NEW YORK STATE | Department of Environmental Conservation

Alternative Restoration Plan for Suffolk County Nitrogen Impaired Waters

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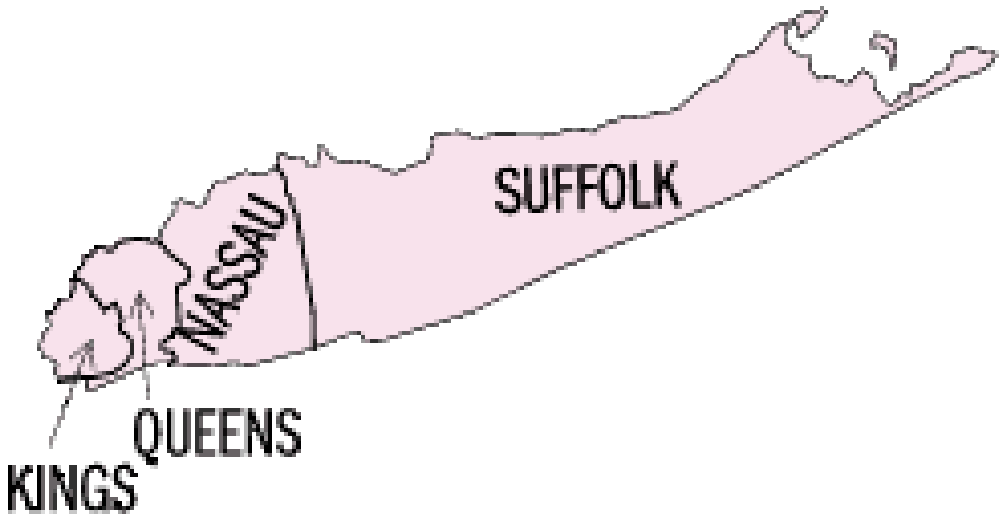
June 2, 2025

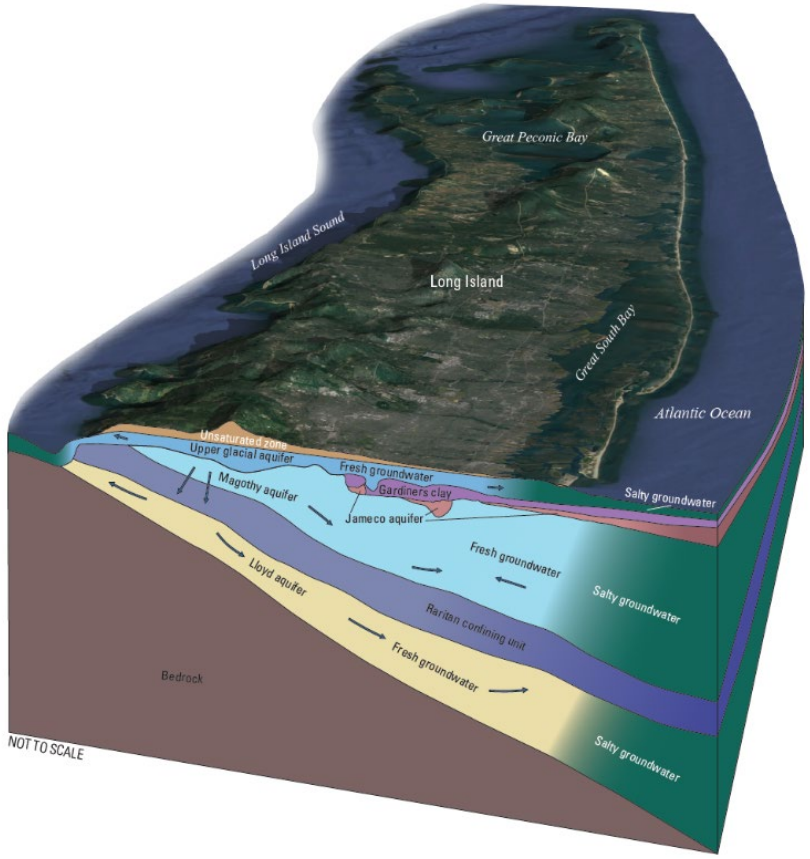
Agenda

- Background
- Nitrogen issue on Long Island
- Long Island Nitrogen Action Plan (LINAP)
- Subwatershed Planning
- Implementation Efforts
- Alternative Restoration Plan

Long Island Facts

- 2.9 million people in Suffolk and Nassau County
- Groundwater dominated system
- Sole-source aquifer that provides the drinking water to all Long Island residents



