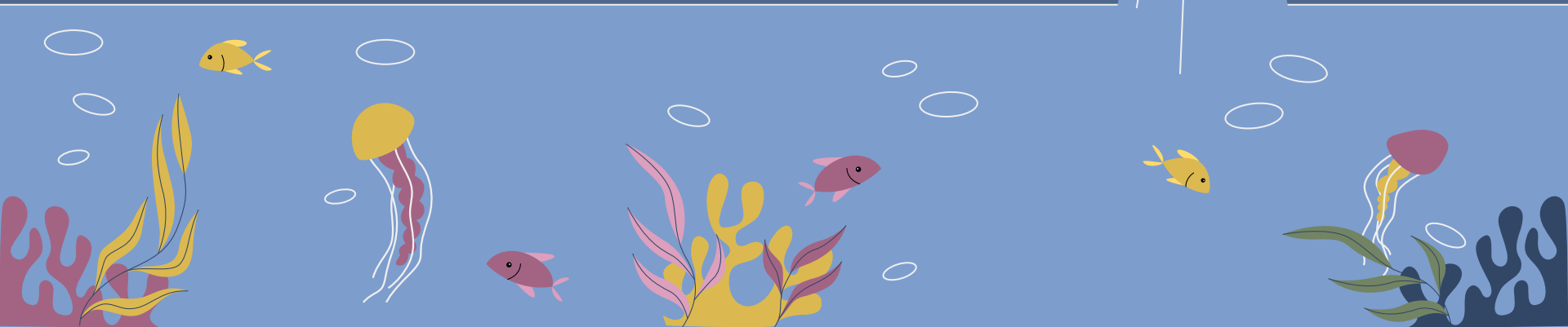
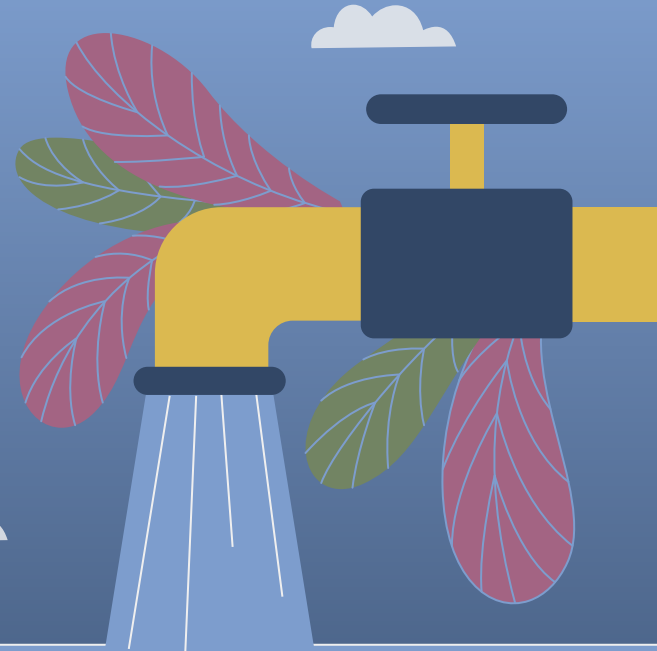


Action Plan for Verona's Water Quality

Cece Manis
VEC Junior Commissioner



Current State:

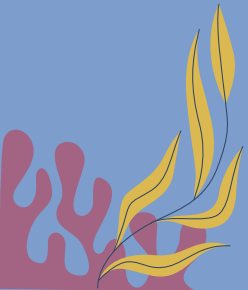


The Township of Verona has been working on removing PFAS from the Linn Drive and Fairview Avenue wells.

Water bills for Verona citizens are rising.

What else is of concern?

