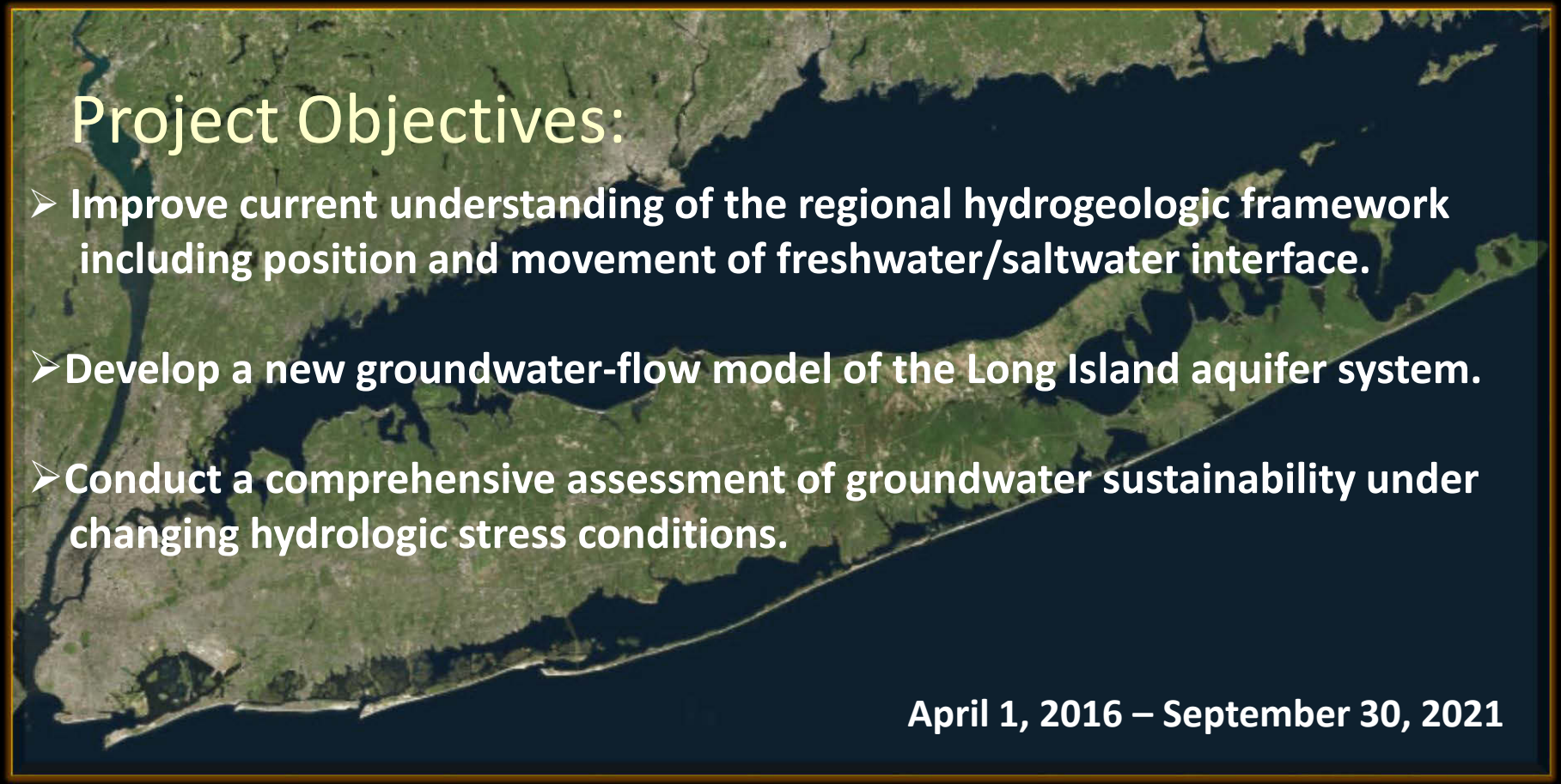
Long Island Groundwater Sustainability Study



Project Objectives:

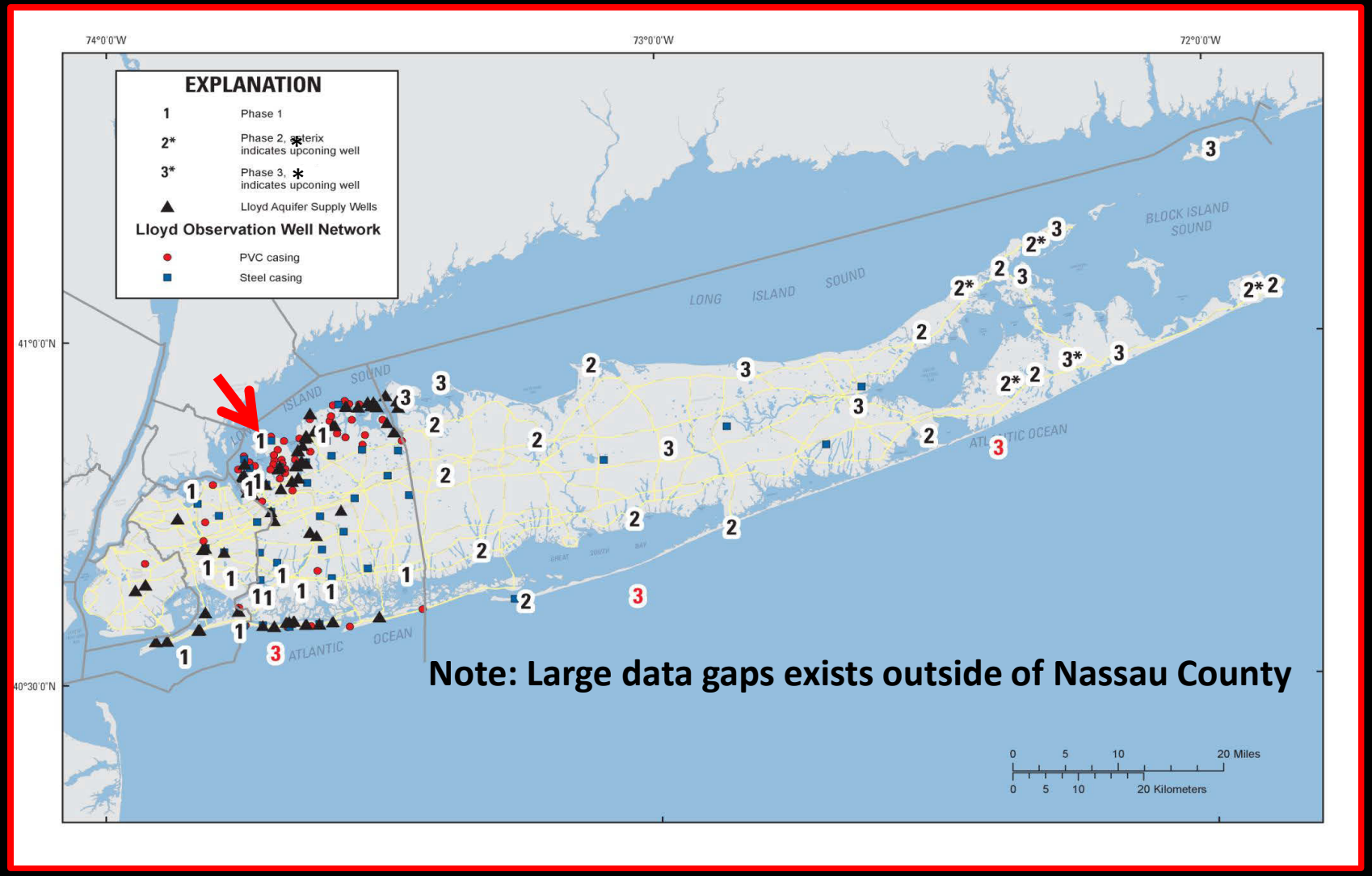
- **Improve current understanding of the regional hydrogeologic framework including position and movement of freshwater/saltwater interface.**
- **Develop a new groundwater-flow model of the Long Island aquifer system.**
- **Conduct a comprehensive assessment of groundwater sustainability under changing hydrologic stress conditions.**

