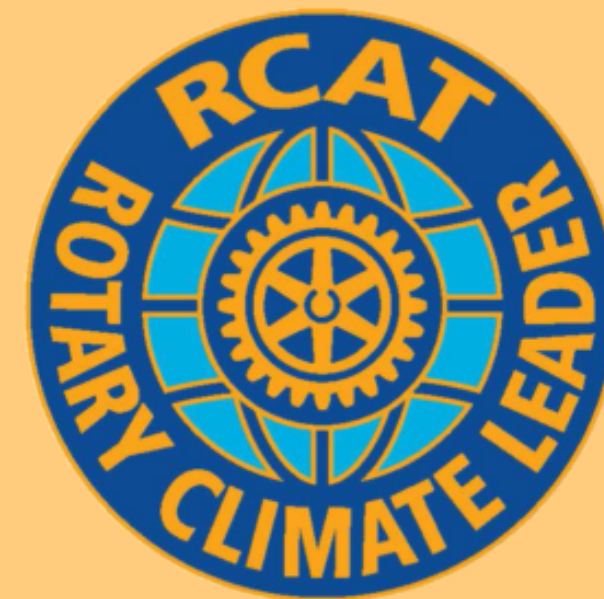


Microplastics

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

GLOBAL CLIMATE *Pledge*



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What are microplastics?
Why are they important?

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An aerial photograph of the ocean with a yellow rectangular text box in the lower-left corner. The text is in a bold, blue, sans-serif font.

**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



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



Huge contributor to plastic pollution

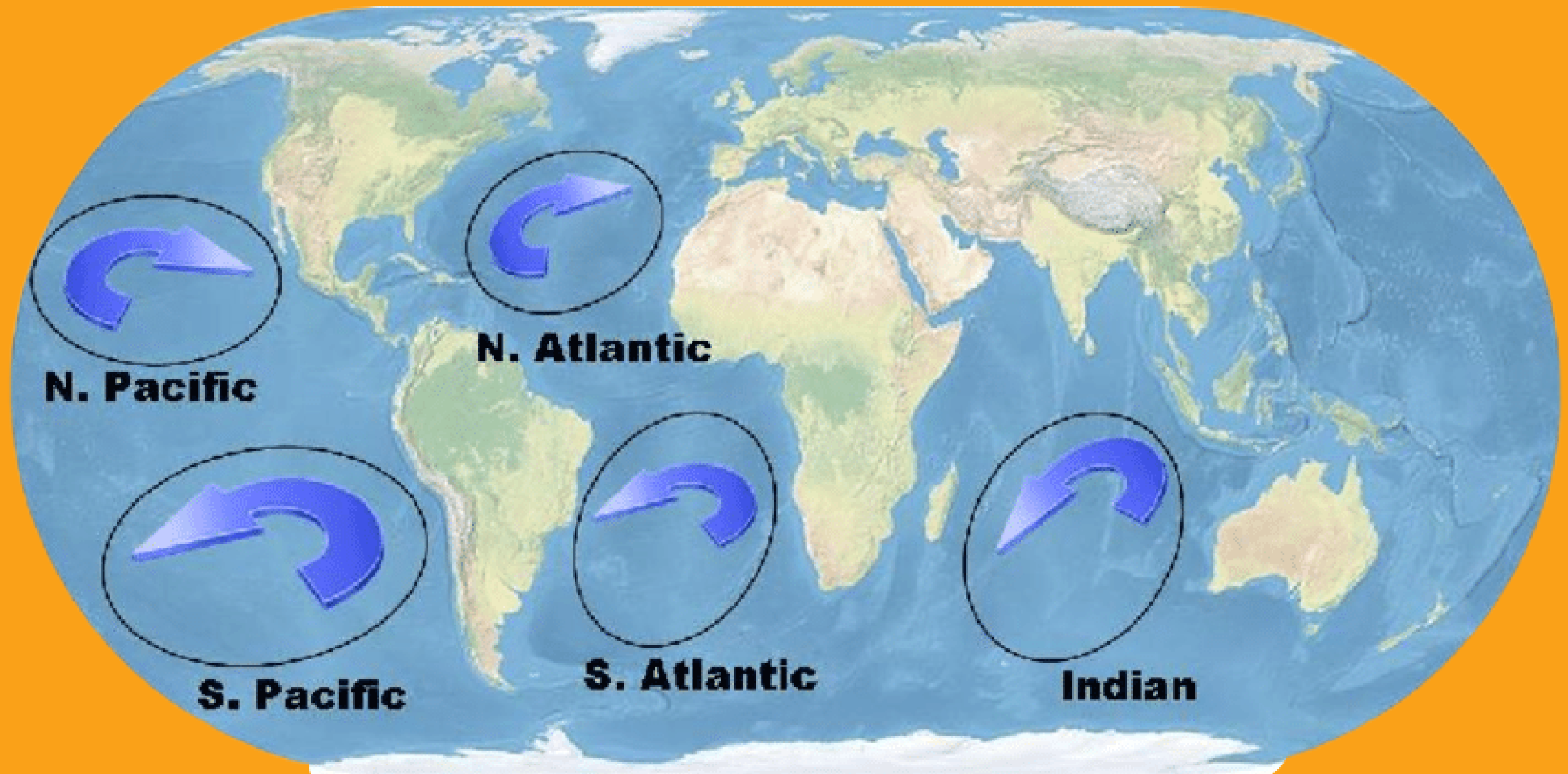
- Despite their size, microplastics still account for 11% of total ocean plastic pollution



