

## 7: Nature of New York's Water Resources

### Introduction to Water Facts and Issues

Prof. Anthony Grande  
Geography Dept.  
Hunter College-CUNY

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## Facts about NYS Waters Source: NYSDEC

### SURFACE

- DEC drainage basins: 17
- EPA watersheds: 57
- Rivers/streams: 52,337 mi
- Lakes/ponds/reservoirs: 7,849
- **Shorelines:**
  - Atlantic Ocean saltwater shoreline: 127 mi (1850 mi tidal)
  - Great Lakes freshwater shoreline: 577mi (776 mi total)
- Estuaries/bays/harbors (incl. part of LI Sound): 1530 sq mi
- Freshwater wetlands: 3750 sq mi
- Tidal wetlands: 39 sq mi

### UNDERGROUND

- Long Island aquifers: underlay c. 3% of NYS
- Principal aquifers (intensively used): underlay c. 11% of NYS
- Primary water supply aquifers (potentially productive): underlay c. 4% of NYS (upstate)

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## Major Surface Waterways



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### SURFACE WATER ISSUES:

- **Dependency:** c.65% of NYS residents (including nearly all of NYC) rely on surface water supplies for daily needs.
- **Disruption of ecosystems:** impact of flow modification
- **Water quality issues:** assessment and monitoring
- **Issues of control and use:** water rights of land owners
- **Interstate and international issues:** geopolitical

## Detail of Surface Waters



## Definitions

See Chapter 16 of Geology of New York

- ❖ **Hydrogeology:** the study of surface and groundwater in relation to local geology.
- ❖ **Hydrology:** the study of water movement.
- ❖ **Surface waters:** water in rivers, streams, and lakes.
- ❖ **Groundwater:** water found beneath the surface of the earth. It is absorbed by surface material and is stored in and moves through aquifers (porous layers of rock material).

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### What is a watershed?

- ✓ **Watershed** (also called **drainage basin** or **river basin**): the area of land where all collected water flows to the same place (outlet). Watersheds range in scope from continental- to community-sized.
- ✓ **Watershed divide:** high ground that separates the flow of water within a watershed (drainage boundary).
- **The US EPA identifies 57 watersheds within NYS** (subdivisions of continental and major drainage basins).
- **NYS DEC identifies 17 drainage basins.**

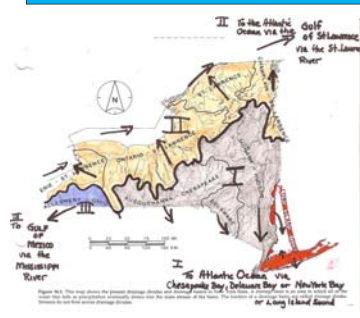
## Watersheds



Source: US EPA

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## Sub-Continental Drainage Basins within NYS



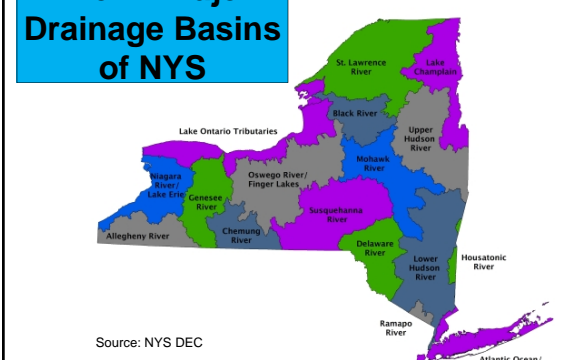
**I:** to the Atlantic Ocean via Hudson, Delaware and Susquehanna rivers.

