Microfibre Data Portal constitutes one of, if not the, largest database on fibre fragmentation globally.

The Microfibre Data Portal is an industry first that houses both test data results (using the TMC Test Method) and the underpinning technical specifications. It constitutes one of, if not the, largest databases on fibre fragmentation globally.

The Microfibre Consortium, 2024

Ø ZDHC



Standardize methods



Improve knowledge



Apply BMPs: Textile
care & production



Design low-shed
textiles



Contain microfibers



Minimize chemicals

Ø ZDHC



Materevolve



Textile
Exchange
Conference
2024

Fibre Fragmentation in Textile Wastewater and How This Connects To Sustainability Strategies

hosted by ZDHC, The Microfibre Consortium and Materevolve

Agenda:

8am	Arrival at the Pasadena Convention Center (PCC)
8:15am	Bus Departs for LA Water Reclamation Plant (LAG)
8:45am	Bus Arrives to LAG
9:00am	Tour of LAG
11:30am	Bus Departs for Moore Institute for Plastic Pollution Research (MIPPR) in Long Beach
12:30-1pm	Bus Arrives at MIPPR
1-1:30pm	Catered Lunch
1:40-2:40pm	Rotation of expert talks at MIPPR
2:40-2:50pm	Closing: Thank you & next steps
2:50-3:00pm	Bus Departs MIPPR
4:30pm	Bus Arrives back to PCC (could be as late as 5pm depending on traffic)

HOSTED BY:

Ø ZDHC



Standardize methods



Improve knowledge



Apply BMPs: Textile care & production



Design low-shed textiles



Contain microfibers



Create outreach



NEW

BED

BATH

APPAREL

LIVING

COYUCHI.COM

Closing the Loop

2nd Home Renewed empowers you to bring circularity home with pre-loved Coyuchi goods.

SHOP NEW ARRIVALS



Improve circular
economy



Minimize chemicals

Coyuchi, 2023



California Product Stewardship Council, 2024





Develop nontoxic degradable textiles



Minimize chemicals

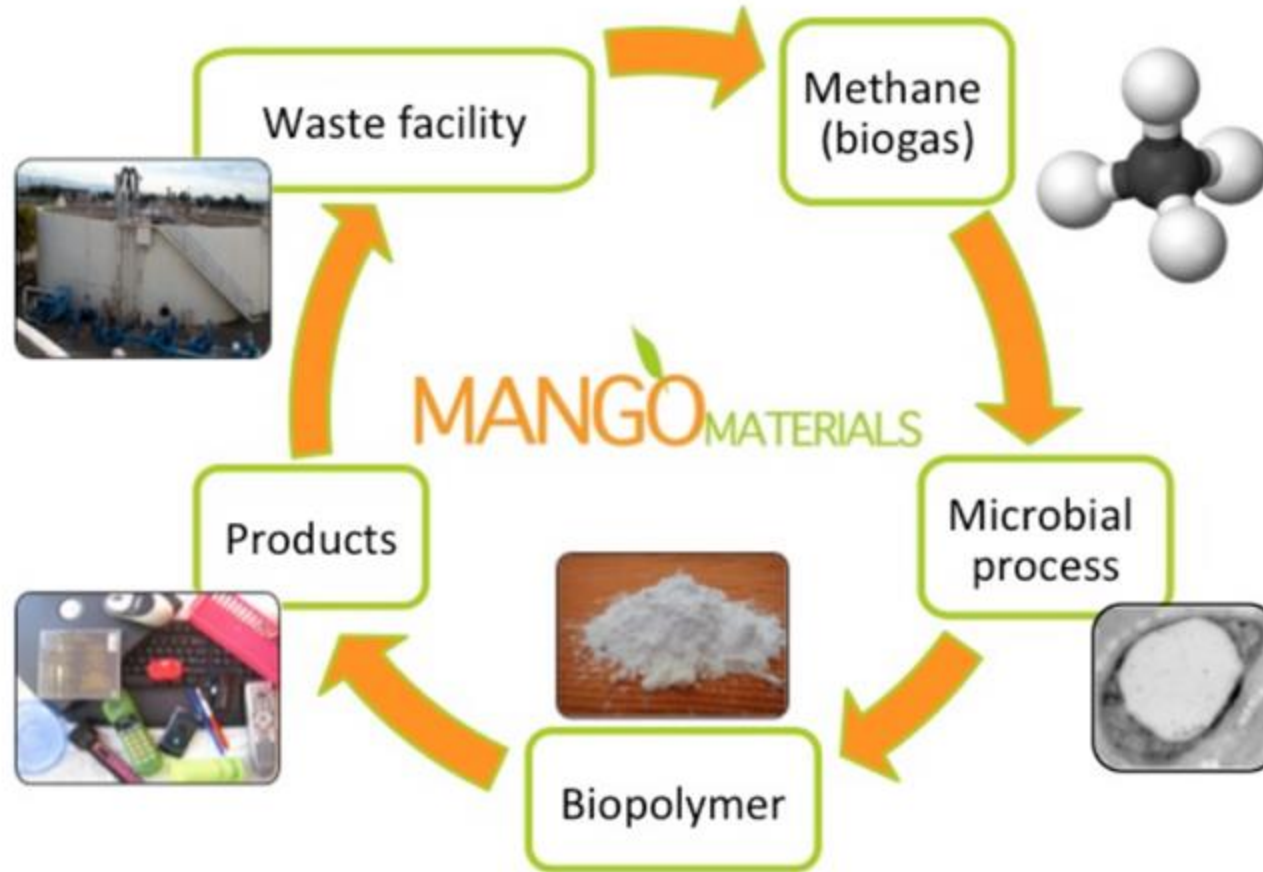


California Cotton and Climate Coalition, 2024

Let's Change the Way Cotton Is Grown

Our on-farm goals:

- ✓ Increase soil biology and life
- ✓ Increase soil carbon
- ✓ Decrease the use of synthetic fertilizers, insecticides, and herbicides
- ✓ Create a model for a California-based, biologically focused, cotton farming system that prioritizes soil health in both a conventional and organic farming context




Develop nontoxic degradable textiles


Minimize chemicals

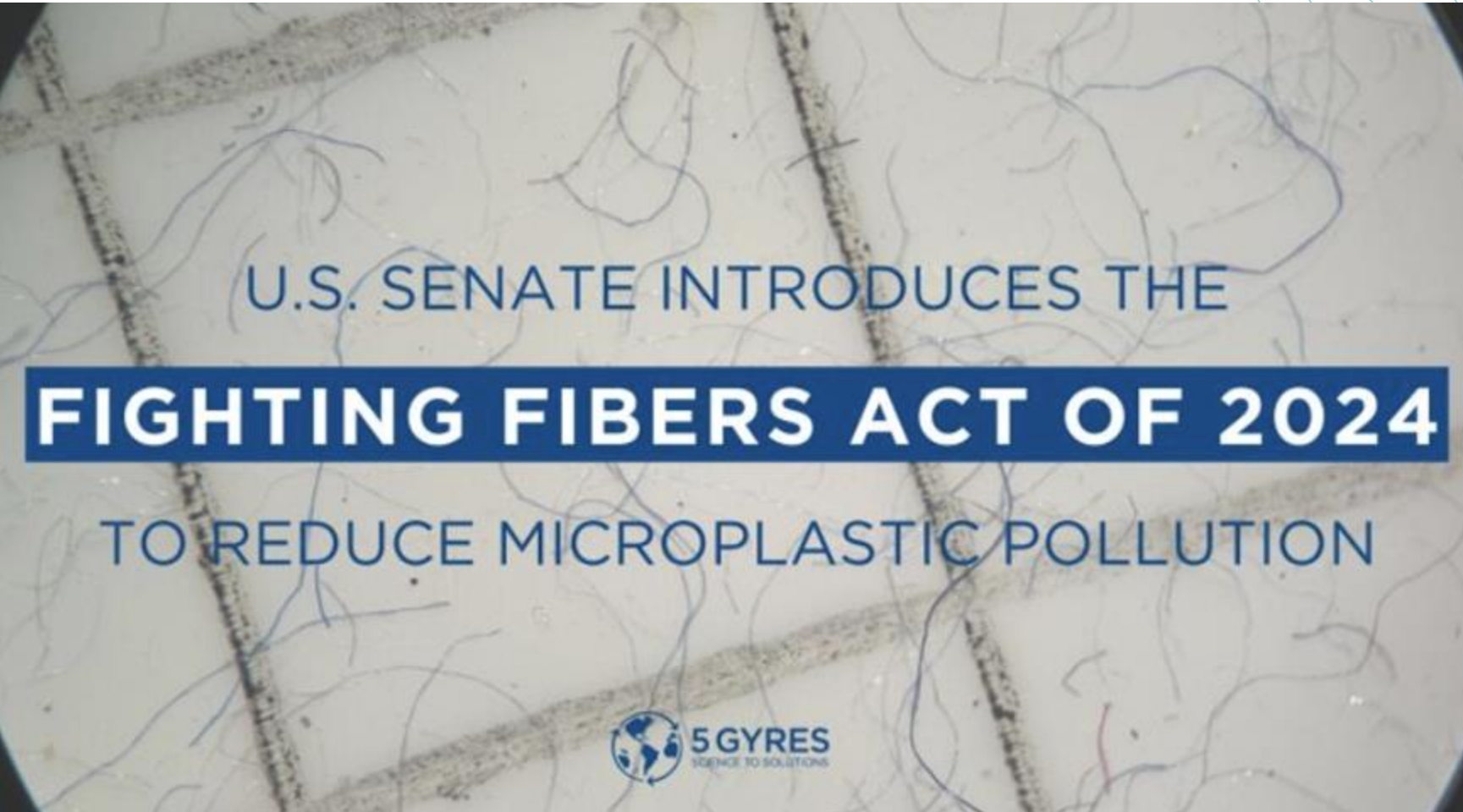
Mango Materials, 2022



Improve knowledge




Contain microfibers



U.S. SENATE INTRODUCES THE

FIGHTING FIBERS ACT OF 2024

TO REDUCE MICROPLASTIC POLLUTION



5 GYRES
SCIENCE TO SOLUTIONS

The 5 Gyres Institute, 2024

TEXTILE X OCEAN CONNECTOR SAIL



- Established 2022; 2-3 programs hosted annually through hands-on learning (e.g. sail, hike, natural dye garden tour, farm tour, factory tour, etc)
- 45-65 global leaders in science, policy, and sustainable textiles
- Goal to:
 - forge deeper connection and solve for the most critical issues at the intersection of textiles and ocean.
 - provide hands-on learning including demonstrating research techniques, site visits, and science demonstrations for deeper context
 - inspire creative solutions and cross-sector collaborations
- UN Ocean Decade Endorsement under Ocean Literacy for All

ALL ABOARD!



Join us for our next
Textile X Ocean
Connector Sail!!!

We are currently looking
for sponsors for our
2025 program!

Location: Sausalito &
possible international
expansion

THANK YOU!

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Materevolve



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