April 1, 2016 – September 30, 2021

NEW YORK STATE | Department of Environmental Conservation

USGS

Proposed Well Drilling Locations



USGS

Drilling and Geophysical Logging

USGS

Saltwater Intrusion in Great Neck

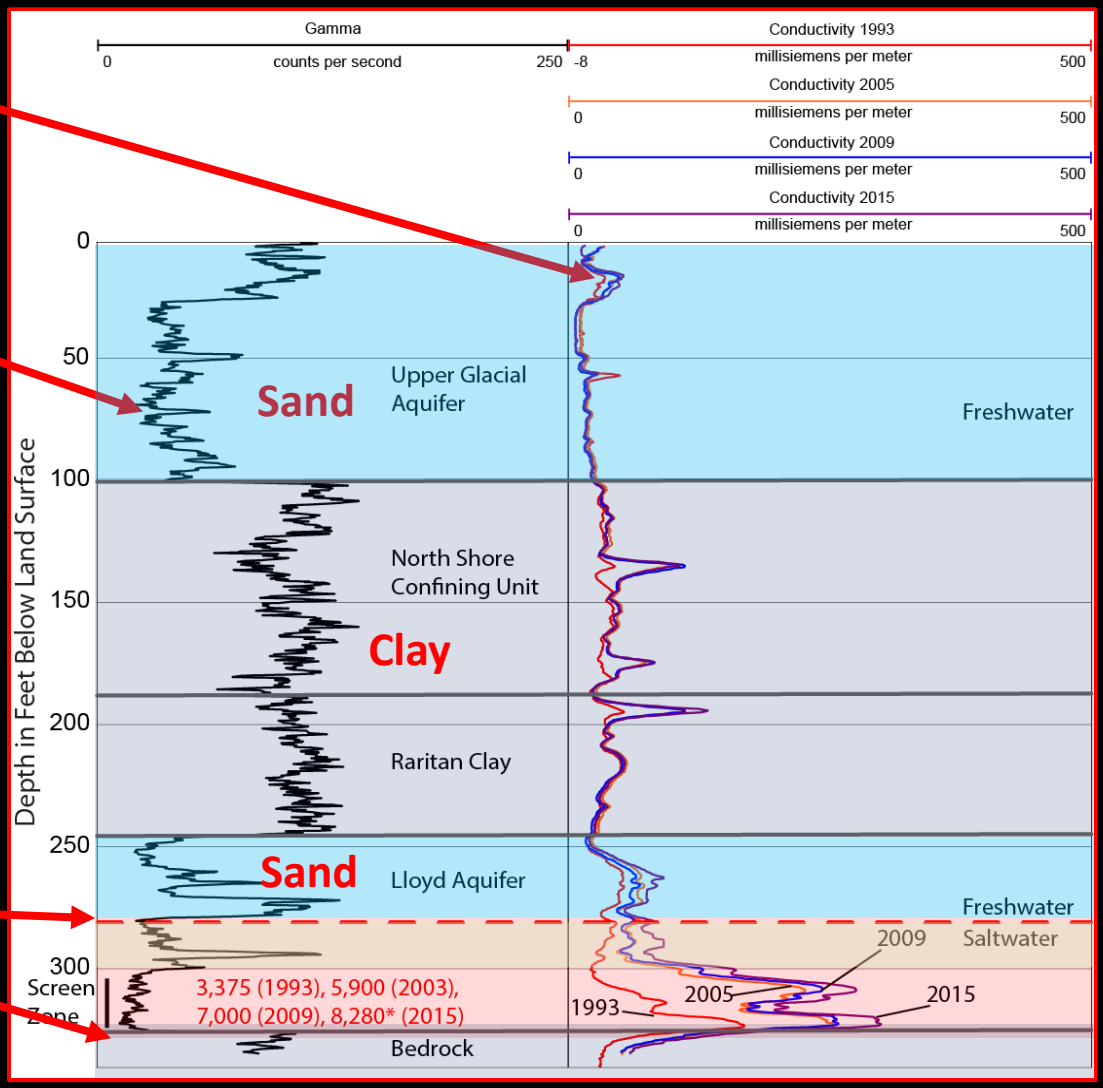
Conductivity Log

Gamma Log

Chloride mg/L

1993	3,400
2003	6,000
2009	7,000
2015	8,300

Saltwater



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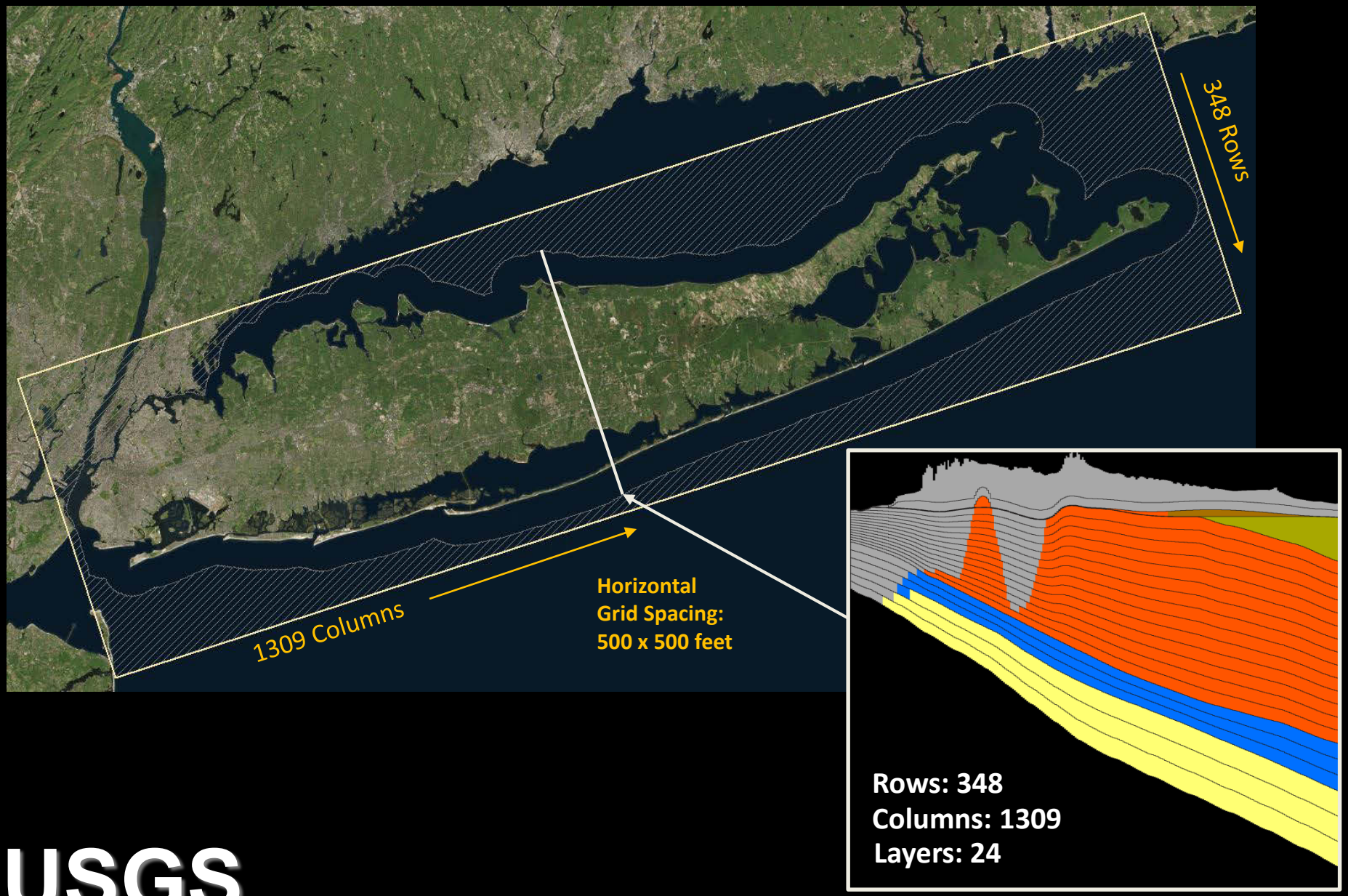
Long Island Regional Model Grid