Source: Verona Township Council Meeting Minutes



The Peckman River

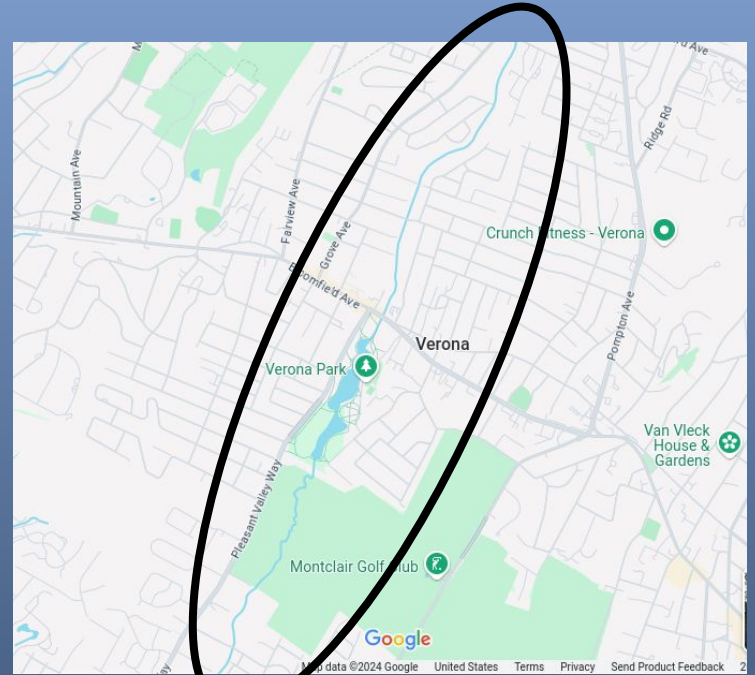
- The Peckman River is a tributary of the Passaic River.
- Some believe the River to be named after the Lenape word for cranberry, "pakim," but it is most likely the surname of a local English settler.
- It runs between the First and Second Watchung mountains.
- Its source is located in the Eagle Rock Reservation.

Source: Riverquest I: The Mighty Peckman, Chris Ehrich



The Peckman River

- This River starts in West Orange. It runs through northeastern New Jersey for 8.5 miles and converges with the Passaic River in Woodland Park.
- Two notable locations along in the river are the Devil's Hole in Cedar Grove and Verona Lake.



The area inside the eclipse shows where the Peckman River flows through Verona.

Source: Google Maps

Source: Riverquest I: The Mighty Peckman, Chris Ehrich

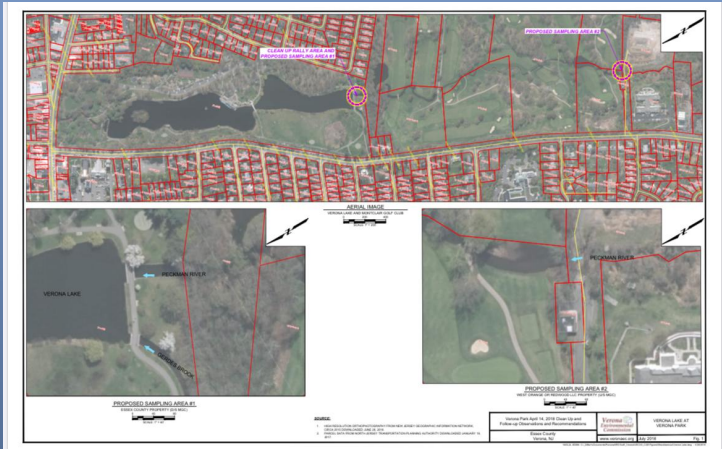
Sampling Location

- The samples were collected between Park Place and Derwent Avenue.
- The River flows below ground level, making it accessible to runoff.
- There was no rainfall the week preceding the sample collection.



