

# Microplastics 2025 Sampling and Analysis

Department of Environmental Protection  
Bureau of Clean Water

Spring 2026 PPAT Meeting (Virtual)  
April 9, 2026





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Department of  
Environmental Protection

# Microplastics

- Surface Waters of Pennsylvania, Water Quality contaminants of emerging concern
  - New to the environment, or
  - Recently-discovered to be an environmental detriment
- Microplastic sizes range from 5mm to 20  $\mu\text{m}$



# Pilot Project Goals

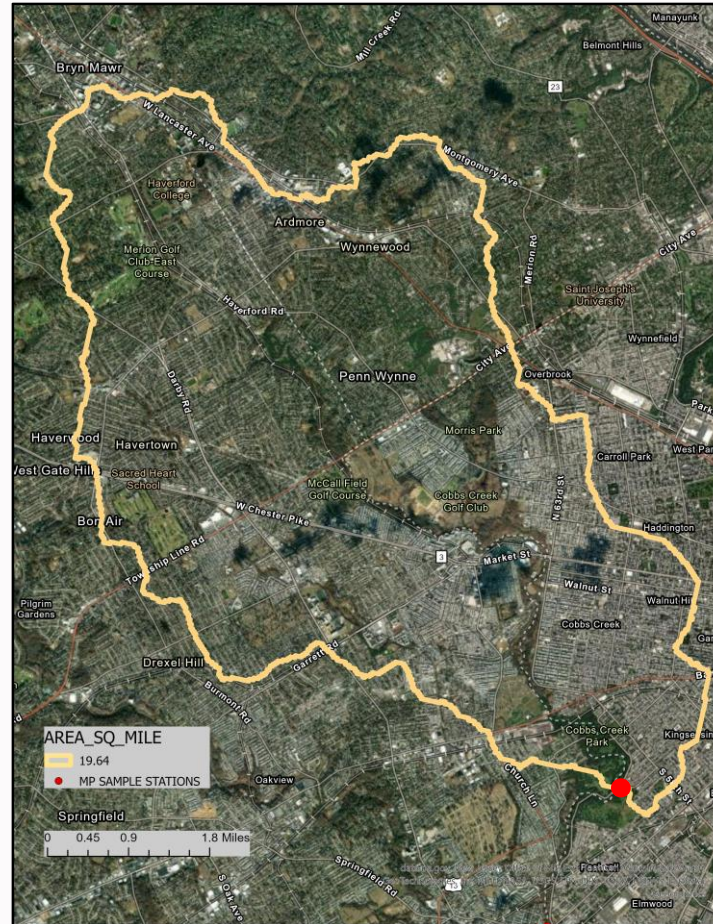
1. Develop collection protocols
  - a) Ability to collect microplastics
  - b) Refine protocol
2. Land Use comparison
  - a) Abundance
  - b) Types
3. Longitudinal comparison, upstream vs. downstream
  - a) Abundance, types
  - b) Particle shapes?



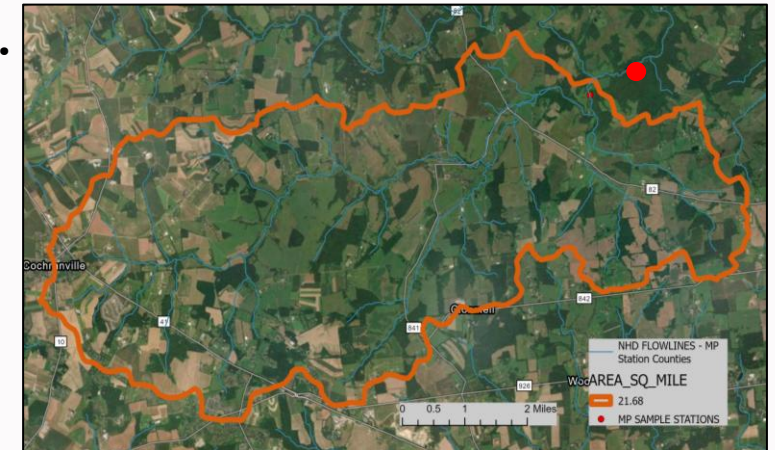
# Land Use Stations

- A. Cobbs Creek, Delaware County, Bristol:  
**88% Urban**, 20 mi<sup>2</sup>
- B. Doe Run, Chester County, West Marlborough Township:  
**70% Agriculture**, 22 mi<sup>2</sup>
- C. Lyman Run, Lyman Run State Park, Potter County, Galeton: **93% Forested**, 21 mi<sup>2</sup>

A.



