

Long Island's Environmental Issues

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Environmental Issues

- agricultural land
- air pollution
- aquifers
- automobile
- barrier islands
- biozones
- fisheries
- Great South Bay
- groundwater recharge
- invasive species
- Jamaica Bay
- land pollution
- land reclamation
- Long Island Sound
- natural processes
- nesting birds
- open space
- parkland
- Peconic Bay
- pine barrens
- planning for the future
- sand dunes
- shell fishing
- superfund sites
- tidal zone
- waste water treatment
- water pollution
- water quality
- water table
- wildlife

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Environmental Setting

- It is an island with limited surface area surrounded by salt water.
- Susceptible to coast altering processes.
- Variety of unique coastal features and habitats
- many are preserved as parkland and wildlife refuges.
- Has some of the widest white sand beaches along the East Coast - location of state, county and city parks
- It is dependent on groundwater.

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Environmental Setting

- Its landscape has been transformed by people from forest cover to agricultural land to rural settlement to a variety of urban and suburban settings.
- Limited mass transit makes motorized vehicles a necessity.
- Higher densities of people and motorized vehicles create air, land and water pollution.
- Pollution degrades the environment.

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Suburbia and the Environment

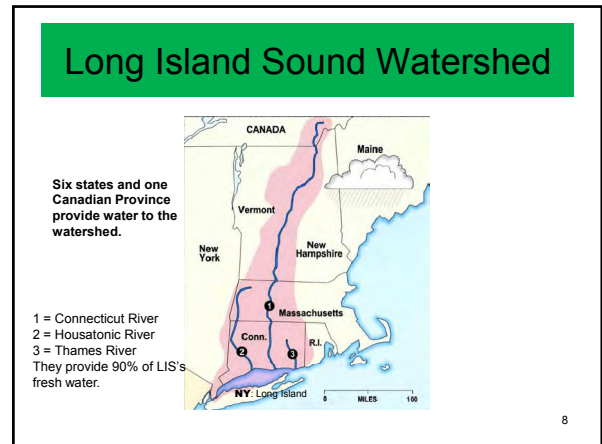
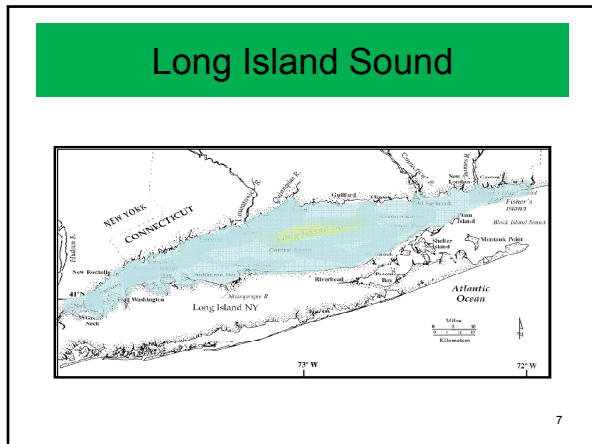
- Untreated sewage pouring into the waters of Long Island Sound and Great South Bay overwhelmed them with nitrogen.
- Sediment build-up from land disturbance changed shallow water ecosystems.
- River damming and blocking of tidal inlets reduced the mixing of fresh and salt water.
- When colonial tidal mills were abandoned, the mill ponds (inlets) became stagnant.

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Suburbia and the Environment

- Pollution from automobile exhaust in the 1900^s and from oil and coal powered plants added nitrogen to the air. LI's sparse vegetation and sandy soil could not absorb the nitrogen.
- Runoff brought the nitrogen to LIS and GSB.
- Increased nitrogen enhanced the growth of algae, plankton and other organic material which in turn absorb oxygen from the water.
- Chemical pollution overwhelms shellfish.

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LIS Basin

- It has 600 miles of coastline in New York, Connecticut and Rhode Is.
- 20 million people live around it.
- There is no major river to flush out LIS from west to east.
- It is shallow (65-120 ft).
- There is limited exchange of sea water at its eastern end.
- Its eastern area is saltier than its western area.