The VEC's History with the Peckman

- The Verona Environmental Commission has drafted and sent clean-up recommendations to the Verona Town Council and the Office of Essex County
- The VEC has held cleanup events near the Peckman
- The VEC has served land around the Peckman River to note the loss of river banks
- Verona has a Stormwater Ordinance that protects runoff from all impervious surfaces
 - The VEC works to make sure this Stormwater Ordinance is being honored when new infrastructure is added to Verona



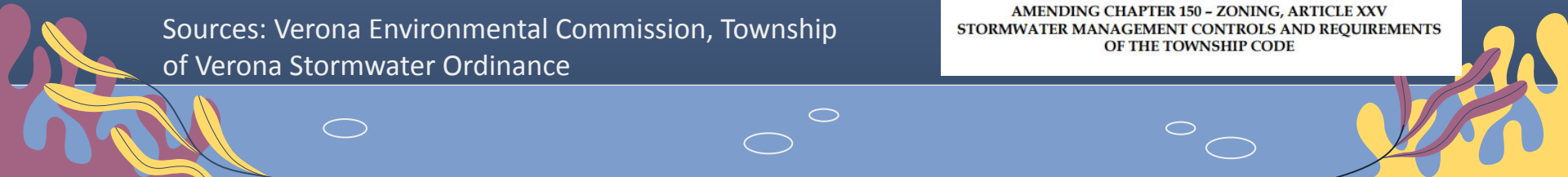
Source: Verona Environmental Commission, Verona Lake Letter

TOWNSHIP OF VERONA
COUNTY OF ESSEX, STATE OF NEW JERSEY

ORDINANCE No. 2024-35

AMENDING CHAPTER 150 - ZONING, ARTICLE XXV
STORMWATER MANAGEMENT CONTROLS AND REQUIREMENTS
OF THE TOWNSHIP CODE

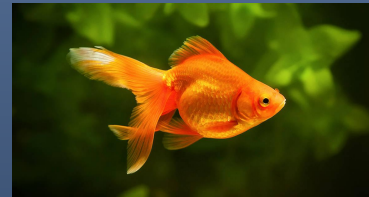
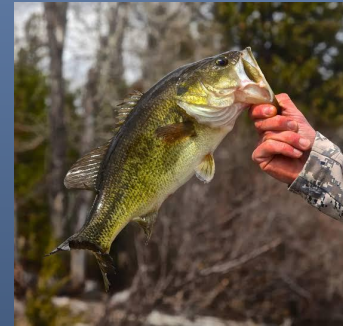
Sources: Verona Environmental Commission, Township of Verona Stormwater Ordinance



What Creatures Are Found in the Peckman?

To better understand the River, these are aquatic creatures that call these waters home.

- Creek Chub (*Semotilus atromaculatus*)
- Blacknose Dace (*Rhinichthys atratulus*)
- Largemouth Bass (*Micropterus salmoides*)
- Brown Bullhead (*Ameiurus nebulosus*)
- Goldfish (*Carassius auratus*)



