GLOBAL CLIMATE *Pledge*

Microplastics

A guide to what they are, how we are being affected by them, and how we can create lasting change

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01 What Are Microplastics? Why Are They Important?

What are microplastics?

- Pieces of plastic that are smaller than five millimeters
  - That's approximately 1/5 of an inch!
- Some are made intentionally
  - Facial scrubs, glitter, etc.
- Others are made after many years of breakdown of larger plastic items
  - Synthetic textiles, plastic bags, tea bags, cigarette butts, tire weathering, dishwasher/laundry pods, etc

They can essentially be made by ANY plastic or synthetic material that has been degrading LONG ENOUGH.

Why are they important?

They are found everywhere

- Snowcaps on Mount Everest
- Deep open ocean
- In humans and other animals

Huge contributor to plastic pollution

- Despite their size, microplastics still account for 11% of total ocean plastic pollution

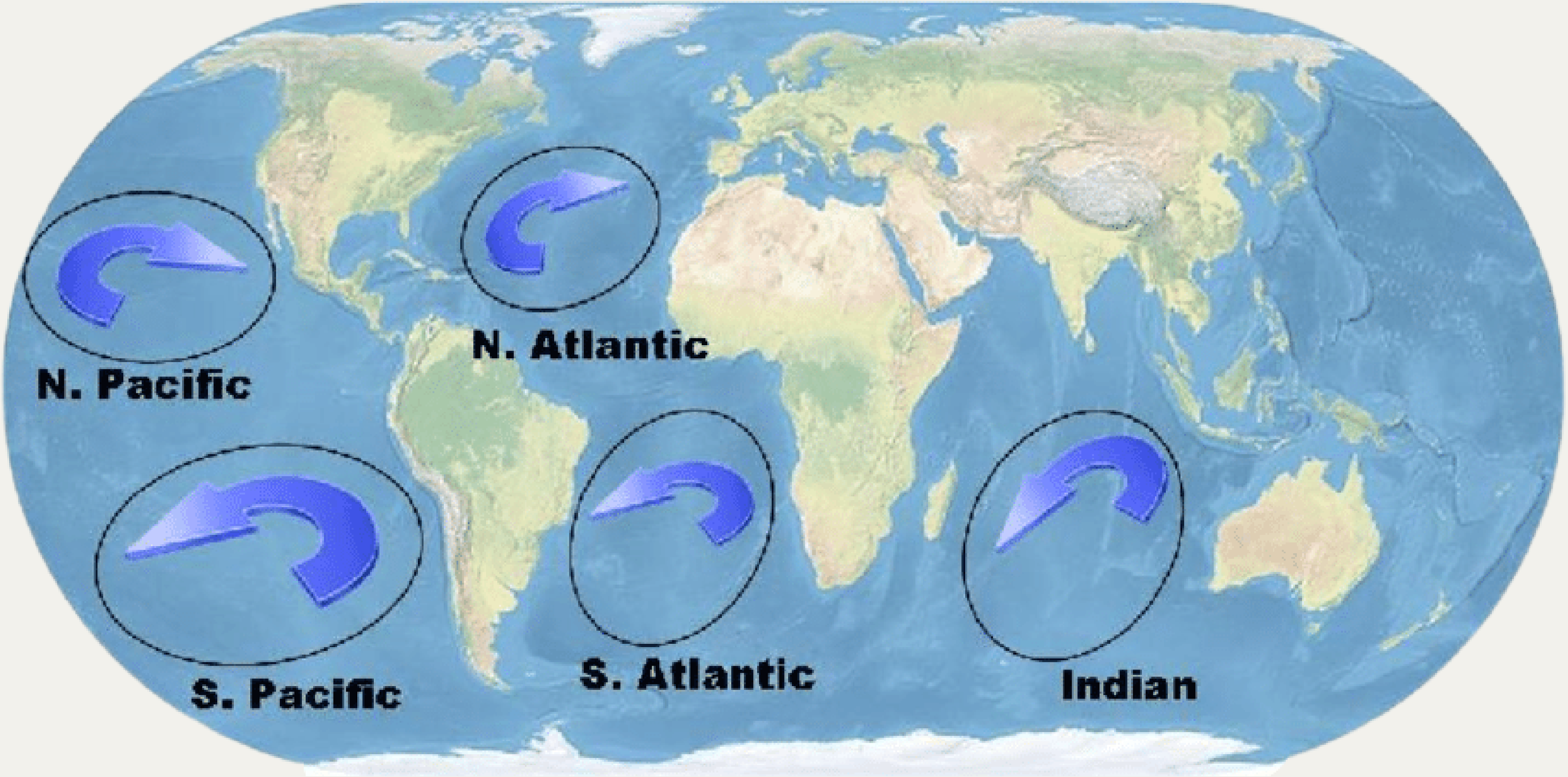
Big impacts on wildlife

- The smaller they are and the more they break down, the more they can impact a wider range of animals
- Smaller animals can ingest the smaller particles

Trillions of microplastic particles in our oceans

- 1,000,000,000,000 particles
- Documented in all 5 of the ocean’s subtropical gyres*
- Found thousands of miles from land

