The Nature Conservancy

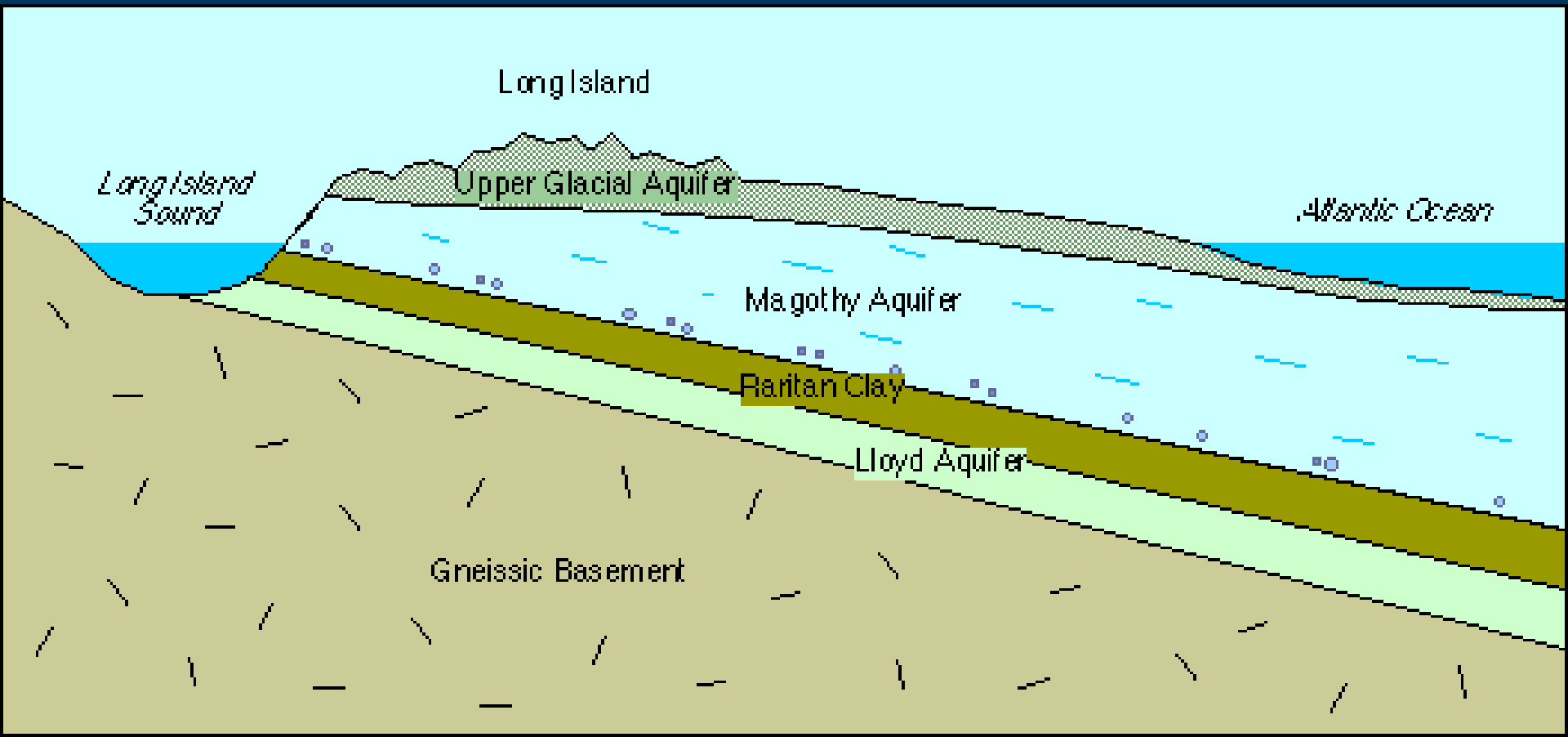
Protecting nature. Preserving life.™

Causes, consequences, costs, and policy ramifications of Nitrogen pollution on Long Island NY

The Nature Conservancy
Protecting nature. Preserving life.™

Aquifers on Long Island

What goes onto and into the land ends up in our drinking water and in our surface waters.



The Nature Conservancy
Protecting nature. Preserving life.™

Bays and harbors of Nassau and Suffolk Counties

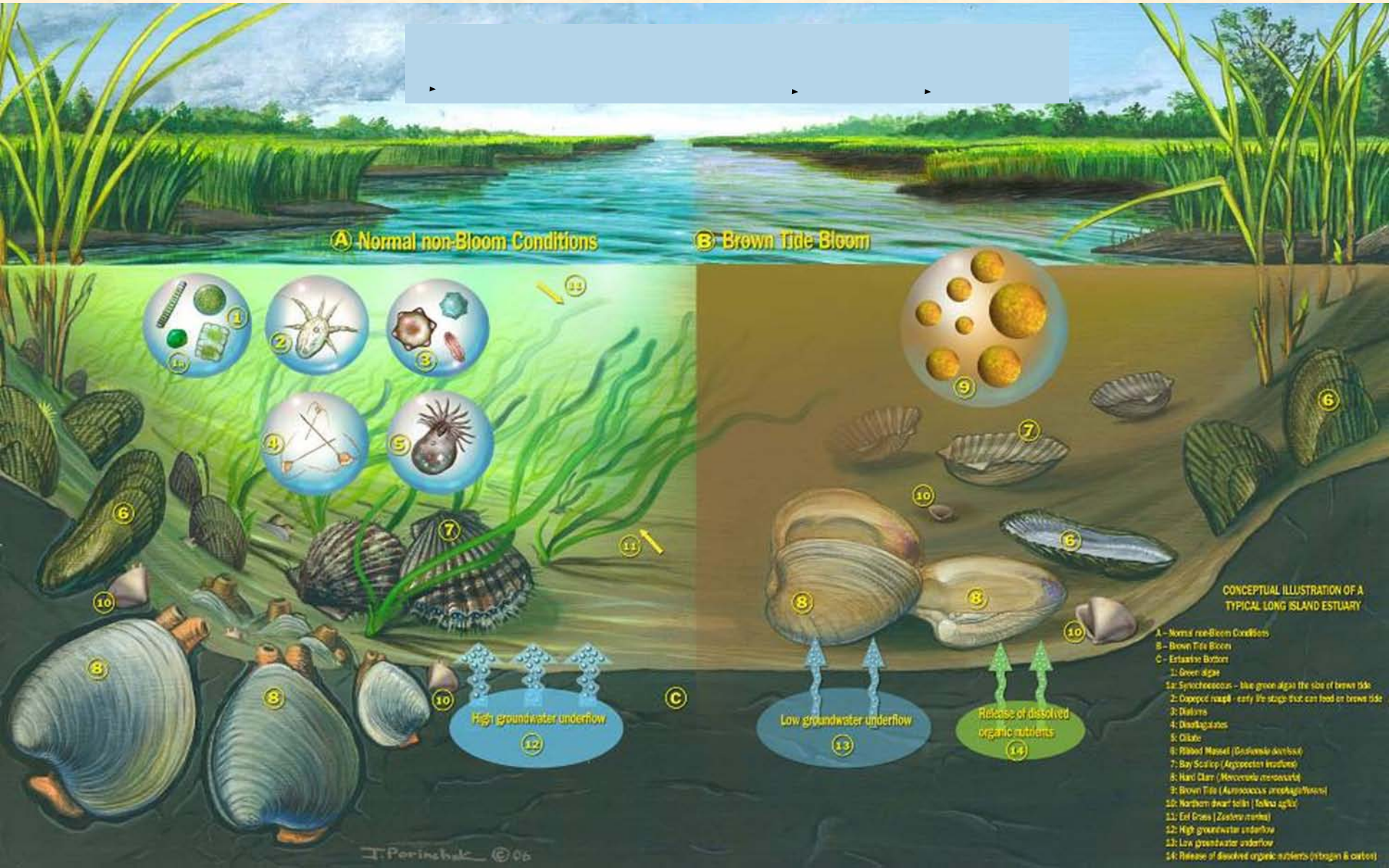
The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy
Protecting nature. Preserving life.™

Key estuarine/coastal biogenic habitats

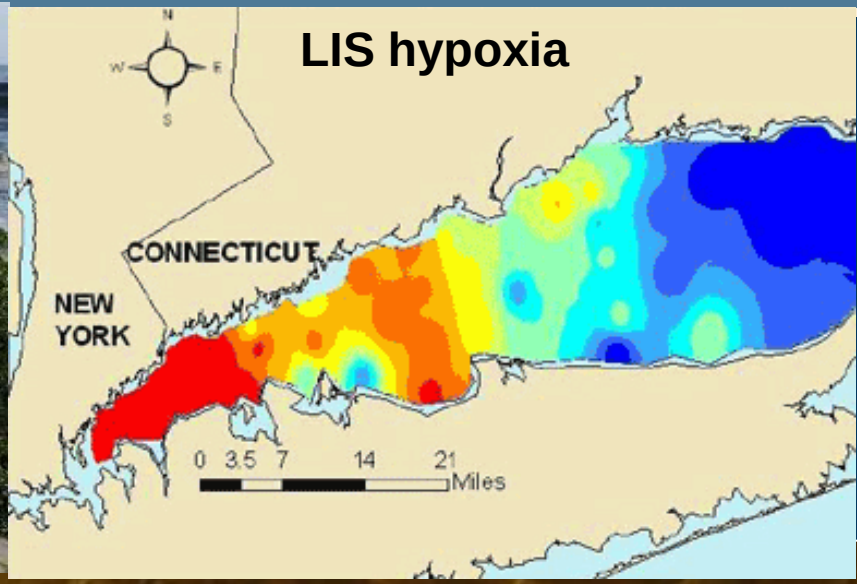
The Nature Conservancy
Protecting nature. Preserving life.™