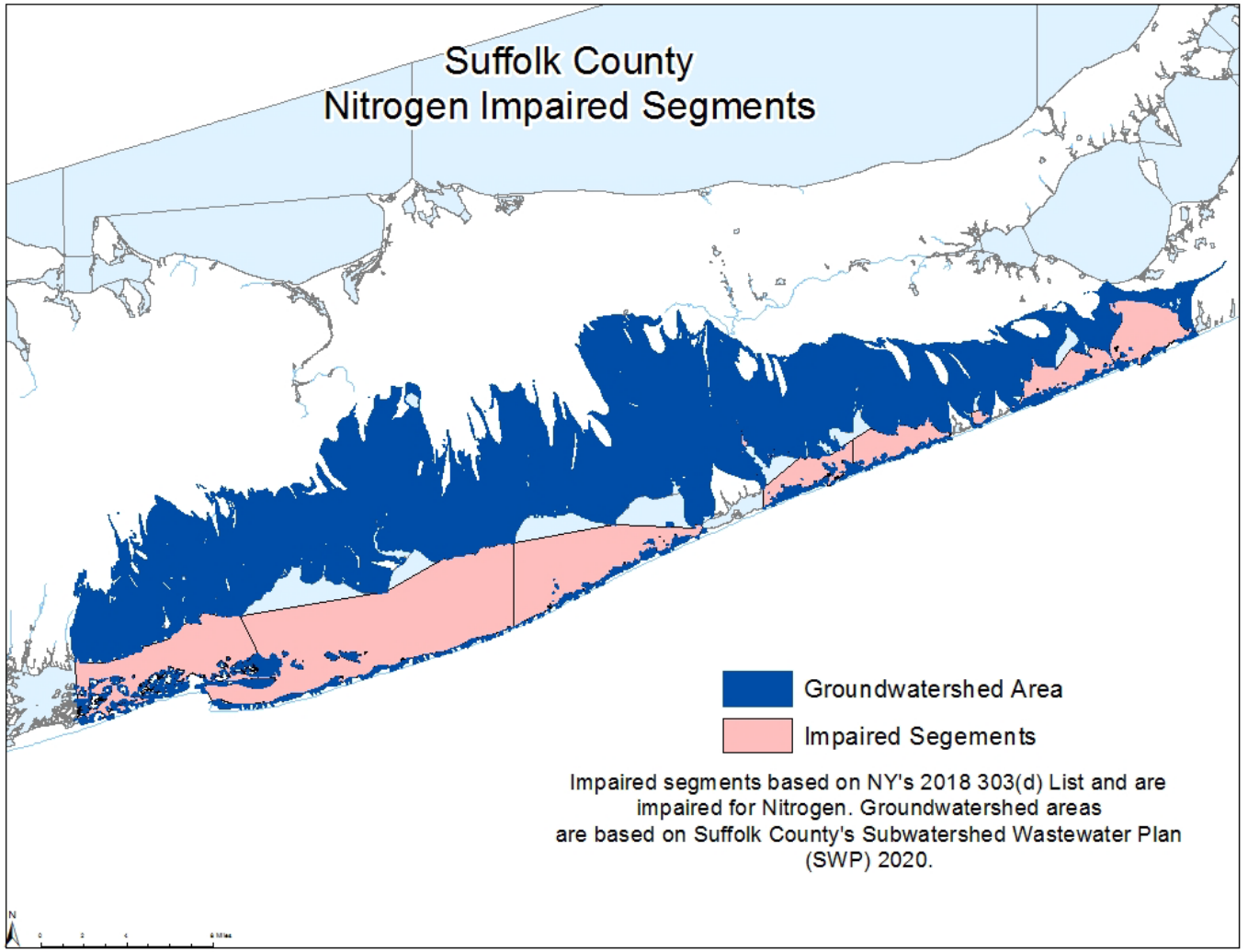


Long Island's aquifers - USGS SIR 2024-5044

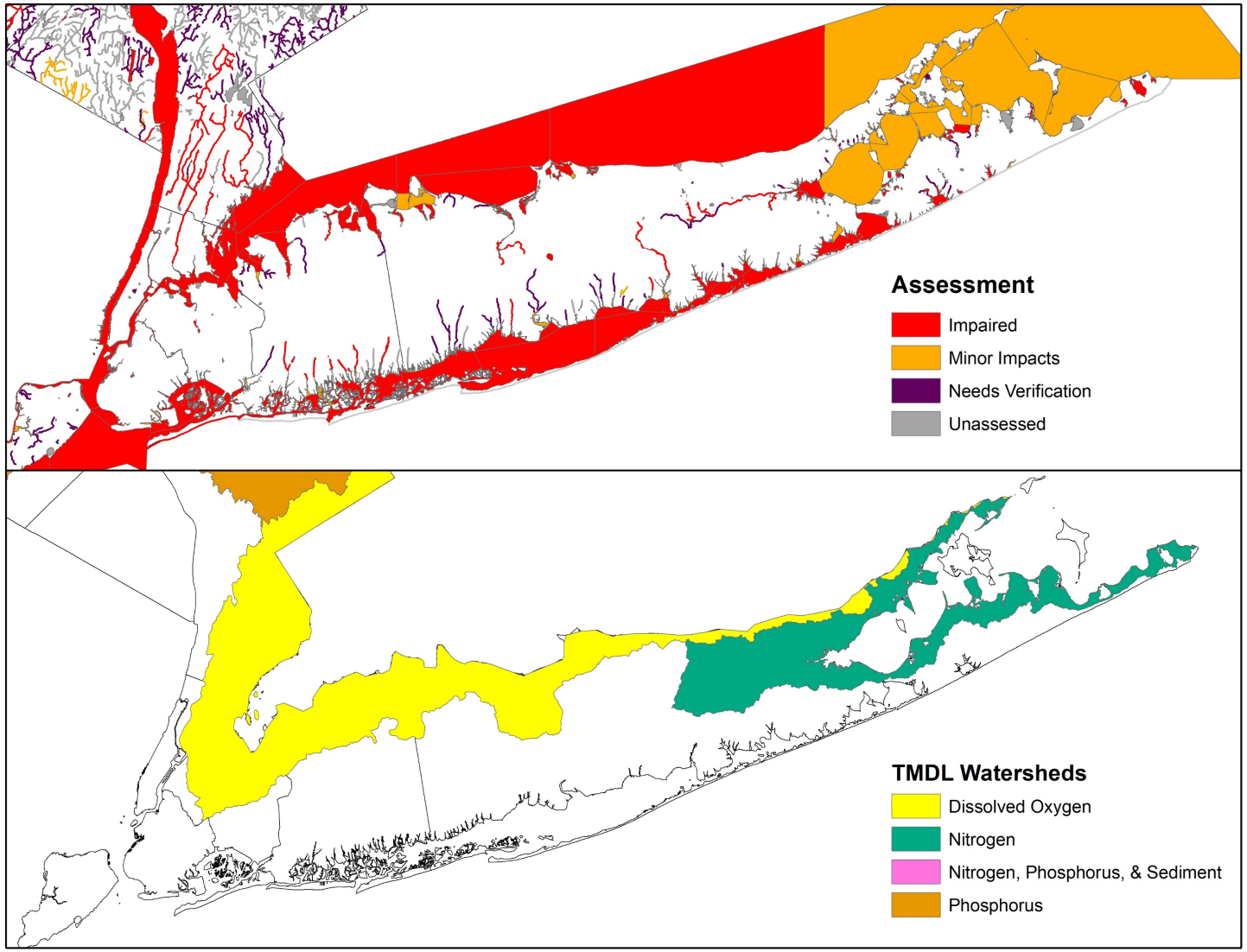
NYS Nitrogen Standard

- NYS doesn’t have numeric nutrient criteria for reduction endpoints
- Narrative standard: “None in amounts that result in the growths of algae, weeds, and slimes that will impair the waters for their best usages.”
- Number of waterbodies on the 303(d) List for nitrogen based off this standard: 22