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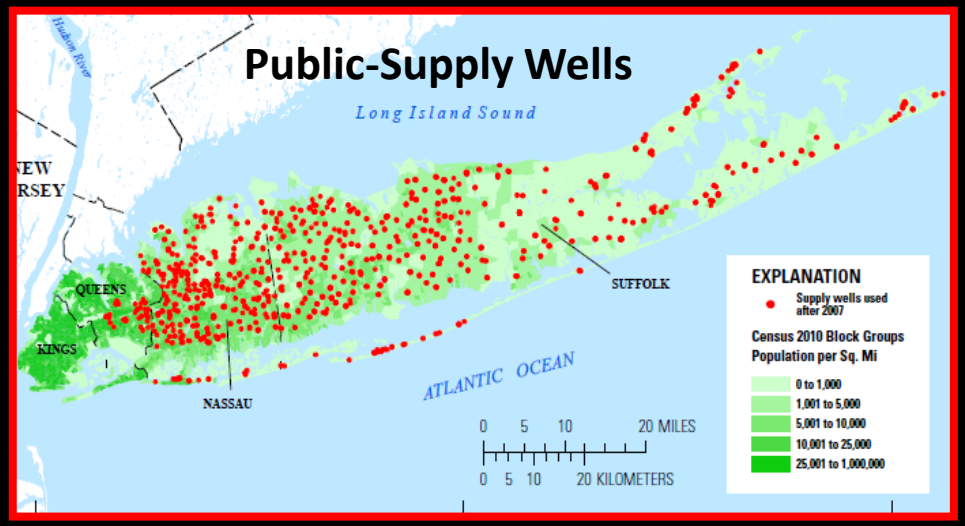
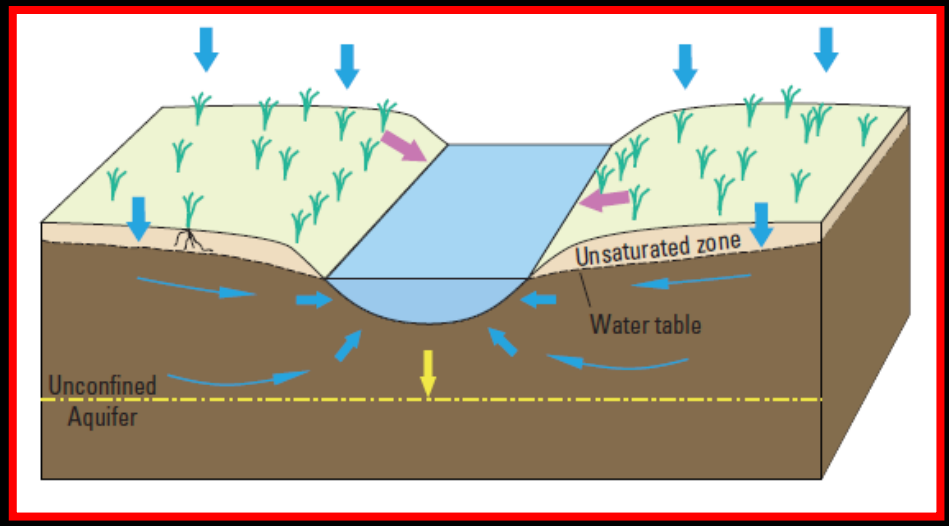
GW Sustainability: Limiting Factors

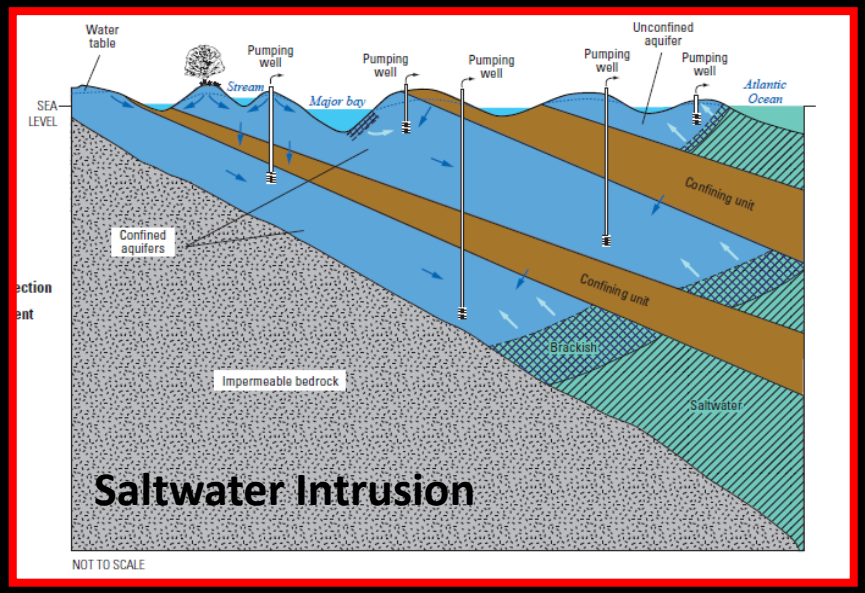
- Water Quantity
  - Groundwater depletion
  - Groundwater-fed ponds, streams, wetlands
  - Coastal discharge
- Water Quality:
  - Saltwater intrusion
  - Anthropogenic contamination