LI waterways transitioning to alternative less desirable state



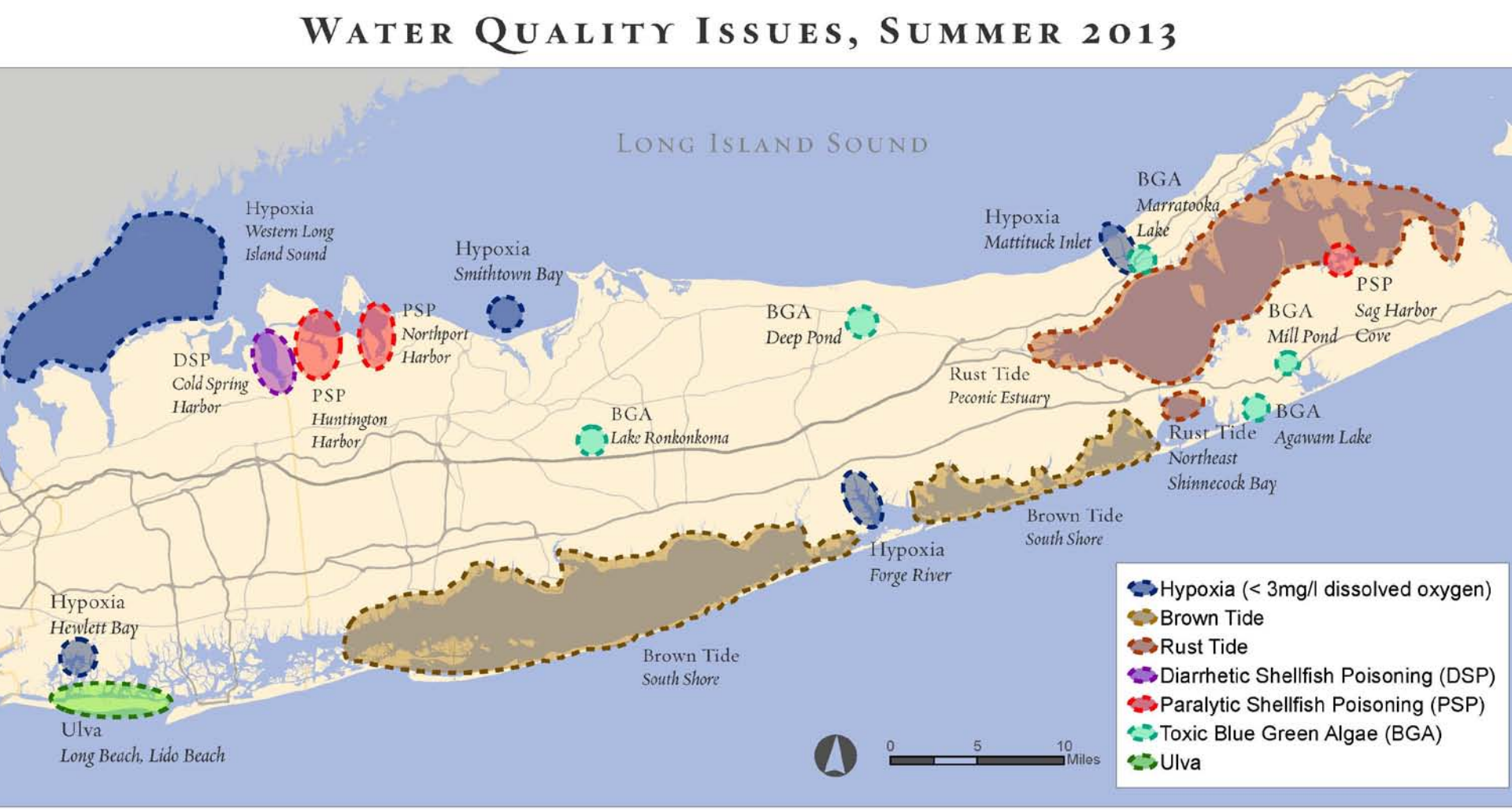
The Nature Conservancy
Protecting nature. Preserving life.™