Suffolk County 303(d) Nitrogen Impaired Waterbodies



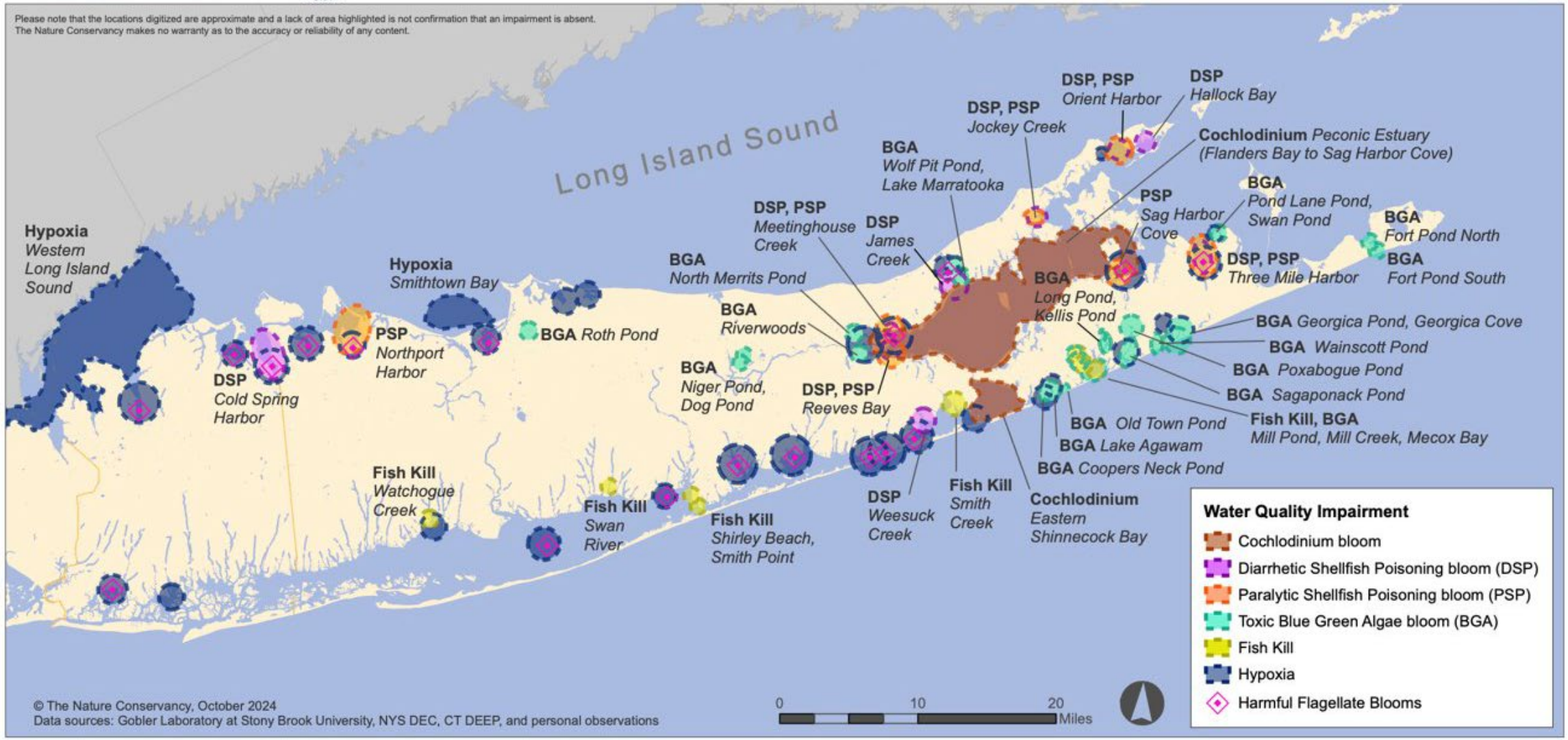
Island-wide Impairments and TMDLs



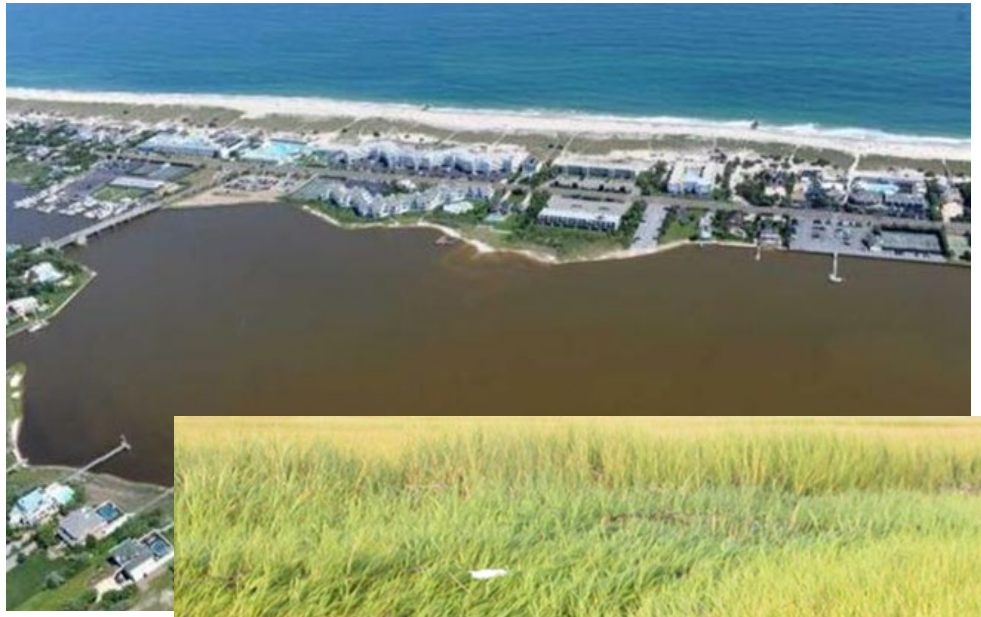
Stony Brook University
School of Marine and Atmospheric Sciences

