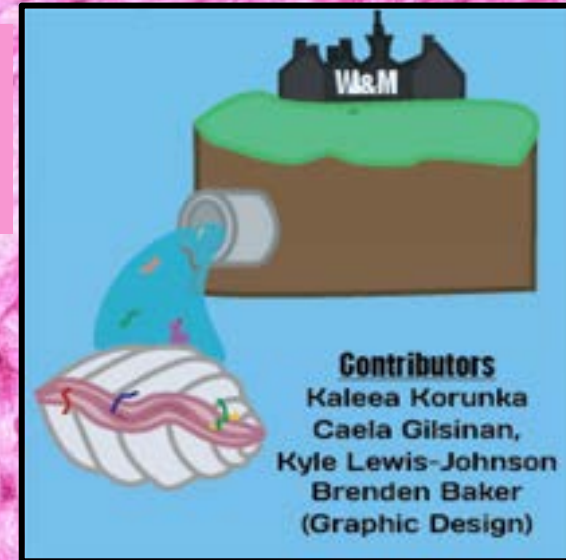


# *Oyster's Don't Need Sweaters!*

## *Microplastic Pollution Solutions*

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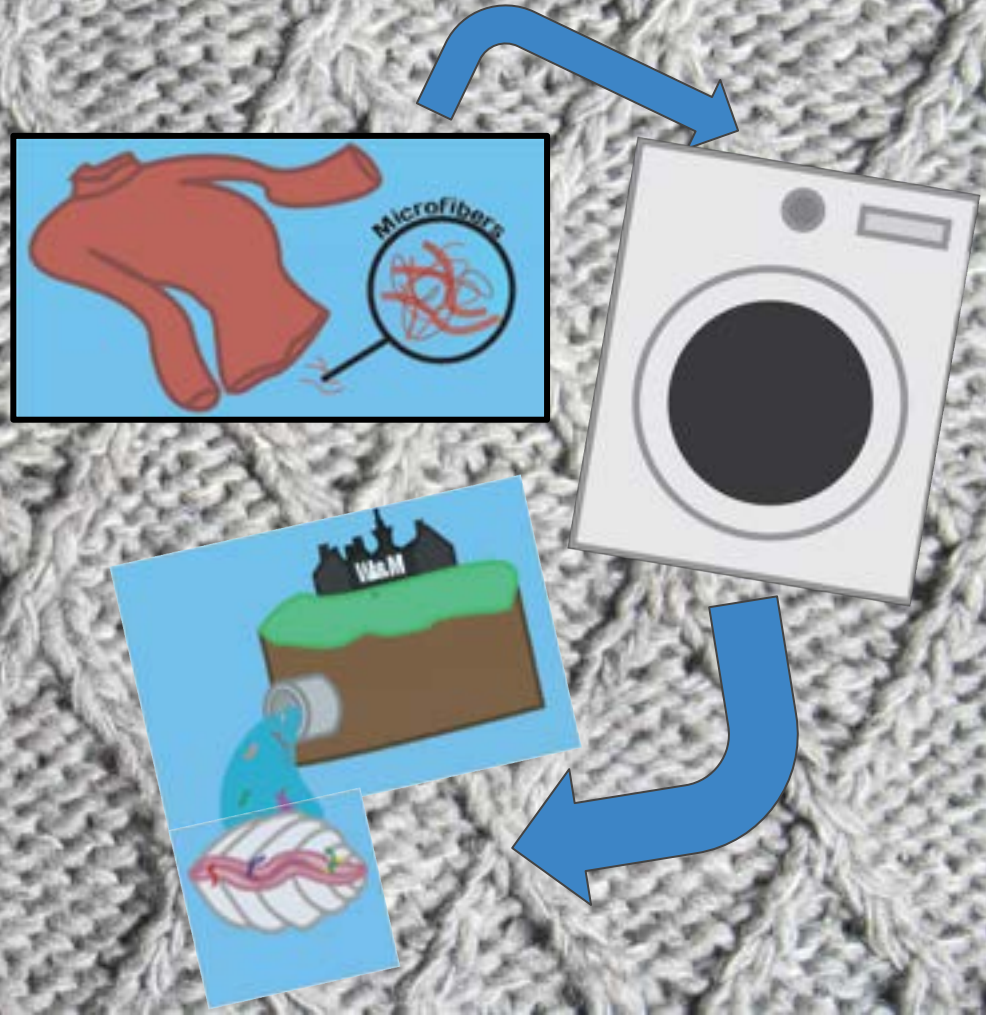
# Why Microplastics are Harmful...



Plastic leaches chemical additives that gave the plastic its characteristics like color or stretchiness. Formaldehyde, chlorobenzene, and AZO dyes are common additives used in plastic based clothing. Microfiber plastic adversely affects the health of Eastern Oysters (*Crassostrea virginica*) in the Chesapeake Bay. Microplastics damages oysters cells, inducing inflammatory responses, inducing immune reactions, causes skewed sex ratios, stunted growth, increases mortality rate and harms energy uptake.

# How Microplastics Get out . . .

Microplastics are shed from garments in washing and drying machines. These microfibers are transported to our ecosystem through waste water. W&M's numerous washes a day are released through our waste water into the James River.



# *Solution (1)*

Only sell William And Mary merchandise made of natural polymers that can break down in the environment without causing harm.



## **You can...**

Buy clothing and other fabric based items made of natural polymers like cotton, wool, or hemp.

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Sell individual Microplastics solutions to students at campus stores like plastic free laundry detergent/dryer sheets.

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Buy plastic free laundry detergent/dryer sheets, use the ! "#\$%&'()\*+, or other future solutions!

## *Solution (3)*

When purchasing new washers and drying machines, chose machines with integrated micro plastic filters.



You can ...

Also chose machines with integrated micro plastic filters



## Solution (4)

Install the *Planet Care* microplastic filters on all campus washing machines.

**Cost** - Initial purchase of \$62.69 and \$8.30 per refill

**Maintenance** - Replace filter every 20-30 washes and mail it back to Planet Care (paid by them) to be refurbished in a closed-loop system.

- William & Mary should find out how often washing machines are used to estimate how often the filters need to be replaced. Likely once a week.



**Installation** - Simple and can be done in about 10 minutes.

- Requires 13 cm of space wide and 90 cm of space vertically (30 cm for the filter and 60 cm for height clearance to replace the filter).
- Very versatile placement options.

## **Effectiveness**

- 64% effectiveness by weight according to the National Research Council in 2018 by testing the water with a 60  $\mu\text{m}$  pore filter, and twice through a 20  $\mu\text{m}$  pore size filter.
- 80% effectiveness by weight according to an unnamed machine manufacturer on the Planet Care website that tested the water with a 1,6  $\mu\text{m}$  glass filter.
- 80% effectiveness by weight according to the National Institute of Chemistry in 2017 tested the water with a 2,5-micron micro-filter and a 0,0-micron ultra-filter then



## *Solution (5)*

William & Mary could encourage the use of microfiber catchers for drying machines like the *Guppy Friend* or cleaning out lint traps.



You can...

Use products like the *Guppy Friend* or clean out your lint trap.

# *Solution (6)*

William and Mary should participate and invest in developing research and tools to help mitigate micro plastic pollution.

You Can...

Promote microplastic research for issues like what to do with lint, how to catch microplastics, or develop microfiber filters for dryers.



# Where to go from here...

Kyle Lewis-Johnson & I (Kaleea Korunka) are applying for the W&M Green Fee this Spring to earn funding to enact some of the solutions you have seen today!



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