Other impacts of excessive algal growth from nitrogen pollution



The Nature Conservancy
Protecting nature. Preserving life.™

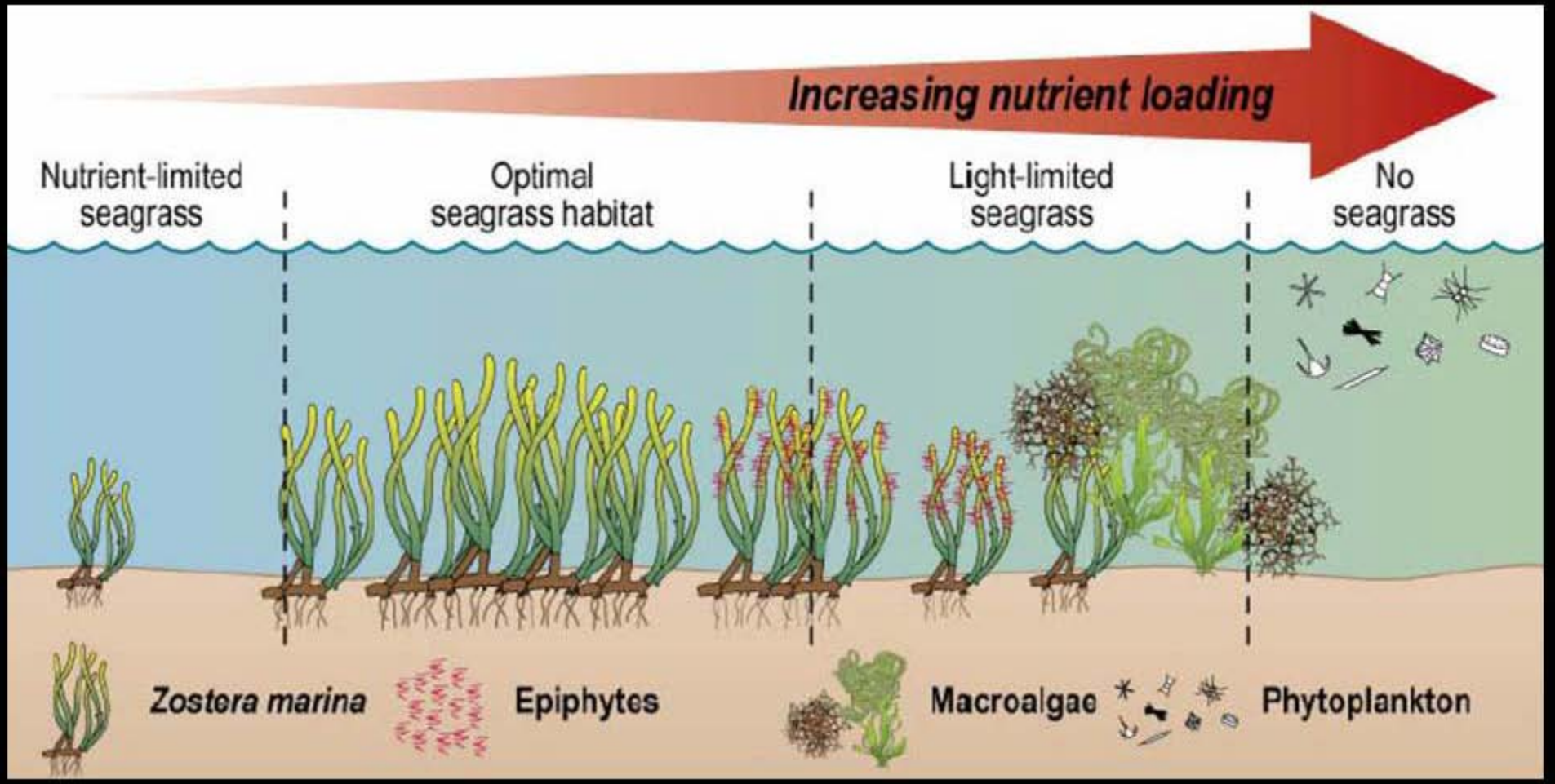
Algae symptoms are island-wide



The Nature Conservancy
Protecting nature. Preserving life.™

Nitrogen enrichment impacts on seagrass *from Butler (1999)*

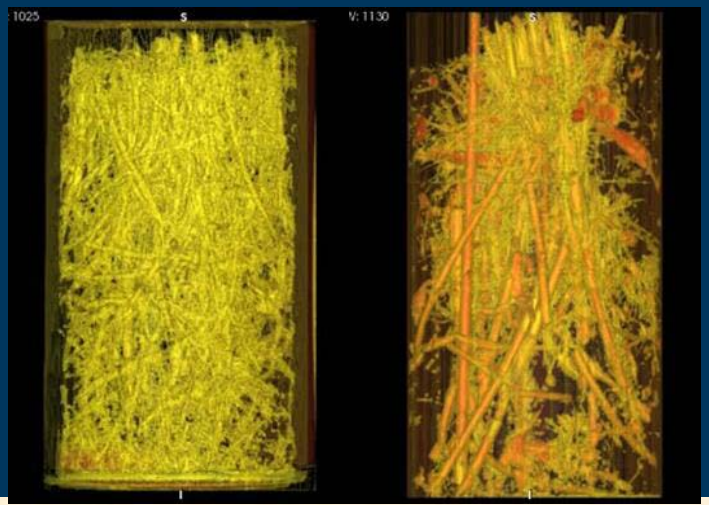
Eelgrass is Essential Fish Habitat

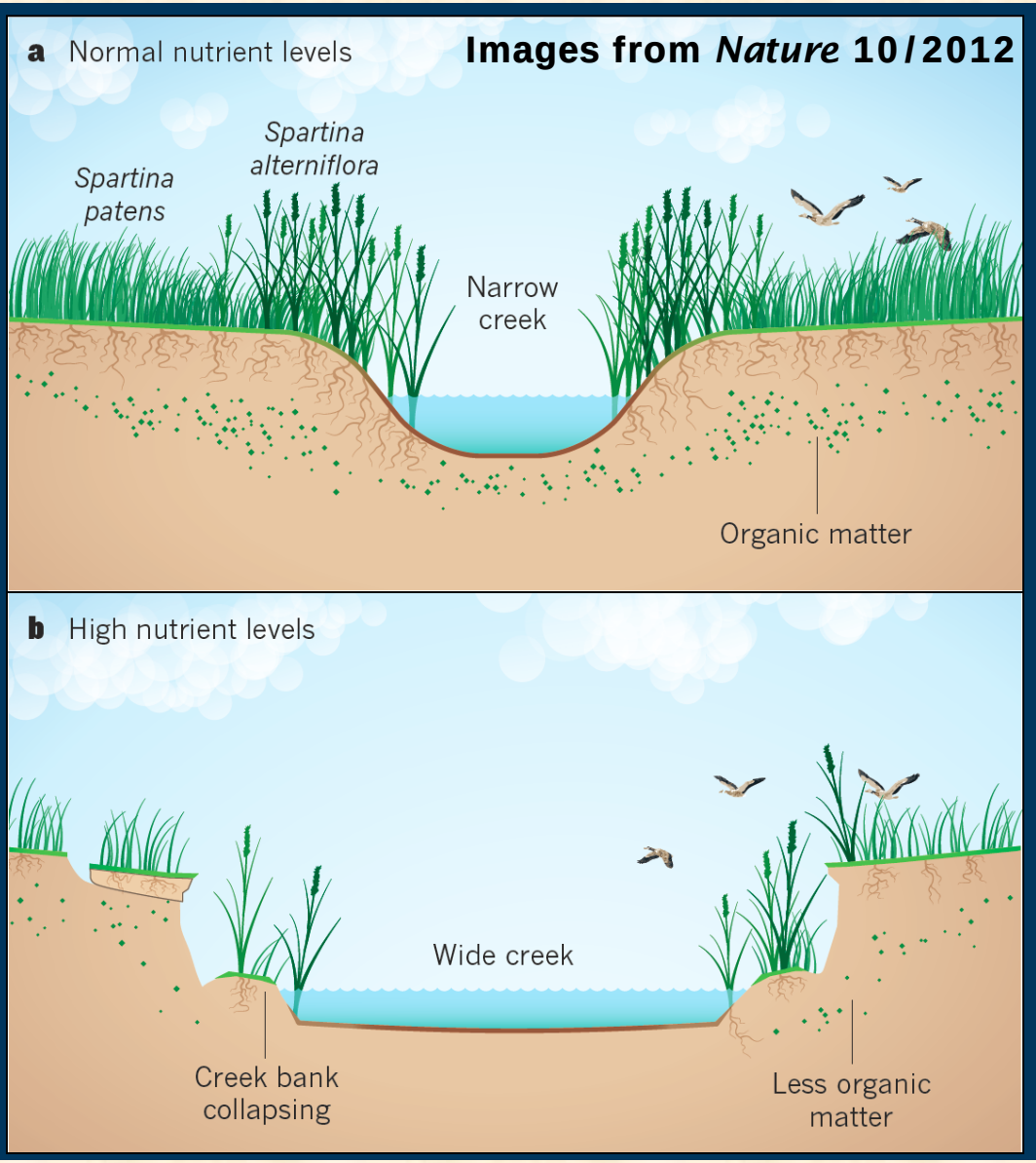


Thousands of acres of eelgrass have already disappeared

The Nature Conservancy
Protecting nature. Preserving life.™

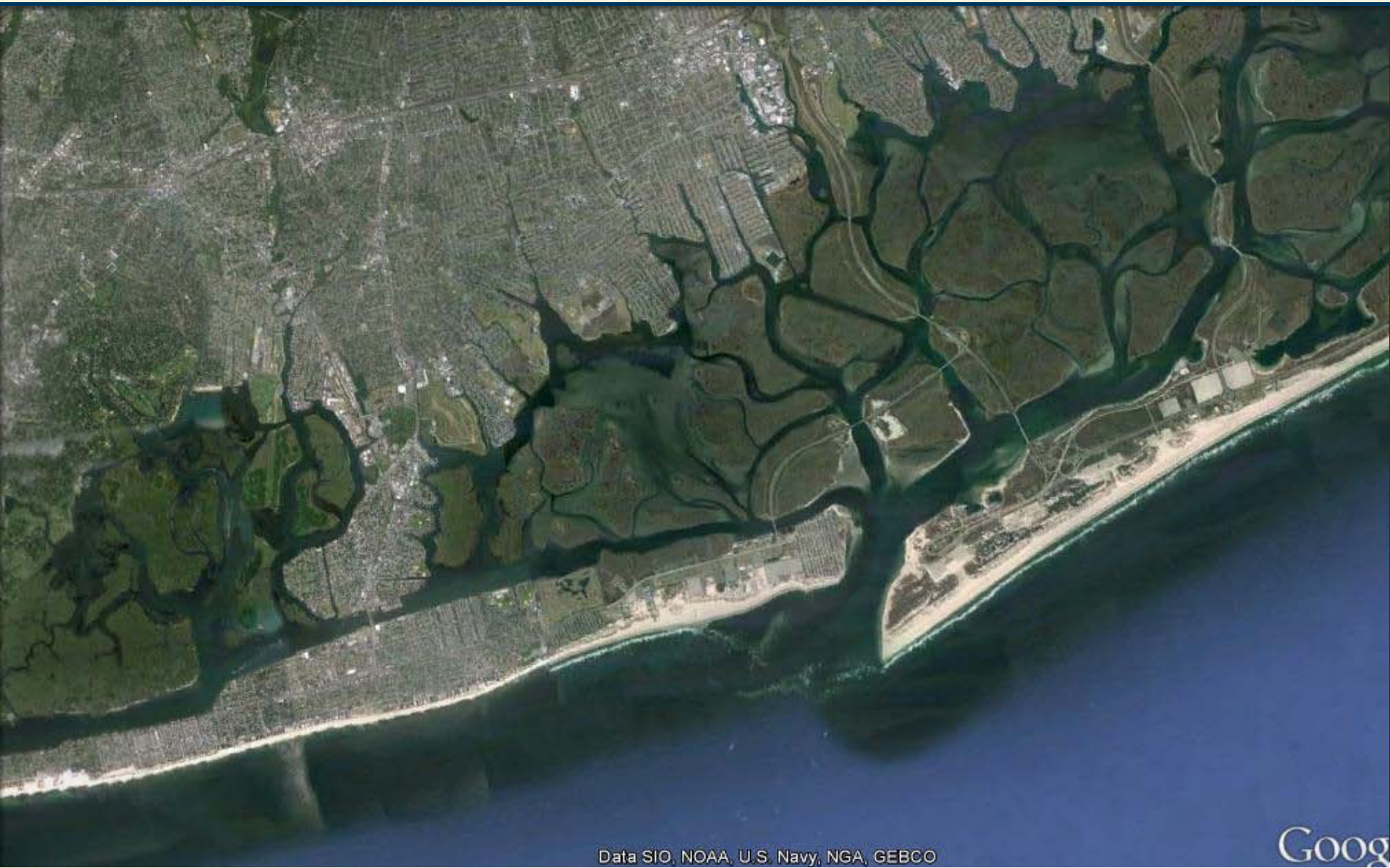
Nitrogen pollution impacts on saltmarshes





