

# THE CONSPIRACY AROUND MARINE PLASTICS

Debunking the main source of microplastics; finding solutions for microfibre pollution

Plastics washed up on the beach.  
Photo from BRANDS FOR CANADA.



## What is the issue?

Plastic is a long-lived pollutant unable to decompose naturally. It is estimated that the oceans contain more than **150 million tons of plastic** consisting of over 5 trillion particles<sup>5, 9</sup>. About 60% of the clothing manufactured consists of synthetic materials such as polyester and nylon<sup>2</sup>. **When washed, clothes made from synthetic materials shed tiny fibres (microfibres) that end up in the environment.** Roughly 35% of primary marine microplastics (the largest single source) are microfibres shed when synthetic textiles are laundered<sup>1</sup>. Due to their small size, microfibres can pass through washing machine filters and wastewater treatment plants, ultimately ending up in the ocean<sup>4</sup>. Recent reviews have shown that microfibres are present in oceans globally, from the Pacific to the Atlantic to the Arctic<sup>10</sup>. Further analyses of microplastics collected from beaches globally have shown high abundances of polyester and acrylic fibres in particular<sup>4</sup>. **More action is needed to address the issue of microfibre pollution in our oceans.**

## Why should you care?

Microplastics pose a threat to both marine organisms and humans. Primary producers such as Daphnia have been shown to ingest synthetic microfibres correlating with an **increased mortality** of the species<sup>2</sup>. Furthermore, the consumption of microfibres by primary producers can be transferred up the food web. **Textile fibres have been discovered in fish and shellfish** on sale for human consumption in markets around the world<sup>10</sup>. It is estimated that a seafood consumer can unknowingly eat 11,000 plastic particles annually, impacting the immune system and disrupting the gut microbiome<sup>12</sup>. The chemical additives in plastics can also pose **toxic health risks**<sup>10</sup>.

## What are microplastics?

According to the National Oceanic and Atmospheric Administration (NOAA), particulates or fibres **less than 5 mm** in diameter are considered microplastics<sup>8</sup>.

THIS IS THE PROBLEM

OCEAN  
CLEAN  
WASH



SPECIES EAT MICROFIBERS, THUS ENTERING THE FOOD CHAIN



MICROFIBERS ATTRACT ORGANIC POLLUTANTS



HEALTH PROBLEMS CAUSED TO ANIMALS AND HUMANS



Photo from: Ocean Clean Wash

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## What has been done?

As of July 1, 2018, there has been a ban on the manufacture, import, and sale of products that microbeads in Canada<sup>7</sup>. Additionally, the city of Vancouver implemented a ban on April 22, 2020, on plastic straws<sup>3</sup>. This ban includes those made from plants or other biological materials (e.g., corn, potatoes, sugarcane) as well as those labelled compostable or biodegradable. However, banning microbeads and plastic straws is not enough to combat plastic pollution in the ocean.

## What can be done?

### At a consumer level:

- Promote the **recycling of clothes**. It has been shown that the number of microfibres shed plateaus after 5 to 10 washes (depending on the material)<sup>2</sup>. Therefore, purchasing recycled clothes can decrease the number of microfibers entering oceans.
- Educate consumers! By washing clothes with **cold water**<sup>4</sup>, using a **front-load washing machine**<sup>6</sup>, and installing a **lint trap**<sup>4</sup>, the amount of microfibres going to treatment plants can be significantly reduced.
- Avoid purchasing synthetic clothes. Instead, buy clothes made of **natural materials** whenever possible.

### At an industry level:

- Encourage **smarter textile design**. It has been found that yarns made of continuous filaments and with a higher twist release less microfibers<sup>11</sup>. By switching to a different textile construction, the fashion industry can directly reduce microplastic pollution.
- **Pre-washing** and **vacuum extraction** of textiles during the manufacturing process can also reduce the amount of microfibres released (assuming proper disposal)<sup>2</sup>. For alternative reasons, these steps are already fairly common practice in the industry, so modifying the process to capture released microfibres should not be too costly.

## Sources

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Microfibres (magnified in the circles) caught in seagrass samples. Photo by the Rotjan lab.