*More information on next slide



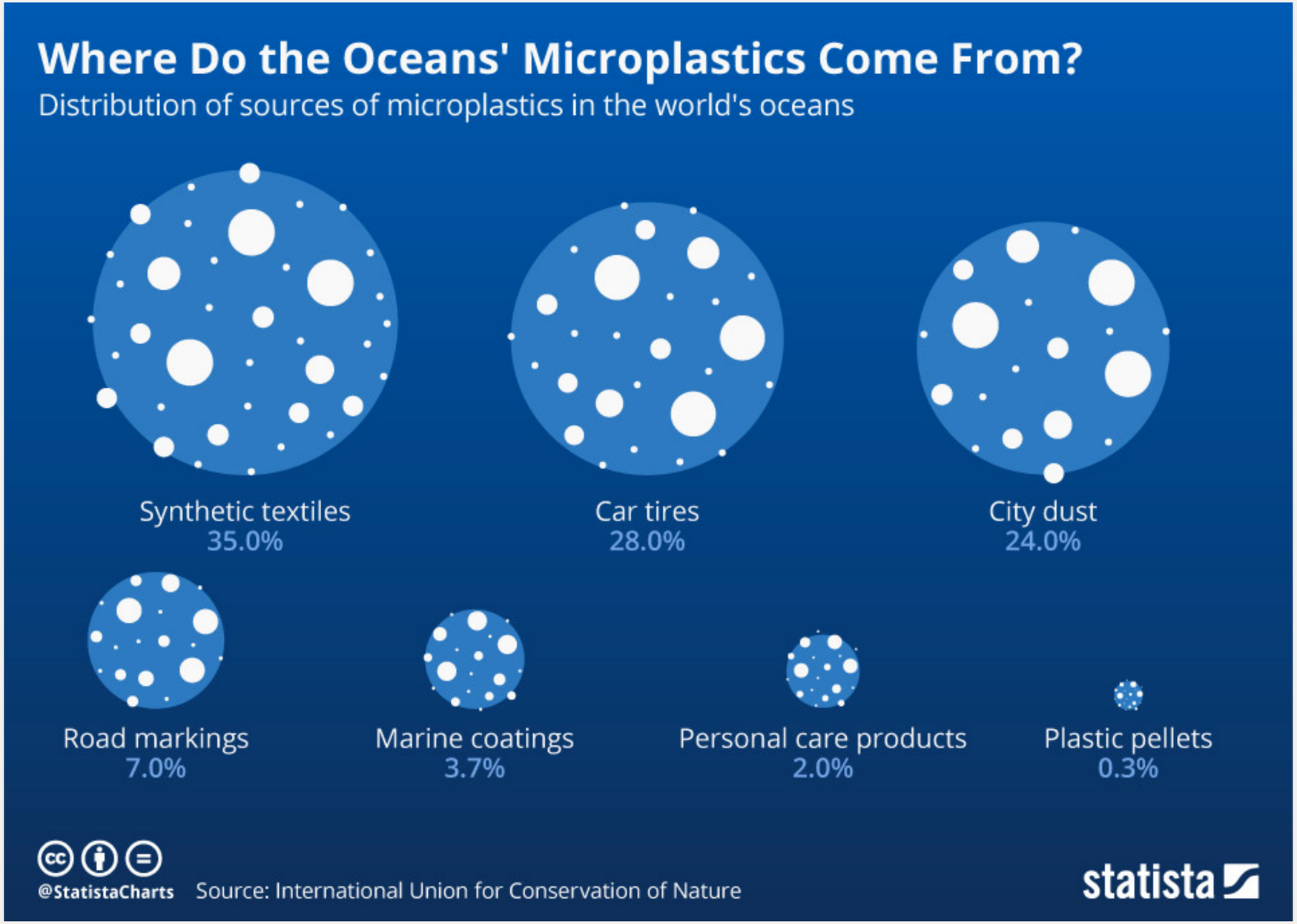
Source

Ocean gyres are large systems of circulating ocean currents.

02 Where Do Microplastics Come From? Where Are They Now?

Where do microplastics come from?

The better question is... where DON'T they come from? Humans use plastic for everything!


Where Do the Oceans' Microplastics Come From?
Distribution of sources of microplastics in the world's oceans
Synthetic textiles
35.0%
Car tires
28.0%
City dust
24.0%
Road markings
7.0%
Marine coatings
3.7%
Personal care products