B.



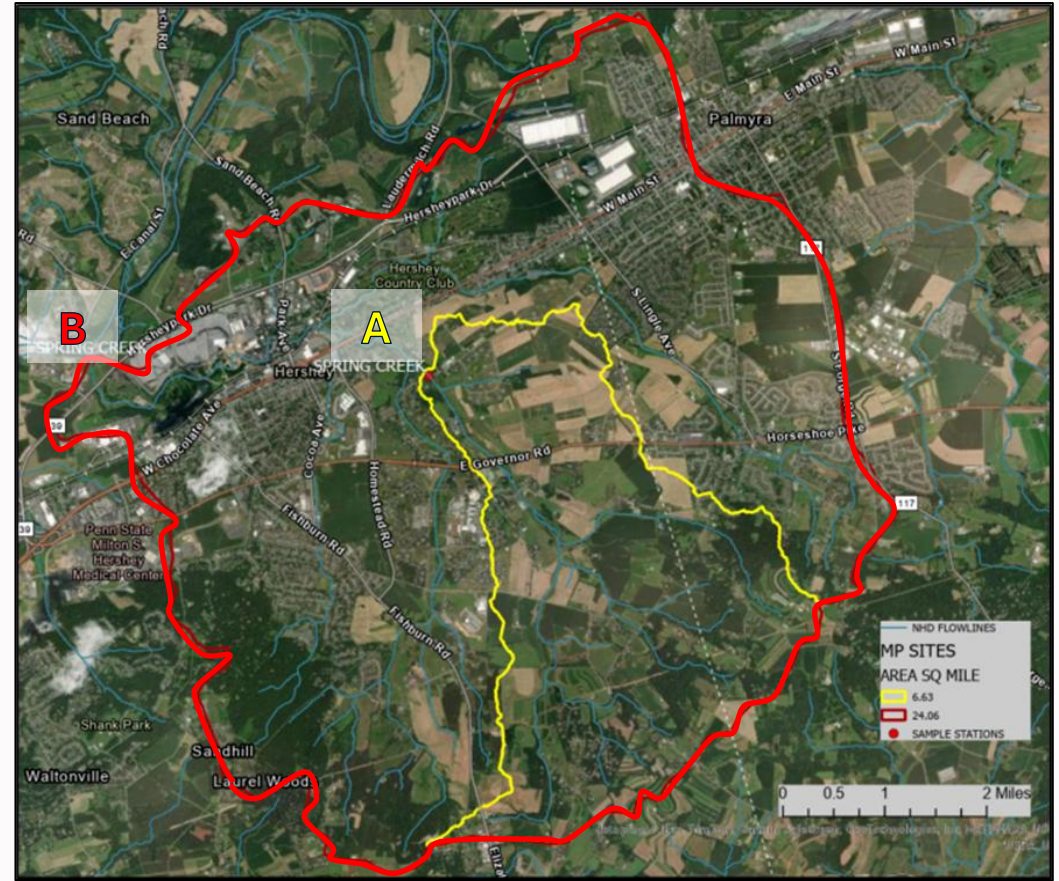
C.





# Longitudinal Stations

- A. Spring Creek Upstream:  
**Primarily Agriculture** 19%, 25%,  
**53%** (Forest, Urban, Ag), 6.6 mi<sup>2</sup>
- B. Spring Creek Downstream  
**Primarily Urban** 12%, **50%**, 36%  
(Forest, Urban, Ag), 24 mi<sup>2</sup>





# Collection Protocol

- All materials were constructed of non-plastic material
- A stainless steel (SS) submersible pump with 3 mm diameter holes and SS tubing were used to pump stream water through a SS sieve stack 12" diameter with mesh sizes of 500  $\mu\text{m}$  and 20  $\mu\text{m}$  (modified ASTM Method D8332.20 (Figure on right))
- Pump rate was determined prior to collecting by pumping and timing 5 gallons of water through the system