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.

An aerial photograph of the ocean with a yellow rectangular text box in the lower-left corner. The text is in a bold, blue, sans-serif font.

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

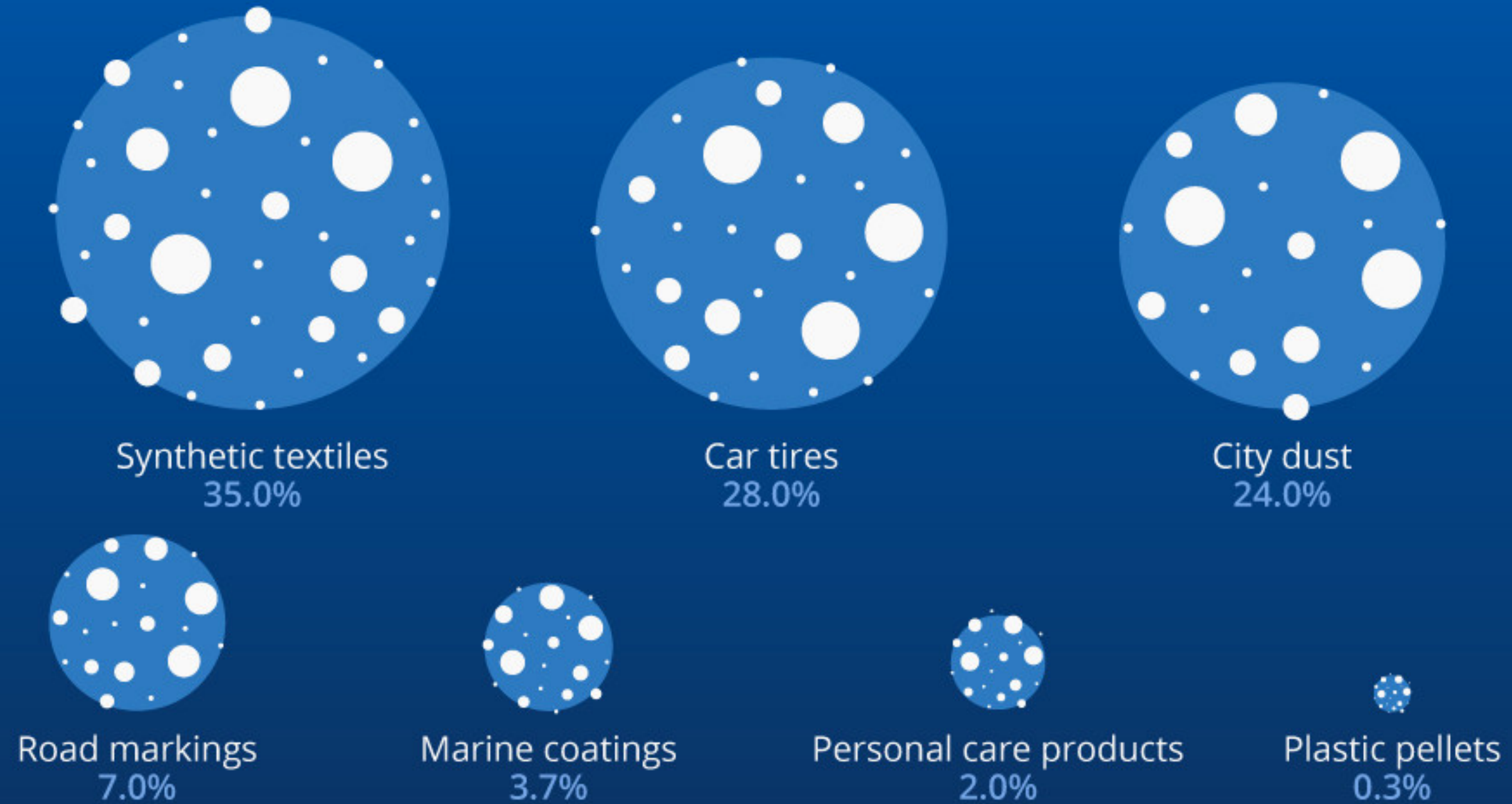
**Where do
microplastics
come from?**



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



@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 are 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!