Source: NJ.Gov, FBI118-R4 Peckman River

Source: Google Pictures

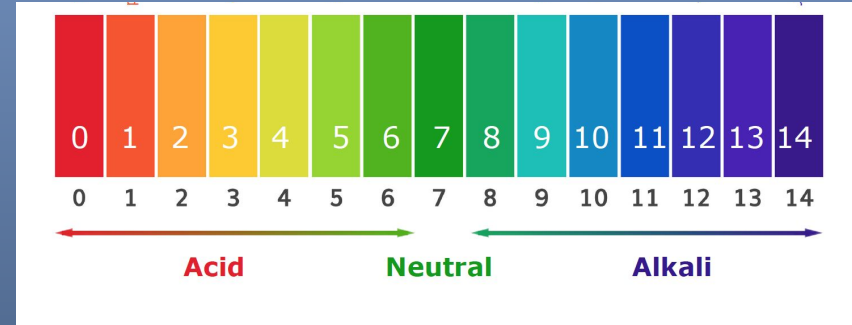
Key Data Points

- 1) The pH
- 2) Phosphate levels
- 3) Nitrate levels



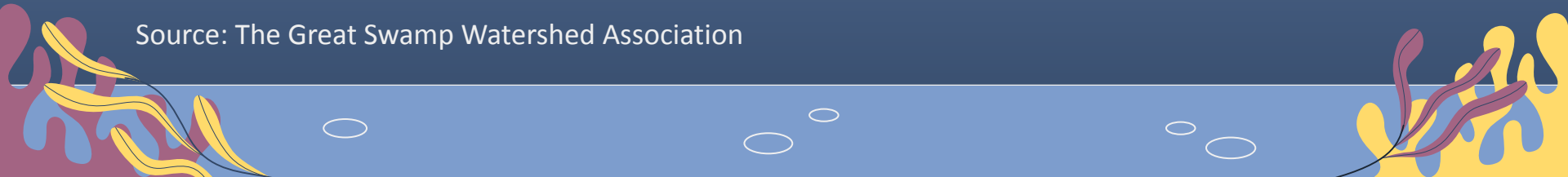
pH

- pH measures how acidic or basic a body of water is
- The pH scale ranges from 1-14
- In streams, aquatic animals prefer a pH range of 6.5-8.0
- pH might be affected by the environment the water runs through



Source: The Learning Hub

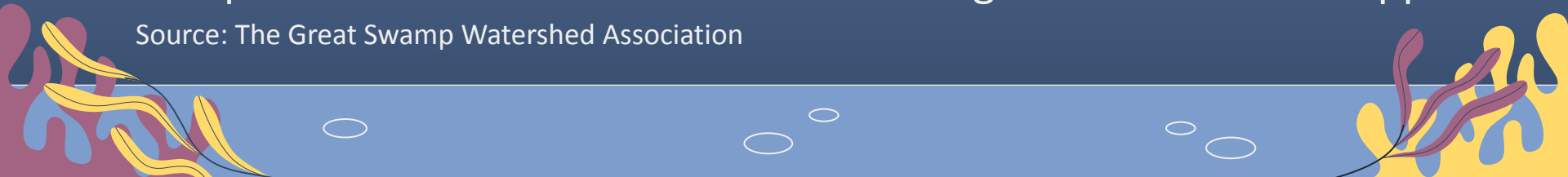
Source: The Great Swamp Watershed Association



Phosphate

- Phosphorus is a nutrient used for plant growth
- It is found in fertilizers, cleaning detergents and soaps
- Phosphorus can be found naturally, but too much can lead to over-fertilization of a land
- When it rains or snows, phosphorus can be found in water runoff, where it ends up in waterways
- High phosphorus levels lead to eutrophication
- Eutrophication can lead to less oxygen in waterways
- Phosphate levels found in rivers should range from 0.08 to 0.10 ppm

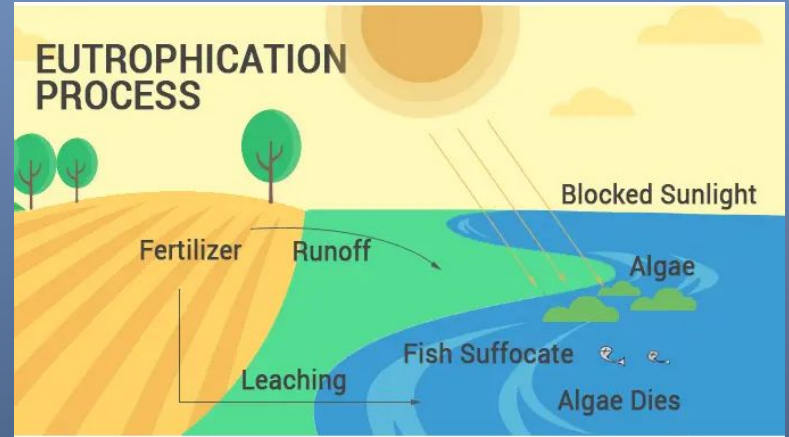
Source: The Great Swamp Watershed Association