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# Collection Protocol

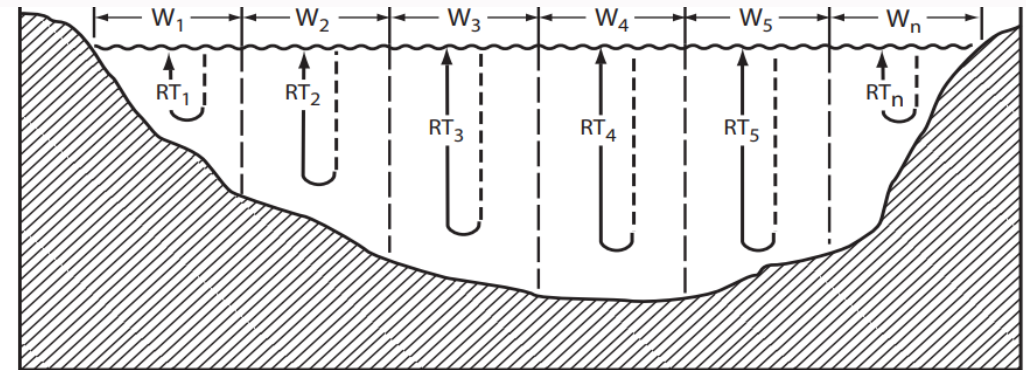
- During sample collection, water pumping through the sieve stack was timed to obtain total sample volumes of 40 gallons ( $\approx$  150 liters) at each site





# Collection Protocol

- The submerged stainless-steel pump was moved across the stream, throughout the water column depths and flow conditions, to capture samples representative of the entire cross-section of the stream
- A blank sample was collected by pumping approximately 5 gallons of UltraPure reagent water from a 5-gallon unlined metal bucket



Source: U.S. Geologic Survey's Collection of Water Samples, Section 4.1.3.A, Isokinetic, Depth-Integrated Sampling Methods at Flowing-Water; Available online at: [https://pubs.usgs.gov/twri/twri9a4/twri9a4\\_Chap4\\_v2.pdf](https://pubs.usgs.gov/twri/twri9a4/twri9a4_Chap4_v2.pdf).

# Collection Protocol

- After the sample volume was collected, both sieves were rinsed into a 1-liter, wide-mouth, amber glass bottle using UltraPure water in the field



