

Water 101

All about water on Long Island and in our area

Long Island is surrounded by water and there is nearly ubiquitous groundwater on the island.

Since Long Island's only source of usable water is our groundwater, it is important to understand it and how to protect it.

And since groundwater eventually flows to our surface waters, groundwater quality impacts aquatic life as well.



The Water Cycle

Long Island Water

Groundwater/Aquifers

Watersheds

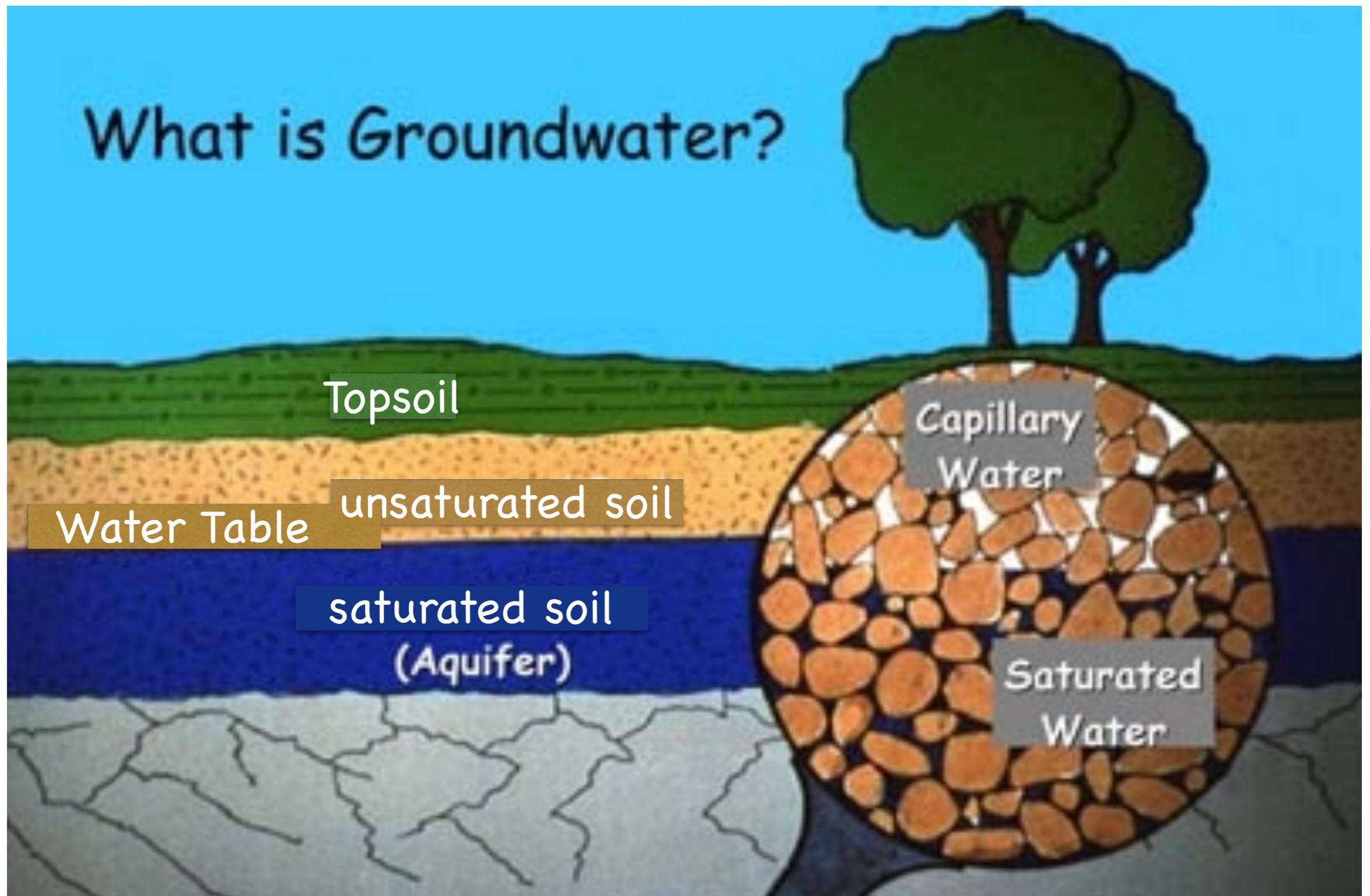
Surface water

Threats to water quality

Water quality protection efforts

What you can do to protect water quality

What is Groundwater?



Groundwater is everywhere.

Watch out! You are standing on some right now.