Long Island Water Quality Impairments
Summer 2024

The Nature Conservancy

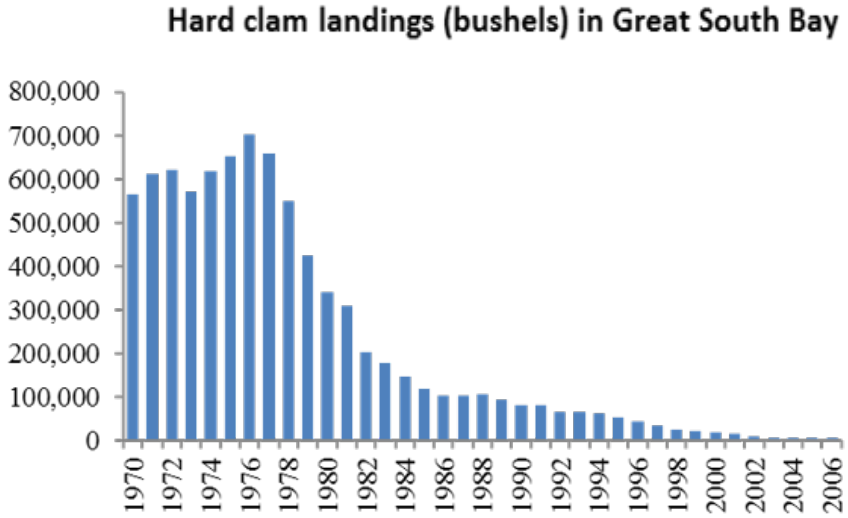


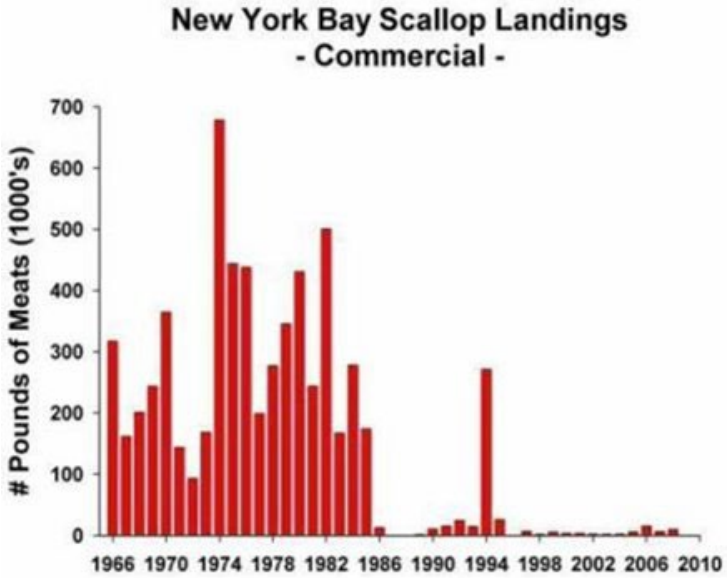
Nitrogen Issue on Long Island



Shellfish Decline

- Landings of clams and scallops have declined 99% since 1980.



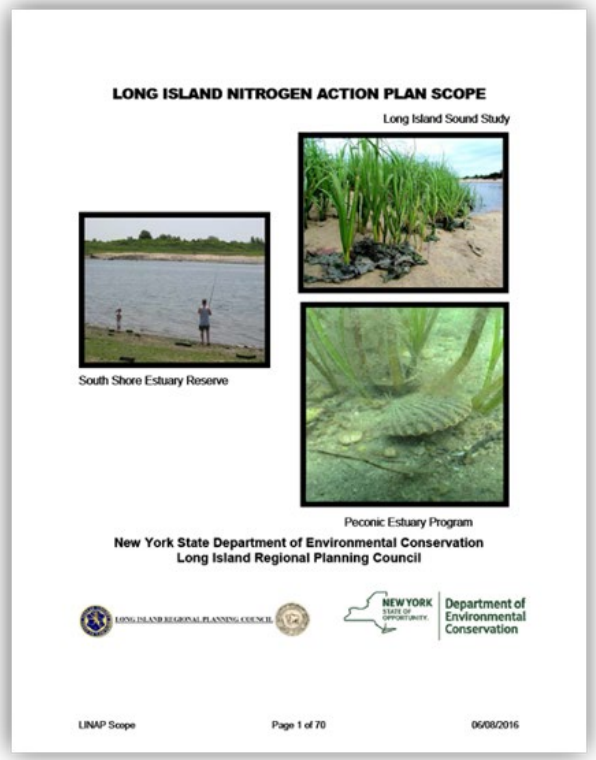


Long Island Nitrogen Action Plan (LINAP)

- Long Island Nitrogen Action Plan was announced in 2015 with $5 million dollars in the state budget to address these issues

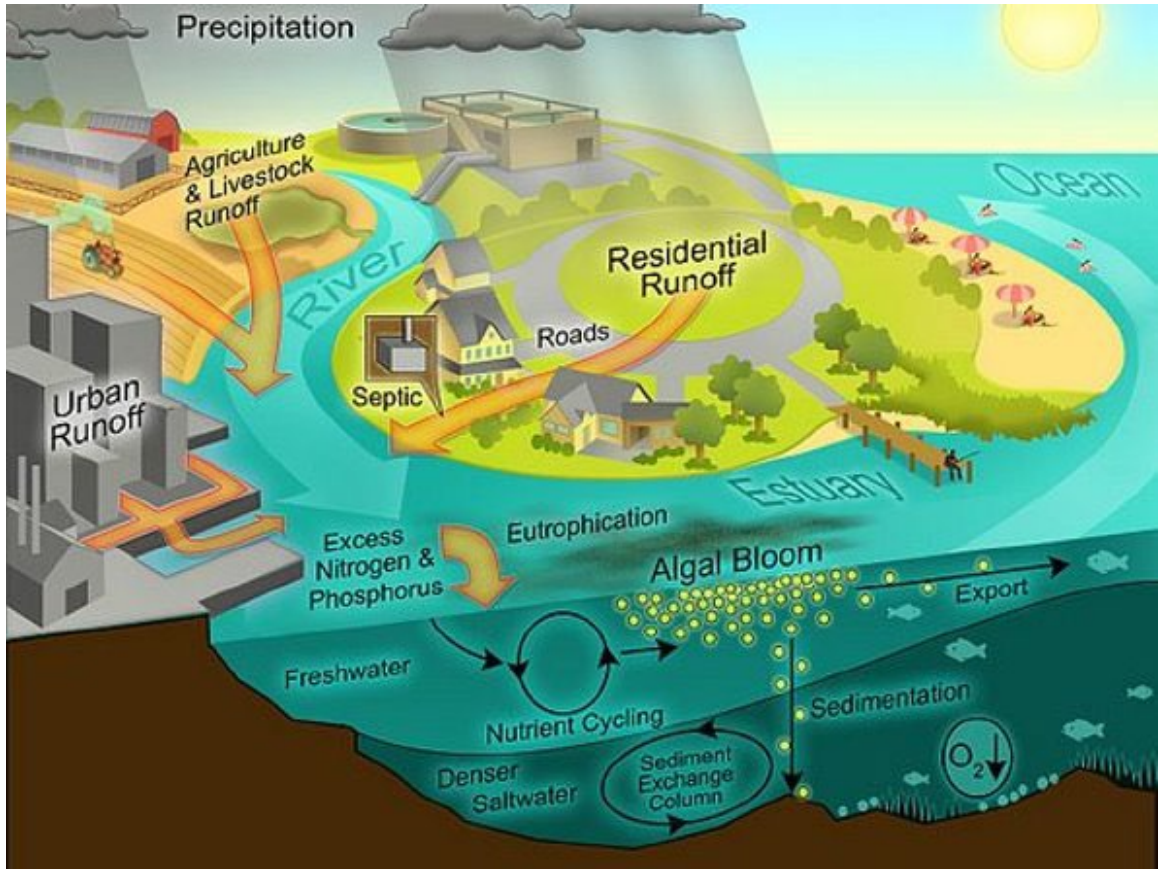
Goals:

- Assess nitrogen pollution in Long Island waters
- Identify sources of nitrogen to surface water and groundwaters
- Establish nitrogen reduction endpoints
- Develop implementation plans to achieve reductions



Partnerships

Goal 2: Identify Nitrogen Sources



https://doi.org/10.1007/978-3-031-10127-4_4

- Human Waste
  - Municipal sewage treatment plants
  - Residential cesspools and septic systems
- Fertilizer
  - Residential/turf grass
  - Agricultural
- Atmospheric Deposition
- Stormwater Runoff