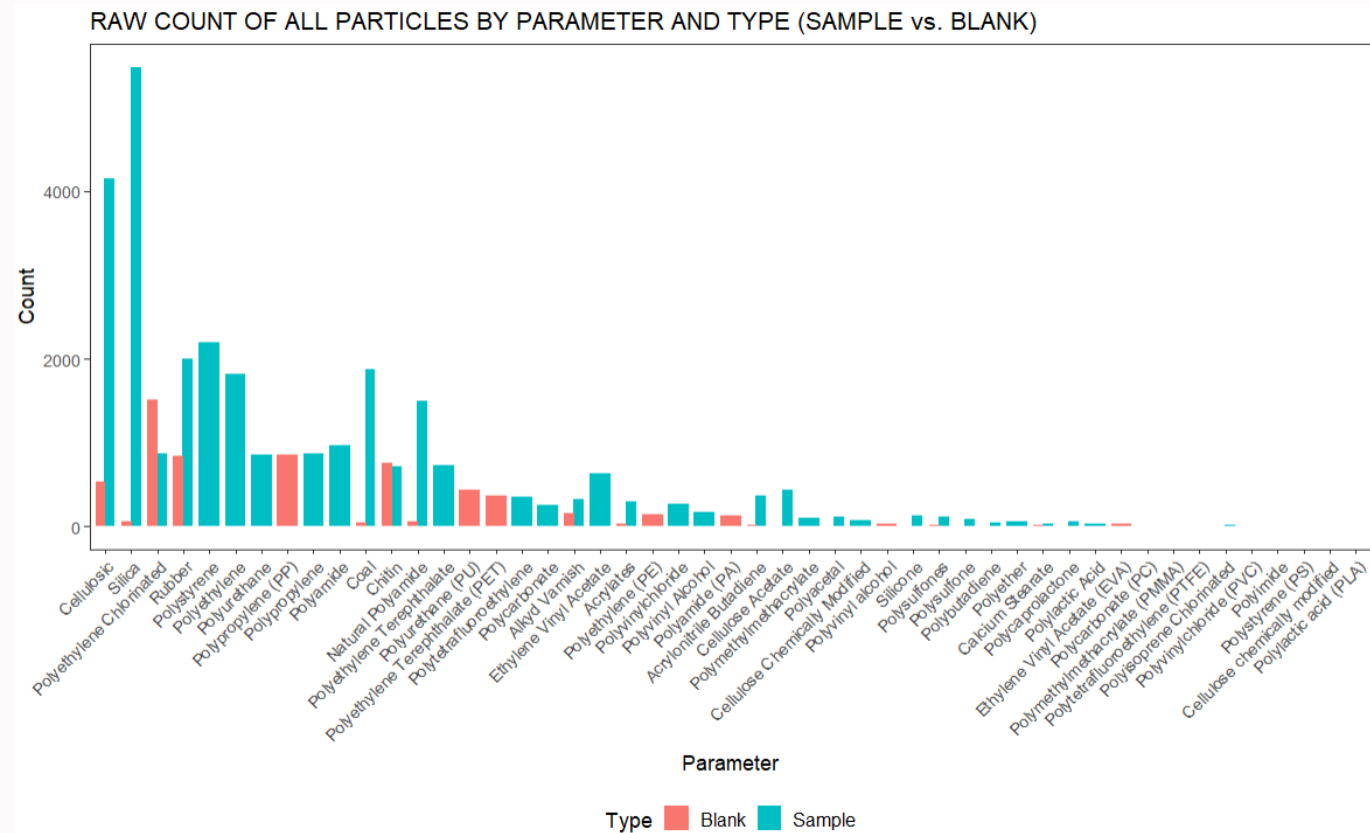


# Collections & Analysis

- In 2025, collected 21 MP samples and blanks at 6 Stations
- Field blanks collected used UltraPure water, stored (up to 48 hours) in an unlined, metal, 5-gallon bucket
- Each sample separated into two fractions:
  - 20  $\mu\text{m}$  – 500  $\mu\text{m}$ : analyzed in 2025 at Penn State's Energy and Environmental Sustainability Laboratories (EESL) through LDIR
  - 500  $\mu\text{m}$  – 3 mm: to be analyzed in 2026 at EESL through Pyrolysis GC-MS