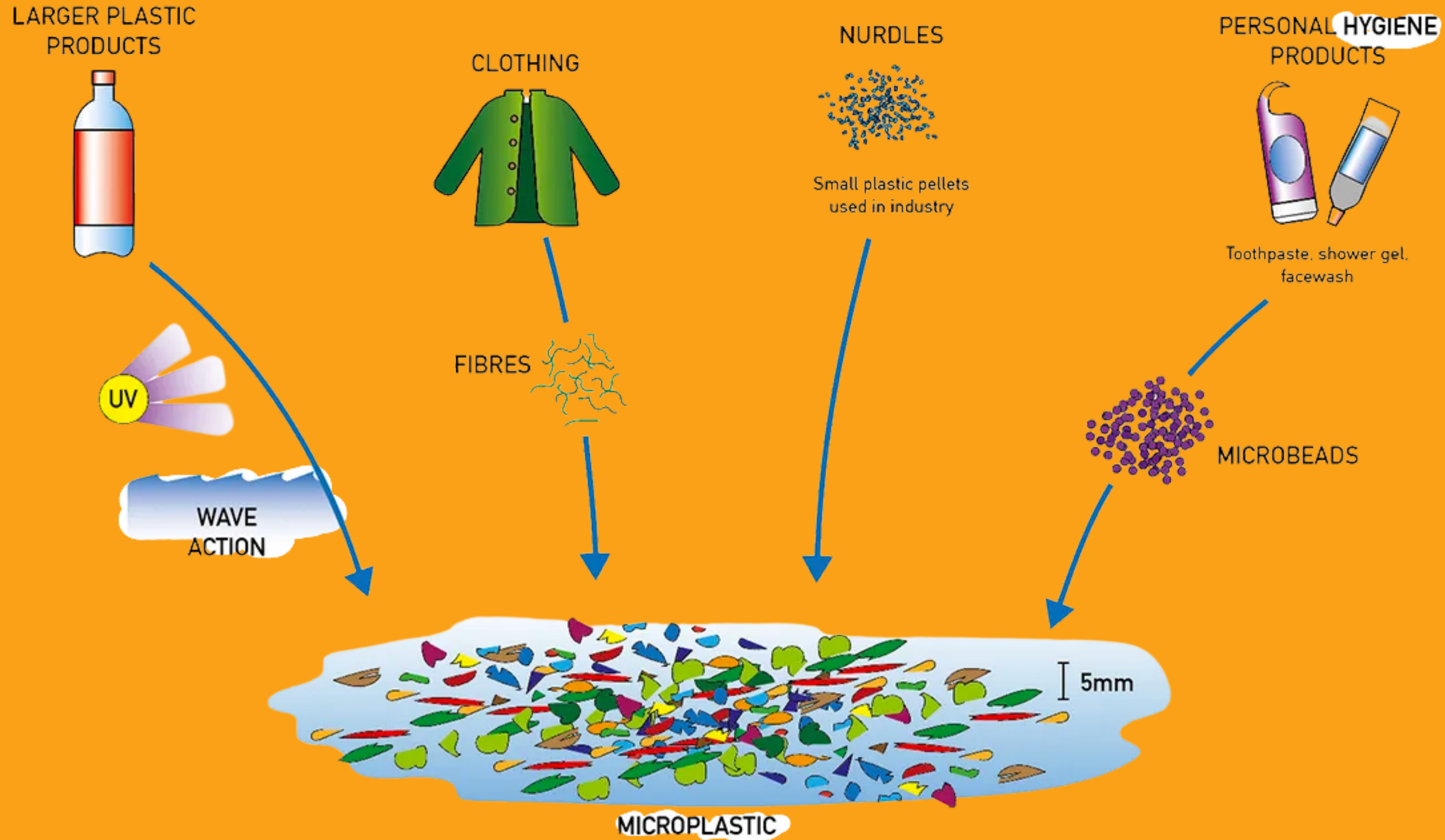
Tires

- ¼ of a tire consists of synthetic rubber (plastic)
- Tires erode through heat and friction when in contact with the road
- Tire 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

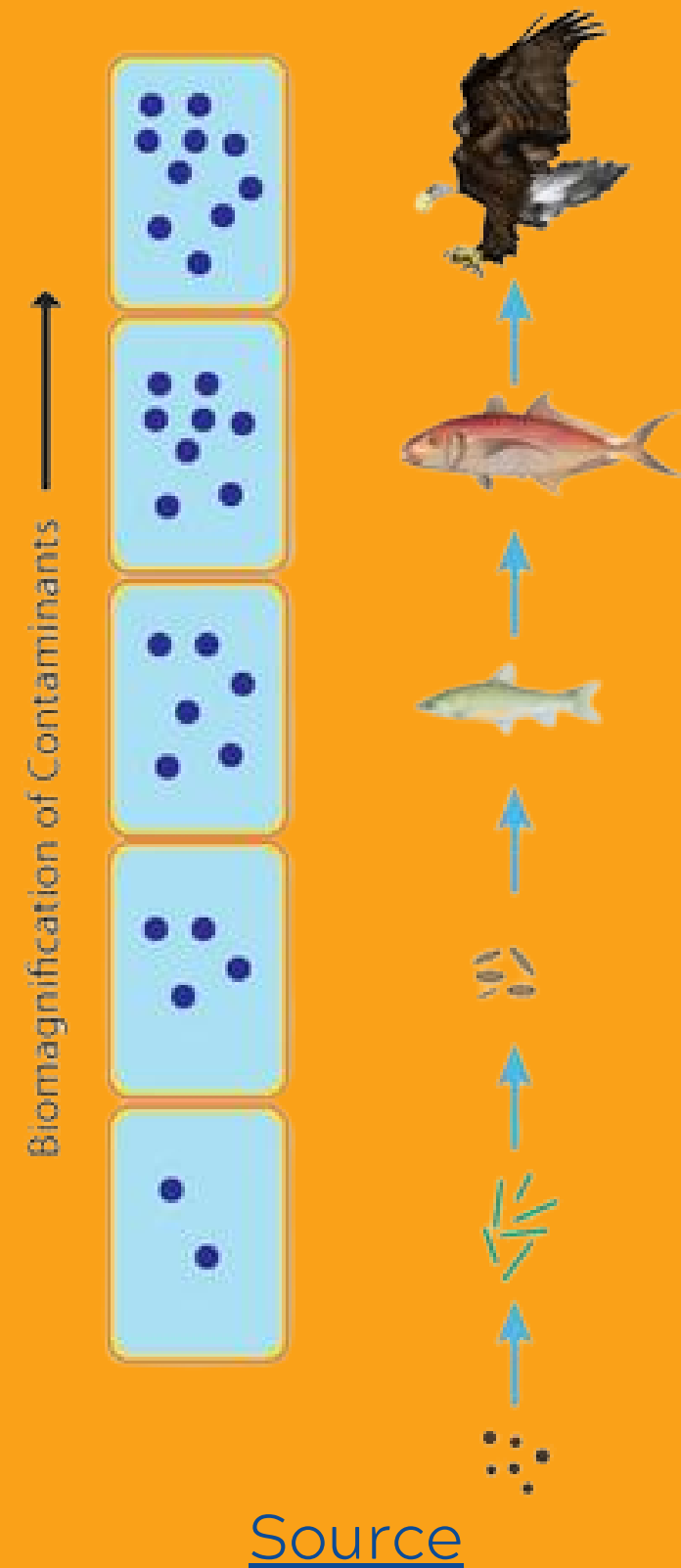


- Depending on your individual lifestyle, the amount of microplastics that are ingested through food or water is much larger than you may think
- Biomagnification* causes microplastics to accumulate in animals higher up the food chain
- Given recommended daily calorie intake levels, annual microplastic 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



