



LONG ISLAND TOP 10 CLIMATE CHANGE IMPACTS



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INTRODUCTION

Climate Change is happening across our planet and the impacts are felt locally across the Long Island region. In a study comparing 100 urban centers across the US, Long Island ranked 4th—not in a good way—to having the “highest chronic physical risk” to the impacts of climate change. The unique geography of Long Island makes us susceptible to the many serious impacts of climate change. We are already experiencing the compounding effects of rising temperatures, sea-level rise, extreme weather, and water quality issues. As climate change worsens at an unprecedented rate, these impacts will only continue to threaten our island’s environment, local economy, and critical infrastructure.



TOP 10 IMPACTS

1. SEA LEVEL RISE AND TIDAL FLOODING:

Long Island is a sand peninsula surrounded by Long Island Sound, the Atlantic Ocean, and the East River, making us extremely susceptible to the risks of sea level rise and tidal flooding. The National Ocean and Atmospheric Administration (NOAA) projects Long Island will experience on average a 1-2ft increase in coastal sea level rise by 2050 and an additional 2-4ft increase by 2100 (compared to the 1995-2014 baseline); which could completely engulf significant portions of Long Island’s shoreline. Coastal communities along the South Shore, particularly areas such as Mastic Beach, Lindenhurst, Patchogue and Freeport, are already experiencing more frequent flooding during high tides and storms. Residents are also facing rising insurance costs.

2. COASTAL EROSION:

The coastline of Long Island’s South Shore consists of barrier islands and tidal inlets that connect the Atlantic Ocean to bays and harbors. Beaches, dunes, and bluffs naturally erode at a rate of about 1-2 feet per year through wind, ocean currents, and tides. However, Long Island’s coasts have begun to shift in response to climate change and human-driven activities. Our wetlands historically served as nature’s critical first line of defense against the impact of storm surges, absorbing the energy from tidal waves and stabilizing the soil through the roots of its vegetation. Increased development and more intense storm surges are destroying these important habitats, leaving our coastlines vulnerable to increased coastal erosion rates.

3. EXTREME RAINFALL EVENTS:

As climate change continues Long Island will experience more extreme rainfall events. Across NYS, there has already been, an average increase of 10% to 20% in total annual rain (from 1901 to 2022). In August 2024, residents on the North Shore witnessed a torrential downpour that the National Weather Service categorized as a 1-in-200-year rainfall event. Catastrophic flash floods broke through a nearby dam, draining Mill Pond, and causing the collapse of Harbor Road which isolated the nearby community. Unfortunately, these types of events are expected to occur more often as annual rainfall is projected to increase an additional 6% to 17% by 2100 across New York State.

4. HURRICANES AND TROPICAL STORMS:

Ocean temperatures are heating up and fueling more intense hurricanes and tropical storms along our coast; bringing more intense downpours, wind gusts, and storm surges. Long Island has already experienced several devastating storms in recent decades, causing substantial infrastructure damage, economic losses, and even deaths.

Hurricane Irene (2011) caused \$13.5 billion in total damage, resulting in 10 deaths in NY. Extensive power outages across Nassau and Suffolk County left over 350,000 homes and businesses without electricity.

Superstorm Sandy (2012) is ranked as the 5th costly storm in the US, causing \$88.5 billion in damage. Long Island experienced severe flooding, power outages and emergency school closures that lasted several weeks. Sadly, this storm resulted in the death of 48 New Yorkers.

Tropical Storm Isaias (2020) caused over \$5.8 billion in damage across the Northeast, with Long Island experiencing widespread power outages affecting over 645,000 customers.

Hurricane Ida (2021) caused \$84.6 billion in damage and flash flood warnings were declared in NYC for the first time. There were 15 casualties directly related to extreme flooding.

5. SEASONAL DROUGHTS AND BRUSH FIRES:

Climate change is increasing the risk of prolonged-seasonal droughts on Long Island and these unusually dry conditions increase the risk of brush fires. In October 2024, Long Islanders witnessed the second-longest seasonal drought on record; with only receiving .23 inches of total rainfall that month. By the beginning of November, the Suffolk County Department of Fire, Rescue and Emergency Services reported a total of 239 reports of brush fires, specifically around the Pine Barrens region. By mid-November 2024, the United States Drought Monitor classified 99.4% of Suffolk County as being in “severe drought”. The damage from these fires will have long-term effects on the soil, affecting future growing and harvest seasons for farmers. Also, wildfire smoke poses significant risks to public health across Long Island.