2.0%
Plastic pellets
0.3%
@StatistaCharts
Source: International Union for Conservation of Nature
statista

Source

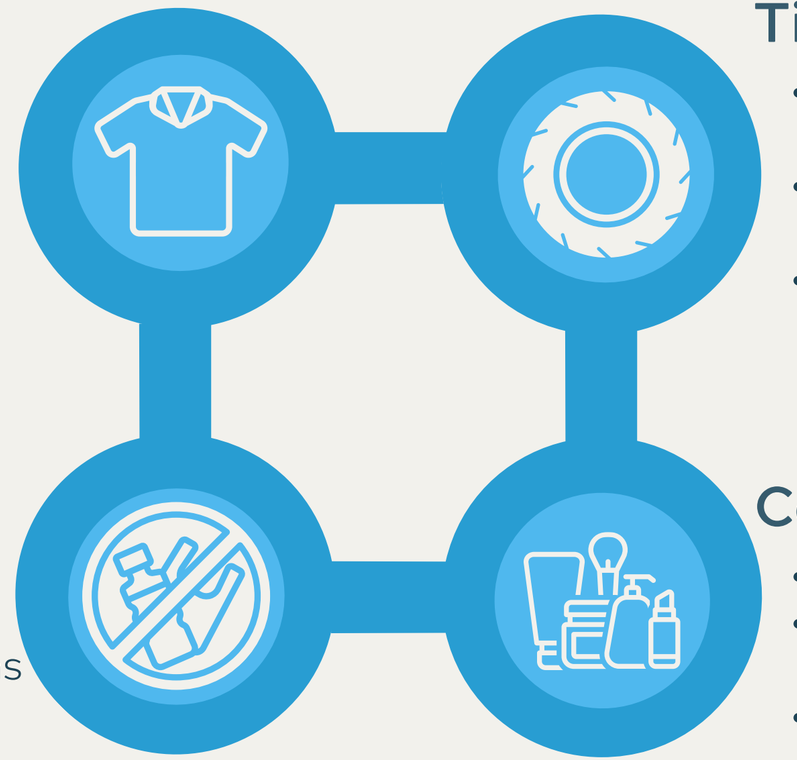
4 major sources of microplastics

Synthetic textiles

- Breakdown of plastic fibers when synthetic textiles are washed
  - Polyester, nylon, acrylic all forms of plastic
- Fibers end up in wastewater

Nurdles

- Nurdles, which are very small plastic pellets, are used in the production of most plastic items
- Raw material of most plastic products
- Click **HERE** to learn more!