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Problems

- Shallow water with limited tidal and freshwater flushing.
- Surrounded by one of the most densely populated urban-industrialized areas of the country.
- Tidal wetlands have been lost to development (filled in).
- Habitat degradation from pollution and floatable debris.
- Contaminated with toxic chemicals (in bottom sediment) and pathogens (bacteria and viruses) in water.
- **Has hypoxia** (low dissolved oxygen level from sewage and agricultural activities containing nitrogen).

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Geographic Zones for Managing Total Nitrogen Loads

Zone - Name	Drainage Area (acres x 1000)	Zone - Name	Drainage Area (acres x 1000)
1 - Thames	1044.2	7 - Westchester	69.4
2 - Connecticut	7211.6	8 - Bronx/Queens	55.6
3 - Quinepiac	3373.9	9 - Manhattan/Queens	43.0
4 - Housatonic	1242.9	10 - Nassau	55.8
5 - Saugatuck	138.4	11 - Suffolk	107.2
6 - Norwalk	158.9	12 - Long Island Sound	852.0

Source: Long Island Sound Study

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LIS Study

- <http://longislandsoundstudy.net/> - Long Island Sound Study
- <http://longislandsoundstudy.net/2010/03/long-island-sound-hypoxia-slide-presentation/>
- http://longislandsoundstudy.net/wp-content/uploads/2010/02/1_LivingTreasures_Intro_LoRes.pdf

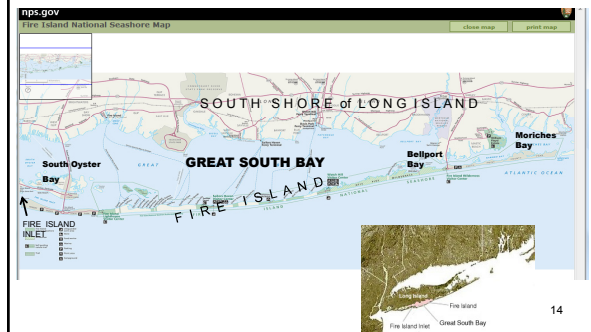
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Great South Bay

- A shallow lagoon (average depth 4 ft.) along the south shore of Long Island separated from the Atlantic Ocean by the barrier islands.
- Its western extension is called South Oyster Bay and its eastern area is called Bellport Bay; Moriches Bay is joined to it by a narrow channel.
- Fire Island Inlet is its only link with the ocean.
- This limits water exchange and creates a unique aquatic environment, especially for shellfish.
- The bay is susceptible to temperature change.

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Great South Bay



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Great South Bay

- Over time, with an increase in population along the South Shore, the fresh water flowing into the bay was diverted for household and agricultural use.
- The volume of untreated polluted water from villages and industry and runoff from agricultural land increased.

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Great South Bay

- Rapid population growth in Nassau County changed the ecology of the western basin.
- Salt water marshes have been destroyed:
 - development encroached into the bay
 - channels were deepened for yachts
 - sewage treatment plants were built
- Habitat destruction as native saltwater grasses have died.
- Oyster beds have disappeared.

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Great South Bay

- Storm water runoff with high nitrogen content from suburban lawns, faulty septic and cess-pool systems and agricultural activities have reduced the oxygen levels in the water.
- The Patchogue oyster and clam industry has been reduced by polluted water.
- Overwash of the barrier islands during winter storms periodically change the salinity of GSB and adversely affect fish and shellfish.

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Great South Bay

- Global warming and sea level rise threaten GSB ecology.
- Currently the growth of marsh grass has kept pace with sea level rise.
- With bulkheaded mainland shorelines, the salt water marshes will shrink with SLR.
- Islands within the bay will be eroded further reducing bird and shellfish habitat.

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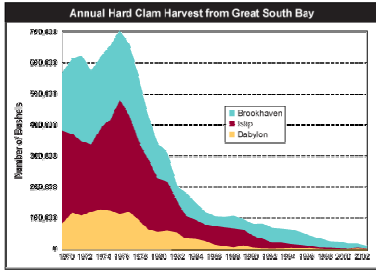
South Shore Wetlands



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GSB Hard Clam Harvest 1970-2002




In 2004, The Nature Conservancy acquired 13,400 acres of underwater land in Great South Bay. It has provided THC with an opportunity to restore the clam populations so important to the ecosystem of Great South Bay. The long-term plan is to restore a robust self-sustaining hard clam population to Great South Bay by 2020.