**II:** to the Atlantic Ocean via Great Lakes-St. Lawrence River basin to the Gulf of St. Lawrence.

**III:** to the Atlantic Ocean via the Ohio and Mississippi rivers to the Gulf of Mexico.

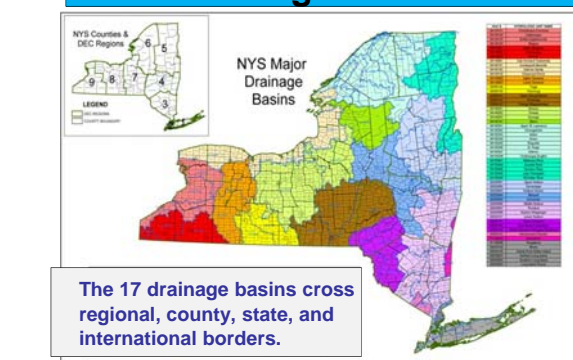
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## The 17 Major Drainage Basins of NYS



Source: NYS DEC

## Drainage Basins



The 17 drainage basins cross regional, county, state, and international borders.

## Watershed Codes

The US EPA identifies 57 watershed units within NYS. Each has a unique Hydrologic Unit Code (HUC) number which is used to collect data from monitoring sites, make assessments and issue rulings.

Surf Your Watershed

Required Exercise 9 covers watersheds and water quality issues.

### State Search Results

List of Huc Codes Produced by Search

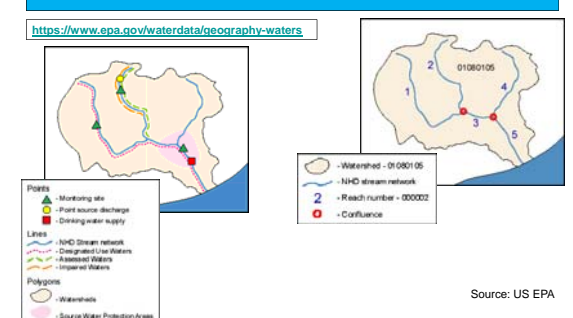
(search for: NY)

- 02010004 Ausable; state(s): NY, VT
- 01150101 Black; state(s): NY
- 02030108 Bronx; state(s): CT, NY
- 01120103 Buffalo-Elghteenmile; state(s): NY
- 01120102 Cattaraugus; state(s): NY
- 01150102 Chemung-Perch; state(s): NY
- 01120101 Chautauque-Conneaut; state(s): NY, OH, PA
- 02050105 Chemung; state(s): NY, PA
- 02050102 Chemung; state(s): NY
- 02010002 Conewango; state(s): NY, PA
- 02040102 East Branch Delaware; state(s): NY, PA
- 01150104 French; state(s): NY, PA
- 01150103 Grass; state(s): NY
- 02010006 Great Chazy-Saratoc; state(s): NY, VT
- 02030103 Hackensack-Passaic; state(s): CT, MA, NY
- 01120002 Housatonic; state(s): CT, MA, NY
- 02020003 Hudson-Hoosic; state(s): MA, NY, VT
- 02020008 Hudson-Wappinger; state(s): NY
- 01150101 Indus; state(s): NY
- 01120101 Irondequoit-Ninemile; state(s): NY
- 01120000 Lake Erie; state(s): MI, NY, OH, PA
- 02010001 Lake George; state(s): NY, VT
- 01150100 Lake Ontario; state(s): NY
- 02010005 Lamolle; state(s): NY, VT
- 01120007 Long Island Sound; state(s): CT, NY, RI
- 02010003 Lower Genesee; state(s): NY
- 02010101 Lower Hudson; state(s): CT, NJ, NY
- 02020006 Middle Delaware-Moyockon-Brookwad; state(s): NY
- 02020005 Mohawk; state(s): NY
- 01120104 Niagara; state(s): NY
- 02020001 Northern Long Island; state(s): NY
- 01120001 Oak Orchard-Twelveville; state(s): NY
- 01120004 Oneida; state(s): NY
- 01120003 Oswegatchie; state(s): NY
- 01120001 Otsego; state(s): NY
- 02010002 Otter; state(s): NY, VT
- 02010001 Oswego-Wappinger; state(s): NY, PA
- 02010001 Raritan; state(s): NJ, NY
- 01120005 Raquette; state(s): NY
- 02010001 Sacandaga; state(s): NY
- 01120001 Salmon-Sandy; state(s): NY
- 01120001 Sandusky; state(s): NY
- 02030104 Sandy Hook-Staton Island; state(s): NJ, NY
- 01120001 Saugruck; state(s): CT, NY
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- 02020003 Schuylar; state(s): NY
- 01120001 Seneca; state(s): NY
- 02020001 Southern Long Sound; state(s): NY
- 01120001 St. Regis; state(s): NY
- 01120001 Tioga; state(s): NY, PA
- 02010001 Upper Allegheny; state(s): NY, PA
- 02010001 Upper Delaware; state(s): NY, PA
- 01120001 Upper Genesee; state(s): NY, PA
- 02010001 Upper Hudson; state(s): NY
- 01120001 Upper St. Lawrence; state(s): NY
- 02010001 Upper Susquehanna; state(s): NY, PA
- 02010001 Winooksi; state(s): NY, VT

