



Water, Art, and Public Health in the New River Watershed



Who We Are

 Students at Appalachian State
University in Boone, NC

Our partners

 New River Conservancy

 Watauga Riverkeeper

 Mountain True

The Issue – Microplastics

The Project



Content

Health Impact

- ♻️ Freshwater Ecosystems
- ♻️ Local Policy
- ♻️ Health Impacts



Field Research

- ♻️ Water Sampling
- ♻️ Images

Community Outreach

- ♻️ Trading Cards
- ♻️ Pet Microplastics
- ♻️ The Glitter Lady

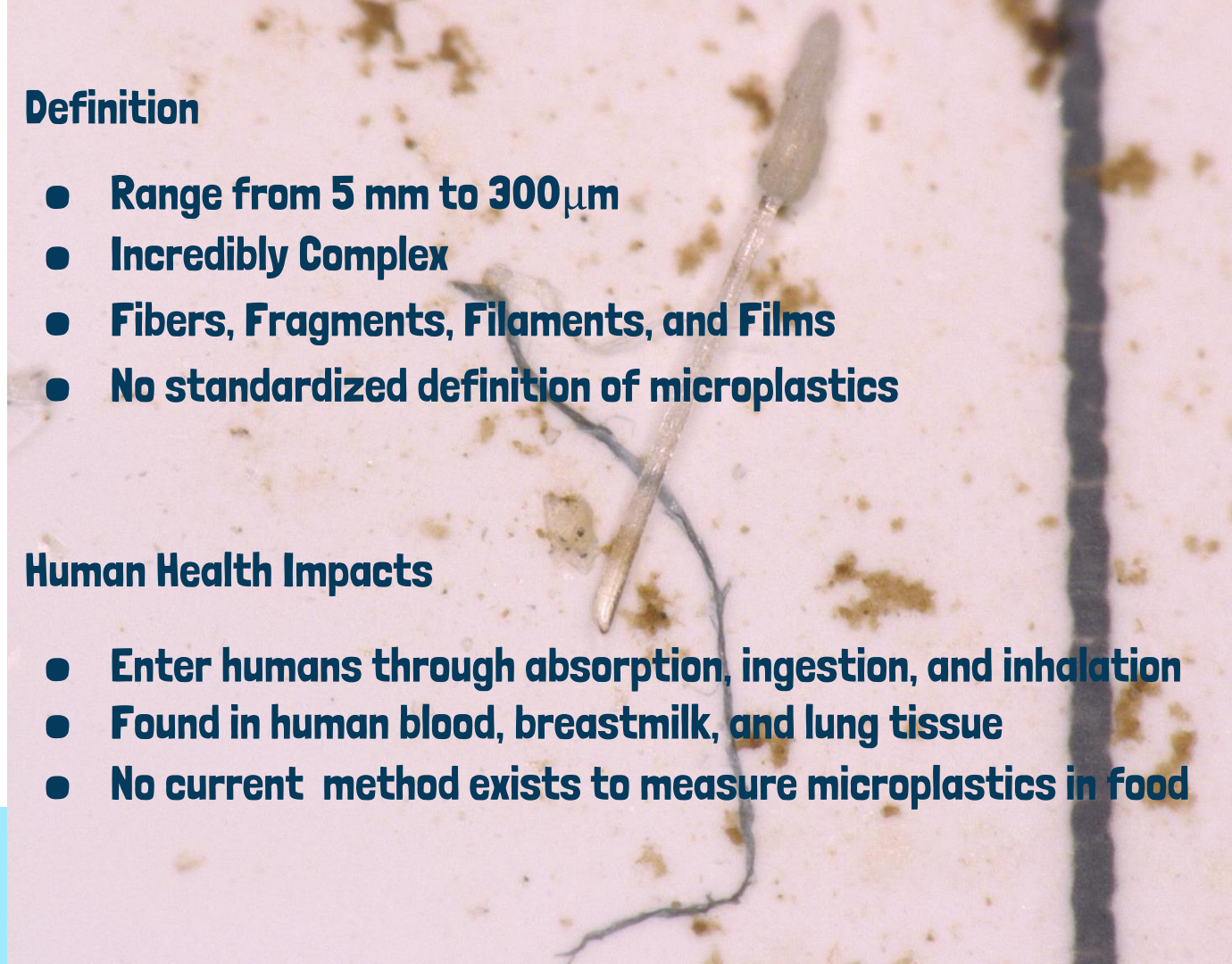
What are microplastics? Why should we care?