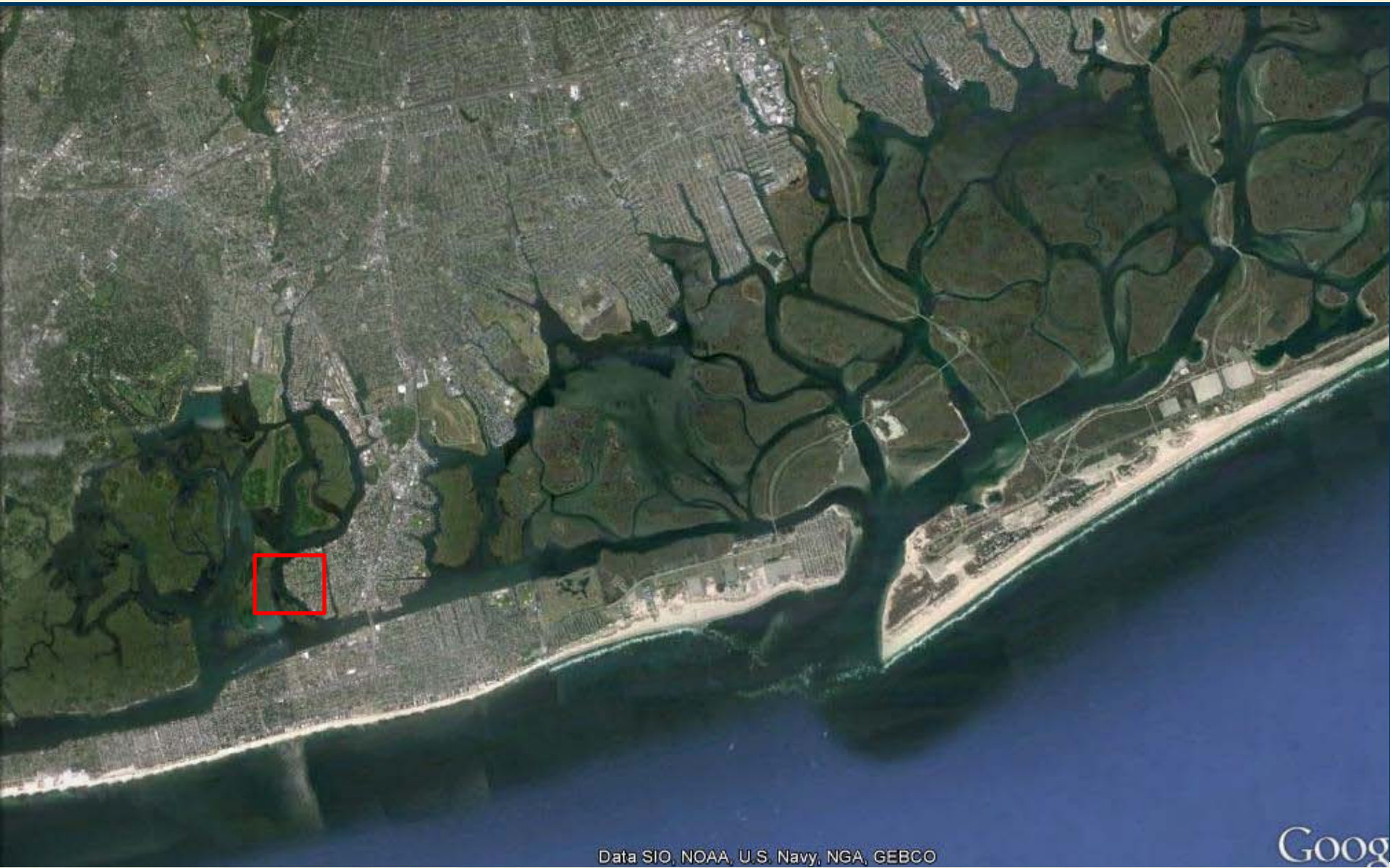
The Nature Conservancy
Protecting nature. Preserving life.™

Marshes protect developed shore from energy every day



The Nature Conservancy
Protecting nature. Preserving life.™

Island Park: Example of vulnerability



The Nature Conservancy
Protecting nature. Preserving life.™

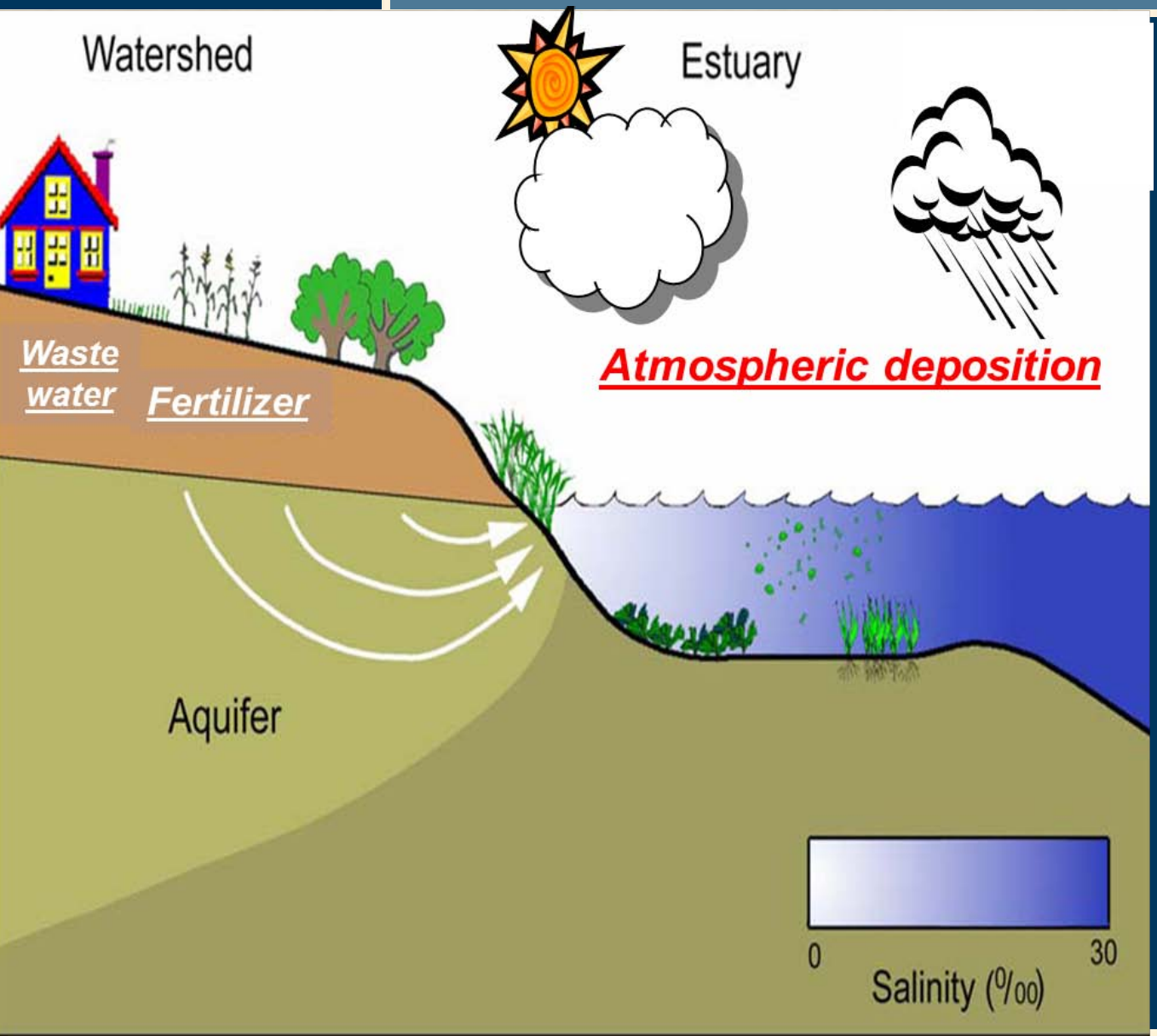
Many coastal properties will be more vulnerable as marshes degrade

The Nature Conservancy
Protecting nature. Preserving life.™

Routine windy day in part of bay without expansive marsh islands

The Nature Conservancy
Protecting nature. Preserving life.™

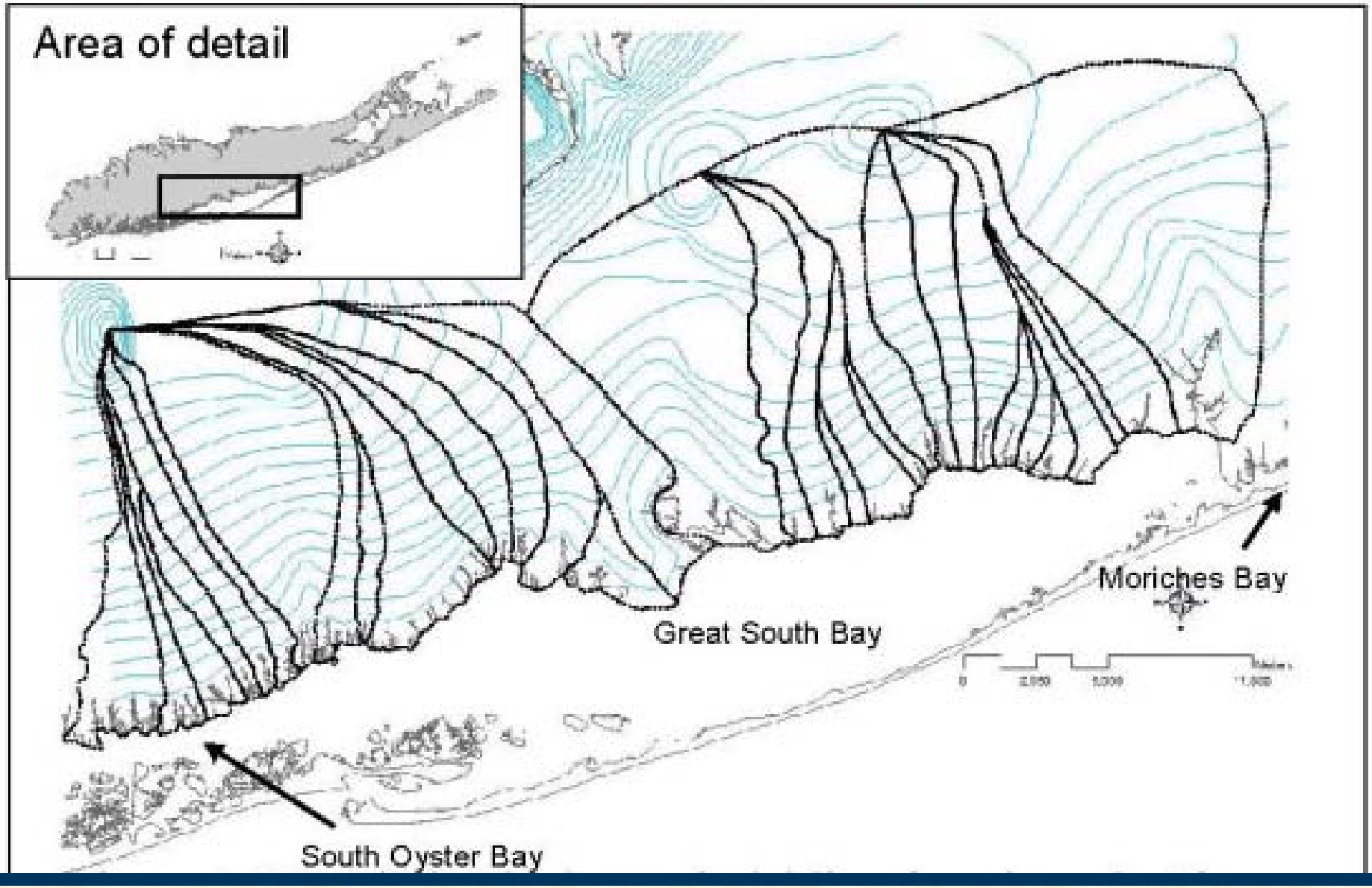
Sources of reactive nitrogen to coastal waters



