



Black Brook, White Bridge Rd



Great Swamp Watershed Association

Protecting the waters of the Passaic River region, from source to sea.



Great Swamp
Watershed Association

2019 Water Quality Report Card

Keeping our waters clean
for everyone

Sandra LaVigne
Director of Water Quality Programs

What GSWA Does

Advocacy

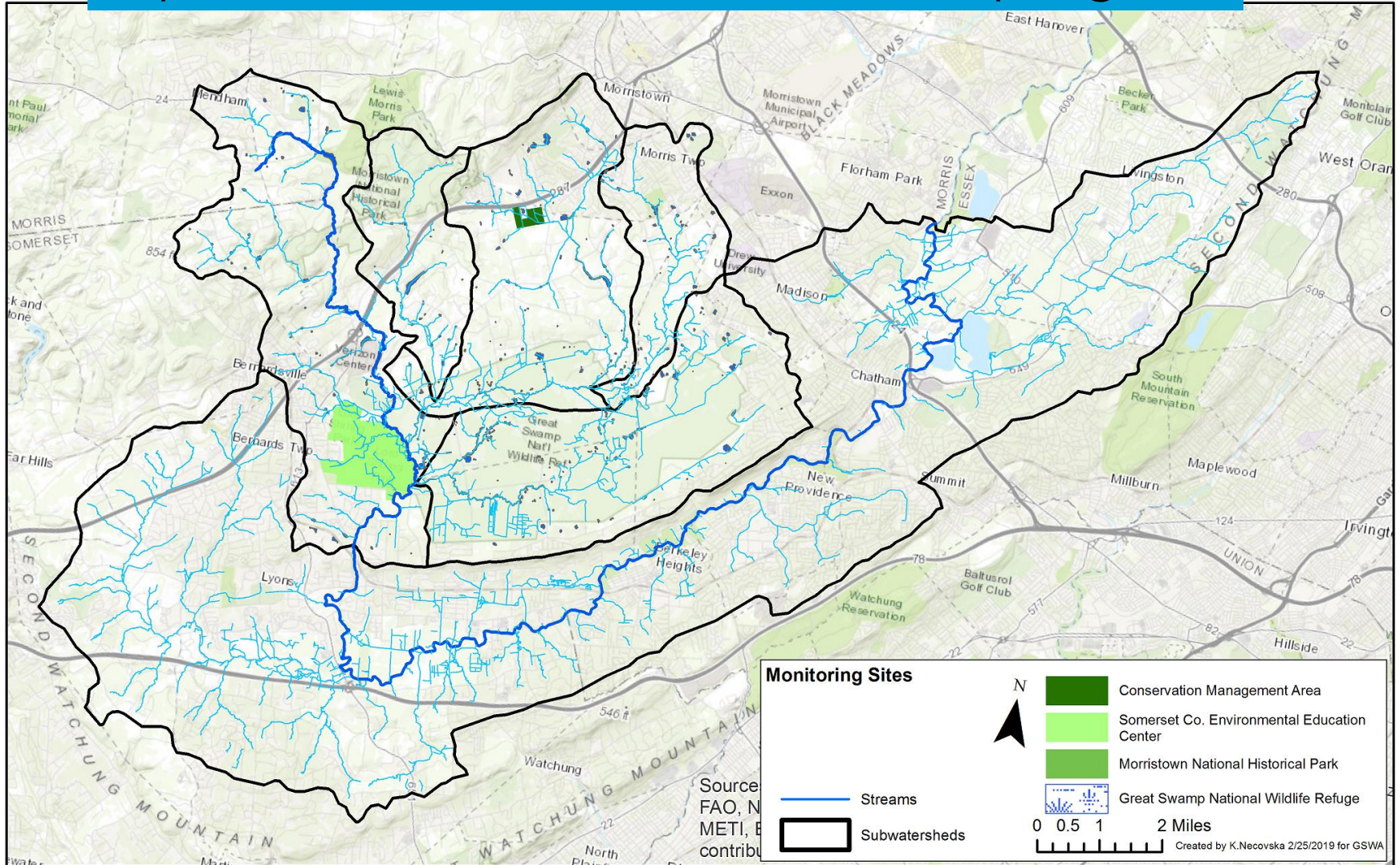
- Preserving open space
- Advocating for smart development
- Helping protect the waters of the Passaic River