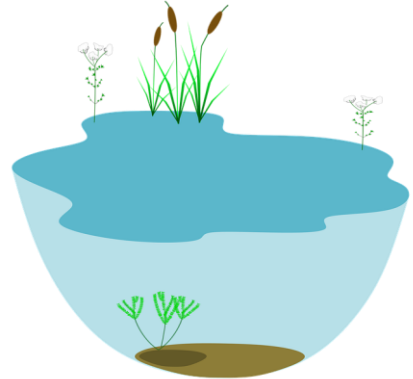
Definition

- Range from 5 mm to 300 μ m
- Incredibly Complex
- Fibers, Fragments, Filaments, and Films
- No standardized definition of microplastics

Human Health Impacts

- Enter humans through absorption, ingestion, and inhalation
- Found in human blood, breastmilk, and lung tissue
- No current method exists to measure microplastics in food







Finding the Evidence

Explored freshwater ecosystems, human health impacts, and local policy implementation

- Systematic reviews
- Semi-structured interviews with key informants
- Trash trout and water cataloging of plastic
- Water sampling
- Publicly available policy and data

Microplastics and Freshwater Ecosystems



Microplastics Ingestion

Microplastics were found within the guts, gills, liver, and even the brains of organisms.

These include red tilapia, zebrafish, and largemouth bass.

Microplastics Effects

Microplastics **DID** have negative health effects on animals such as fish, invertebrates, and snails.

Microplastics and Urbanization

Freshwater located closer to urban areas were more likely to have higher levels of microplastics.



Microplastics and Human Health Impacts

5 body systems and or organs affected:

- ❖ **Maternal placenta, liver, pulmonary system, cardiovascular system, and digestive system**

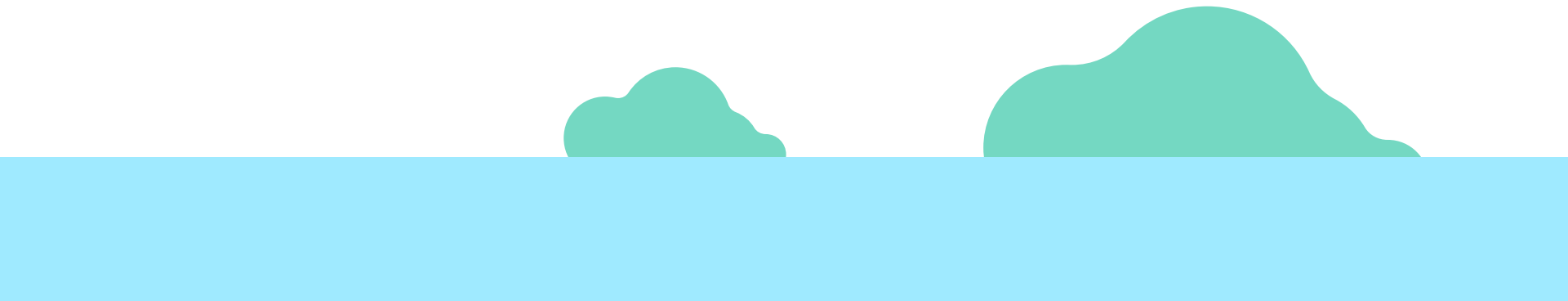
3 harmful plastic by products identified:

- ❖ **Bisphenol A (BPA), phthalate (DBP), and polystyrene (PS)**

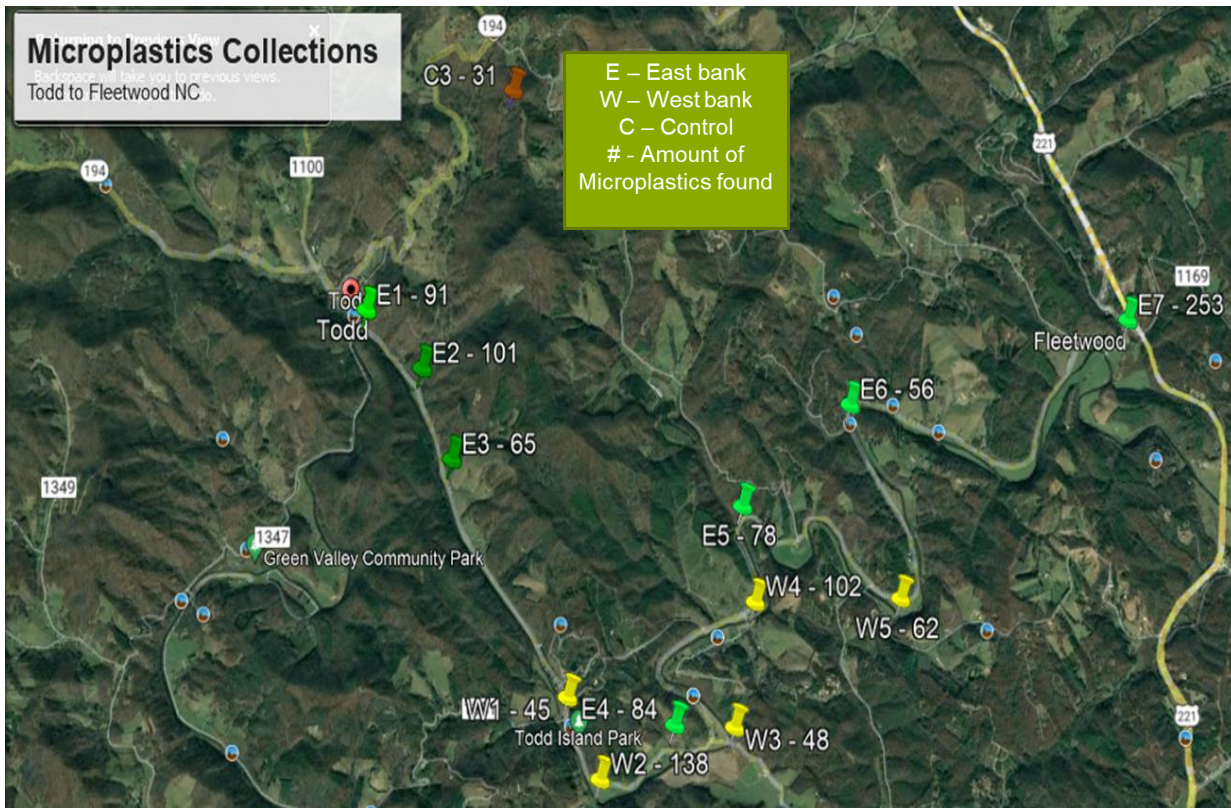
More research is needed to identify safe/unsafe levels of microplastic byproducts, and causation of specific diseases



Plastic Use & Policy

- ♻️ **Grocery Stores reported 600 to 8,000 plastic bags used per week**
 - ♻️ **Fast Food chains reported up to 1,750 plastics used per day**
 - ♻️ **Common items in the trash include styrofoam, plastic bottles, and plastic bags**
 - ♻️ **Recycling was often contaminated and poorly managed**
 - ♻️ **Potential policy solutions: Canada, Asheville NC**
- 

Water Sample Collections



- ♻️ **15 total samples taken**
- ♻️ **3 controls**
- ♻️ **12 from tributaries along the south fork of the New River**