County land use data N-Load and ELM models quantify sources of Nitrogen loaded to LI bays

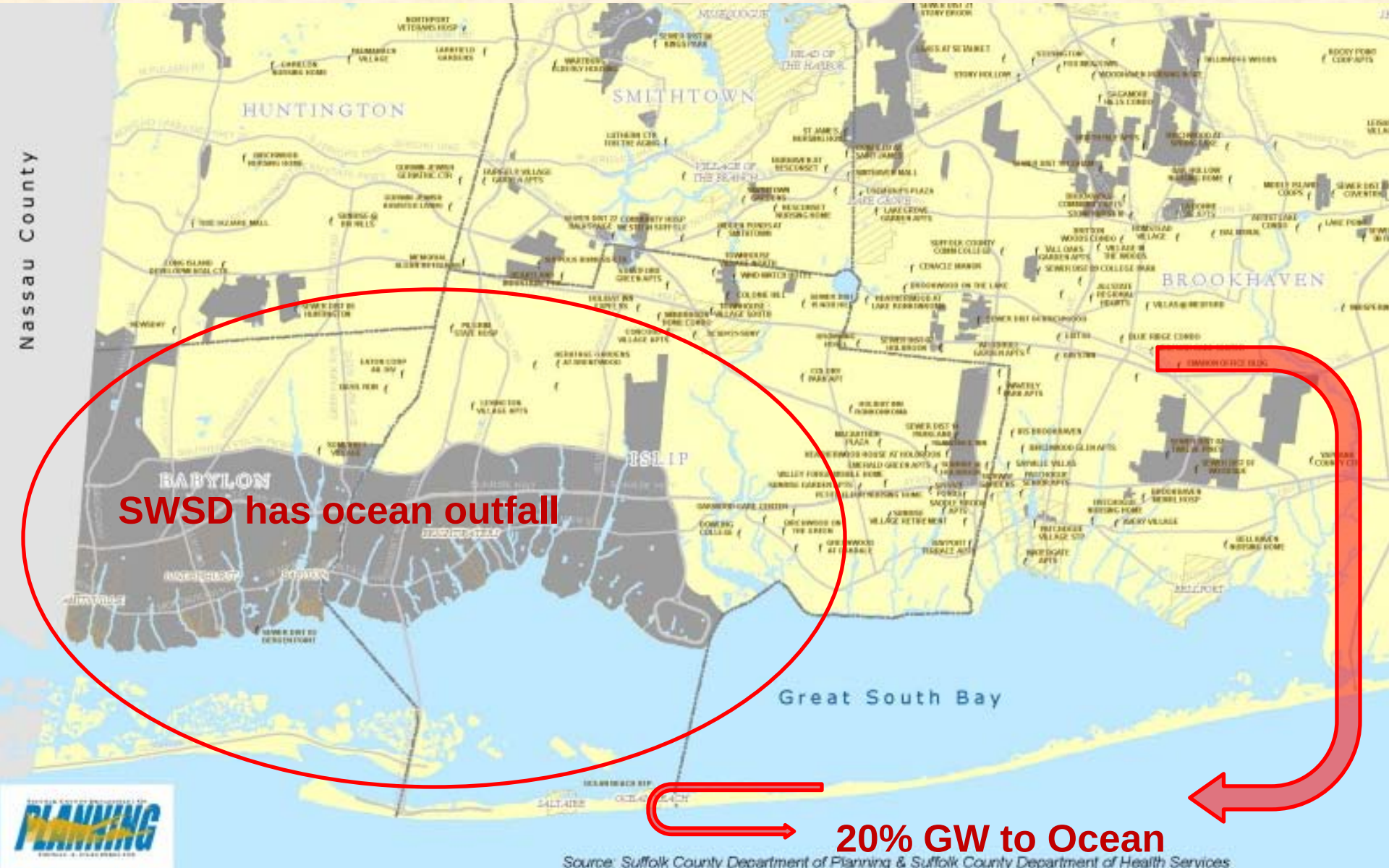
The Nature Conservancy
Protecting nature. Preserving life.™

33 GSB sub-watersheds



The Nature Conservancy
Protecting nature. Preserving life.™

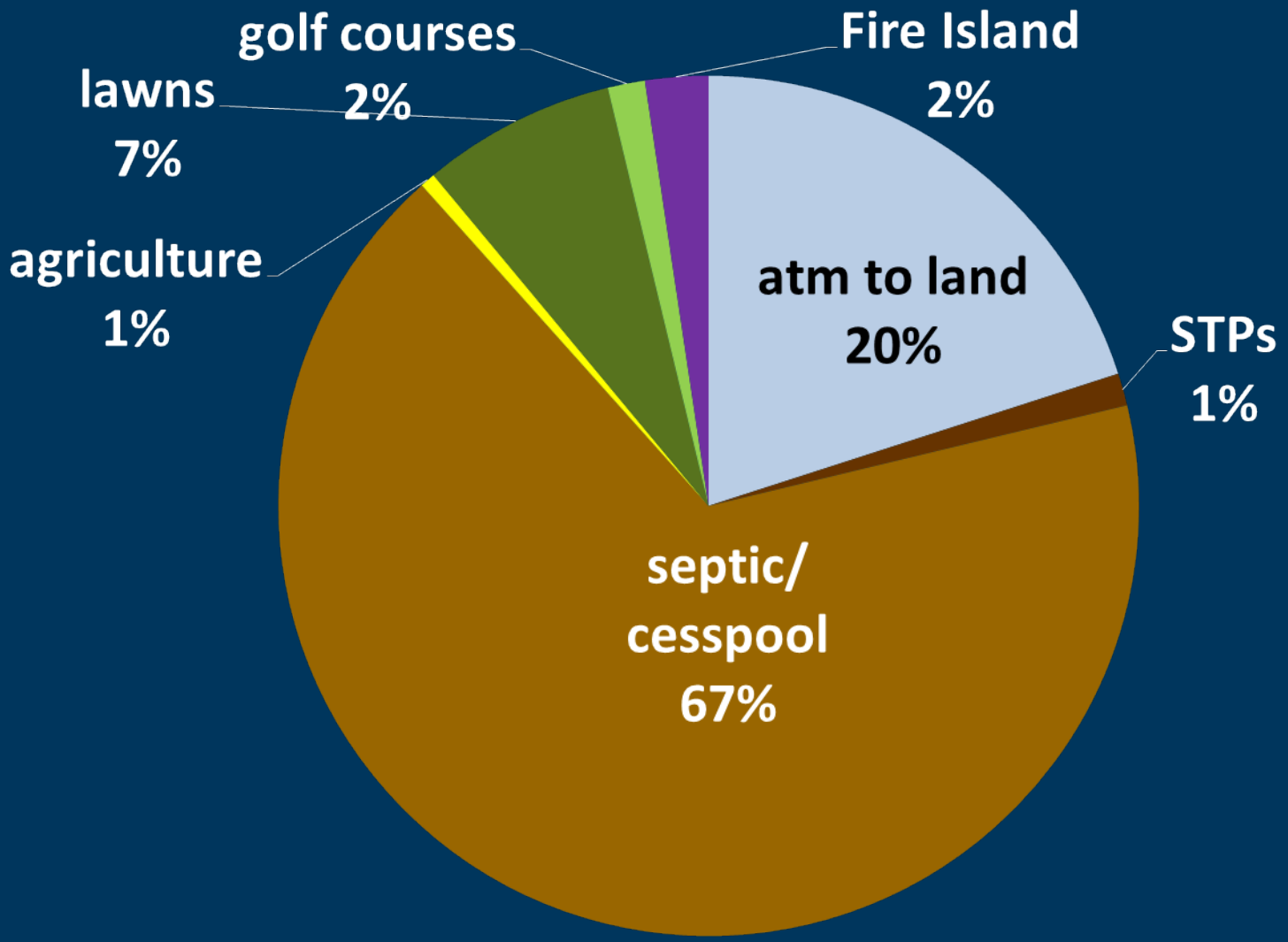
~ 1M people live in the GSB groundwatershed