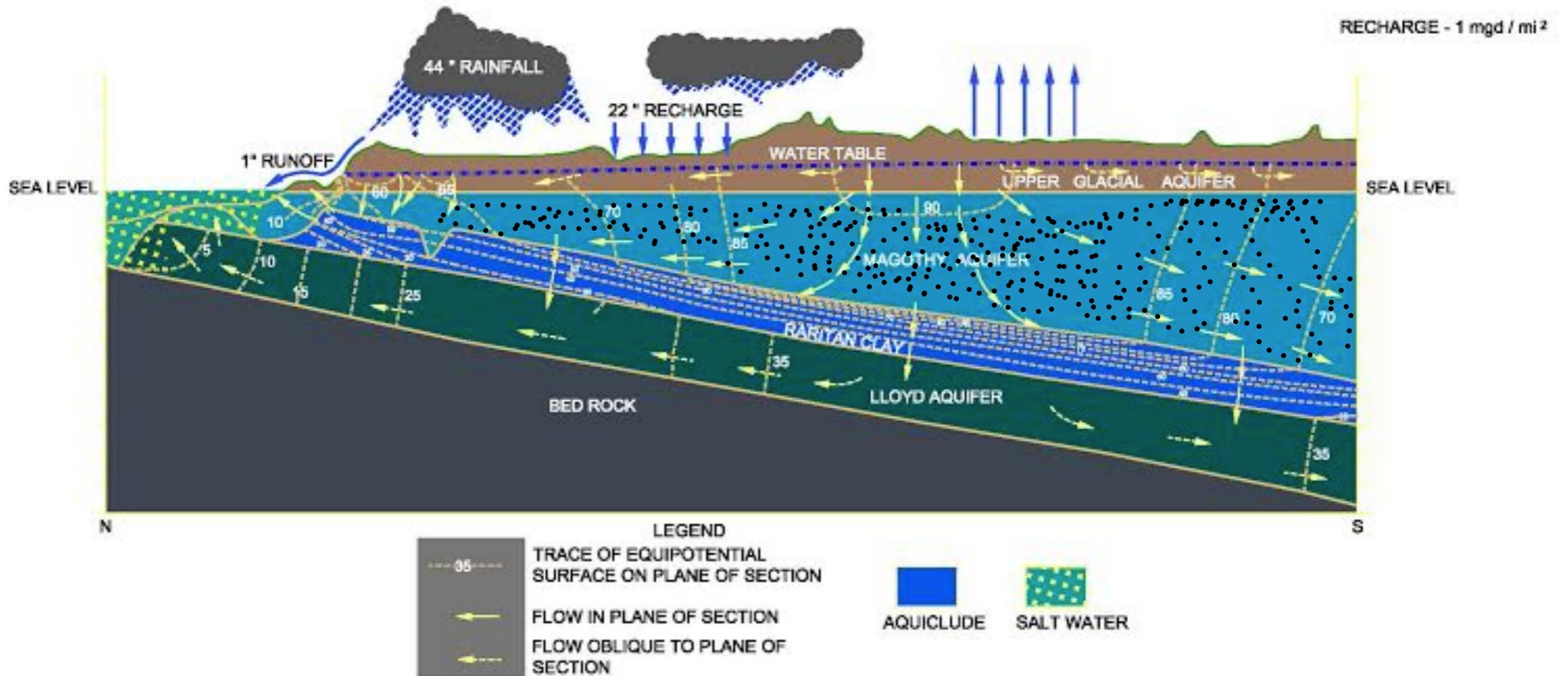
Groundwater/Aquifers

Groundwater is the water present beneath Earth's surface in soil pore spaces.

An unconsolidated deposit is called an aquifer when it can yield a usable quantity of water. Aquifers must be both permeable and porous and include unconsolidated sand and gravel.

The depth at which soil pore spaces become completely saturated with water is called the water table.

On Long Island, everyone lives and works on top of an aquifer.



Long Island Aquifer Map

Groundwater Replenishment

Groundwater is “recharged” back through the ground from precipitation and through on site septic systems. An estimated 85% of all water used in our area returns to groundwater.

About 50% of our annual precipitation or about 22 inches of rainfall/snowpack per year returns to ground water.

In sewerred areas, the treated sewage water is returned to surface water or recharged back to the ground.

Groundwater use on LI

Long Islanders use about 30% more water than the national average (100 gallons/per person/day) at 130 gallons/per person/day.

Fifty to seventy percent of water at residences is used for lawns and gardens.

85% of water that is used is returned to groundwater in our area, which includes water going through septic systems.

Threats to groundwater quality

Dissolved elements in ground water like manganese and iron that are naturally occurring or result from changing water chemistry.

Excessive nitrogen

Dumping of organic compounds (industrial)

Petroleum spills

Groundwater Protection

In Suffolk County, nearly everyone is unsewered and uses an on-site cesspool (Built before the 70s), or a septic system (Built after the 70s).

If your property is on .5 or .25 acres, your contribution of Nitrogen to groundwater shoots up dramatically over time. A large amount of housing in East Quogue is on .25 acres and it is also near the water.

If your property is 1 acre or more, your contribution of Nitrogen to groundwater is pretty low and pretty stable over time.

At 5 acre zoning, fertilizers would contribute more than sanitary and landscaping restrictions are required.