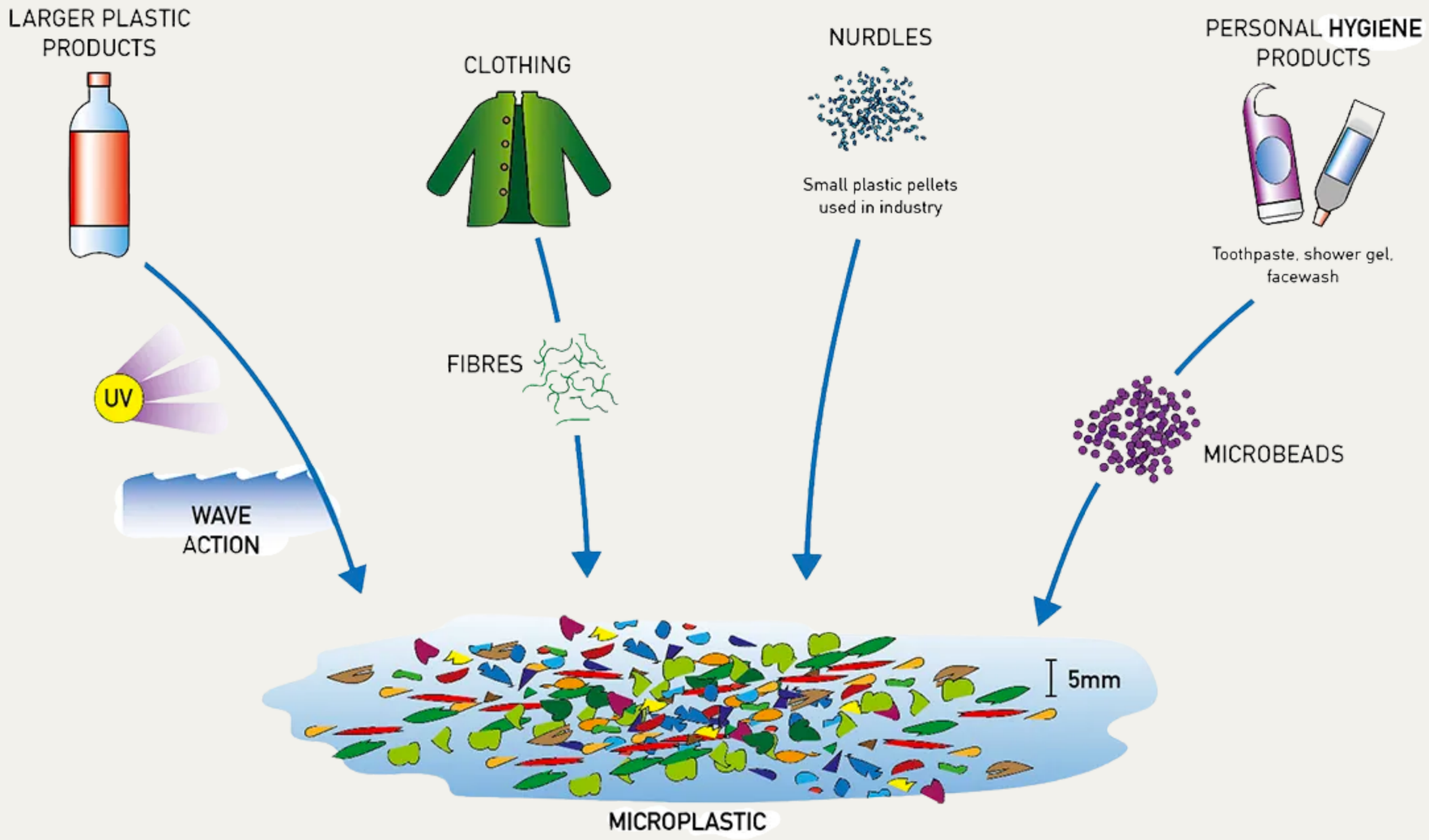
Tires

- ¼ of a tire consists of synthetic rubber (plastic)
- Tires erode through heat and friction when in contact with the road
- Tires dust eventually lands in sewers, where it then enters lakes, oceans, etc.

Cosmetics

- Microbeads
- Found in scrubbing agents, shower gels and creams
- Acts as an exfoliant

Where do microplastics come from?



Source

Where are microplastics now?

Everywhere.

Water. Soil. Air. Food.

They have been found all over the world, even in the Arctic and Antarctica, places we consider PURE and PRISTINE.