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## Geography of Waters

<https://www.epa.gov/waterdata/geography-waters>




Source: US EPA

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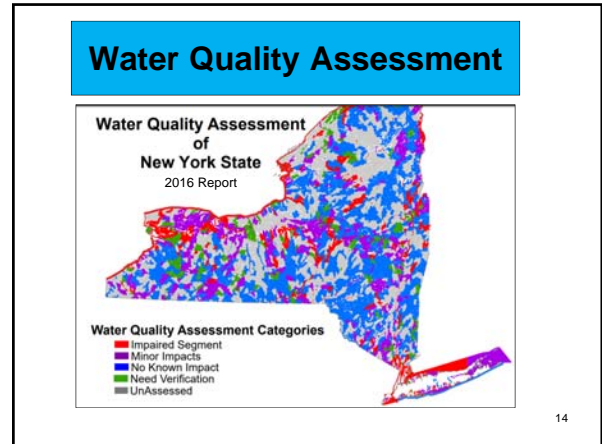
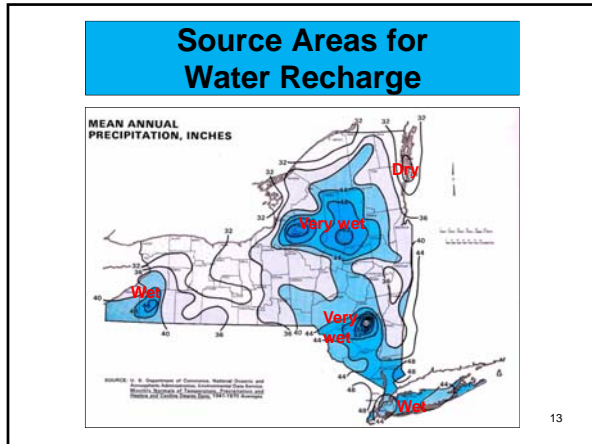
## Water Resources

NYS water resource evaluation is based on the following factors:

- 1. Recharge:** amount of new moisture in the form of rain and snow. Precipitation is an important factor.
- 2. Topography:** slope angle and surface geology determines how quickly water moves and/or is absorbed (precipitation and run off).
- 3. Remnant glacial processes:** influential in the creation of waterways and storage areas.
- 4. People:** Need water. Alter its natural movement and storage. Contaminate it.



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- ### Water Quality Issues
- Among the many water quality issues that need to be addressed by concerned citizens of NYS are:
- land use and water quality within watersheds
  - municipal water supplies conservation
  - acid precipitation
  - erosion control
  - thermal pollution
  - waste disposal (industrial, household and agricultural)
  - underground water supplies including recharge
  - coastal zone management
  - preservation of wetlands
  - flood control
  - drought
  - power production
  - fisheries
  - recreational use
  - net result of the imposition of rules and regulations
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- ### DEC's Top Ten Water Quality Issues
1. Urban storm runoff
  2. Aging wastewater infrastructure
  3. Nutrient loadings and eutrophication
  4. Atmospheric deposition and acid rain
  5. Legacy pollutions and fish consumption
  6. Atmospheric deposition of mercury
  7. Habitat and/or hydrologic modification
  8. Aquatic weeds and invasive species
  9. Pathogen contamination of shellfish
  10. Inadequate onsite wastewater treatment
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**READ: Top Ten Water Quality Issues in New York State**  
[http://www.dec.ny.gov/ocs/water\\_pdf/305btop10.pdf](http://www.dec.ny.gov/ocs/water_pdf/305btop10.pdf)