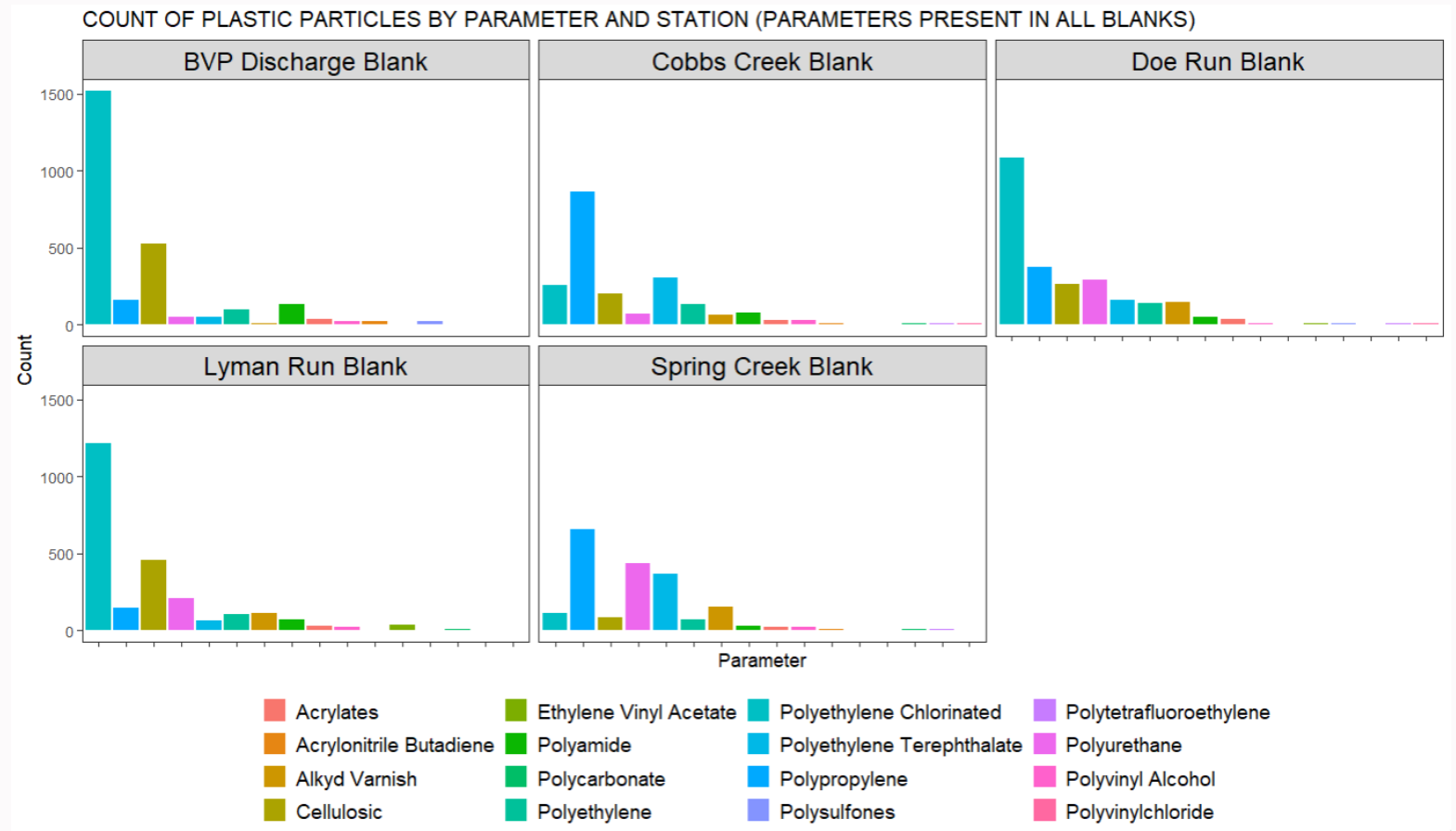
# Results: Overall Raw Counts

- 35 parameters across all samples
- Up to 16,200 particles per sample
- Field blanks were contaminated – protocol needs refinement