Source: Suffolk County Department of Planning & Suffolk County Department of Health Services

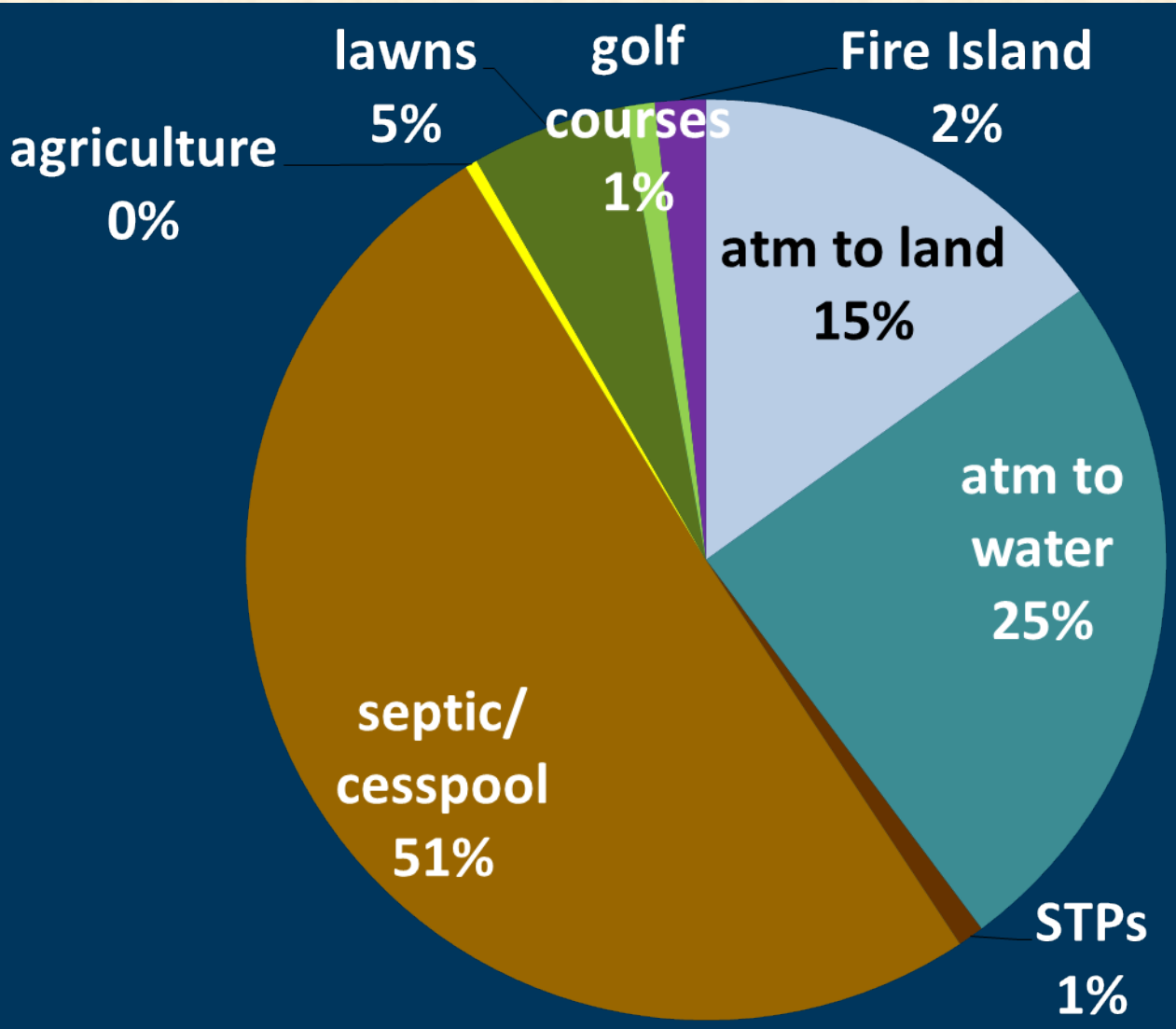
The Nature Conservancy
Protecting nature. Preserving life.™

N loads to GSB from watershed (684,000 kg N/Yr)



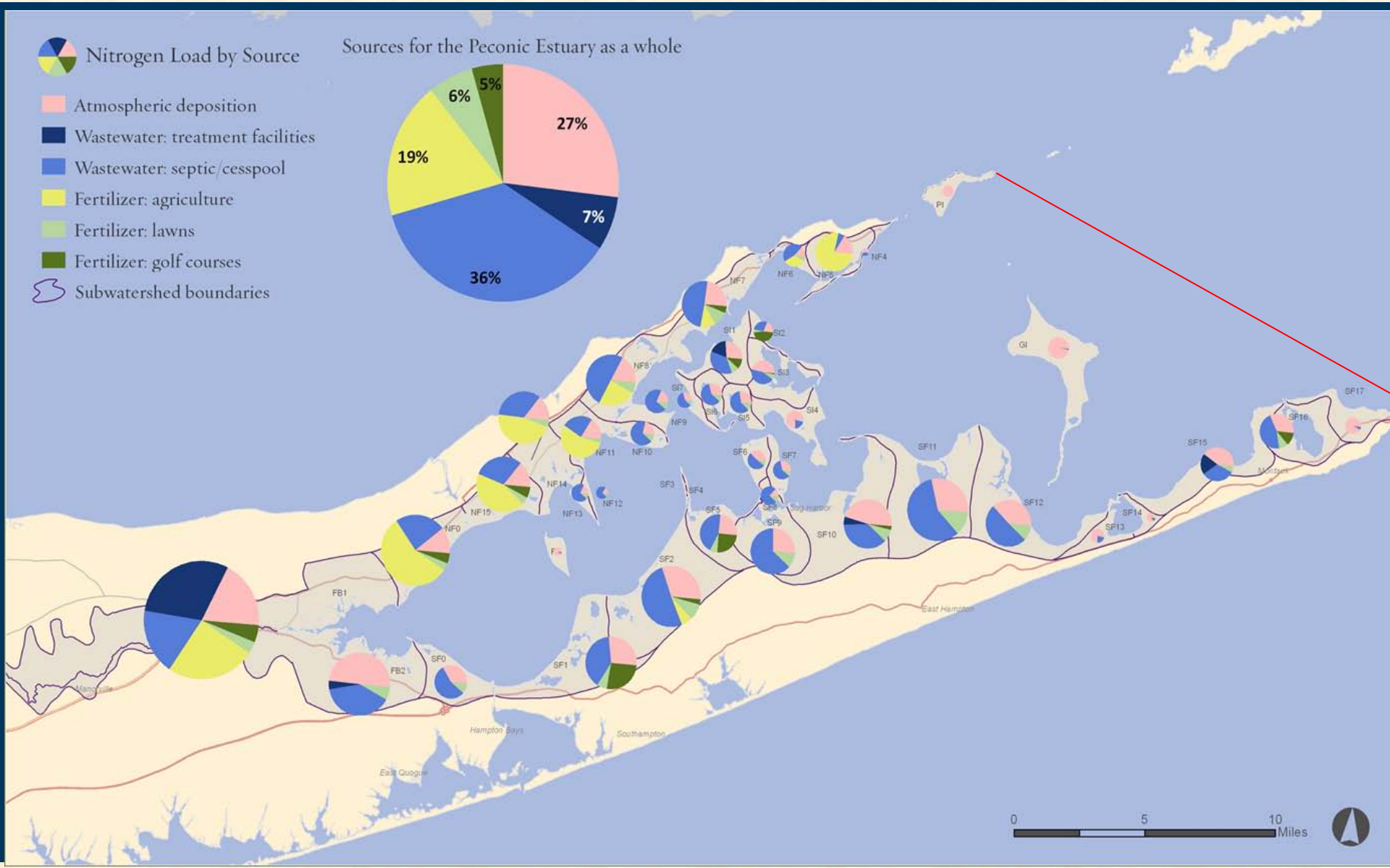
The Nature Conservancy
Protecting nature. Preserving life.™

Total N Loads to Great South Bay (908,000 kg N/Yr)