Role of The Nature Conservancy


- THC and its partners are working throughout Long Island to make its waters thrive once again by:
 - Restoring shellfish populations by creating "spawner sanctuaries" and shellfish nurseries where clams and scallops can grow, reproduce, and live safely.
 - Monitoring the role shellfish play in improving water quality, controlling harmful algal blooms, and enhancing habitat for other marine life.
 - Engaging partners to help in its mission to restore the Great South Bay to its former health.

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Seed Clams in GSB



Clams help filter water and keep it clean, but they also need clean water to survive. Great South Bay's clam population remains susceptible to harmful algal blooms.



The most severe brown tide on record started in 2008 and stretched into 2009. This affected the survival and growth of juvenile clams, and impacted the survival and spawning of adults.

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Problems affecting LI Groundwater

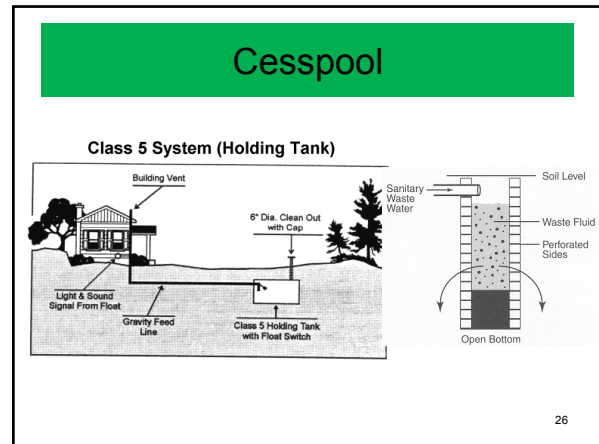
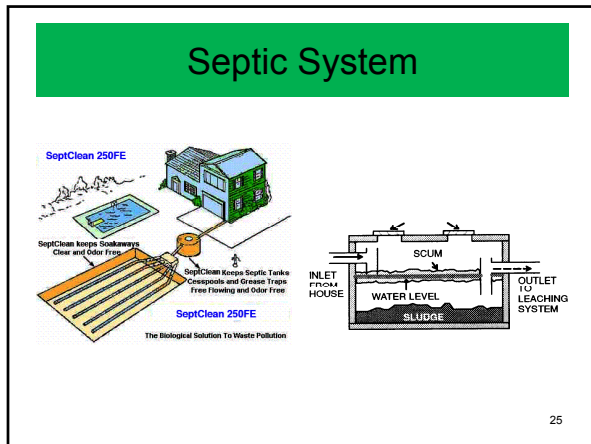
- Freshwater area under LI is shrinking.
- Surface area for freshwater recharge has gotten smaller.
- The water table is being lowered (pumping - recharge).
- Reduction in outward pressure is allowing salt water to move inland.
- Rising sea level will submerge more coastal areas reducing recharge and contaminating freshwater.
- Surface pollution has contaminated groundwater closest to the surface.

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Septic Tank vs. Cesspool

- **Septic Tanks**
 - The septic tank is the chamber which receives the raw sewage.
 - Here bacterial action breaks down the solids into gases, liquids, sludge, and scum.
 - The gases escape through the house sewer, passing off into the air through the stack on the roof of the house.
 - The sludge settles to the bottom of the tank, the scum forms at the surface, and the nearly clear liquids flow out into the disposal lines and seep into the ground.
- **Cesspools**
 - The cesspool is a method of disposing of liquid waste.
 - It consists of a covered pit into which raw waste is discharged. The liquid waste is taken off by seepage while the pit retains the sludge.
 - Cesspools are particularly dangerous in areas where ground water is less than 20 feet from the surface and on properties where shallow wells are in use.

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- ## Ensuring a Safe Yield on L.I.
- | <u>Problem</u> | <u>Remedy</u> |
|---------------------------------|---|
| • Increased use >> | Conservation programs; regulate consumption |
| • Suburbanization >> | Preserve open space; restore wetlands |
| • Over pumping >> | State regulation |
| • Replenishment >> | Building of recharge basins; open space |
| • Loss of run off >> | Collection: sanitary sewers, seepage ponds |
| • Irrigated farmland > | Water conservation methods; hybrid plants |
| • Salt water intrusion > | Reduced pumping; pressurized recharge |
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