Nitrate

- Nitrogen is a nutrient that encourages plant growth
- It is found in fertilizers, animal/human waste, and decomposing organic matter
- It leads to eutrophication of waterways
- A nitrogen reading less than 1.0 ppg is ideal

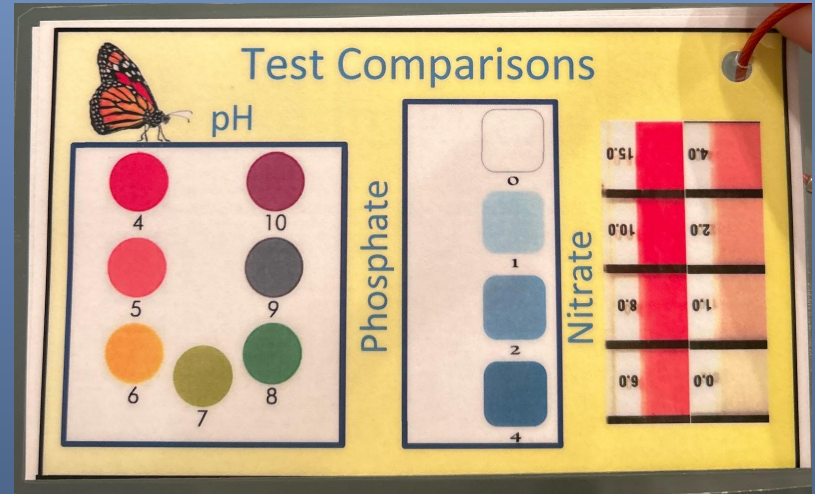
Source: The Great Swamp Watershed Association



Source: Earth How

Steps for Testing

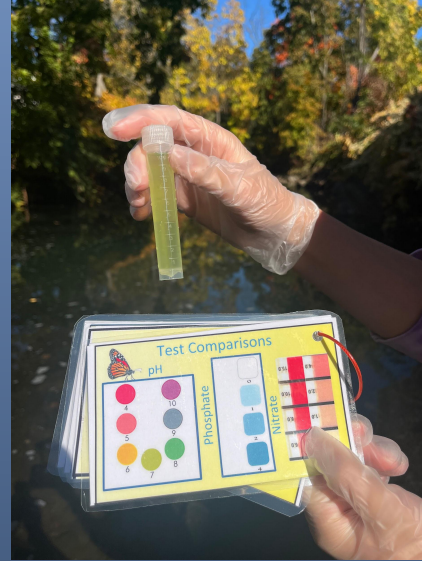
- 1) A test tube was with filled 10 mL of river water
- 2) A chemical tablet was dropped into the test tube
- 3) After five minutes, a color appeared that reflected the River's pH, phosphate, and nitrate levels



Source: The Great Swamp Watershed Association

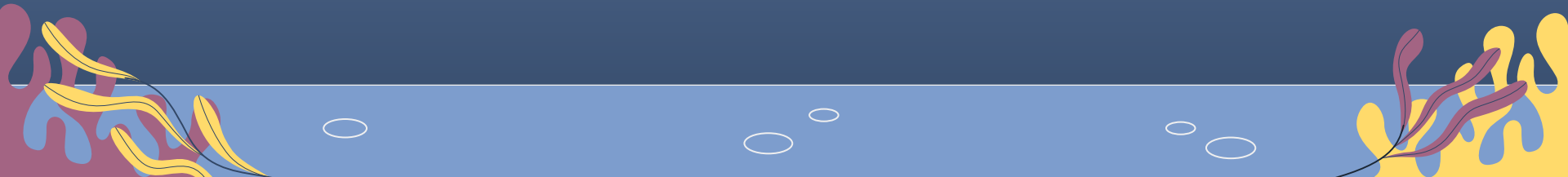
pH Results

- The pH of the water has a pH 7.
- This is a positive result, as an ideal pH is between 6.5-8.