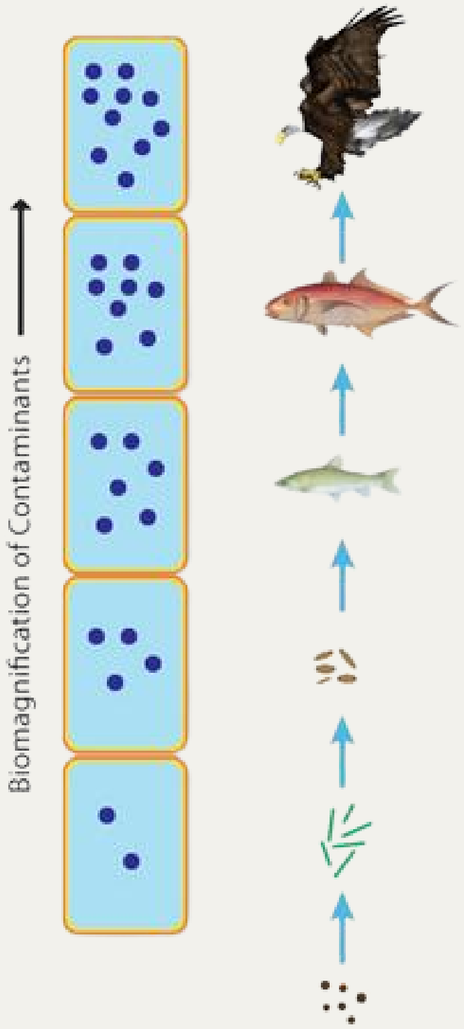
Microplastics in Our Food

- Depending on your individual lifestyle, the amount of microplastics that are ingested through food or water is much larger than you may think
- Biomagnification* causes microplastics to accumulate in animals higher up the food chain
- Given recommended daily calorie intake levels, annual microplastic consumption can range from **39,000 to 52,000 particles**
- Additionally, drinking water from single-use plastic bottles as opposed to from the tap can also increase microplastic ingestion

*more information on next slide

Microplastics in Our Food

Biomagnification



Source

- Build up of toxic chemicals within the food chain
- Affects all organisms in the food chain but animals higher up on the food chain are more heavily affected (ex: humans)
- As small animals and insects on the bottom of the food chain ingest microplastics, the damage and toxicity levels will make its way up the food chain until the food finally reaches our plates

Microplastics in Water

- There are two main sources where microplastics enter the water system:
  - **Run off** (primarily from land-based sources)
    - Landfills
    - Road-marking paint
    - Sewage
    - Mulching
  - **Wastewater overflow**
    - Treated and untreated
    - Cosmetic beads
    - Synthetic fibers from washed clothing
    - Sanitary pads and wipes that are flushed down toilets
- Also includes atmospheric pollution, industrial overflows, degrading construction materials, etc

Microplastics in Soil Ecosystems

- Microplastics are at an increasing risk of threatening biodiversity and ecosystem functioning
  - Soil ecosystems have been identified as a major sink of microplastics
    - Environmental sink: a reservoir that provides storage
  - Main sources of microplastics in soil include **mulching film, sludge, wastewater irrigation and atmospheric deposition**
  - Microplastics can influence soil biota at different trophic levels, and even threaten human health through food chains

Microplastics in the Air

- Microplastics can get into the air when any plastic object gets damaged, scraped, abraded, etc.
- Polyester in clothing is known for having small plastic components that are added during production
    - If you rub against something, or scratch yourself, microplastics may be released in the air
- **They can become airborne and be breathed in by anyone** who happens to take a breath of air containing those microplastics

Microplastics in Our Blood

- The smallest microplastics can **cross our gut barrier and reach our bloodstream**
- Microplastics have been found in the stomach, kidney, heart and intestines of rats
- Research suggests it is even possible for microplastics to be transferred to fetus rats in the womb
- There has also been evidence of microplastics in human placenta

03 How Are Microplastics Harming People?

How are microplastics harming people?

- Detrimental levels vary depending on how the microplastics enter your body
  - Consumed, inhaled, or injected
- Microplastics can act as a host for microorganisms to breed on
- They can build up and **damage alveoli in your lungs**
  - This can increase your risk of developing lung conditions like **emphysema and lung cancer**
  - The potentiality of metabolic disturbances, neurotoxicity, and cancer risk are significantly increased

04 Legislation

Legislation

There is very little legislation around the world that directly addresses microplastics.