Under pinned with Water Quality

- Visual Assessments
- *E. coli*
- Macroinvertebrate
- Chemical Monitoring



Water Quality – Expanded 2017 - 2019 GSWA Sampling



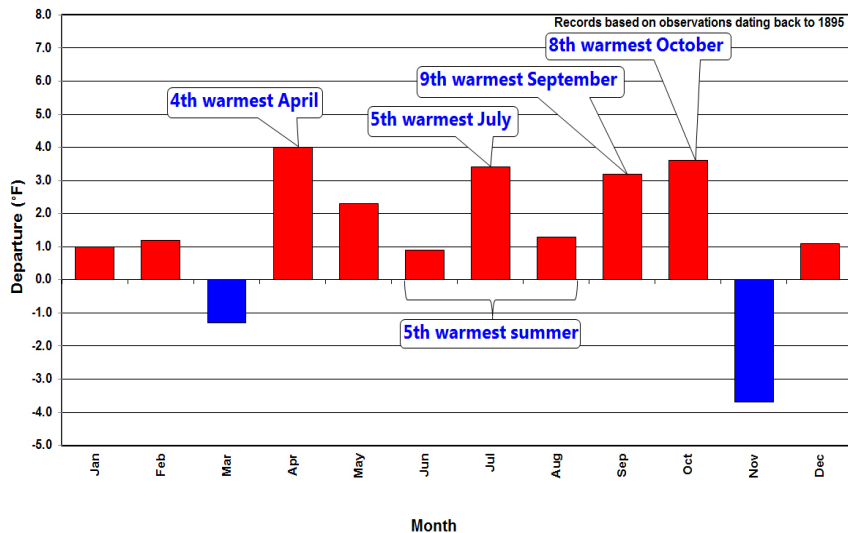
2019 Climate Effects

Rutgers State Office of Climatology Monthly Departures

Temperature

NJ Monthly Temperature Departures (January 2019 – December 2019)

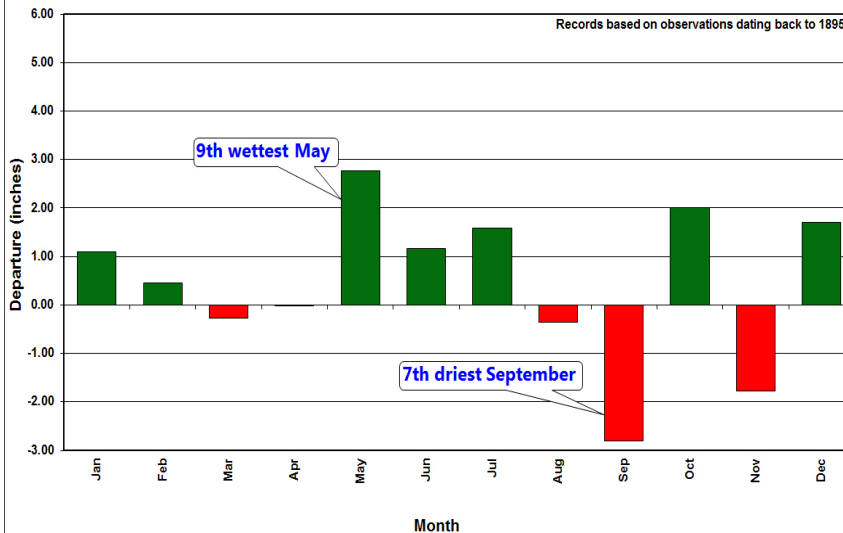
Departures calculated from differences between observed monthly temperatures and 1981-2010 monthly averages



Precipitation

NJ Monthly Precipitation Departures (January 2019 – December 2019)

Departures calculated from differences between observed monthly precipitation and 1981-2010 monthly averages



- Chemical Monitoring
 - 4 times a year
 - Handheld meters
 - Lab analysis
- Visual Assessments
 - NJ DEP protocols
 - Spring and Fall
 - 22 sites
- Bacteria Monitoring
 - 21 sites
 - Five consecutive weeks July/Aug
- Macroinvertebrate Sampling
 - 12 sites
- Microplastic Sampling
 - 15 sites