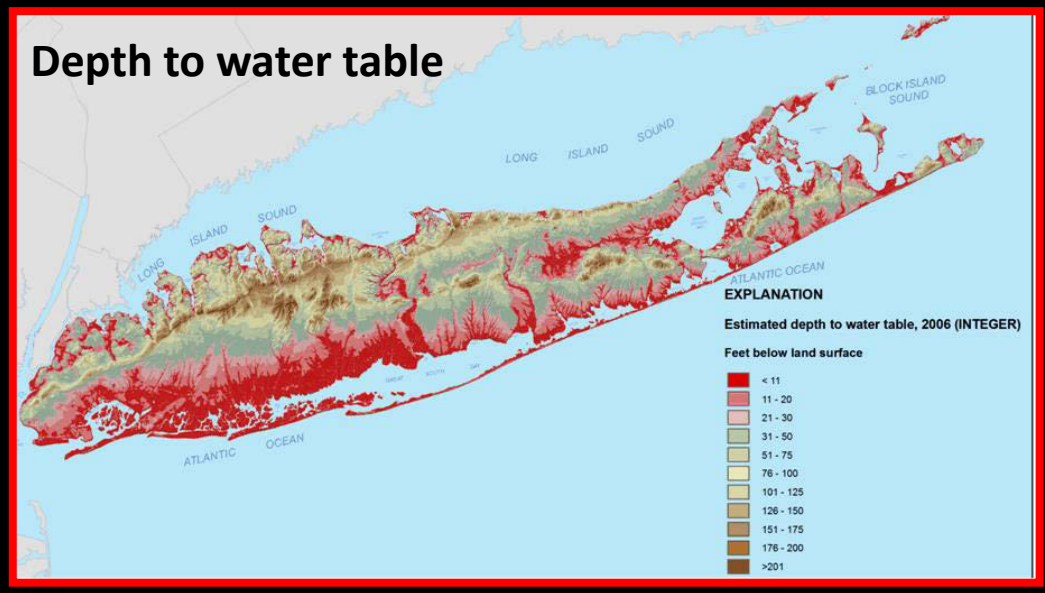
USGS

Water Quantity Concerns









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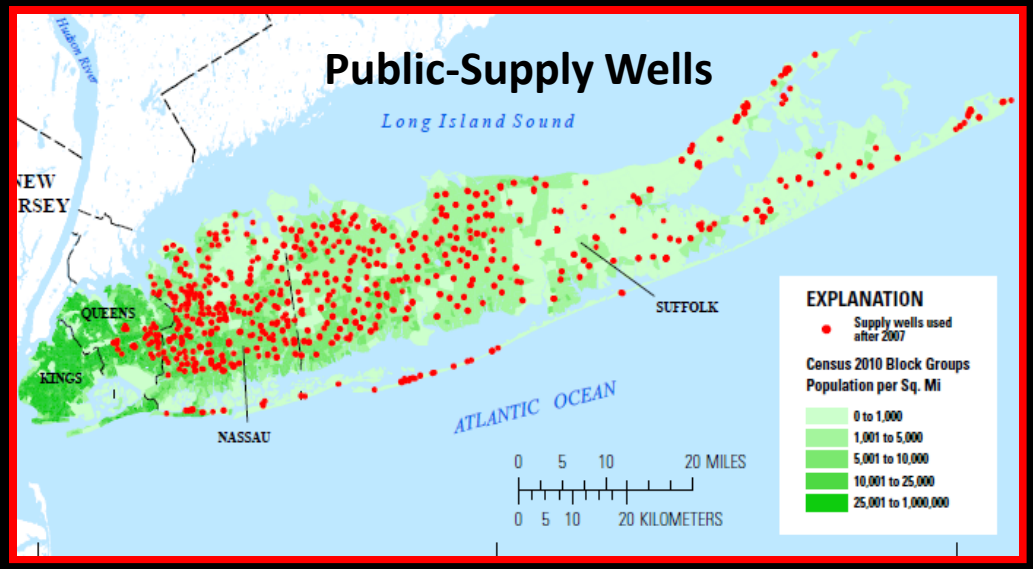
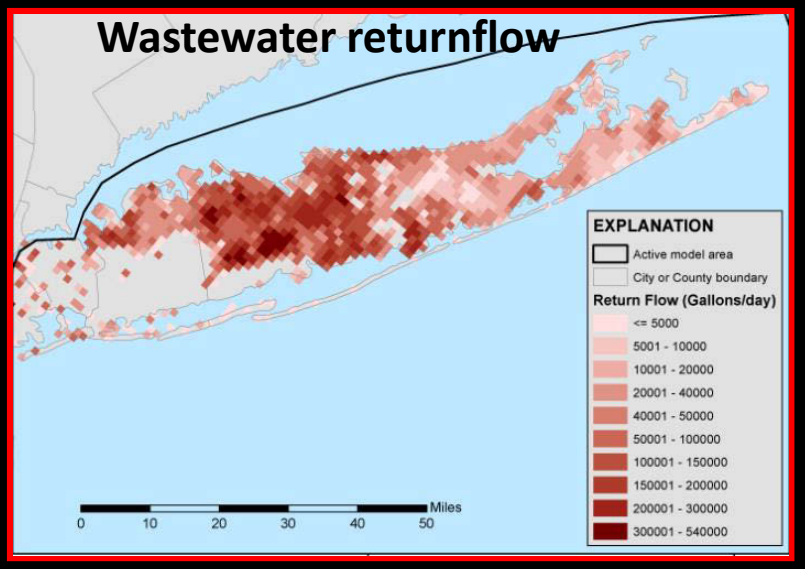
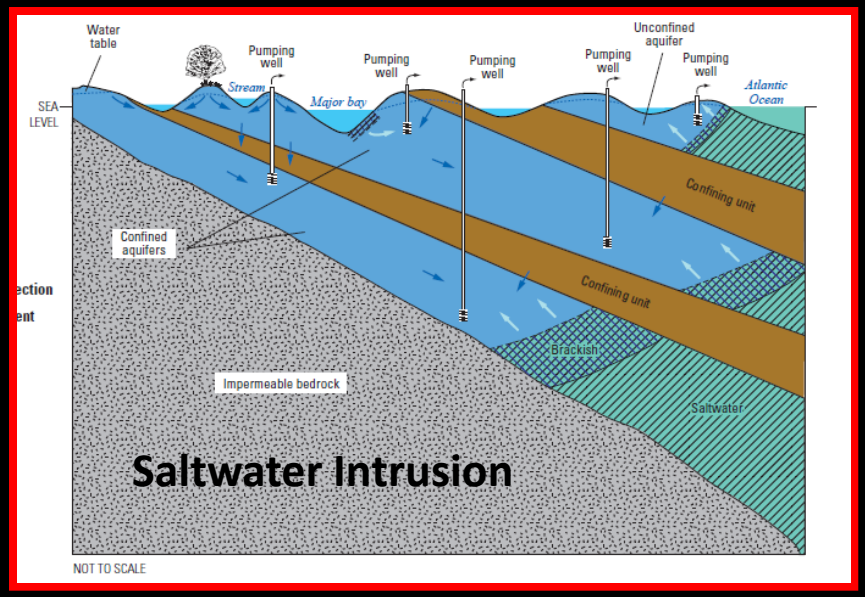
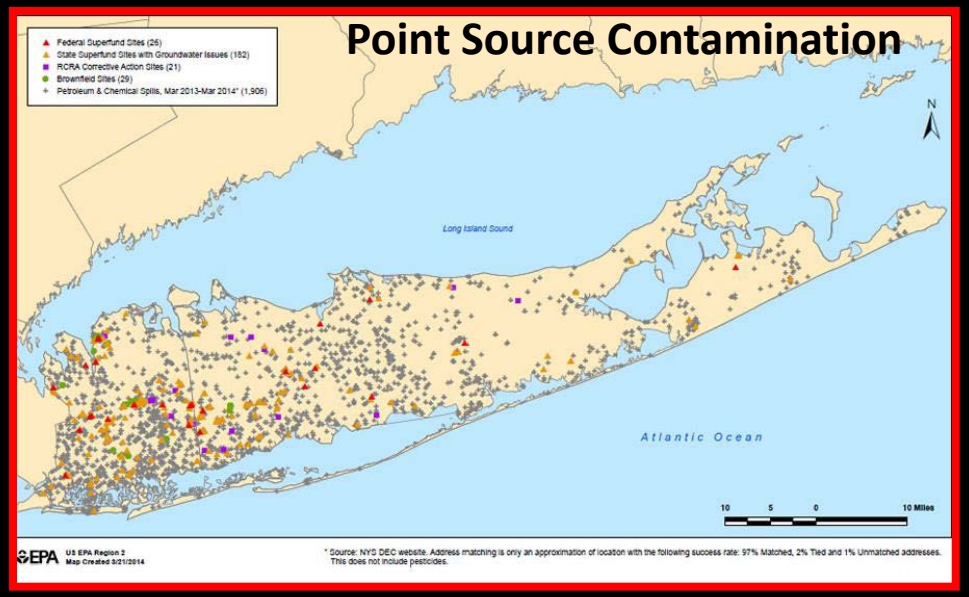
Water Quality Concerns