Lower density zoning (1 acre+) protects long-term water quality

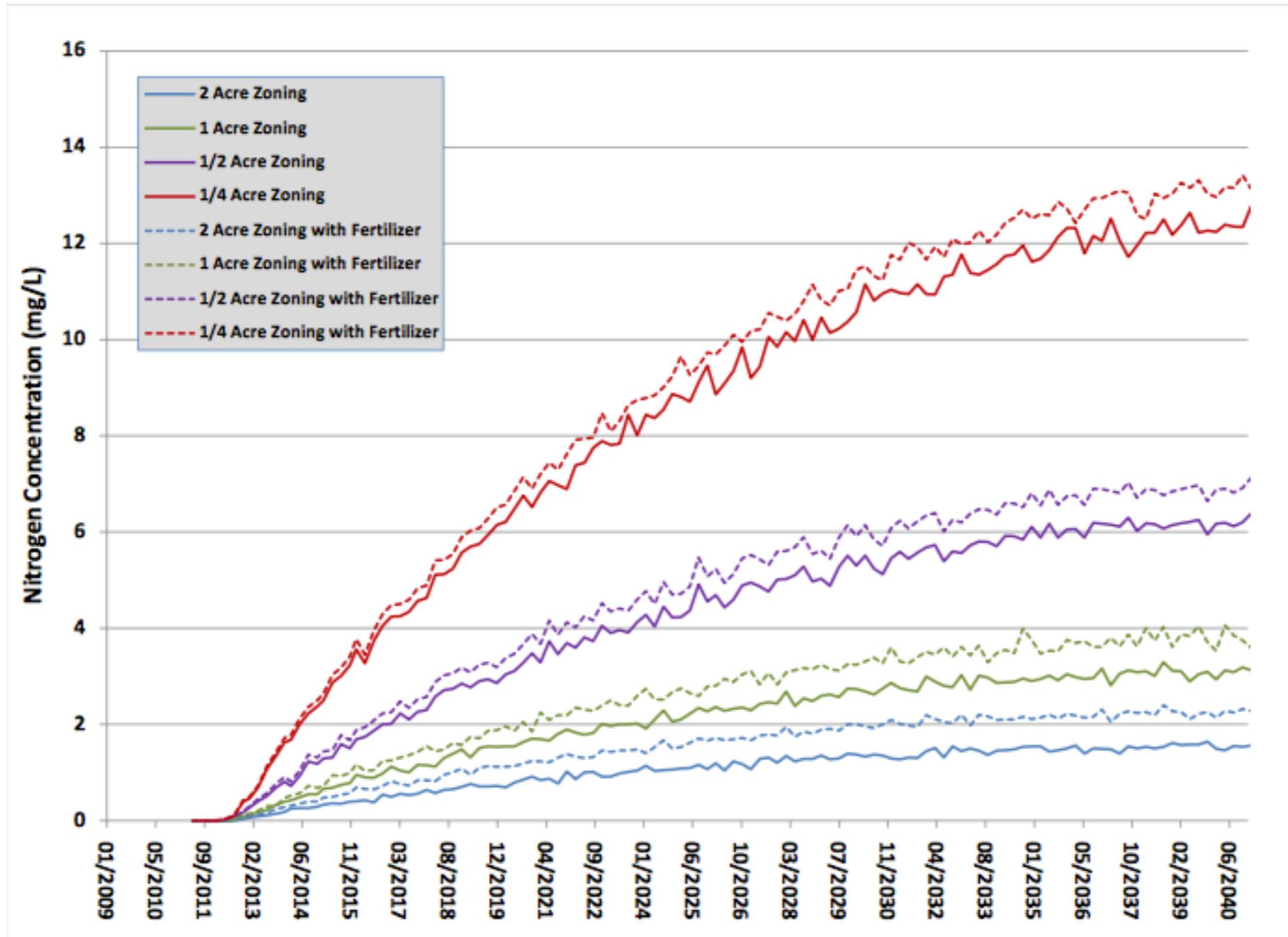


Figure 3-16
Simulated Hypothetical Nitrogen Concentrations at SCWA Country Club Drive Wellfield



Watersheds are areas wherein the groundwater and surface water will eventually flow into, “ending” that part of the cycle.

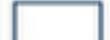
Groundwater is always moving

Groundwater is always moving either down or sideways

In the Weesuck creek watershed, water flows in a southeasterly direction towards Weesuck Creek and Shinnecock Bay, from the Sand mine and farms down in the direction of Lewis Road South.



Legend

-  Weesuck Creek Watershed
-  Hills Property
-  Kracke Property
-  Parlato Property

LOCATION MAP

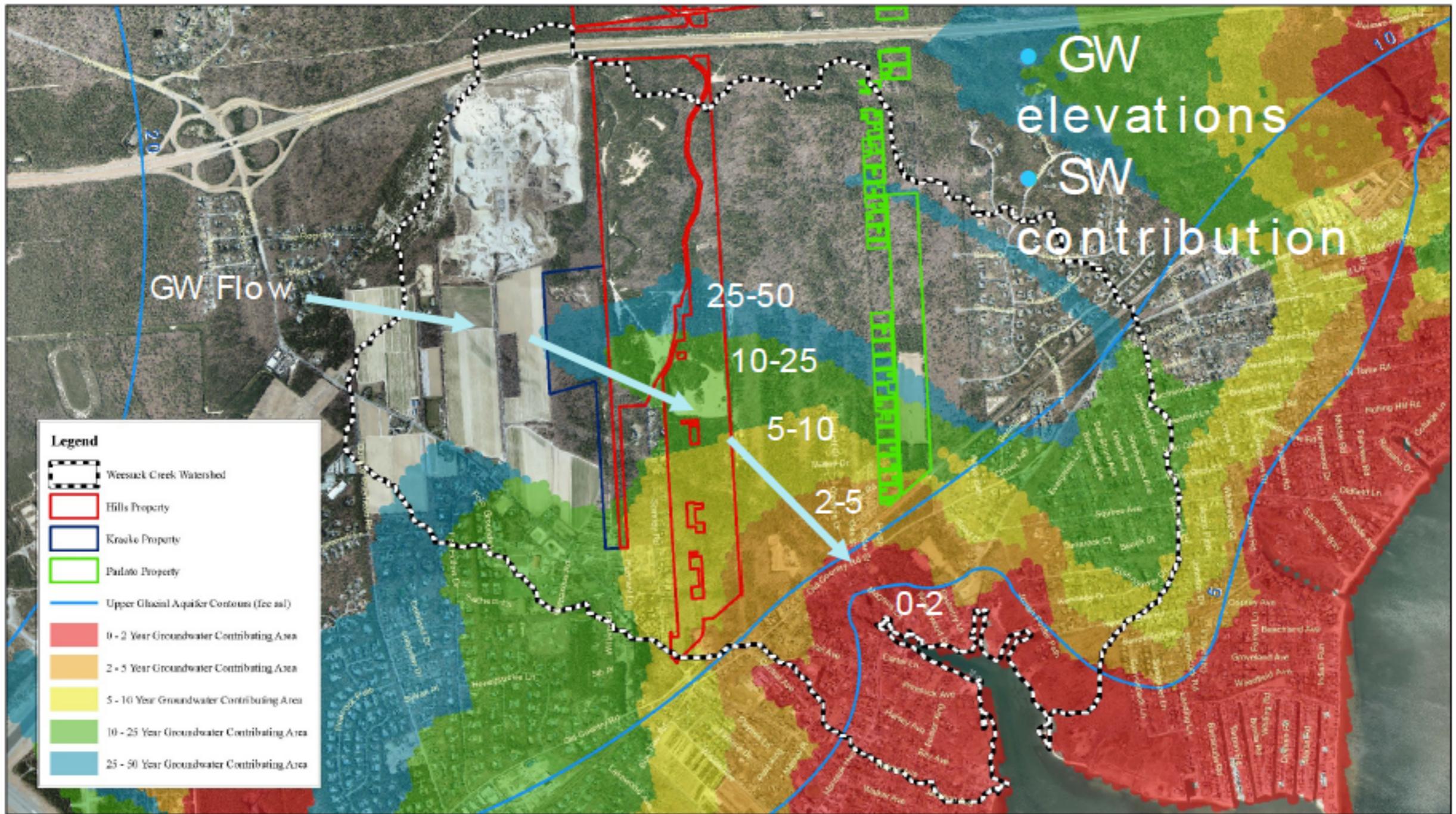
Source: NYSGIS Orthoimagery Program, 2013
 Scale: 1 inch = 1,500 feet

Weesuck Creek

Watershed Assessment



Weesuck Creek watershed



Groundwater flow in the Weesuck Creek watershed

Surface Water

Ponds

Lakes

Rivers/Creeks

Wetlands

Bays and the Ocean

Threats to surface water quality

Excessive nutrient loading from septic systems is estimated to be 70% of the Nitrogen loading problem in area bays