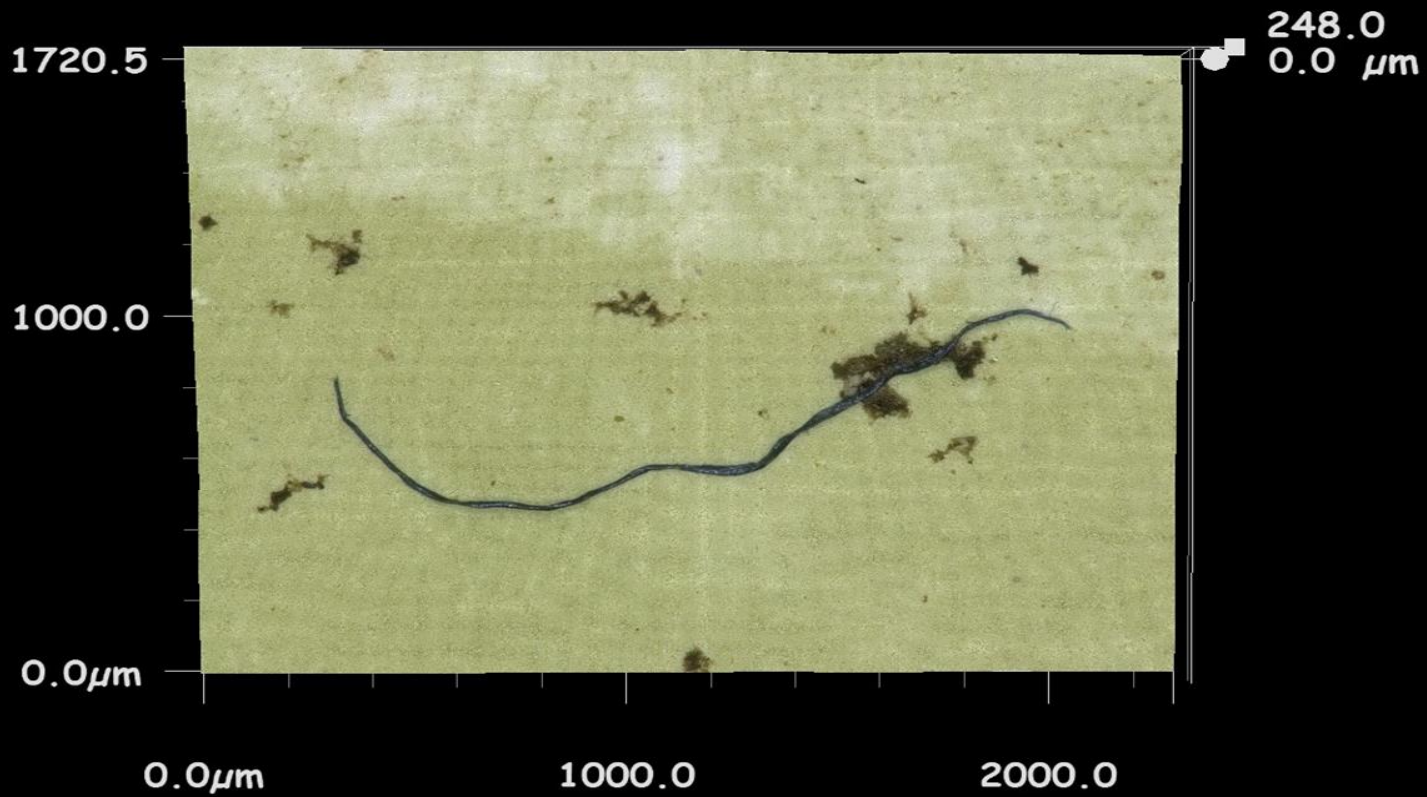
Process and Analysis

- ♻️ **Methodology was to collect a single jar of water from tributaries, filter, and analyze under a microscope**
- ♻️ **Major findings include:**
 - **Microplastics were found in every sample. Collections in the New River tributaries ranged from 45 to 253 particles in a sample jar**
 - **Higher access areas (bridges, kayak and fishing areas) had generally higher microplastic counts indicating the source is trash (inadvertent or deliberate)**
 - **The majority of microplastics found were fibers and styrofoam**



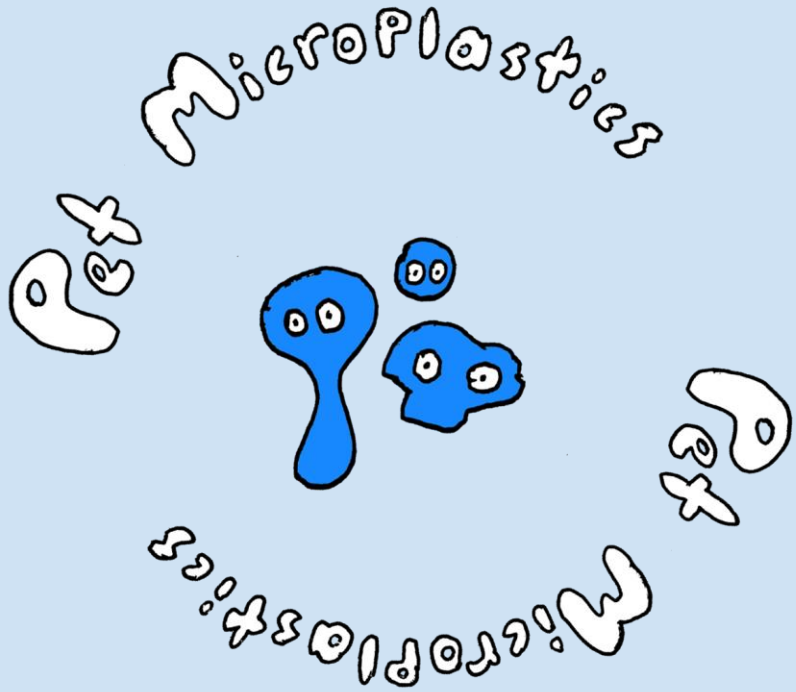
Microscopic images of microplastics in our waterways