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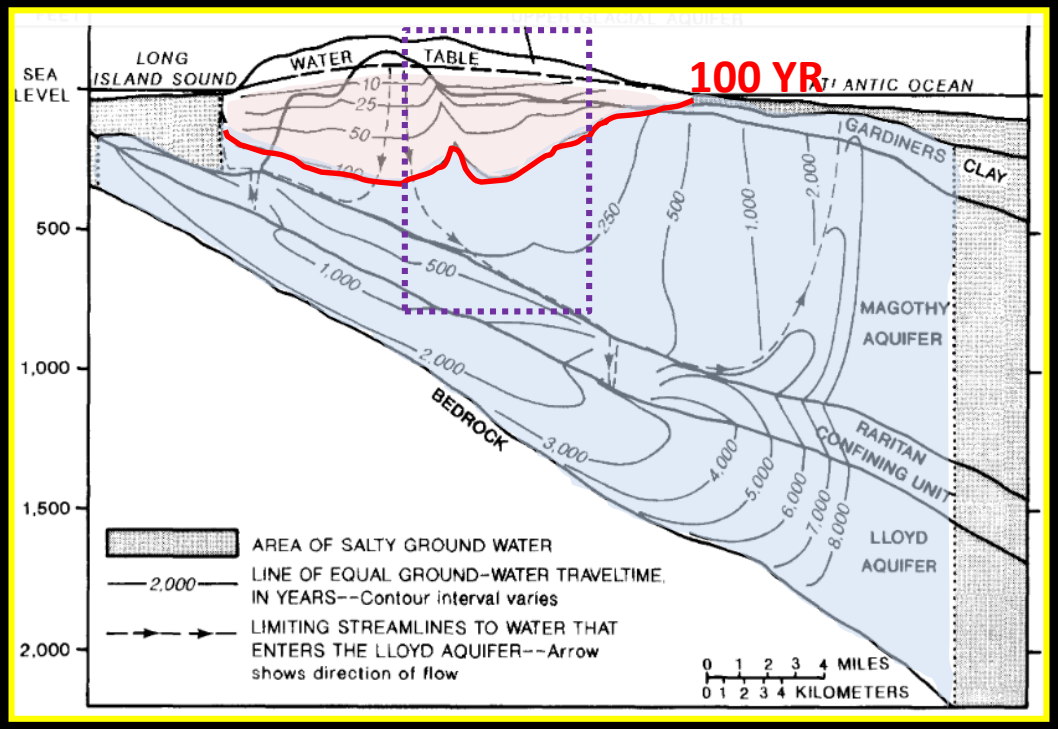
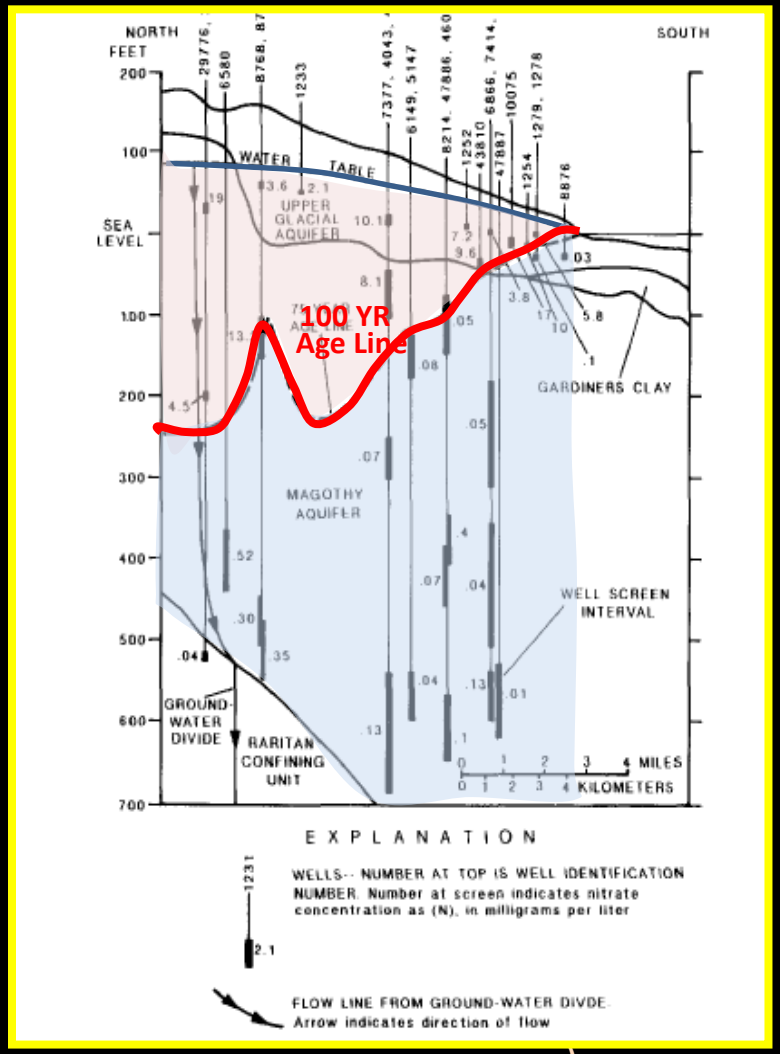
GW Age: Surrogate for Water Quality