Goal 2: Identifying Nitrogen Sources

- Nitrogen Loading Model was used to determine source contributions
- Nitrogen Loading Model Workgroup was established to ensure the most current data and science was used and that there would be local stakeholder acceptance of the results
- Also included the surface water contributions to give a full picture of the nitrogen loading to each surface waterbody
- Groundwater model and hydrodynamic models were also developed

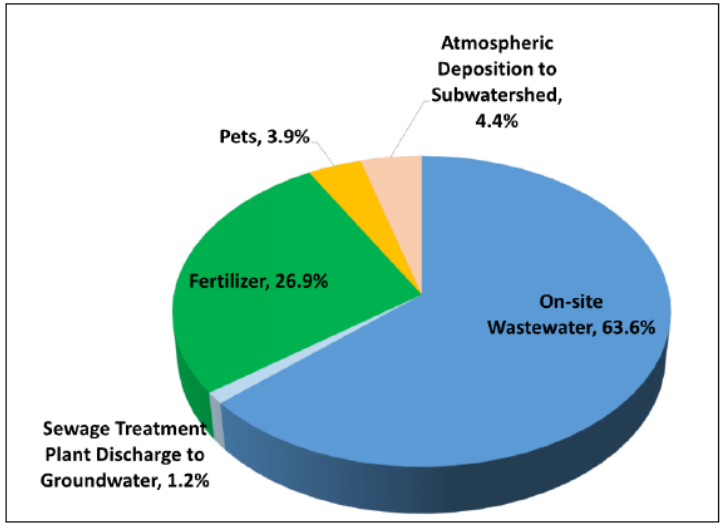


Figure 2-24 Nitrogen Loads from Groundwater to All 191 Subwatersheds

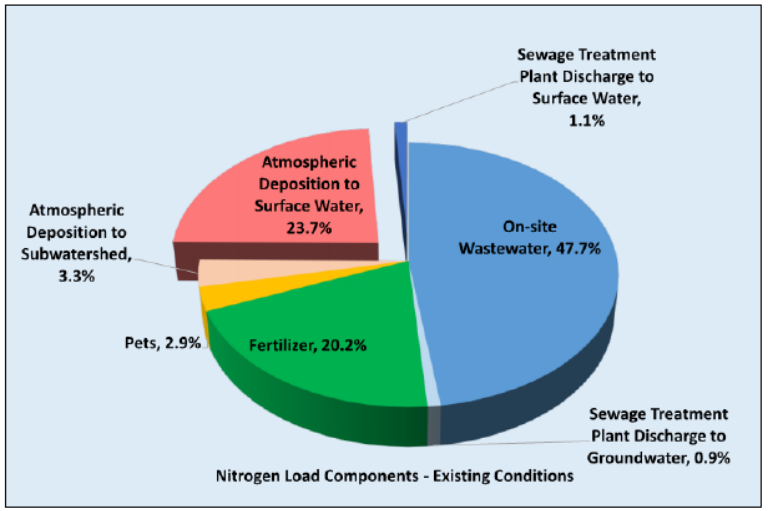


Figure 2-25 Nitrogen Load Components to the 191 Subwatersheds

Goal 3: Establish Endpoints

- NYS doesn't have numeric nutrient criteria for reduction endpoints
- Narrative standard: "None in amounts that result in the growths of algae, weeds, and slimes that will impair the waters for their best usages."
- Number of waterbodies on the 303(d) List for nitrogen based off this standard: 22
- Due to this, ecological endpoints were selected instead, with the assistance of an Endpoints Workgroup:
  - Dissolved oxygen: DEC standard of 4.8 mg/L, allowable excursions not less than 3.0 mg/L
  - Chlorophyll-a: greater than 5.5 µg/L
  - Secchi depth/water clarity: greater than 2 meters
  - Presence/absence of HABs: non within the past 10 years

Goal 3: Establish Reductions

- Using the ecological endpoints, a reference waterbody approach was used to identify and establish load reduction goals
- Approach assumes that nitrogen loading to impacted subwatersheds should be reduced to the level of existing loading to subwatersheds with observed good water quality within Suffolk County

$$\frac{\text{Subject Waterbody's Nitrogen Residence Time} - \text{Average Reference Waterbody Nitrogen Residence Time}}{\text{Subject Waterbody's Nitrogen Residence Time}} = \text{\% Load Reduction Goal}$$

Goal 4: Develop implementation plans

- With the nitrogen sources for each subwatershed known (goal 2) and the reduction needed (goal 3) an implementation schedule was put in place to tackle the major nitrogen sources
- Management areas were developed based on groundwater travel time, wastewater management, and drinking water/aquifer protection
- These areas were ranked to determine where to prioritize implementation

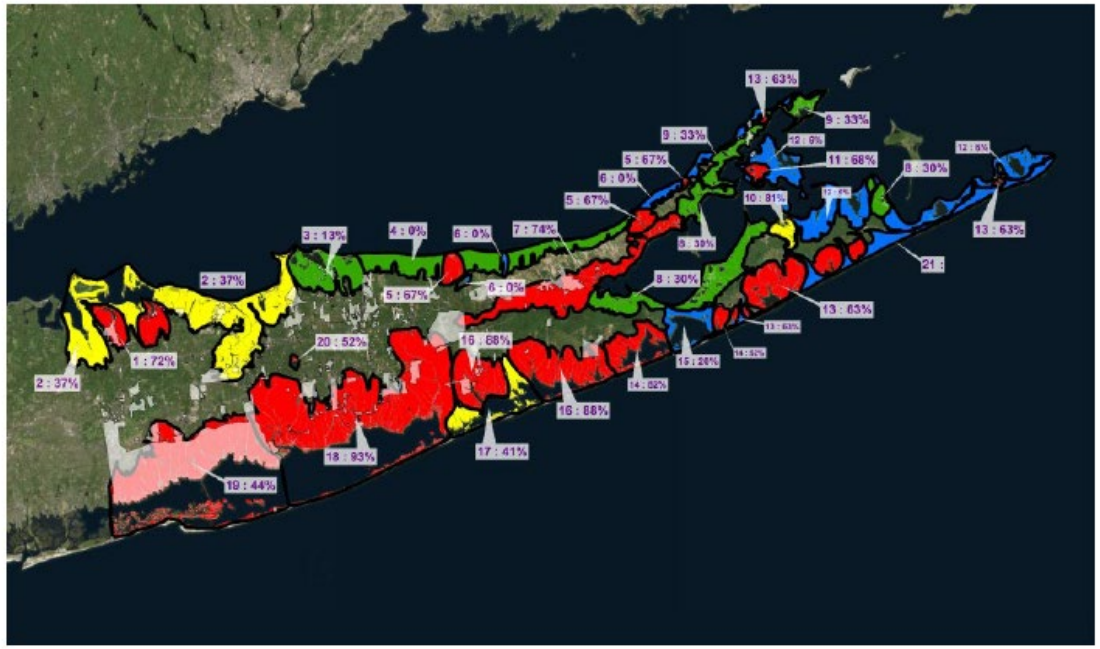


Figure 4-3 Wastewater Management Areas and Nitrogen Load Reduction Targets

Suffolk County Subwatershed Planning Effort Summary

- Suffolk County did an extensive planning effort that looked at all waterbodies in the County
  - LINAP/DEC funded most of the work, as well as participated in all aspects
- DEC accepted Nine Element Plan
- Modeling results showed that septic systems and cesspools were the main contributor to the nitrogen issue on the island
- The implementation aspect to meet the recommendations of the plan is the part that is going on now and what made us want to consider this work as part of an Alternative Restoration Plan