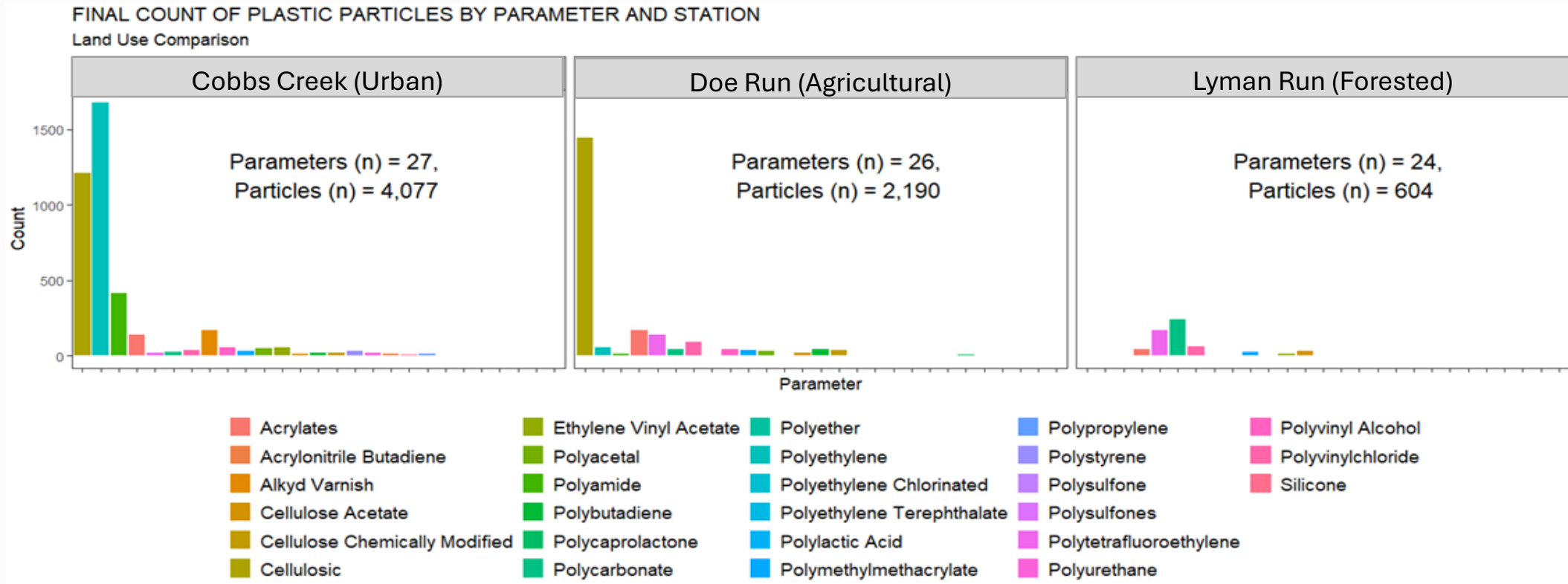
# Blank Contaminants

- 16 *plastic* parameters in all blanks





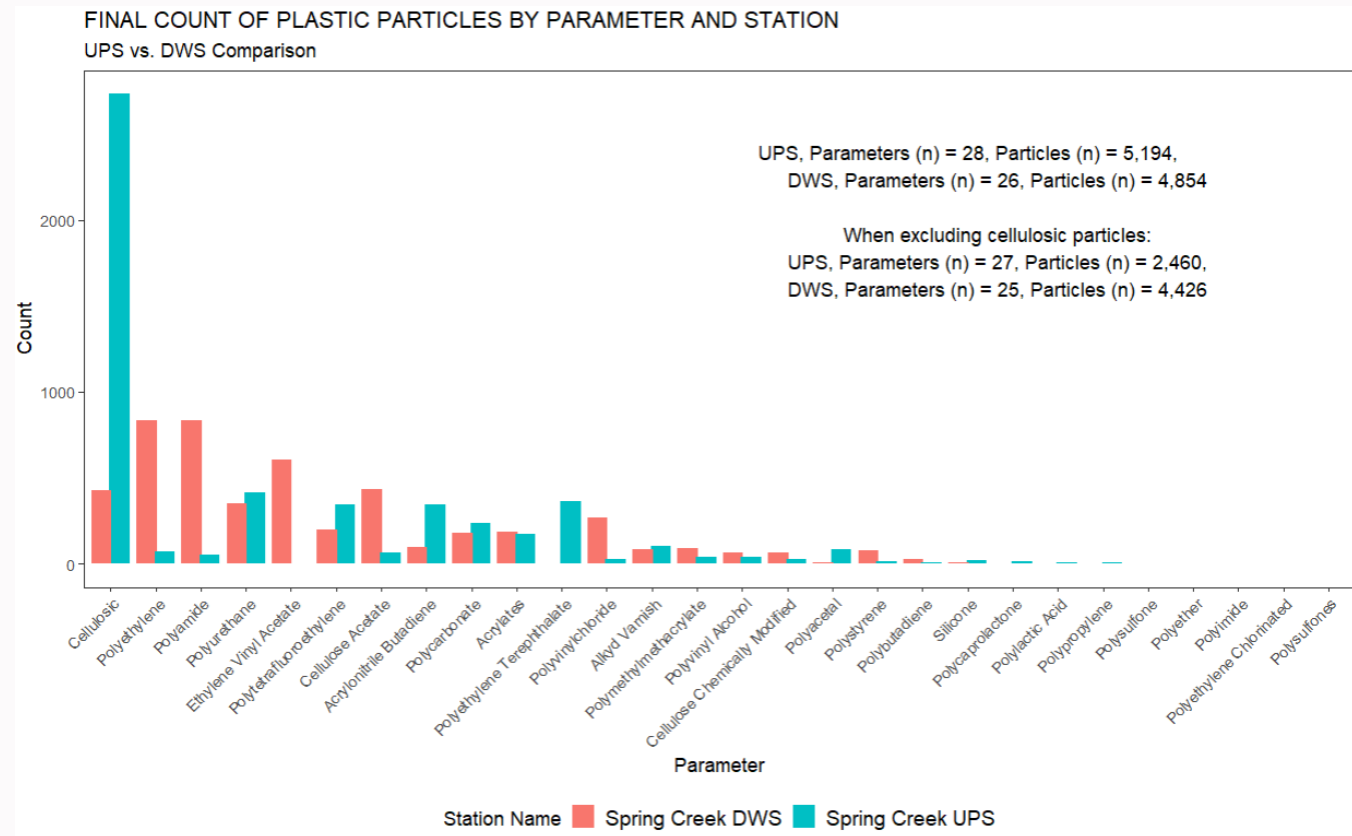
# Results: Land Use Comparison





# Longitudinal Comparison

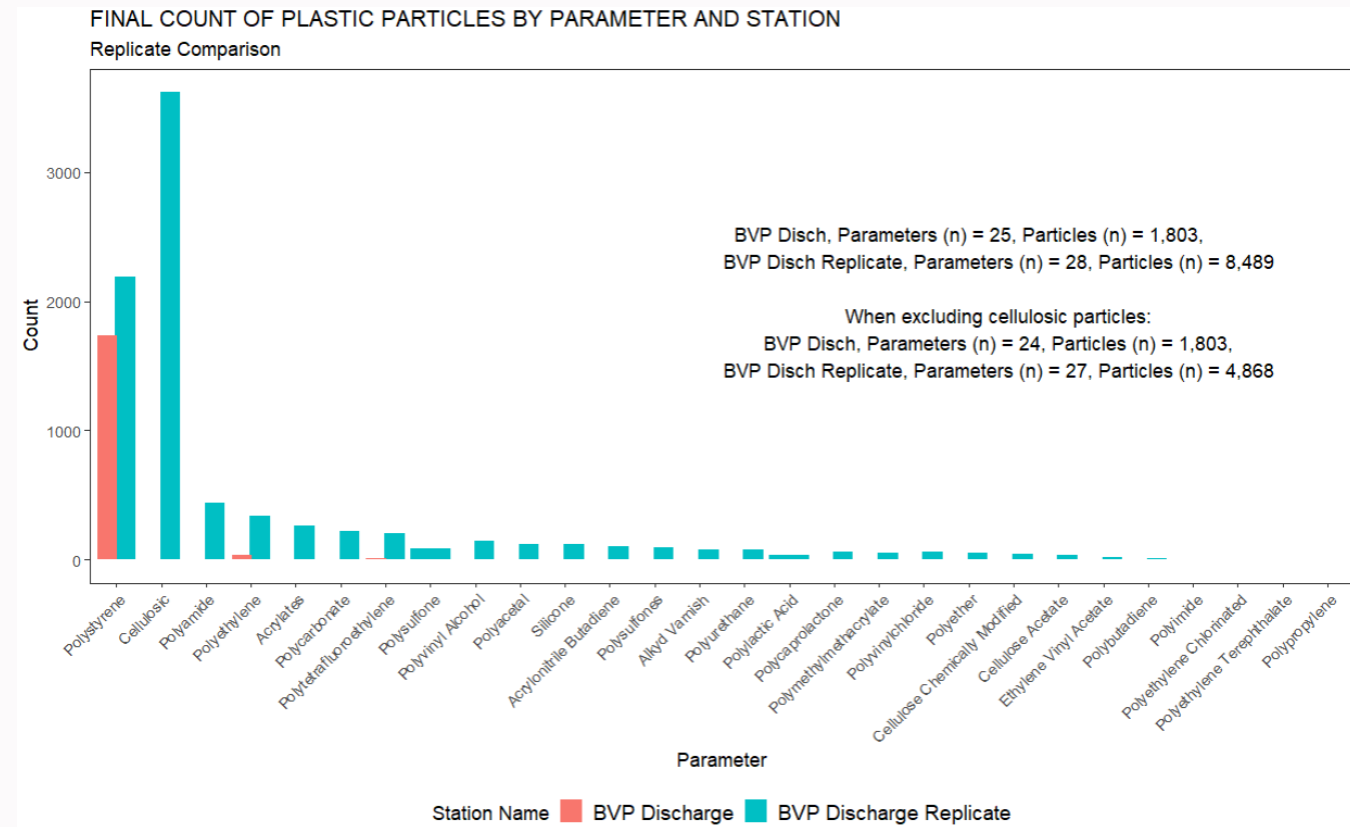
- Upstream vs. downstream





# Replicate Samples

- Sampled at a known discharger of microplastics





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# Next Steps

- Identify source(s) of contamination
- Refine, draft, publish collection protocol
- Conduct additional sampling in 2026



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# Get in Touch

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