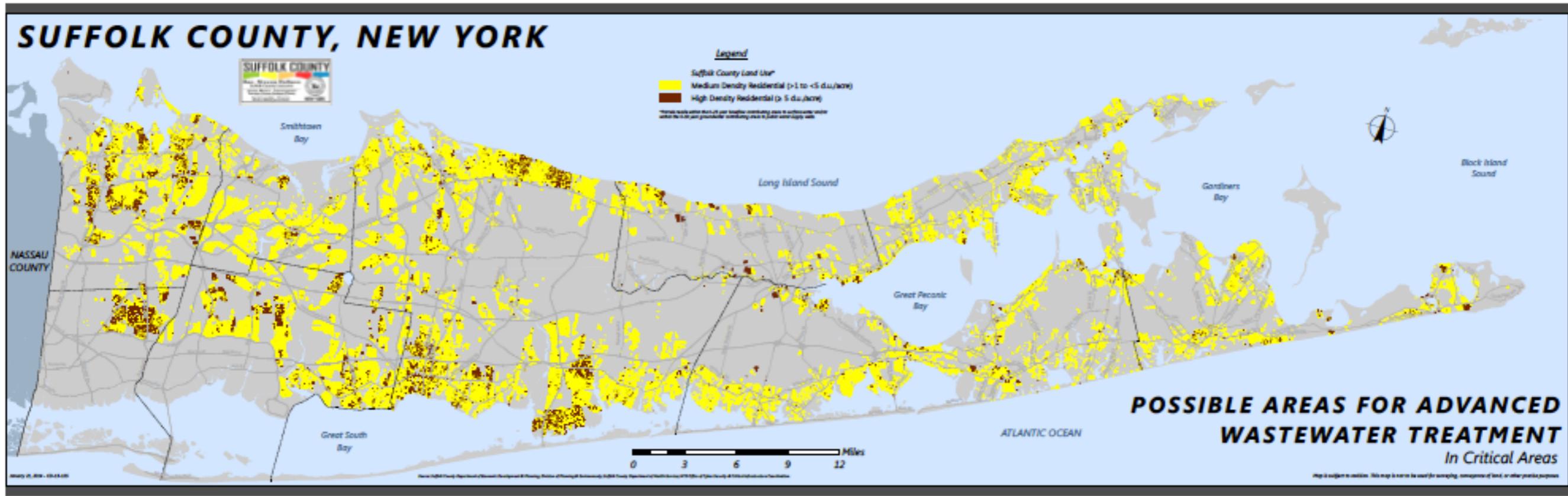
Excessive nutrients grow more algae which reduces sunlight to the bay bottoms killing eel grass.