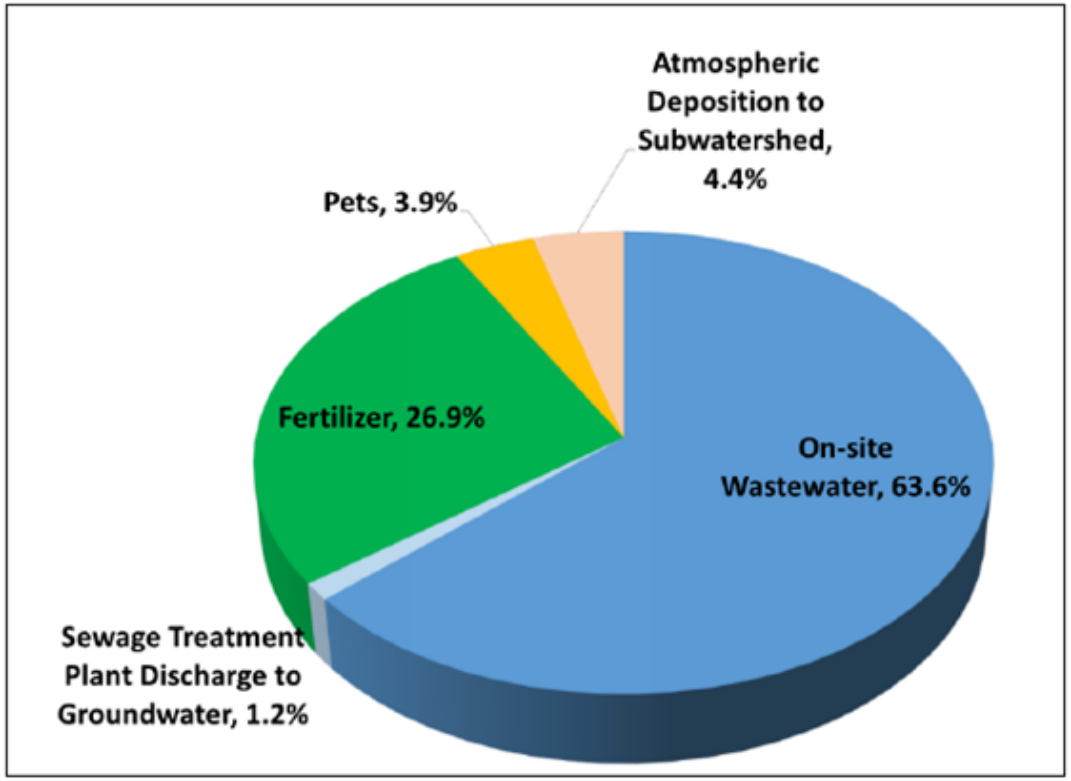


Figure 2-24 Nitrogen Loads from Groundwater to All 191 Subwatersheds

Implementation Programs/Initiatives

Septic Upgrades and Regulations

Wastewater Treatment Facilities

Countywide Management District

Residential Fertilizer

Long Term Monitoring and Adaptative Management

Septic Improvement Program

Credit: Suffolk County

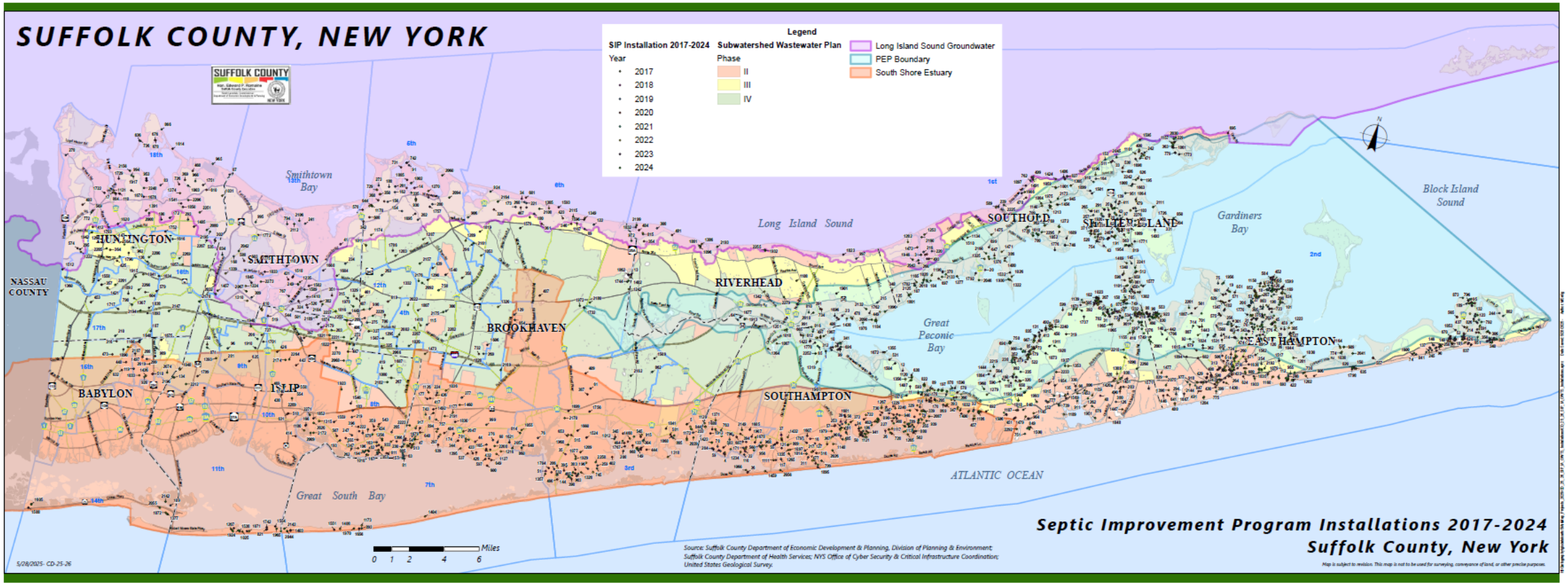
- Suffolk County's Septic Improvement Program is a grant program to update the over 360,000 cesspools and septic systems in the County to systems that treat for nitrogen
- Requirements:
  - Systems must meet a 19 mg/L nitrogen limit
  - Approved list of systems that have met the County's extensive testing process
  - Approved list of septic installers
  - Grant funded systems must have O&M agreements in place to ensure systems continue to be in proper working condition for the lifetime of the system
- Open enrollment for grant applications, but funding is provided based on application score
- Applications for septic systems are scored based on the recommendations of the subwatershed plan and take into consideration systems that are deemed failing