Passed and Proposed Legislation

Microbead-Free Waters Act of 2015 (USA)

- Prohibits the manufacturing, packaging, and distribution of rinse-off cosmetics containing plastic microbeads

European Union ECHA Microplastics Ban

- In 2019 ECHA (European Chemicals Agency) proposed a wide-ranging restriction on microplastics in products placed on the EU/EEA market to avoid or reduce their release to the environment
- This is expected to prevent the release of **500,000 tonnes of microplastics over 20 years**
- This is the most comprehensive legislation on microplastics to date
- As of August 2022, this ban still hasn’t been passed*

*This proposed ban is being continually checked and updated by our team

Single-Use Plastic Legislation

- Despite the lack of legislation specific to microplastics, laws regarding the reduction of single-use plastic products have been widely adopted worldwide
- The most well-known example is the phasing out of lightweight plastic bags and plastic straws, achieved through either the complete ban or charges on these product
- However, this does not prohibit the production of these plastic products, which means they still circulate and have the potential of eventually breaking down into microplastics
    - In the USA, it is still very common to see plastic bags in grocery stores

Kenya

Kenya provides a good example of impactful and effective legislation regarding single-use plastics

- Total ban on plastic bags and fining of up to $40,000 or imprisonment of up to 4 years for the production, sale or use of plastic bags
- Some of the strictest penalties in the world to enforce the ban

05 Prevention

Prevention

- Reduce single-use plastic usage
- Strengthen garbage collection and recycling systems
  - This will help prevent waste from leaking into the environment between the time it is picked up and disposed in the landfill
  - This will increase recycling rates
- In the long run, real systemic change will be required
  - We need to rethink how we produce, use, and dispose of plastic

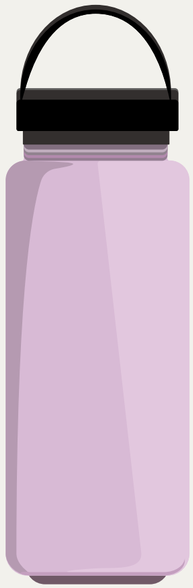
06 How You Can Get Involved

As an Individual

Since most microplastics come from the breakdown of larger single-use plastic materials, it is important to lower plastic usage in general.

Individual Actions

- Use alternatives to plastic products
  - Stasher bags instead of ziplock bags
  - Beeswax wrap instead of plastic wrap
  - Reusable shopping bags instead of plastic bags
- Consider shopping at bulk, zero-waste stores
  - Bring your own jars/bottles for food, shampoos, soaps, etc.
  - Example of a zero-waste store in Paris
- Try to drink tap water in a reusable water bottle!
  - A non-plastic reusable bottle is the best option, but if you prefer a reusable plastic water bottle, make sure it is BPA free!
  - If using a plastic bottle, be sure to properly recycle it
  - Use Reverse Osmosis filters to avoid any microplastics in tap water



Individual Actions (cont.)

- Pay attention to what clothes and cosmetics you buy!
  - Click **here** to learn more about what you should avoid when shopping
- Consider installing a microfiber filter in your washing machine
  - It filters out most microfibers released by clothing when washing
- Make sure to discard your trash properly
  - Never throw trash in an overflowing trash bin
  - Learn and understand how to read recycling numbers*
- Support and vote for comprehensive state and local policies that address plastic usage and single use plastic

*more information on next slide

7 Plastics for 7 Recycling Options

Source (click **here** to open a PDF you can download)

As a Group / Organization

- One month tracking competition
  - Create a friendly competition to gauge plastic usage in your group/organization
- Plan a cleanup event!
  - Beach, river, park, anywhere with trash!
  - If less plastic ends up in the water, less microplastics will be eroded and consumed by marine organisms
- Practice zero/low waste at group events!
  - Click **here** to see Poulsbo Rotary Club use these practices!
- Sign the **Global Climate Pledge**!
  - Commit to helping the environment as a group in whatever way is manageable for you

Sign the Global Climate Pledge!

1- Sign the Pledge

Use the QR code or go to
www.globalclimatepledge.com
to sign the pledge

2- Share the Pledge

Our pledge helps people move from awareness to action.

Encouraging others to sign establishes a larger community of people who support each other and can make a substantial difference in our environment.

Organizational Pledge QR

Individual Pledge QR

GLOBAL CLIMATE Pledge

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