Eel grass are important parts of aquatic life support

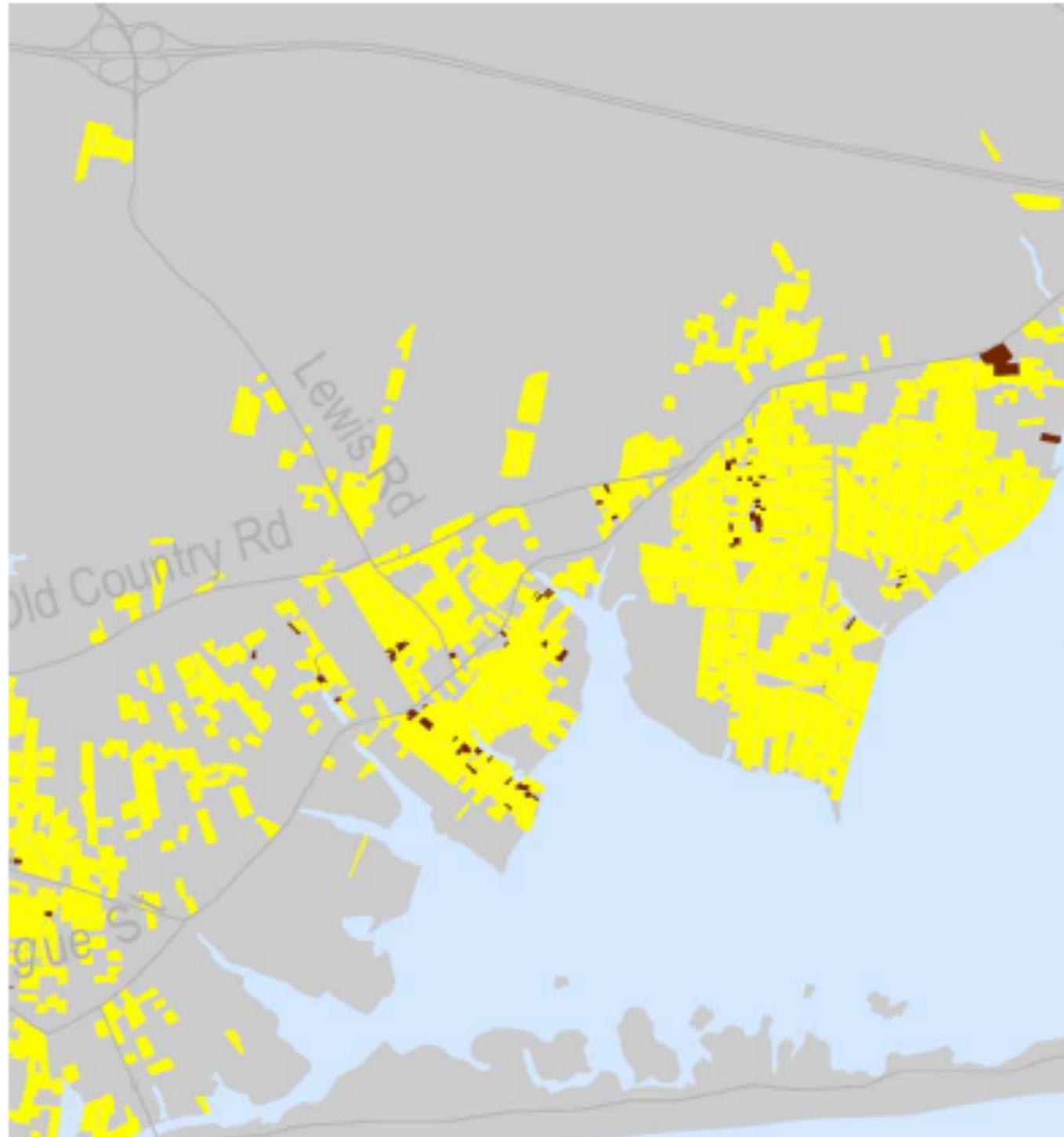
Water Quality Protection Tools

- Sewering
- Advanced septic systems
- Bio-filtration

Sewering targets in Suffolk County



Priority Targets in East Quogue

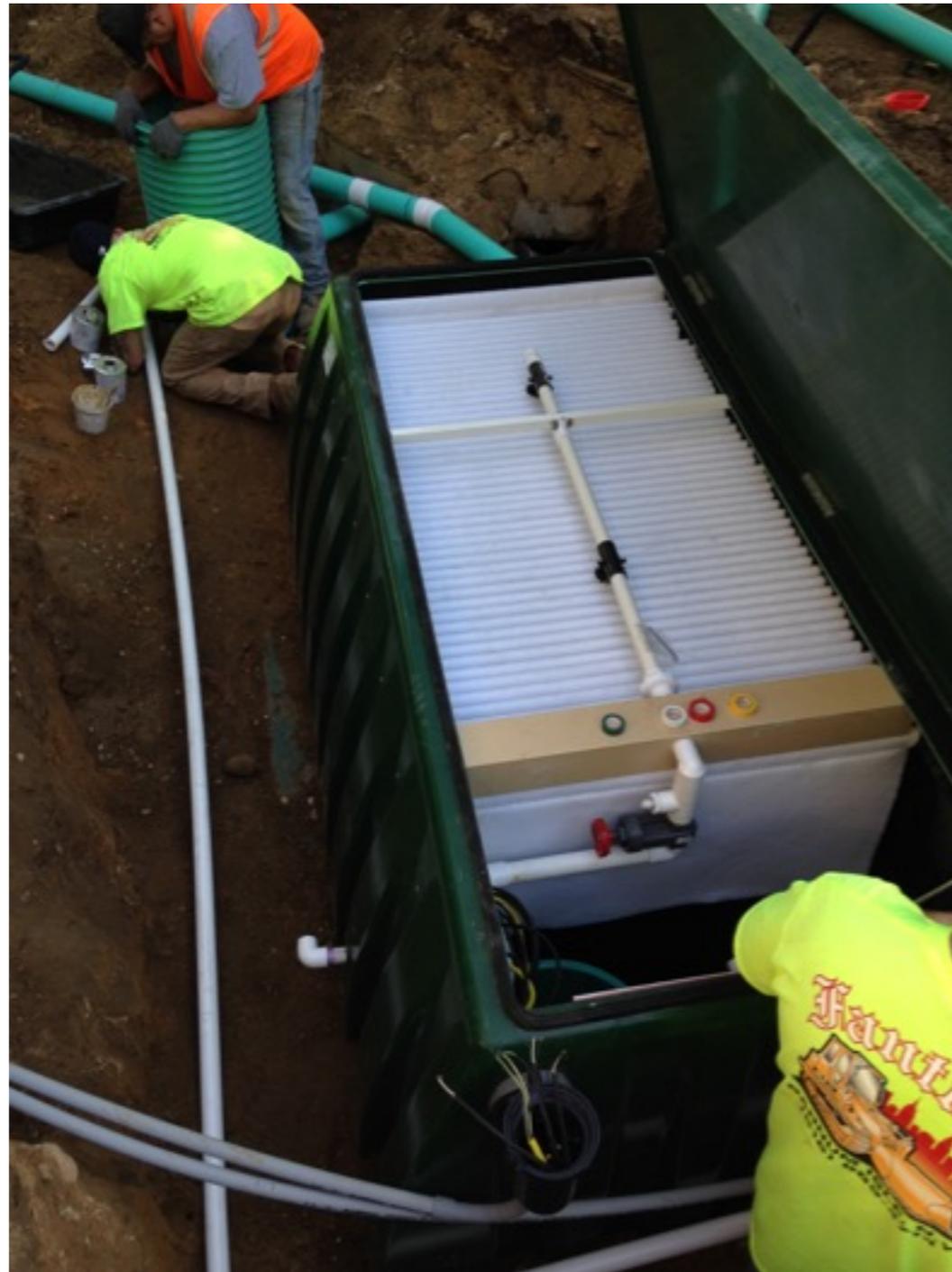


Sewering

- Improves overall water quality
- Current sewerage projects
 - Carlls River
 - Forge River
 - Connetquot River
- Pros and Cons
- What can coastal communities do?



Residential Advanced Treatment System



Advanced Treatment System at private residence



New System at Meschutt



New System at Meschutt

Bio-Filtration

- Using plants to filter water of pollutants before it returns to the ground or the bays
- Rain gardens use deep-rooted perennials to filter and purify water in just 24 hours
- Grass/turf, managed properly