Groundwater Age Distribution



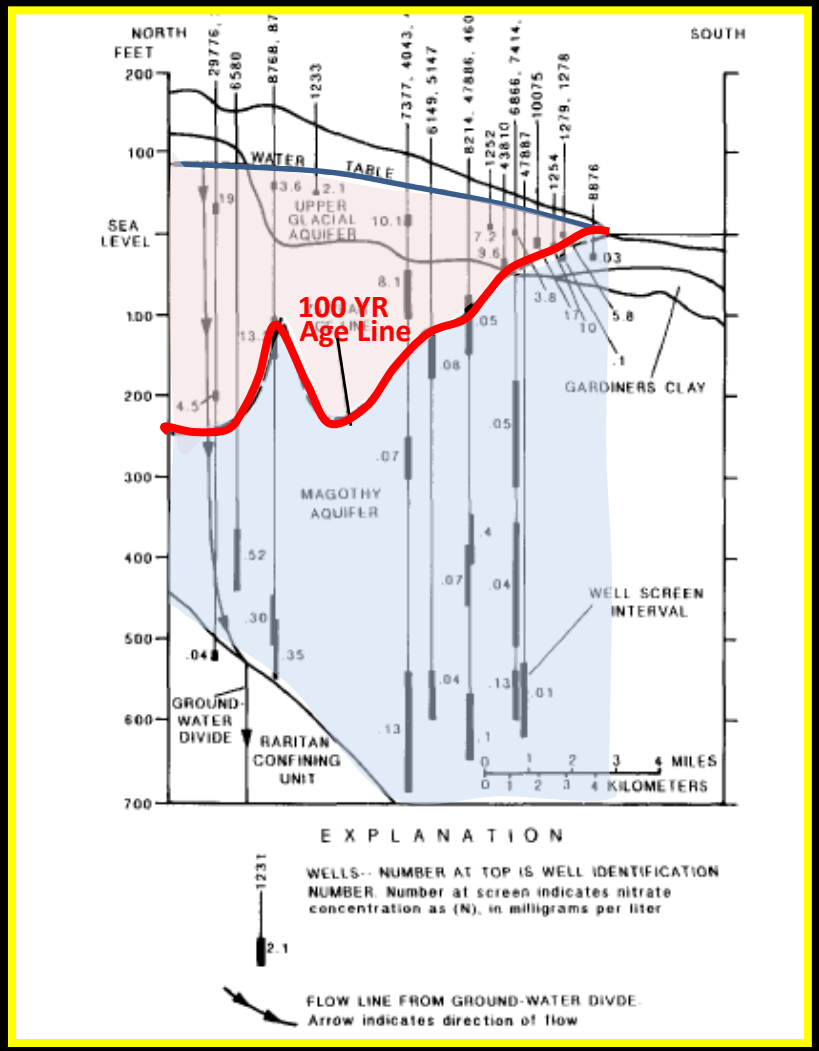
Modified from Buxton and Modica (1992)