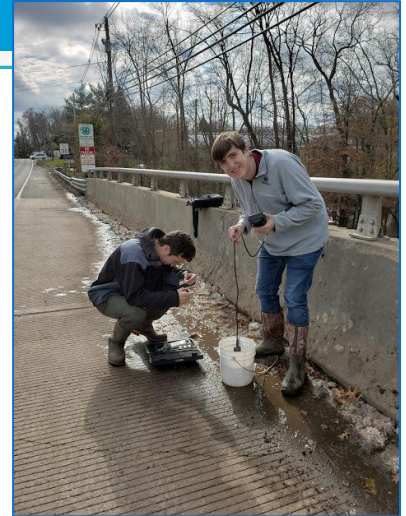
2019 Water Quality Monitoring

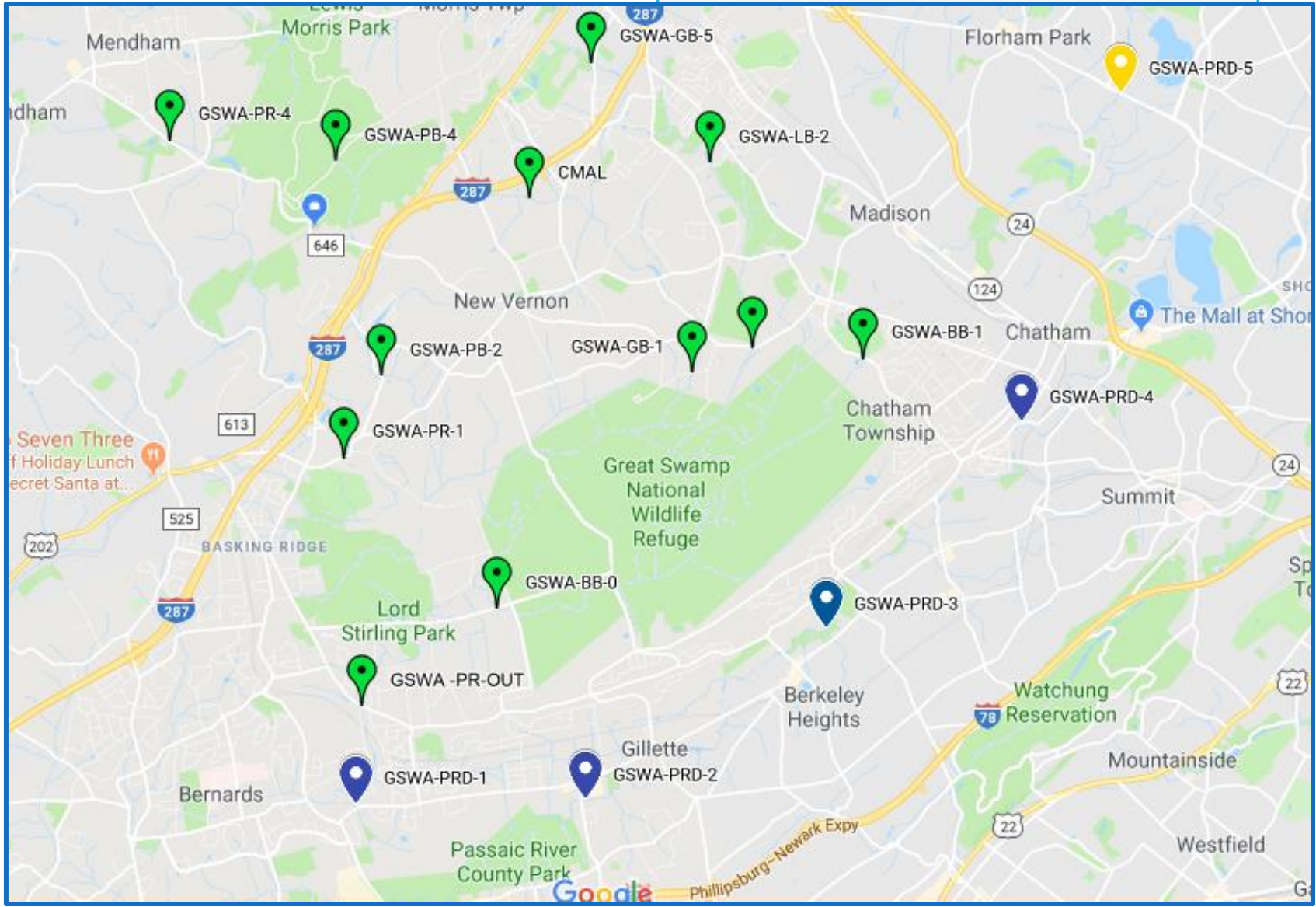
Overview of parameters

Chemical Parameters

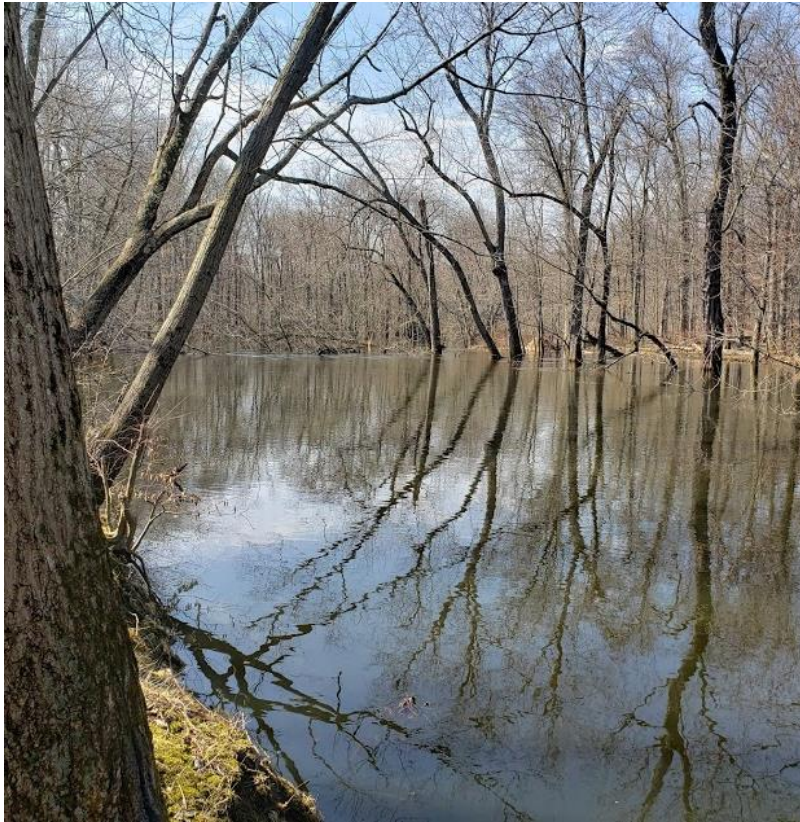
- pH
- Temperature
- Dissolved Oxygen
- Flow
- Nitrogen
 - Nitrate
 - Nitrite
 - Total Kjeldahl Nitrogen
 - Ammonia
- Phosphorus
 - Total Phosphorus
 - Soluble Reactive Phosphate

- Road Salt
 - Total Dissolved Solids
 - Sodium
 - Chloride
 - Conductivity
- Water Clarity
 - Turbidity
 - Total Suspended Solids





Chemical Findings in 2019



- Nutrient levels elevated during dry periods
 - Passaic River below Millington gorge significant impacts moving downstream