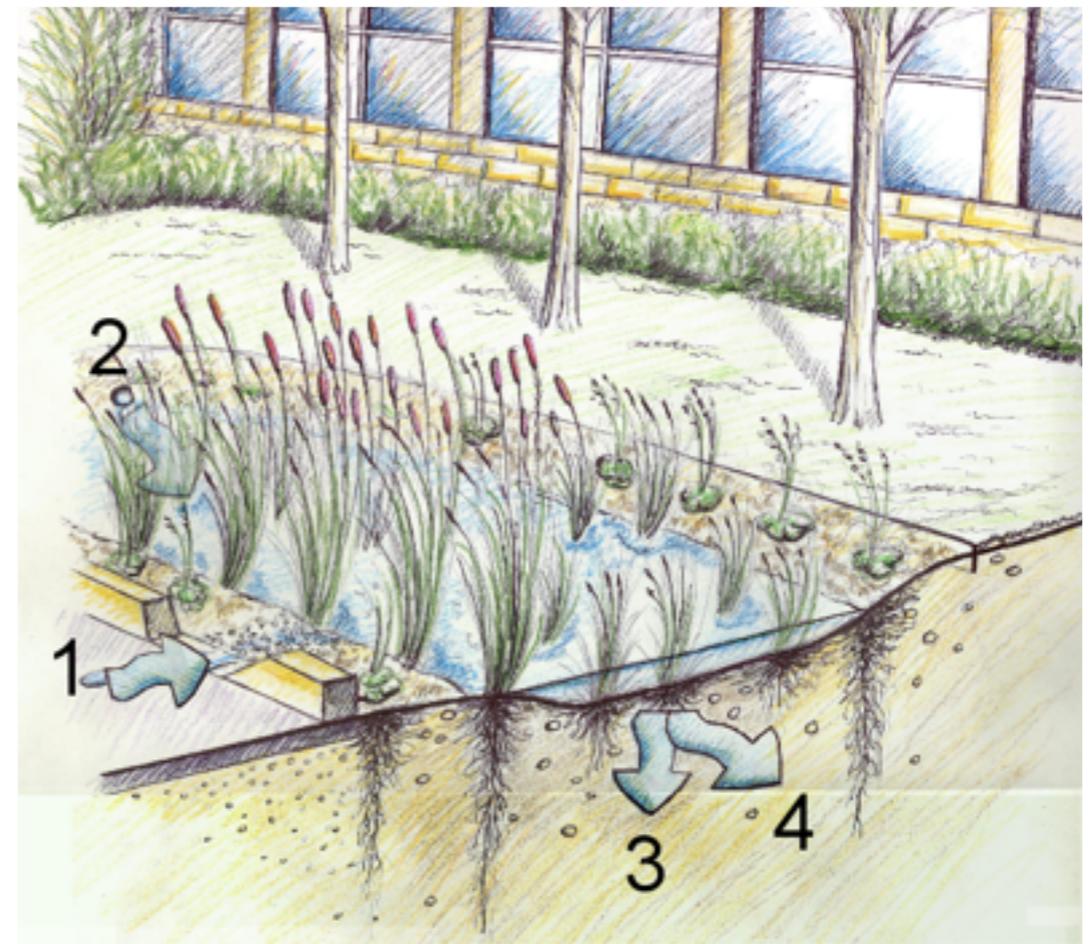
Why Raingardens?



Rain Gardens help protect our wetlands,
rivers, streams, bays and LI Sound

How do Raingardens work?

1. Capture runoff from rooftop, downspout, sidewalk, driveway or road
2. Slow and reduce runoff
3. Infiltration to recharge aquifer
4. Infiltration to watershed



Burnsville, MN

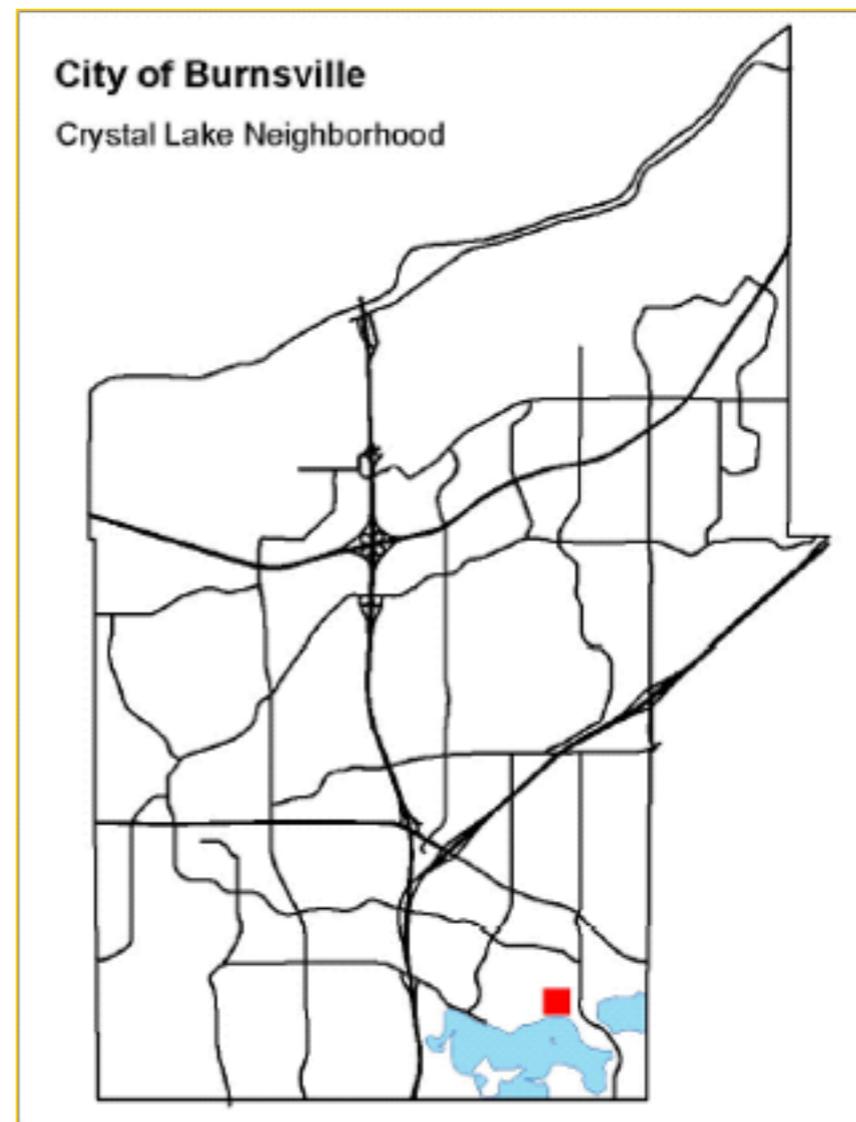
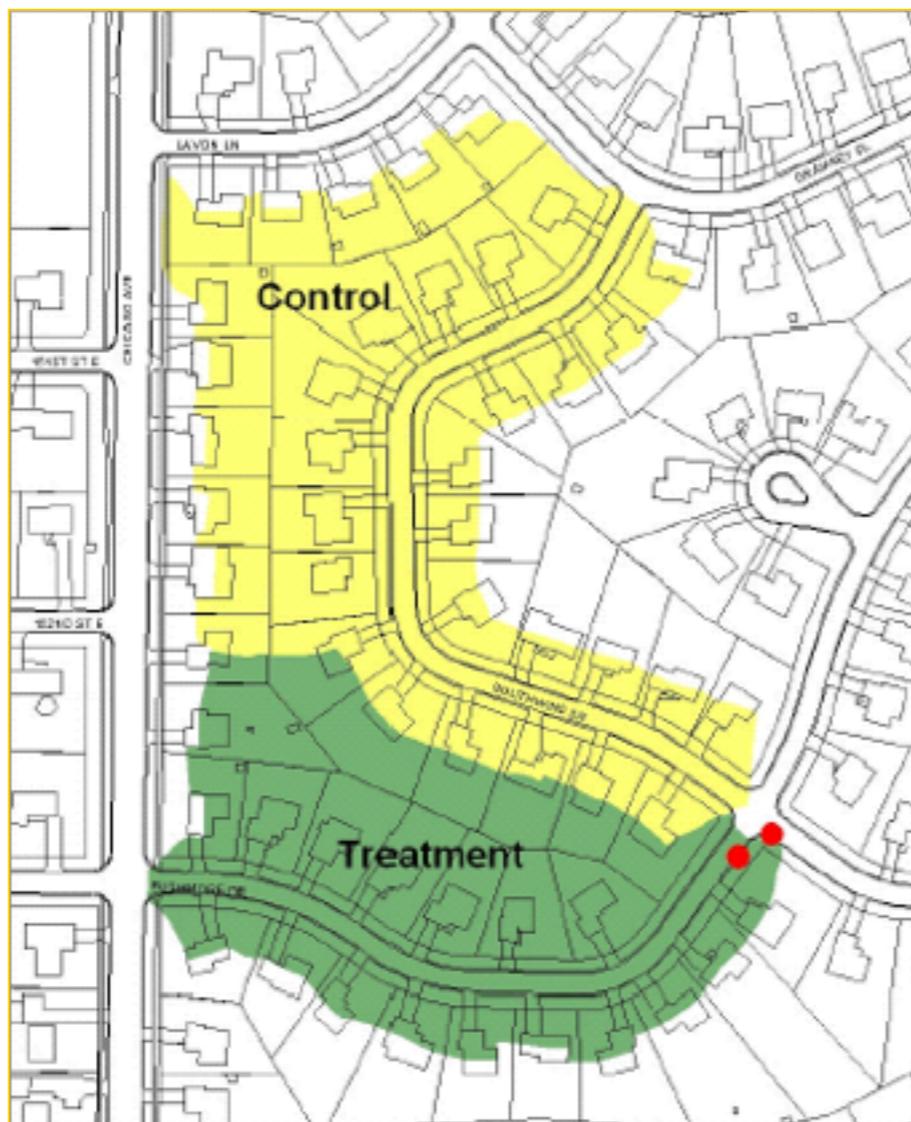
A Municipal success story