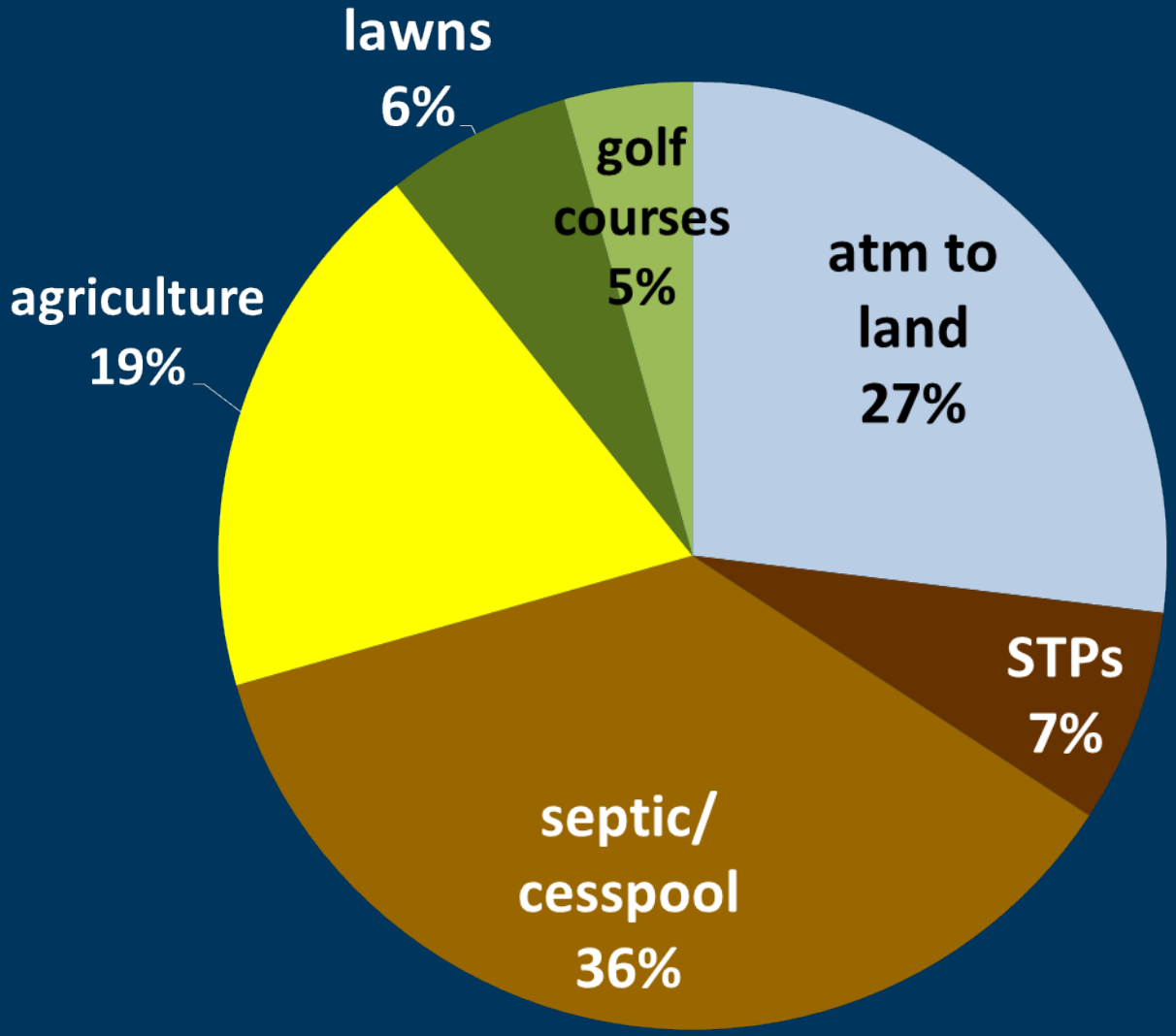
The Nature Conservancy
Protecting nature. Preserving life.™

Nitrogen loading to Peconic Estuary

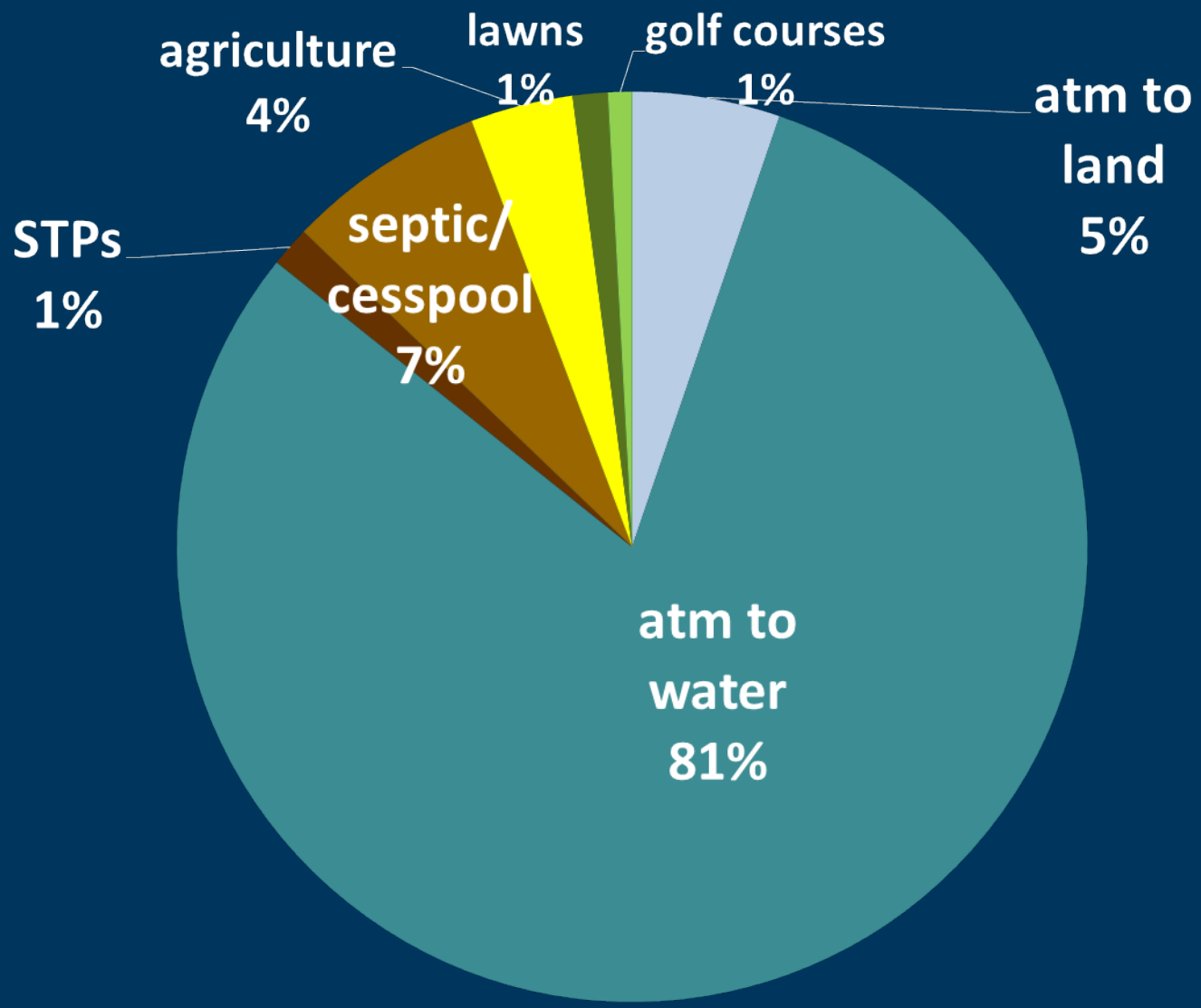


The Nature Conservancy
Protecting nature. Preserving life.™

N Loads to PE from watershed (243,000 kg N / Yr)