- Dissolved oxygen impacted by warmer drier climate
- Road salts have seen a decrease overall
 - Loantaka Brook- elevated salt numbers

Visual Assessments

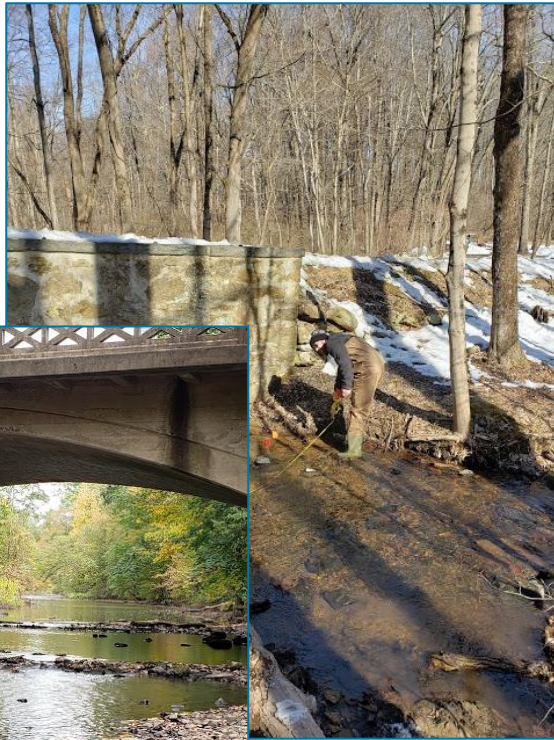
- Twice a year
 - Spring and Fall
- Stream Team Citizen Scientists
- Now offering self paced training on our web site
 - Parts 1 and 2
 - available
 - Part 3 and Self Quiz –
 - Coming soon

Did you ever wonder how healthy the stream is that you like to walk along?

- Welcome to **Part 1** of GSWA's Stream Assessment Training Program
- Each part of the Assessment Program will cover a section of the NJDEP's Habitat Assessment for High Gradient Streams – the form to follow can be downloaded [here](#).