Septic Improvement Program

- Grant funding information
  - $10,000 from New York State Septic Replacement Program (NY SSRP)
  - $20,000 from Suffolk County's SIP
  - $5,000 additional from Suffolk County for low-to-moderate income households
  - Total of up to $35,000

- Current stats:
  - Over 2,296 systems have been upgraded
  - Total of over $22.4 million has been spent in NY SSRP grant funding (does not include the County grant amount)

Current Stats



Credit: Suffolk County

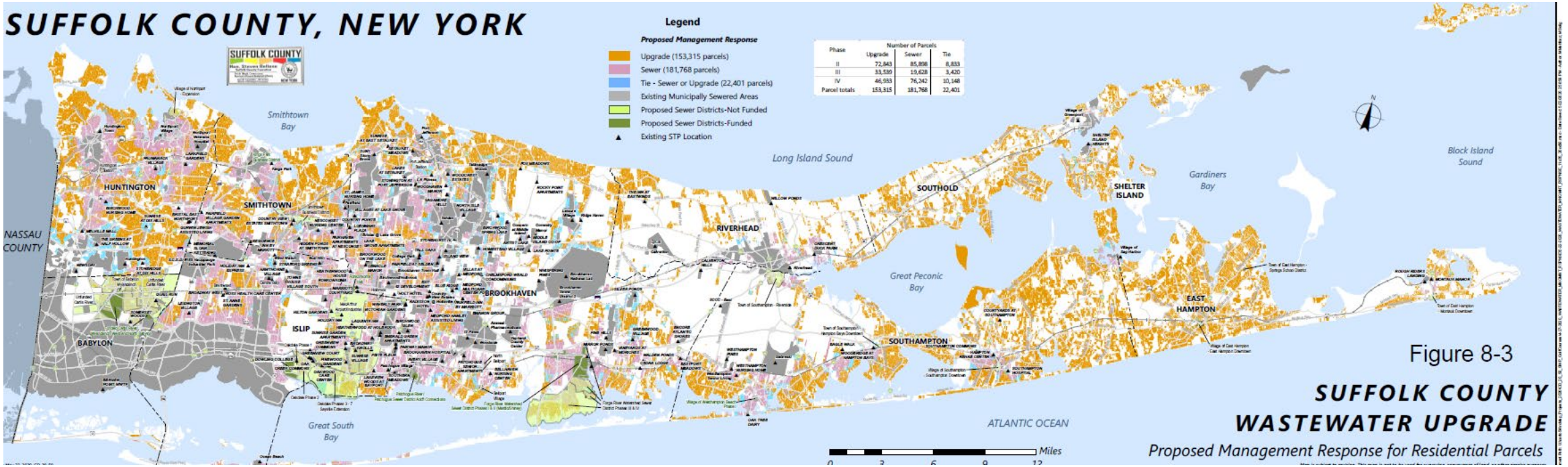
Septic Systems

- Regulations passed:
  - Cannot replace a cesspool with a cesspool
  - Only approved systems that can treat down to 19 mg/L can be installed for new construction

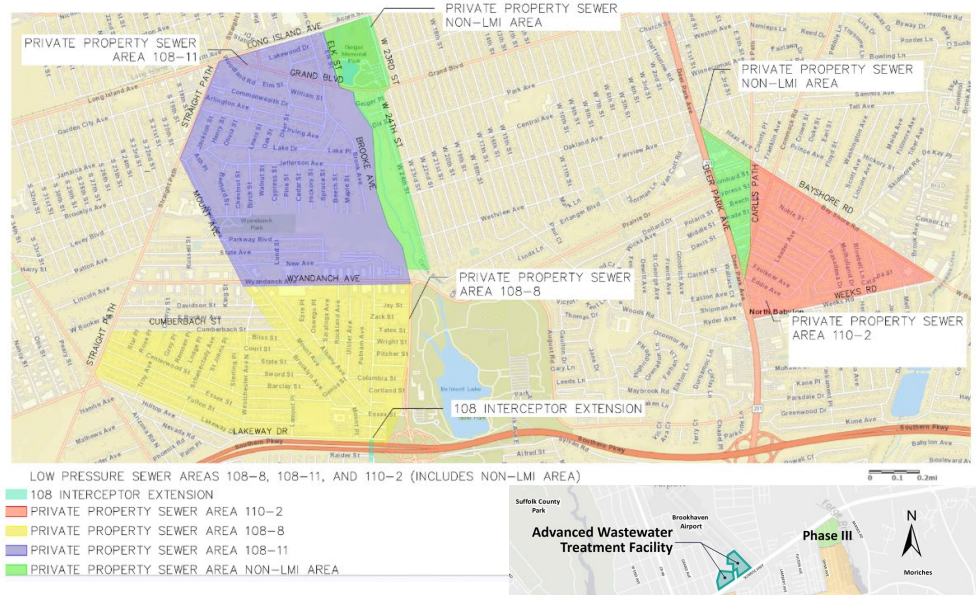
- Recommendation for regulations that are being studied:
  - Upgrade of a system to approved system upon property transfer
  - Upgrade of a system to approved system upon system failure

Wastewater Treatment Facilities

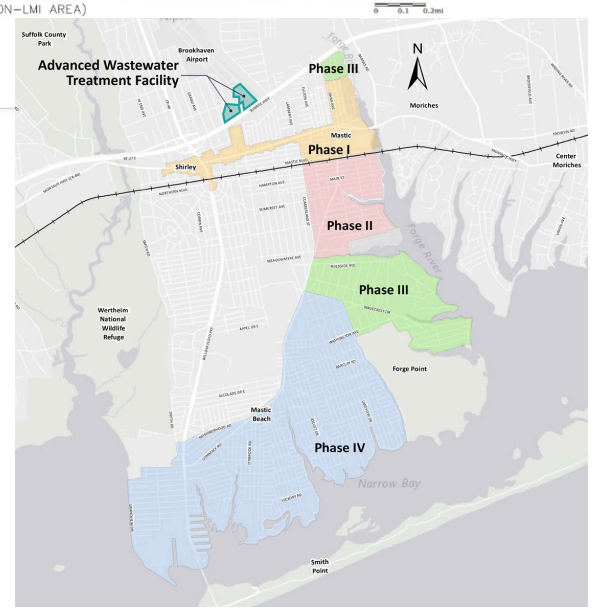
- Subwatershed plan included a parcel level scoring system to determine if a parcel was better suited to have a septic upgrade or connect to a wastewater treatment facility
- Capacity study almost complete to determine which wastewater facilities have the capacity to take on more flow and what parcels would be eligible to connect to those systems