6. INVASIVE SPECIES:

Climate change is catalyzing the spread of many invasive species which are traveling north with warming air temperatures. Significant ongoing efforts to protect the health of the Central Pine Barrens Preserve are ongoing. Sadly, this preserved area is experiencing an infestation of the Southern Pine Beetle, an invasive species that has killed over 40,000 trees on LI since the outbreak began in 2014. The declining health of the Pine Barrens heightens the risks of wildfires. Another recent infestation is the Spotted Lanternfly, first discovered in 2020, this invasive species poses a significant threat to agriculture and forest health.

7. EXTENDED TICK SEASON:

Warmer temperatures and milder winters are causing ticks to spread into new areas and remain active beyond the typical May-August season, increasing our risk of tick-borne diseases. There are now 4 ticks on LI that cause several serious illnesses including Lyme disease, Ehrlichiosis, Alpha-Gal Syndrome, Rocky Mountain Spotted fever, and Babesiosis. Lyme disease cases on Long Island have increased since 2000. Another rapidly spreading invasive tick species known as the Asian Longhorned Tick has been discovered across Long Island and



has become the most abundant tick species, next to the Lone Star Tick, which raises significant public health concerns for LI residents and livestock. We also have the Rocky Mountain Tick. Suffolk County has since established a 'Tick and Vector-Borne Diseases Task Force' to mitigate the spread of this infectious disease.

8. SALTWATER INTRUSION INTO AQUIFERS:

Rising sea levels have exacerbated the risk of saltwater intrusion into Long Island's freshwater aquifers, potentially compromising our region's only drinking water supply. A study by the US Geological Survey found that saltwater is increasingly intruding on significant portions of our aquifer, threatening our sole source of drinking water. Long Beach City, Montauk, the North Fork and the Port Washington Peninsula are particularly vulnerable to saltwater intrusion.

9. WARMING OCEAN AND ESTUARY TEMPERATURES:

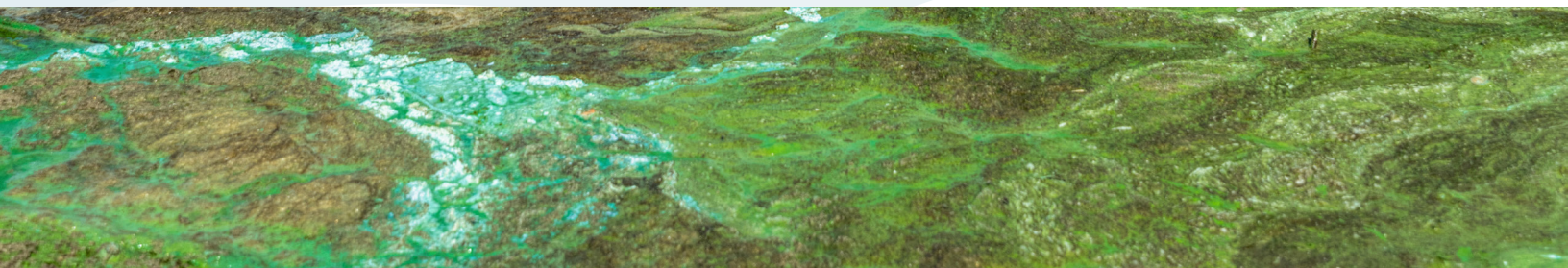
Our surrounding Long Island estuaries and bays are warming at an alarming rate due to the absorption of excess CO₂ in our oceans from climate change.

Long Island Sound is warming 5 times faster than other water bodies on the east coast! The Long Island Sound (LIS) Study found that this estuary is warming faster (1°F/decade) than the global average (.32°F/decade) in the winter season. Warming waters are causing severe marine ecosystem disruptions

across Long Island, including shifts in marine species populations, biodiversity, as well as welcoming invasive species that can thrive in a changing habitat. Cold-bodied marine animals such as, the American lobster has already migrated northward, toward colder climates. Invasive species such as the Asian Shore Crab, European Green Crab, and Chinese Mitten Crab have taken over local Long Island habitats and feed on local oysters, clams, scallops, and mollusks. This issue has been affecting many Long Island fisheries and local economies that depend on a sufficient supply of fish every year. Warmer waters can hold less oxygen, and that has led to oxygen-depleted "dead zones" and promotes toxic algae blooms know as HABS. HABS thrive in warmer weather so as global temperatures continue to rise, the impacts will only worsen.

10. OCEAN ACIDIFICATION AND HARMFUL ALGAL BLOOMS (HABS):

Carbon from burning fossil fuels is not only going into our atmosphere but also into our oceans. This excess carbon is increasing the acidity levels of our ocean and estuary waters. A study from Stony Brook University found an increase in acidity levels across the Long Island Sound, Peconic Estuary, and the South Shore Estuary caused by the absorption of excess CO₂. This hinders shellfish populations, harms seagrass growth and kills fish larvae. Increases in acidity levels in our estuaries will decrease the productivity of these critical habitats.



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