Weather and Climate of Long Island

Definitions

- Weather – the state of the atmosphere at one point in time. The elements of weather are temperature, air pressure, wind and moisture.
- Climate – the average of all weather over a very long period (<50 yrs.) of time.

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Cornell

New York State Climate Office

NOAA

The Office of the NYS Climatologist is based in the Dept. of Earth and Atmospheric Sciences at Cornell University.

It partners with the National Climatic Data Center (NCDC) and the National Weather Service (NWS) at NOAA.

Web address: http://nysc.eas.cornell.edu/

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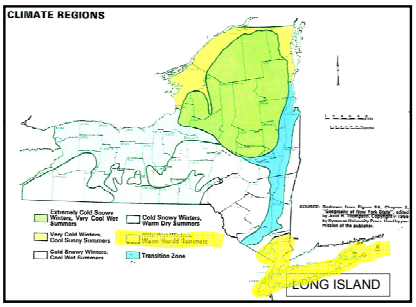
Climate Regions of NYS



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Characteristics of Long Island's Climate

1. Humid Subtropical/Continental – coldest month's average temperature is around 32°F.
2. Temperature and precipitation are influenced by its coastal location; coldest in central LI.
3. Generally warm to hot humid summers and warm to cold winters.
4. No dry season; snow in winter.
5. Predominant wind direction is from the west.
6. Greatest recurring storm hazard is snow and ice in winter; thunderstorms in summer. Nor'easters are intense winter ocean storms. Hurricanes and tornados are rare.
7. Microclimates develop over urbanized areas.

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Climate Controls

Of all the factors that influence climate development on Long Island, the following five are the most influential:

- **Latitude –** solar energy and seasonal variation
- **Land vs. Water –** heat exchange differences
- **Ocean Currents –** temperature; flow direction
- **Wind –** direction; characteristics
- **Air Masses –** source region; characteristics

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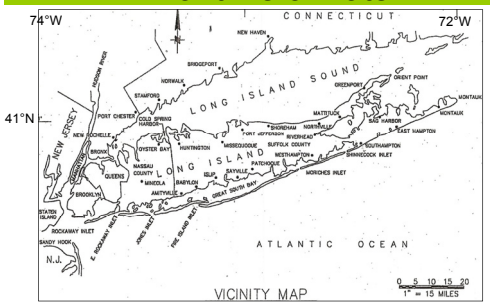
Long Island has a mid-latitude maritime climate



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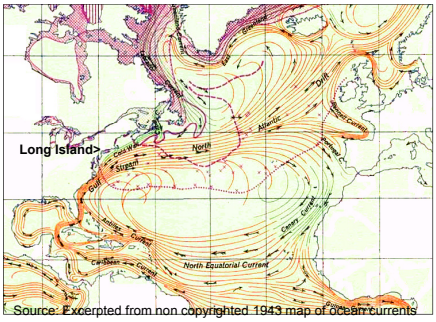
North Atlantic Ocean Currents



Source: Excerpted from non copyrighted 1943 map of ocean currents

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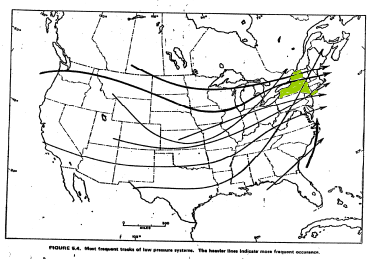
Storm Tracks

Predominant wind direction is from west to east.



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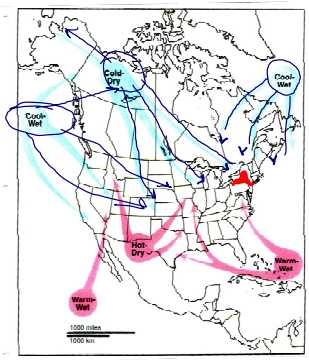
Air Mass Source Regions and their Characteristics



Source: Getis, Intro to Geography, 10th edition

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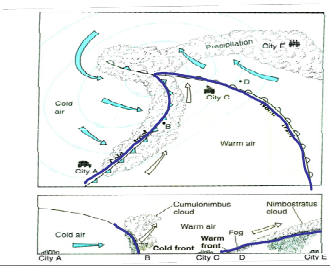
Cyclonic Storms – warm and cold fronts.

Daily weather makers.



Nor'easter: An intense cyclonic storm that forms off the east coast of North America over the warm waters of the Gulf Stream. Its counterclockwise circulation interacts with an Arctic high pressure cell to produce high winds from the northeast, great amounts of precipitation (rain or snow) and a heavy surf. They are most intense during the winter.

Microclimates

- Microclimates develop locally due to changes in an area's physical character-istics.
- Rural areas – local conditions change as an area goes from forest to large farmstead to suburb.
- Urban areas – artificial conditions
  - Concrete and asphalt surfaces (warmer)
  - Limited soil and vegetation (less humid)
  - Tall buildings (shadows and wind channels)

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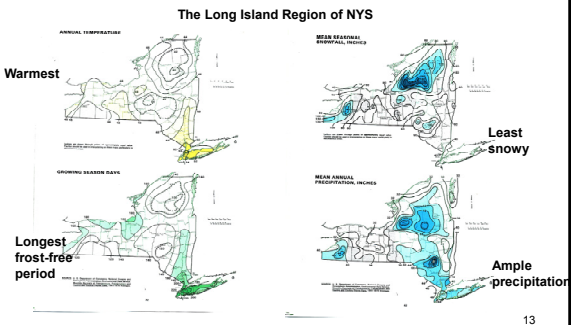
Temperature and Precipitation Characteristics of Long Island



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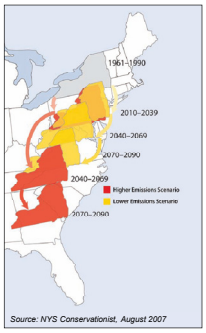
Global Warming and Long Island

- As climate warms, NYS's equivalent earth position will move toward the equator.
- "Southern" flora and fauna will move into NYS.
- Winter storms will increase in number and intensity.
- Snowstorms will increase.
- Sea level will rise as ice caps melt.
- Long Island will be the first area of NYS to experience this.