- 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

An aerial photograph of the ocean with a yellow text box in the bottom-left corner. The text in the box reads:

**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

An aerial photograph of a vast, deep blue ocean. The water is covered in small, rhythmic waves that create a textured surface. The color of the water transitions from a lighter blue in the upper part of the frame to a darker, more saturated blue towards the bottom. In the bottom-left corner, there is a solid orange rectangular box containing the text '04 Legislation' in a bold, blue, sans-serif font.

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

An aerial photograph of the ocean, showing a vast expanse of blue water with small, rhythmic waves. The water's color transitions from a lighter blue in the upper half to a deeper, darker blue in the lower half. In the bottom-left corner, there is a solid yellow rectangular box containing the text '05 Prevention' in a dark blue, sans-serif font.

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

An aerial photograph of the ocean, showing a vast expanse of blue water with small, rhythmic waves. The water's color transitions from a deep blue in the lower part of the frame to a lighter, more vibrant blue towards the top. In the bottom-left corner, there is a solid yellow rectangular box containing the text '06 Rotary in Action' in a bold, blue, sans-serif font.

06 Rotary in Action

Rotary in Action - End Plastic Soup



- **What:** Organization hosted by Rotary Club of Amsterdam.
 - "End Plastic Soup" is a Dutch Public Benefit Organization, focusing on bringing Rotary, Rotaract, and Interact clubs to prevent and end plastic pollution.
- **Where:** Worldwide, through active Rotary Clubs
- **Contact:** endplasticsoup@gmail.com
- **Link for more information:** [End Plastic Soup](#)

Rotary
Clubs of Amsterdam

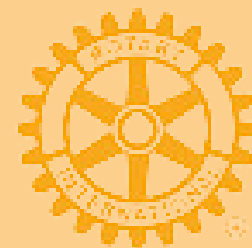


Rotary in Action – Plastic Solutions Taskforce



- **What:** An affiliation of ESRAG (Environmental Sustainability Rotary Action Group), raising awareness of how we create, use, and dispose of plastic.
 - They help Rotary Clubs to develop projects related to Plastic Solutions: cleanup activities, data collection, landfill/incineration diversion, economic development, individual behavior change, systemic & global change.
- **Where:** Worldwide, through active Rotary Clubs
- **Contact:** info@esragplastics.org
- **Link for more information:** [ESRAG Plastic Solutions](#) & [Contact/Experience Form](#)

Rotary



ESRAG
ENVIRONMENTAL
SUSTAINABILITY
ROTARY ACTION GROUP

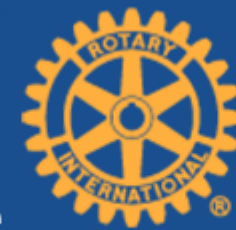
**PLASTIC
SOLUTIONS**
LEARN • PLAN • ACT

Rotary in Action - Plastic Recycling Project



- **What:** An innovative plastics recycling social enterprise designed by Rotarian Dr. Prakash Tata.
 - The plastic waste processing plant will collect and shred 2 tons of plastic waste per day. The pellets that they produce will be sold to bulk recyclers.
- **Where:** Visakhapatnam, Andhra Pradesh, India
 - Collaboration between India Youth For Society, the Greater Visakhapatnam Municipal Corporation, Rotary Club of Naperville IL, Rotary Club of Lake District, Moinabad, Hyderabad, and Rotary Elite Club of Visakhapatnam
- **Contact:** [link to Rotary Club of Naperville website](#)
- **Link for more information:** [ESRAG blog post](#)

Rotary
Club of Naperville



Leadership Through
Community Service
Since 1941

Rotary in Action - War on Plastic



- **What:** A county wide plastic bags recycling collaboration project with Rotary Club of Vero Beach, Publix, and the Indian River County School District.
 - Receptacles for plastic bags are placed in schools in the Indian River County
 - Once the receptacles are full, they are taken to the nearest Publix store
 - Publix will then recycle the plastic bags
- **Where:** Rotary Club of Vero Beach, FL
- **Contact:** info@rotaryofverobeach.com
- **Link for more information:** [Local radio interview with Rotary Club of Vero Beach](#)