Barr Engineering Study, Presented by Rusty Schmidt, URS

Burnsville, MN

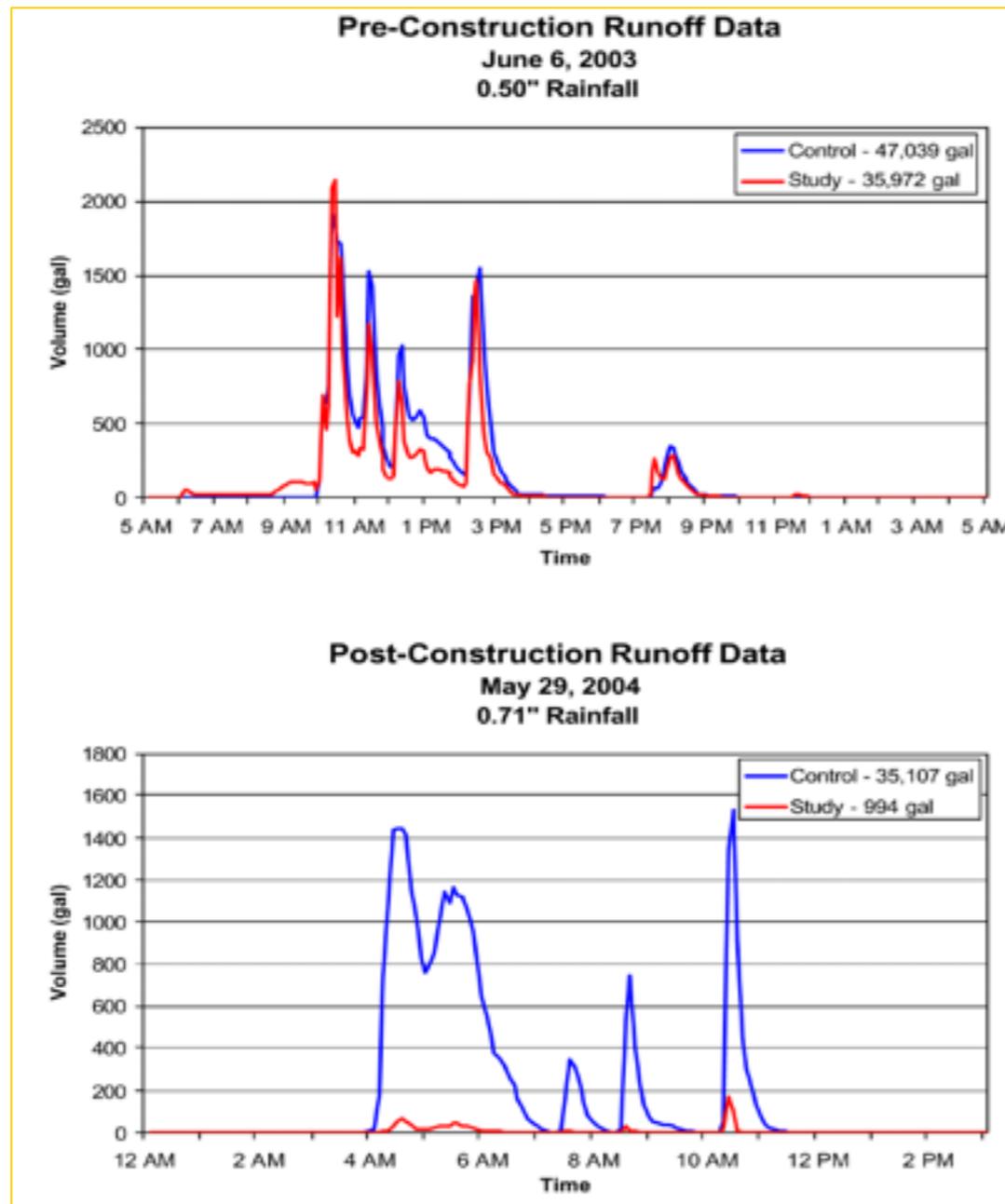
Paired study of Residential Street Runoff Control