Source: NYS Conservationist, August 2007

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Global Warming (cont'd)

- As sea level rises, areas of SE NYS and the Hudson valley north to Albany will be under water.
- Long Island coastal areas will see greater erosion from waves.
- Warm-climate diseases and pests will spread into the area, especially if winter temperatures do not drop below freezing for extended periods.

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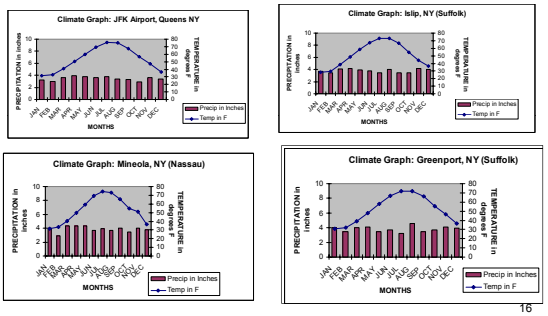
Climate Charts for LI



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Climate Statistics

- To find a LI weather station statistics, see pp 4-7 of the Monthly Station Climate Summaries for New York at http://cdo.ncdc.noaa.gov/climatenormals/clim20/state-pdf/ny.pdf. **(DO NOT PRINT THIS FILE. IT IS 442 PAGES LONG.)**

- Brooklyn LaGuardia JFK Airport
- Mineola Setauket Riverhead
- Greenport Bridgehampton

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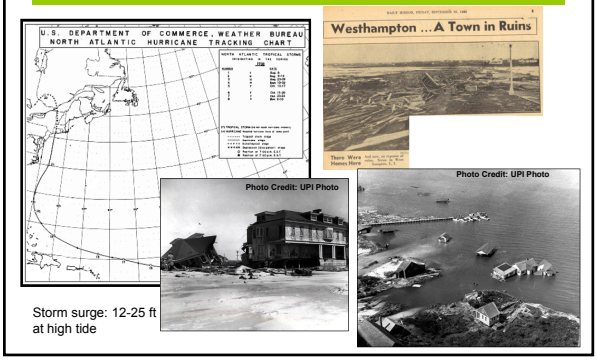
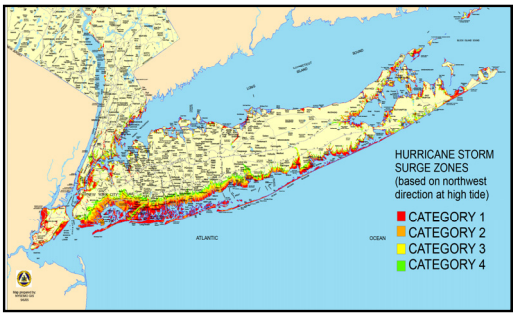
Hurricane of 1938



Storm surge: 12-25 ft at high tide

Hurricane Storm Surge Zones



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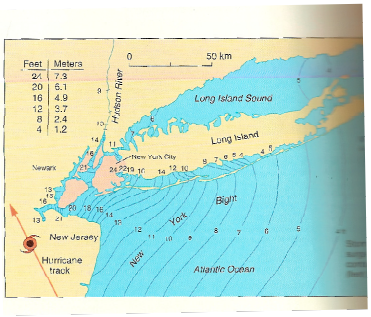
SLOSH Map of NY Bight

(Sea, Land Overland Surges from Hurricanes)



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Hurricane Storm Surge Zones

- Some of the key observations from the include:
- Category 1 hurricanes inundate just about all of the immediate south shore of the Island, including the north side of Great South Bay locations and both sides of the north and south forks.
- Montauk Highway (RT. 27A) is completely covered by flood waters during a Category 3 hurricane. Therefore, this road would be considered impassable during the storm.
- The highest storm surges (Category 4) would occur in the following regions:
  - Amityville Harbor - 29 feet
  - Atlantic Beach & Long Beach areas - 24 to 28 feet
  - South Oyster Bay, Middle Bay, & East Bay areas - 24 to 28 feet
  - Montauk Point is completely cut off from rest of south fork during a Category 1 storm.
  - Much of the north and south forks are entirely under water during a Category 3 hurricane.
- A category 4 hurricane inundates **entire** towns along South Shore.

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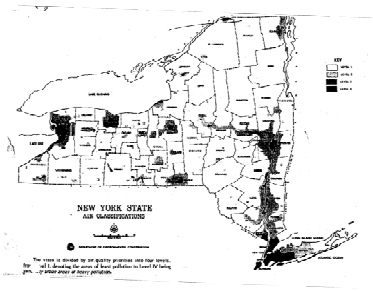
Air Quality Map



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Air Quality Issues

- Air quality is relevant to issues of human and environmental health.
- Sources of air pollution originate within and outside NYS.
- Air pollution includes:

  -gaseous emissions: CO_2, NO_2 ,ozone, methane

  -particulates: dust, soot (urban, agriculture, mining)

  -acid precipitation: sulfur dioxide + moisture = sulfuric acid

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