Rotary
Club of Vero Beach



Rotary in Action - Microplastic Madness



- **What:** A stop-motion animation film conveying the urgency of plastic pollution.
 - Film was created by 56 fifth graders from Brooklyn, who take a deep dive into the root causes of plastic pollution.
 - They take action to rid their school cafeteria of single-use plastic.
- **Where:** Filmed in Brooklyn, NY
 - Rotary Club of Windsor and ESRAG hosted the preview of the film
- **Contact:** Link to [ESRAG contact form](#)
- **Link for more information:** [Link to article on Rotary Club of Windsor page](#)



Rotary in Action - EcoEclectic Technologies



- **What:** A start up venture created by Rotarian Binish Desai.
 - Desai works with industrial companies to recycle paper, plastic, and other industrial waste to create ecobricks.
 - Desai's ecobricks helped reduce plastic and paper waste and created steady employment for the women in his local community.
- **Where:** Valsad, India
 - Rotary Club of Vibrant Valsad
- **Contact:** [Link to the Rotary Club of Vibrant Valsad Facebook page](#)
- **Link for more information:** [Link to The Rotarian article](#)

An aerial photograph of a vast, deep blue ocean. The water is covered in small, rhythmic waves that create a textured surface. The color of the water transitions from a lighter blue in the upper part of the frame to a darker, more saturated blue towards the bottom. In the lower-left corner, there is a solid orange rectangular box containing white text.

07 How You Can Get Involved

As an Individual

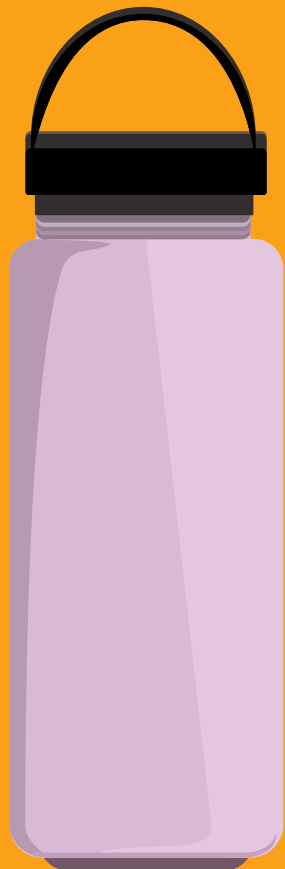


Since most microplastics come from the breakdown of larger single-use plastic materials, it is important to lower plastic usage in general.

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

Plastic Recycling
Made Easy

The lower the number, the more recyclable.

1
PETE
WIDELY RECYCLED
Clear, tough plastics.
• Drink bottles • Clothing • Carpet fibre • Rope • Medicine bottles

2
HDPE
WIDELY RECYCLED
Common plastics.
• Milk containers • Shampoo bottles • Detergent bottles • Soap dispensers

3
PVC
CAN BE RECYCLED - CHECK KERBSIDE COLLECTION
Hard, rigid plastics.
• Pipes • Shower curtains • Children's products • Raincoats

4
LDPE
CAN BE RECYCLED - CHECK KERBSIDE COLLECTION
Soft, flexible plastics.
• Sandwich bags • Clingfilm • Plastic bags • Squeezy bottles • Frozen food packaging

5
PP
RARELY RECYCLED - CHECK KERBSIDE COLLECTION
Flexible hard plastics.
• Plastic bottle caps • Butter tubs • Yoghurt pots • Straws

6
PS
RARELY RECYCLED - CHECK KERBSIDE COLLECTION
Flexible soft plastics.
• Meat trays • Foam packaging • Disposable coffee cups • Plastic cutlery

7
OTHER
RARELY RECYCLED - CHECK KERBSIDE COLLECTION
All other plastics, acrylics, and nylon.
• CDs and DVDs • Baby bottles • Sunglasses • Phone cases

willshee's
waste & recycling

[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



Contact Us!

U.S. Green Chamber of Commerce
National Headquarters 249 S. Highway
101 #420 Solana Beach, CA 92075

Info@GlobalClimatePledge.com

<https://usgreenchamber.com/>

<https://www.globalclimatepledge.com/>