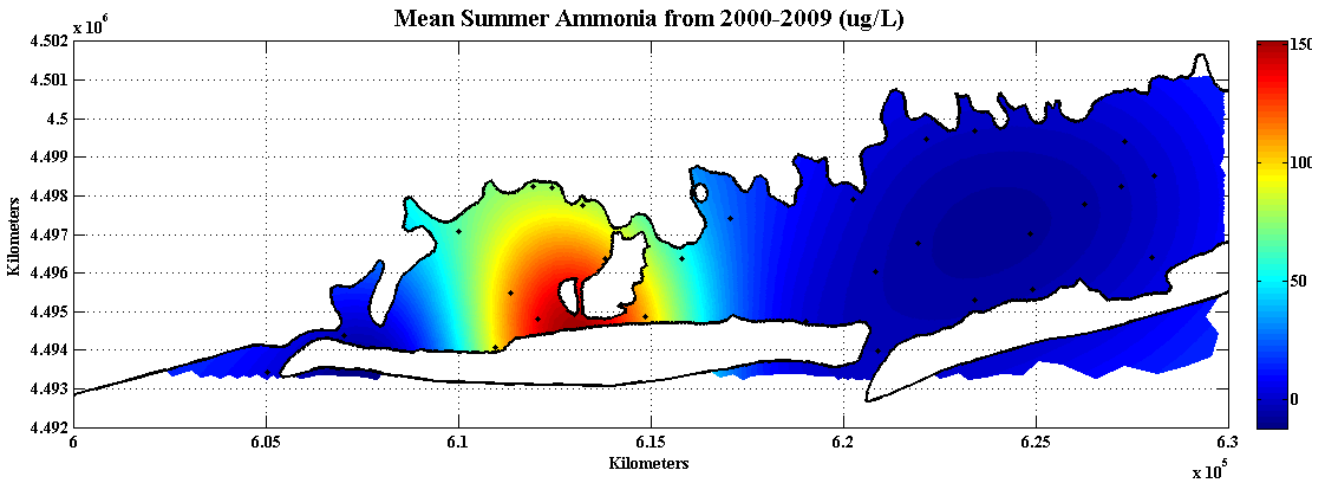


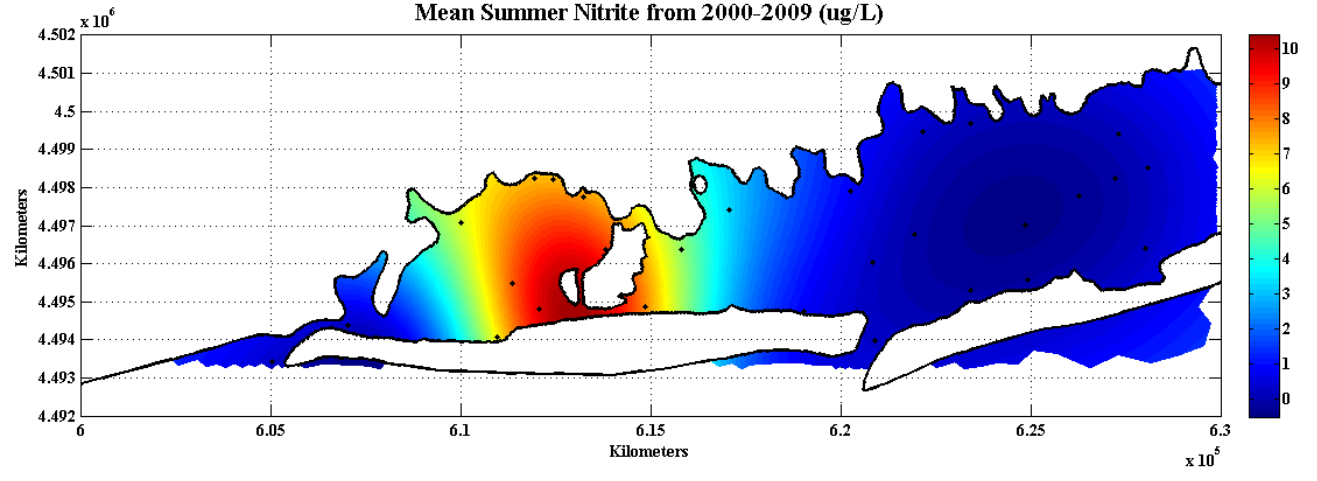
The Nature Conservancy
Protecting nature. Preserving life.™

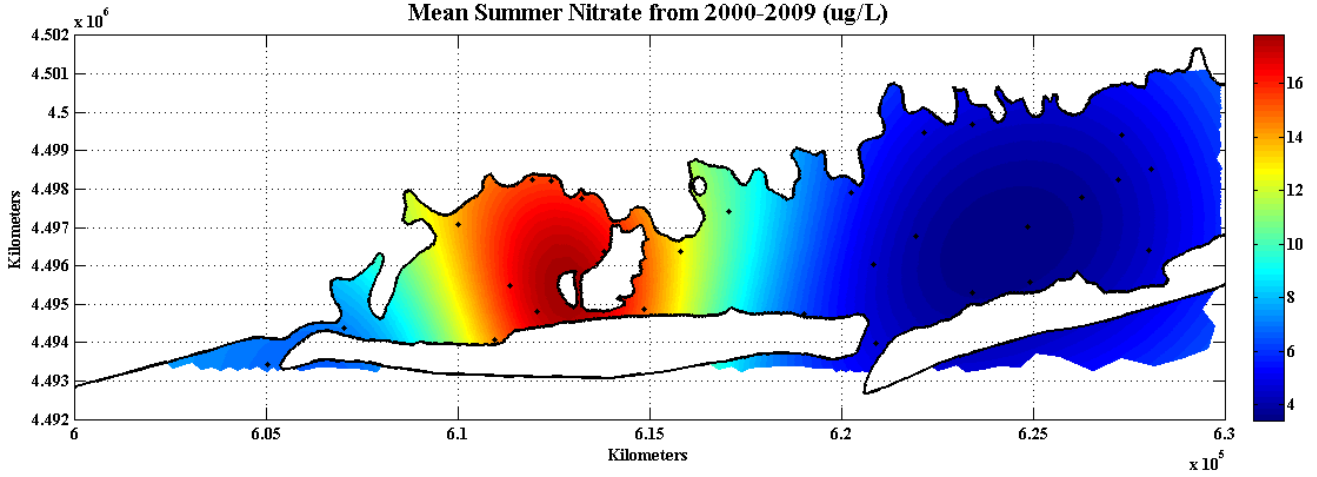


The Nature Conservancy
Protecting nature. Preserving life.™

Bay Park STP







In some places like Western Bays, the majority of N is end of pipe

Mean Summer (June, July, August) Ammonia, Nitrate, Nitrite (2000-2009)

SoMAS
School of Marine and Atmospheric Sciences
STONY BROOK UNIVERSITY

The Nature Conservancy
Protecting nature. Preserving life.™

Excessive seaweed impacts prime ocean front beaches along Point Lookout

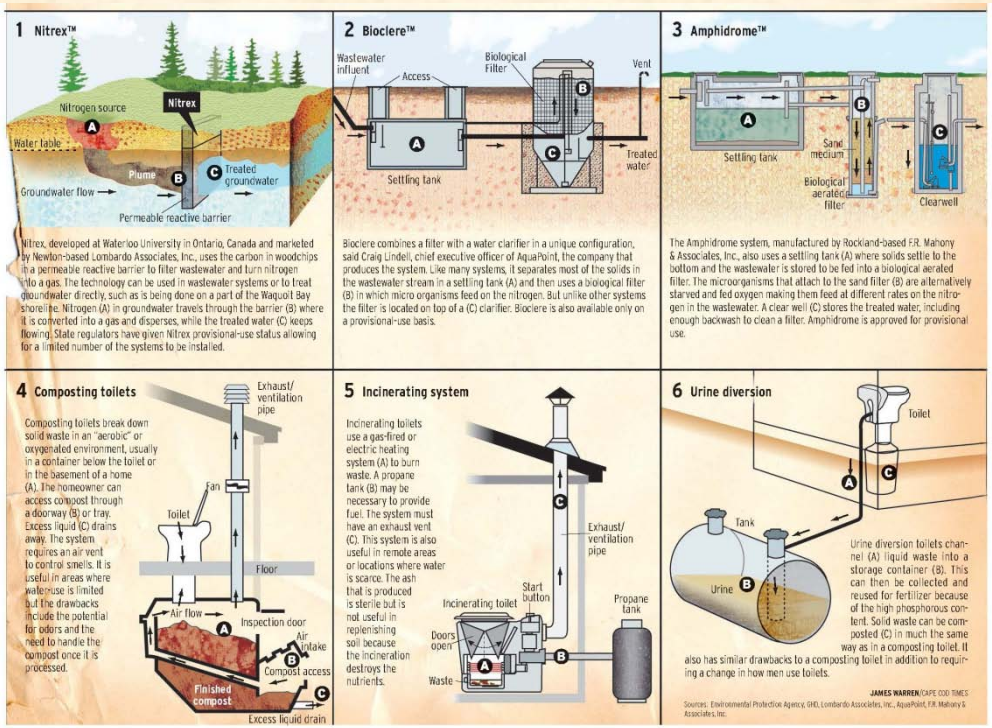
Nov 14, 2012 Newsday Photos

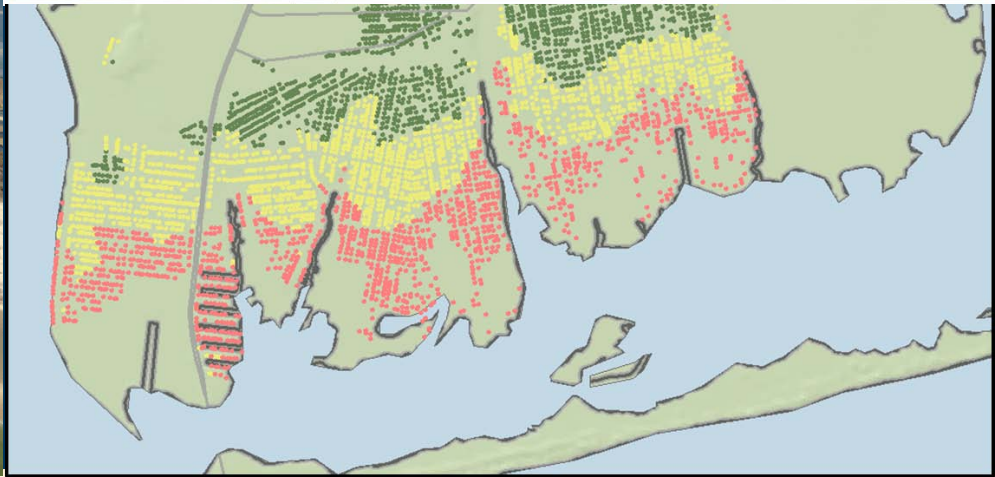
The Nature Conservancy
Protecting nature. Preserving life.™

What can we do?

The Nature Conservancy
Protecting nature. Preserving life.™

What is happening locally





The Nature Conservancy
Protecting nature. Preserving life.™

Opportunities for modernization

The Nature Conservancy
Protecting nature. Preserving life.™

Living and working in LI coastal communities

Costs and Risk

Benefits and Opportunities

The Nature Conservancy
Protecting nature. Preserving life.™

NYSERDA: Linking Science and Policy

Potential ideas for future work

- Critical Loads approach for estuaries
- Cost per lb of N-load reduction
- Recovery of resources from wastewater
- Decentralized power for alternative septics
- Others?

The Nature Conservancy
Protecting nature. Preserving life.™

Questions?

Point Lookout July 2013