USGS

GW Age: Surrogate for Water Quality

Quantify Susceptibility:

- Volume of aquifer
- Number of wells affected
- Amount of water pumped
- Population served
- Future vulnerability



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Regional Sustainability Assessment:

Water Quantity:

- Calculate changes in water levels, streamflow, and coastal discharge to be used for ecohydrological response assessment.

Water Quality:

- Determine potential areas susceptible saltwater intrusion and use groundwater age distribution for regional vulnerability/sustainability assessment.

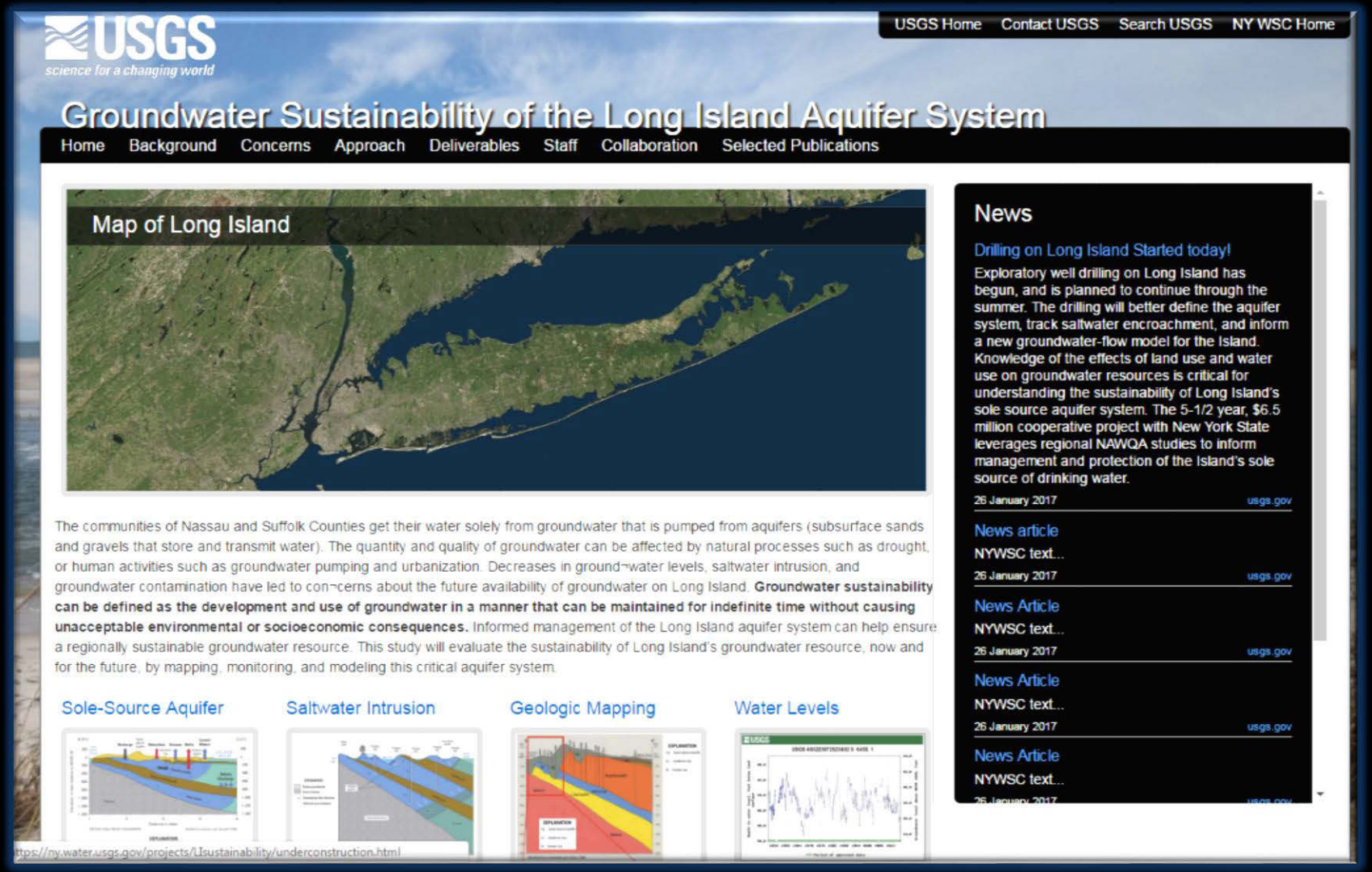
USGS

GW Sustainability Scenarios

- Change in withdrawals:
  - Existing wells
  - New wells
  - Short-term, emergency reactivation of existing NYC wells
- Changes in returnflow:
  - Wastewater
  - Recharge basins
  - Water reuse
- Climate change:
  - Sea-Level Rise
  - Recharge (changes to precip. and temp. regime)

USGS

Project Website



https://ny.water.usgs.gov/projects/LIsustainability/

USGS