



PECONIC GREEN GROWTH

## EAST MARION Fact Sheet

Water sustains life and symbolizes purity. But water quality is degrading. Our ground and surface waters need protection. The aquifers are not only sources of drinking water, but flow horizontally to surface waters, impacting the marine health of our bays. Excess nitrogen compounds are a critical cause of algal blooms, which lower oxygen levels, create toxins, and ultimately cause fish kills. Contaminants of emerging concern, such as pharmaceuticals and personal care products, need to be treated before being released to ground and surface waters. Poor water quality will ultimately impact community character and vitality, which are especially relevant for our coastal and tourist economies.

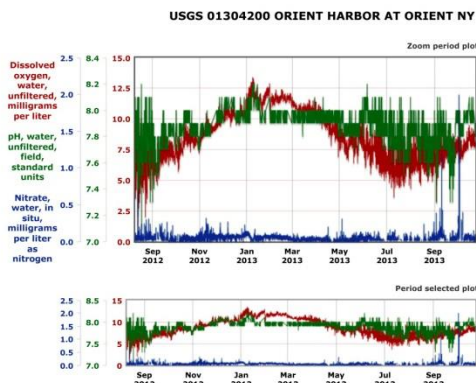
The following is a snapshot of local issues that impact excess nitrogen loading. More detailed maps are available at <http://peconicgreengrowth.org/community-maps-2014/> where you can find the areas needing priority action, as well as identify conditions relevant to your home. Visit our website to learn about options for upgrading your wastewater system to help protect your environment.



### EXCESS NITROGEN (N) LOADING

- Excess nitrogen compounds can be harmful to human health.
- Our surface waters are 20 times more susceptible to N loads than maximum contaminant levels for drinking water.
- Excess N feeds algal blooms, which in turn create toxins. These impact fish and shellfish formation and survival rates.
- Excess nitrogen contributes to declines in eel grass and wetland grass beds. Their loss impacts marine habitats and reduces their usefulness as property buffers in storms.

### Orient Monitor



### EAST MARION WATER QUALITY

- East Marion groundwater has high levels of N compounds.
- Spring Pond is impaired and closed to shell fishing year-round.
- Marion Lake experiences blue-green algae, which is toxic to humans and pets.
- Waters off the coast of East Marion show high ratios of dissolved organic nitrogen to inorganic nitrogen, an indicator of poor water quality contributing to brown tides.
- A sensor in Orient Harbor, to which parts of East Marion drains, records chronic levels (4.8 mg/L) of nitrogen in the summer and early fall, and a trend toward acidity.
- Eel grass has declined > 50% since 2000 in the Peconic Estuary.
- LI Sound has a recommended N reduction goal of 19%.
- A 90 % N reduction is needed to address source loading in the subwatershed of the Peconic Estuary off East Marion.

### Nitrogen Sources



Courtesy TNC and Prof. Christopher Gobler

### SOURCES OF EXCESS NITROGEN

The East Marion subwatershed is responsible for 7% of all the nitrogen loading in the Peconic Estuary (43 subwatersheds).

Sources are estimated as coming from:

- 53% septic/cesspool systems
- 22% atmospheric deposition
- 10% agriculture
- 10% fertilizer from lawns
- 4% golf course



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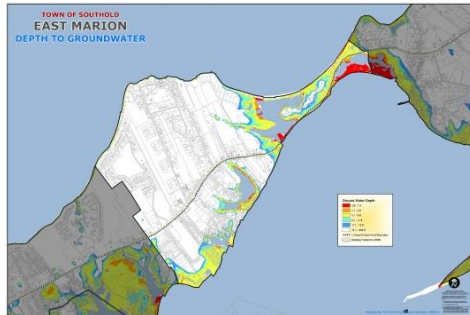
Is this a Cesspool or Part of a Septic System? Answer: Could be either

## CESSPOOLS VS. SEPTIC SYSTEMS

CESSPOOLS, which are often found on properties developed before 1973, (~ 43% in East Marion) dispense all wastewater with no treatment directly to the ground. Dissolved solids, contaminants and pathogens can percolate to groundwater. The current code requires SEPTIC SYSTEMS, which places an enclosed tank before the leaching pits (which resembles a cesspool) or field. In the tank, fats rise and solids settle to the bottom, where microbes treat the solids. Clarified effluent is dispensed, with roughly 10% of the nitrogen mitigated. New, enhanced systems can lower nitrogen levels by 50 – 90%.

## DEPTH TO GROUNDWATER

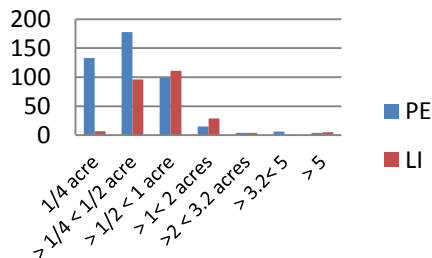
The Suffolk County Sanitation Code (SCSC) requires a 3-foot separation distance from the bottom of wastewater systems to groundwater to allow for natural treatment and filtering of effluent. When groundwater is less than 7 feet below grade, there can be difficulties siting the system. Where depths to groundwater are less than 13 feet, systems are likely to become noncompliant as groundwater elevations rise due to climate change. In EAST MARION 168 buildings (32%) in the PE have depths to groundwater of less than 13 feet.



## SMALL LOT SIZES

In East Marion **65%** (283) of the developed lots in the PE and **18%** (45) in the LI Sound watershed are **nonconforming** to the 20,000 SF (nominal half-acre) minimum lot sizes SCDHS requires to dilute wastewater to acceptable contamination levels for drinking water. If a community relies on individual wells, this minimum lot size is even larger – a nominal one acre.

EM # Developed Lots by Size  
(not in a sewer district)

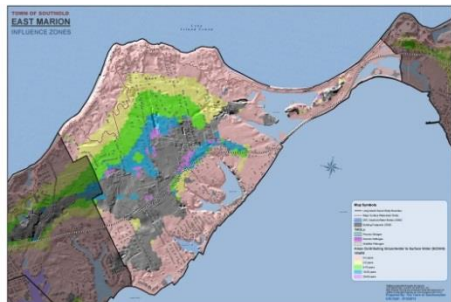


30% of developed parcels in the Peconic Estuary in EM are less than ¼ acre. This means that contaminant concentrations discharged from these systems are higher than code.

By 2080 we estimate that 50 buildings in East Marion will be inundated

## CLIMATE CHANGE

By 2080 an estimated 193 buildings in East Marion will most likely have their wastewater treatment systems compromised due to inadequate horizontal distances to surface waters.



## INFLUENCE ZONES

*Denoting the Time it Takes Groundwater to Reach Surface Waters*  
404 or **77%** of the buildings in East Marion in the Peconic Estuary 158 or **53%** of the buildings in East Marion in the LI Sound watershed are in the “Pink Zone, where it only takes 0-2 years for groundwater and any contaminants to reach surface waters. It makes sense to prioritize improvements in the “pink” zone, as the beneficial impacts will be felt more quickly.