



Department of
Environmental
Conservation



NRD Restoration Project Long Island Groundwater Sustainability Study

Long Island Commission on Aquifer Protection

December 16, 2020

Natural Resource Damages

- Natural Resource Damages are sought from responsible parties when there is a spill or contamination release
- The goal is to restore the injured resource and compensate the public.
- The “natural resources” include but are not limited to land, water, groundwater, drinking water supplies

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Water Availability and Use
Prepared in cooperation with the New York State Department of Environmental Conservation

Water for Long Island: Now and for the Future

Do You Ever Wonder Where Your Water Comes From?
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Why Is Groundwater Important?
Groundwater pumped from these aquifers provides essentially all the drinking water for the nearly 3 million people that live on Long Island; the U.S. Environmental Protection Agency (EPA) has designated them as a sole-source aquifer system. About 425 million gallons of water is pumped daily from tens to hundreds of feet below the ground by more than 1,500 public-supply wells throughout the island. The good news is that all this pumping only removes a small amount of the total groundwater beneath the island and precipitation replenishes the aquifer system at a rate of nearly four times the amount that is pumped. This replenishment also sustains the island's groundwater-fed ponds, streams, wetlands, and coastal waters. The bad news is that not all this groundwater is available, or safe, to drink.

Why Is Saltwater Intrusion a Concern?
Because Long Island is surrounded by saltwater at the surface and at varying depths below ground, the freshwater that replenishes the aquifer system and slowly flows through it and that eventually exits the aquifer system at the coast is what keeps the saltwater in the sediments that are offshore from pushing landward beneath Long Island. The area where the fresh groundwater, which flows seaward toward the coast, meets the salty groundwater, which flows landward toward the shore, is referred to as the freshwater/saltwater interface. If too much fresh groundwater is pumped from an aquifer near this interface, salty groundwater will move inland, affecting the water quality in wells near the interface. If a pumping well pulls in salty groundwater (by a process referred to as saltwater intrusion), that water is no longer safe to drink. Once intruded, an aquifer no longer can provide drinking water until the saltwater is flushed out naturally by freshwater, which can take decades to as much as centuries.

What Are Other Groundwater Quantity and Quality Concerns?
Another issue with pumping groundwater from a coastal aquifer system is that it can reduce the amount of freshwater that flows toward the shoreline. This freshwater naturally discharges into the coastal bays and estuaries and is needed to maintain the proper salinity in coastal waters to support the shellfish and finfish in these marine habitats. Removing groundwater from the aquifer system also affects surface waters away from the coast. Overpumping can lower the water table (the level below the ground in which sediments are saturated with water); if the water table is lowered below the bottoms of ponds, streams, and wetlands, then no groundwater can sustain them, and they will dry up. Quantity is not the only water-related issue facing Long Island. Essentially all the groundwaters in the aquifer originated as precipitation at land surface so any contaminant releases or spills at land surface can potentially affect the quality of the underlying groundwater. Examples of possible contamination sources include fertilizers and pesticides, domestic wastewater

Block diagram showing groundwater flow on Long Island, New York.

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Restoration Efforts

- Focus on injury to groundwater to LI's sole source aquifer system
- Restoration involves funding the completion of Phase 1 and 2 of the Long Island Groundwater Sustainability Study
 - Updated hydrogeologic framework
 - Long Island Regional Groundwater Flow modeling tool.

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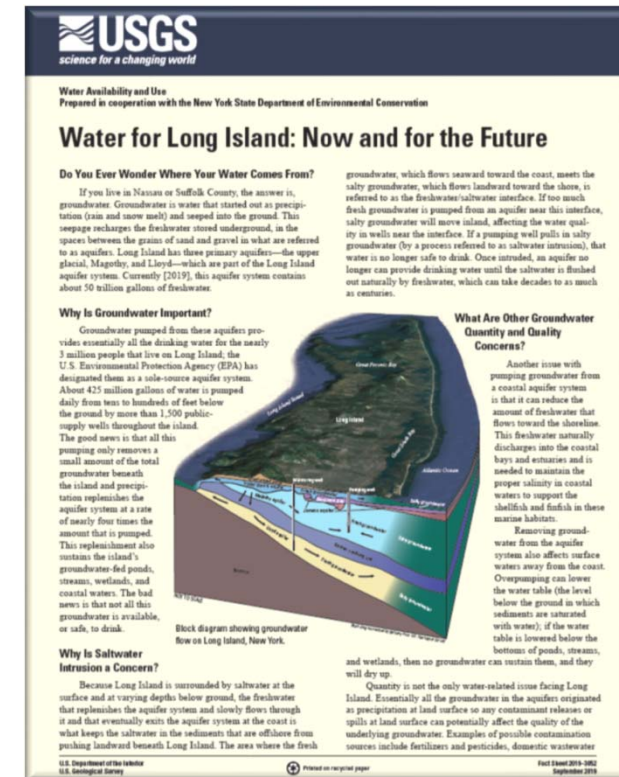


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LISUS: Original Project Scope

- Island-wide drilling, geophysical logging and saltwater mapping
- Hydrogeologic framework analysis
- Develop 3-D transient, coupled freshwater/saltwater flow model
- Produce two reports on framework and modeling analyses by October, 2021



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Unforeseen Circumstances

- Contracting issues resulted in a delay in drilling start from spring, 2017 to summer, 2019
- Additional funding made available to jump start drilling focused on western LI
 - Phase I: Western LI
 - Phase II: Central/Eastern LI
- COVID-related 6-month hiatus in drilling added an additional delay in completion schedule

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Revised Workflow: Phase I

- Western LI drilling: August, 2019 – spring, 2021
- Western LI framework/modeling analyses completed by spring, 2022
- Publication of western LI framework and modeling results by fall, 2022
- Publication of interim products (ongoing)



Phase I Interim Products

- Current extent of onshore saltwater intrusion in western Long Island:
<https://pubs.usgs.gov/of/2020/1093/ofr20201093.pdf>
- Hydrogeologic characteristics of the Upper Glacial and Magothy aquifers:
<https://pubs.er.usgs.gov/publication/sir20205023>
- Analyses of aquifer properties of western Long Island:
<https://pubs.er.usgs.gov/publication/ofr20201108>
- Development of steady-state groundwater-flow model:
<https://pubs.er.usgs.gov/publication/sir20205091>



Revised Workflow: Phase II

- Central/eastern LI drilling: spring, 2021 – fall, 2022 [funded]
- Central/eastern LI framework and modeling completed by spring, 2023
- Publication of central/eastern LI framework and modeling results by fall, 2023

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Conclusion

- In addition to the NRD funding, USGS will be providing a 50% cost share for the project extension
- NRD fact sheet link: <https://www.dec.ny.gov/regulations/115050.html>
- Long Island Groundwater Sustainability Study project website: <https://www.usgs.gov/centers/ny-water/science/groundwater-sustainability-long-island-aquifer-system>
- Letters of support for this restoration project can address to the “NRD trustees” be sent to jared.reed@dec.ny.gov

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