Wastewater Treatment Facilities



https://www.cleanwaterforcarllsriver.com/project-milestones.html



https://masticshirleychamber.org/2018/08/07/forge-river-watershed-sewer-project/

- Suffolk County Coastal Resiliency Initiative
  - Partly funded by FEMA Superstorm Sandy funds, a $390 million dollar sewering effort on the south shore of the County that will hook up over 5,500 parcels off septic and connect to an existing or newly constructed wastewater facility that treats nitrogen down to 5 mg/L

Countywide Wastewater Management District

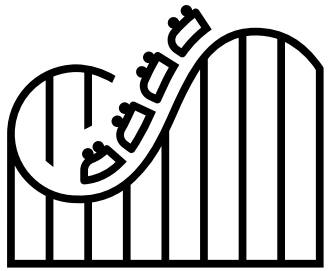
- A recommendation of the Subwatershed plan was to create a Countywide Wastewater Management District (CWMD) for wastewater facilities and on-site systems
- Put up to vote to Suffolk County residents in 2024 and would include a 1/8 % sales tax that will fund the septic grant program and wastewater facility upgrades
  - Passed with over 70% voter support and started as of January 1, 2025
- Estimated to generate $3 billion in revenue through 2060

Fertilizer

- DEC, through LINAP, is the lead on this effort
- Fertilizer Management Workgroup assembled to better understand barriers to proper fertilizer usage and how to achieve reductions
  - Included fertilizer industry representatives to enact change at the manufacture level
- Through multiple workgroup sessions, a set of recommendations was developed and released in 2019
- Scott's Fertilizer brand developed a Long Island specific fertilizer blend based off the recommendations

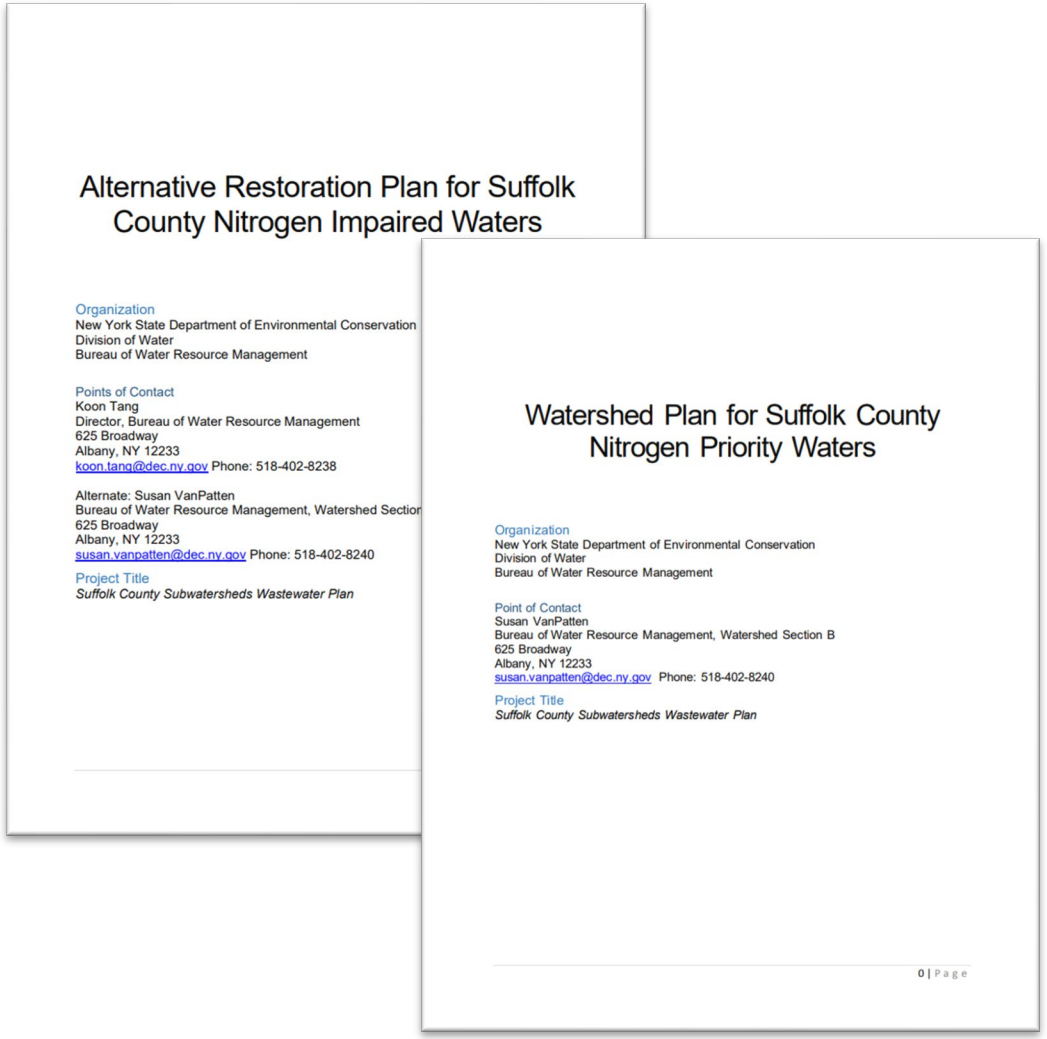
Adaptative Management and Long-Term Monitoring Plan

- Long-Term Monitoring Plan developed to:
  - Assess all monitoring occurring in waterbodies
  - Determine where there are gaps and/or where there are duplication of efforts
  - Ensure there is adequate sampling occurring to track improvement progress
- Adaptative Management Plan developed to:
  - Track implementation and effectiveness of the implementation projects
  - Identify changes needed to achieve nitrogen reduction goals



Alternative Restoration Success?

- We believe the implementation efforts that are ongoing will be what is needed to reduce nitrogen and improve the water quality
- Jurisdiction of on-site wastewater and fertilizer is not with DEC and therefore better suited to be dealt with at the local level
- As noted, this is a groundwater dominated system and therefore we do not expect to see change immediately
  - This is reflected in the ARP where we note a 50-year implementation timeline to see improvements
- Also developed a watershed protection plan for waters surrounding Suffolk that aren't officially impaired on the 303(d) list



Questions and Thank you!

Questions?

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Department of Environmental Conservation