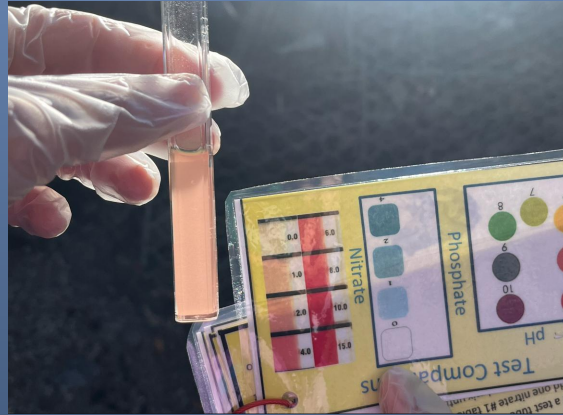
Phosphate Results

- The phosphate of the water was around 1 ppm.
- The ideal range is between 0.08 to 0.10 ppm.



Nitrate Results

- The Peckman River had around 2 ppm.
- The ideal ppm for nitrate is less than 1 ppm.



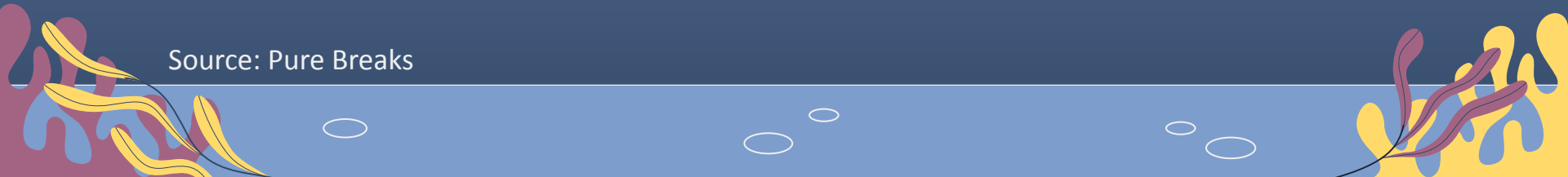
What Does This Mean?

Conclusion: While the pH of the water is optimal, the phosphate and nitrate levels are dangerous. They can lead to an increase of algae blooms and a decrease of organisms living in the river.

What challenges does a river face without organisms living in it?

- 1) Disruption of the Nutrient Cycle: Decomposers help filter leaves and dead plants would build up in the water which stables pH.
- 2) Loss of Water Quality Regulation: Fish can help filter out pollutants found in the water.
- 3) Sediment Accumulation and Changes in Flow: Organisms regulate sediment
- 4) Loss of Biodiversity Interactions: Rivers support ecosystems by providing water, food, and nutrients for surrounding organisms.

Source: Pure Breaks



Possible Solutions for the Town...

- **Reduce the use of fertilizer**
 - This can be done through a new ordinance that might restrict the use of synthetic fertilizers, or encourage a limit on the amount of fertilizer consumed per citizen
- **Monitor the recycling of soaps and detergents**
 - Set up a program or post flyers that encourage residents to rinse out their soap and detergent bottles after usage, and then responsibly dispose of them at the recycling center on Ozone Avenue
- **Plant buffers along the Verona Lake and the Peckman River**
 - These buffers will help prevent fertilizer runoff from reaching the river



What can YOU do?

- **Research your fertilizers: try to invest in organic fertilizers instead of synthetic fertilizers**
 - Some organic ideas are compost, manure, bone meal and blood meal, seaweed fertilizer, cover crops, biochar, and fish emulsion
- **Make sure your trash ends up in the can**
 - Soaps, detergents, and of course, fertilizers, might have high levels of nitrogen and phosphate. If these items are not disposed of properly, they can end up leaking their toxins into the River
- **Educate others!**
 - Waterways are only going to improve if a majority of Verona citizens are willing to understand and take action



Many Thanks

- Verona Schools and Staff
- Verona Township
- The Great Swamp Watershed Association
- The Environmental Commission