Burnsville, MN



Burnsville, MN



Blue: Control
Red: With Raingardens

Burnsville, MN

Designed by: Barr Engineering



Burnsville, MN

Designed by: Barr Engineering



Take care of your lawn the right way to protect water

- Fertilize once a year with the minimum amount of fertilizer needed by your property. Agway in Riverhead will test your soil for free.
- Leave your grass clippings in place to minimize the amount of fertilizer you need.
- Leave the grass cut a little high
- Water less frequently with longer periods of watering

Golf courses and water quality

- Modern, eco-sensitive golf courses, like Sebonack, have better water quality than residential lawns. Residential lawns contribute 150% to 200% of the Nitrogen of one of these golf courses.
- High tech closed irrigation loops and precision management protects ground and surface water.
- Regular testing by Town monitors shows that water quality at Sebonack has nitrogen less than 2mg/L

Regulations

- Suffolk County has the most restrictive NYSDEC pesticide regulations and local laws for fertilizer use in the State.
- Suffolk County Local Law for Fertilizer Use
- Cornell's Suffolk Golf Course Nitrogen Management Summary Report
- 2011: Petrovic & Portmess-
Average N = 1.58 lbs./1000 SF/Year (less than 2.0 mg/L).

Proven Results - The Bridge

In late 1999- through Southampton Town's approval process, Golf Courses became the only private land use required to perform long term ground water monitoring protocols with land management programs.

The Bridge was Southampton's first golf course required to conduct ground water monitoring/management programs. Now in its 15th year of water sampling it provides a Living Lab for environmental studies.

Water quality samples analyzed indicate there is no significant impact to ground water from leaching of pesticides. The averaged N loading is at < 1.8 mg/L.

What you can do to protect our water

Upgrade your septic system to an advanced system

Have your septic system pumped every year if you use a garbage disposal in your sink - otherwise every 2 or 3 years

Fertilize your yard only once a year, at the right time and with the appropriate fertilizer and amounts for your soil

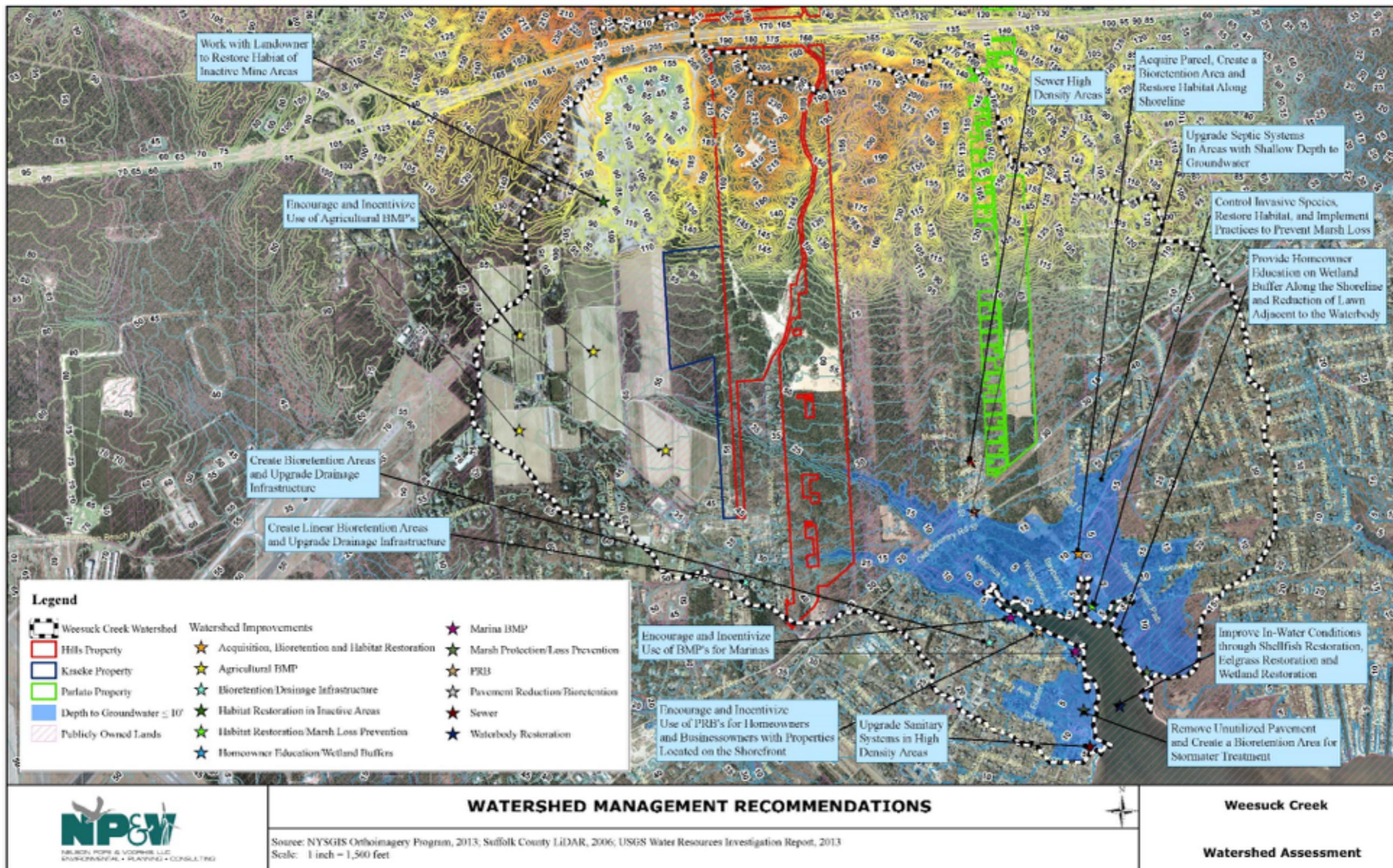
Maintain the greatest amount of permeable surfaces on your property

Plant rain gardens to intercept stormwater runoff

Conserve water whenever possible

Area Resources

- Southampton Town Septic Subsidy Program
- Southampton Town Rain Garden Program
- Cornell SPAT Program
- Stony Brook SHiRP Program



Other recommendations