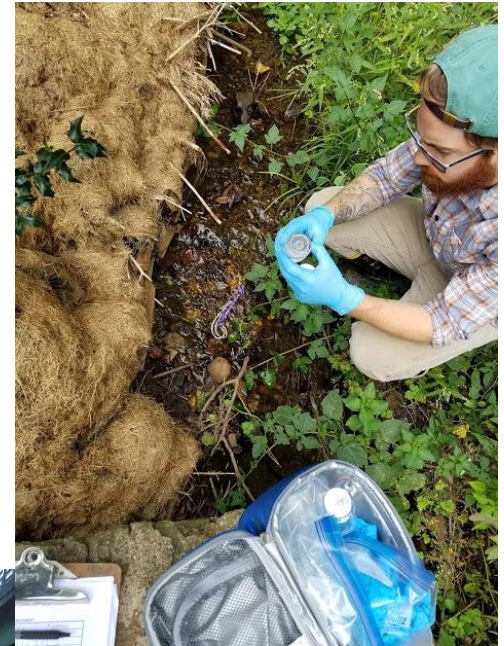
Visual Assessments 2019



- Wet weather and flooding in spring
- Increased erosion
 - Primrose Brook
 - Loantaka Brook
 - Great Brook
- Low water levels in the fall
 - Increased algae growth – Black Brook

E. Coli bacteria

- Indicator of fecal pollution
- Health implications
- Monitor sites watershed wide once yearly in summer over 5 weeks
- Sites selected represent areas where people or pets are likely to be in contact with water
- 2018 and 2019
Partnered with NJ DEP to collect samples in expanded areas along the Passaic





2019 Bacteria Results

- GSWA data
 - Weather had significant impact
 - Lower overall numbers
 - Third week significant rainfall
 - Spring Garden Brook
 - Follow up sampling for elevated numbers
- NJDEP Data
 - Continued joint sampling
 - Results pending

Results for Macroinvertebrates

- Overall averages went up
- Loantaka Brook
 - Significant decrease
- Silver Brook
 - Preliminary sampling
 - Diversity low



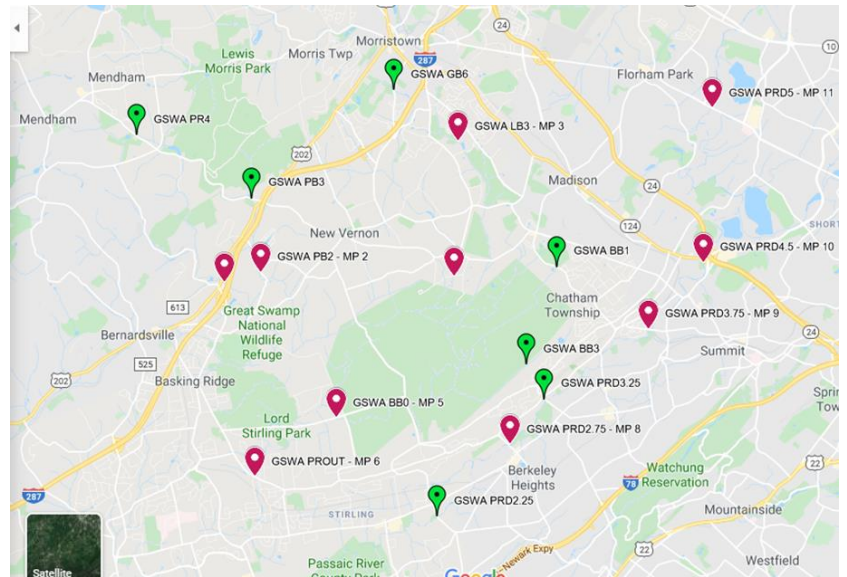
2019 Microplastics Pilot Study

- Worked with New Jersey City University for more in-depth analysis
 - Fenton Reaction Digestion of Organic Materials
 - Sub-sample – chemically analyzed to determine likely source of plastic
- Total of 17 sites
- Seven new locations (plus the Livingston site)
- Site selected upstream of locations with elevated numbers



2019 Microplastics Pilot Study

- Fewer large particles
- Increase in microfibers
- Low flow conditions
- Stormwater condition sampling postponed



Legislative Outreach

- Worked with Madison, Chatham, Morristown, Berkeley Heights
 - Passed ordinances to reduce single use plastics
 - Environmental Commissions
 - Tabling and community outreach to educate the public
 - Working with high school students



Moving Forward

- Continued downstream expansion
- Work with communities throughout the region on water quality issues



- Promote green infrastructure and smart development
- Protect and improve the waters all along the Passaic River



The 2018 water quality program was funded in part by a generous grants from

- **The Watershed Institute**
- **The Leavens Foundation**
- **Summit Area Public Foundation**
 - **Allergan Foundation**
 - **FirstEnergy Foundation**

Great Swamp Watershed Association would also like to sincerely thank our members, corporations, and foundation supporters whose generous contributions helped fund our water quality monitoring programs throughout 2019. It is the support of GSWA members that makes the work we do possible.

Thank you!



- To GSWA staff
- To Stream Team Volunteers
- To generous donors



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