Community Outreach





"Giving form to an invisible presence"

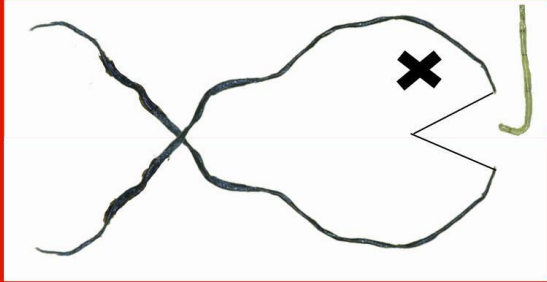
Premise



- ♻️ **Labeled jars of samples from local waterways**
- ♻️ **Microplastics are largely invisible to the naked eye and are frequently associated with faraway oceans**
- ♻️ **Each jar of Pet Microplastics brings the problem into your hands, making the abstract tangible**

Trading Cards

MICROPLASTICS TRADING CARDS



THEY SAY
YOU ARE WHAT YOU EAT, AND
EVEN MICROPLASTIC FISH
GOTTA EAT!

COLLECT 'EM ALL... AND SAVE YOUR TOMORROW!

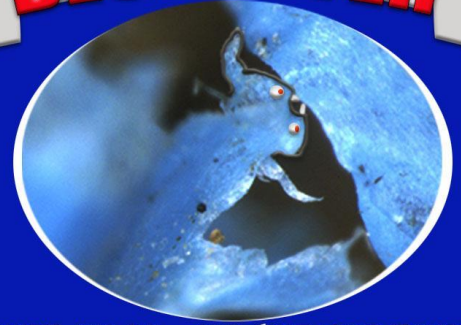
♻️ Microplastics Trading Cards are a way to engage kids and simultaneously involve their parents.

♻️ The images are of real microplastics taken from the waterways

MICROPLASTICS TRADING CARDS

You might not see the damage, but this mean microplastic will wreck your world just like a termite will wreck your house!

DESTROYER



COLLECT 'EM ALL... AND SAVE YOUR TOMORROW!

The Glitter Lady

♻️ The Glitter Lady is a performance featuring a character that “hates all wildlife and the environment”.

♻️ Her original song parodies human disregard for our rivers and streams.



GLITTER LADY LYRICS

I'M THE GLITTER LADY, I'M THE GLITTER LADY,
I DON'T CARE WHO DIES,
I'M THE GLITTER LADY, I'M THE GLITTER LADY,
I JUST WANT TO SHINE.

I'M A MICROPLASTIC THAT THEY CALL PET,
THAT DOES NOT BREAK DOWN IN THE RIVERS OR SEA.

MY BEAUTIFUL SPECKS ARE SO DANGEROUS INDEED,
ONCE LOOSE IN THE WATER THEY CAN'T BE RETRIEVED.

I'M THE GLITTER LADY, I'M THE GLITTER LADY,
I DON'T CARE WHO DIES,
I'M THE GLITTER LADY, I'M THE GLITTER LADY,
I JUST WANT TO SHINE.

I SWIM THROUGH THE RIVERS AND INTO THE SEA,
FOULING ALL THE WATERS AND ALL THAT DRINK ME.

ALTHOUGH I AM SMALL, I DO NOT DISAPPEAR,
A BRIGHT MICROPLASTIC, THE ONE MOST TO FEAR.

I'M THE GLITTER LADY, I'M THE GLITTER LADY,
I DON'T CARE WHO DIES,
I'M THE GLITTER LADY, I'M THE GLITTER LADY,
I JUST WANT TO SHINE.

BROOK TROUT, WHITE SUCKERS, AND FISH OF MANY KINDS
ARE DRAWN TO MY COLORS AND TO MY BRIGHT SMILE.

BEAUTIFUL BUT DEADLY I'M A FEMME FATALE
I ADD TO POLLUTION, A DANGER TO ALL.

I'M THE GLITTER LADY, I'M THE GLITTER LADY,
AND I DON'T CARE WHO DIES,
I'M THE GLITTER LADY, I'M THE GLITTER LADY

Concluding Thoughts



- ♻️ **More research is needed**
 - **Focus on the Appalachian region is important**
- ♻️ **Potential policy solutions**
- ♻️ **Lessons Learned from Creative Community Outreach**

Acknowledgements



Appalachian
Regional
Commission



- Center For Appalachian Studies
- Levine Health Sciences College
- Dr. Andrew B. Heckert & PURL - Department of Geologic and Environmental Sciences