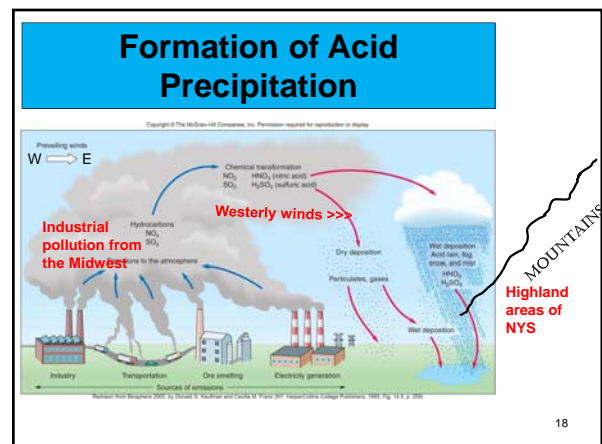
### Agriculture and Water Regulations

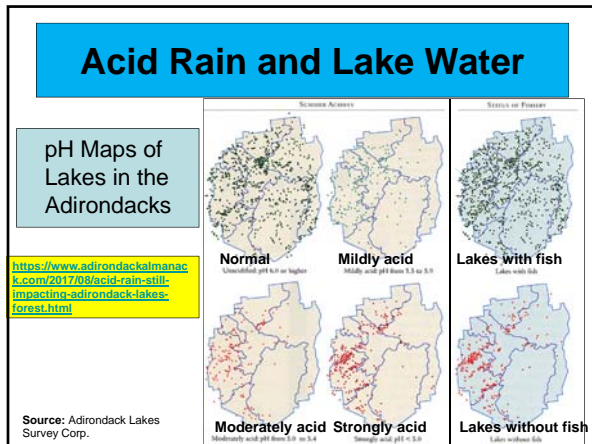
**L.I. free-range duck farms struggled with water regulations**

Officials said the Forge River's nitrogen levels are too high.

High-end restaurants value the free-range ducks from the Jurgielewicz farm in Moriches, N.Y., but regulators call them polluters. **Closed in Aug 2011.**  
**Massey Farm** in Eastport, NY, the last free range LI duck farm, closed in December 2014.

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## NYS Flood Summit

Created in response to major flooding throughout the state in the early 2000s.

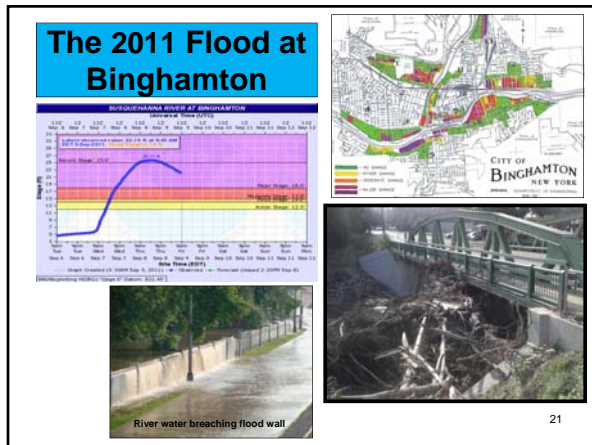
**FOCUS: What Can We Do To Help Stop The Destruction?**

- Stream management
- Floodplain development
- Protect natural wetlands
- Contain rainwater in paved areas
- Flood control projects

<https://www.youtube.com/watch?v=UyJWpBHb1IA>  
Fredonia, NY flooding 2015

**Chenango River in flood at Binghamton 2006**

**NYSFSMA**  
New York State Floodplain and Stormwater Managers Association  
<http://nyfloods.org/>

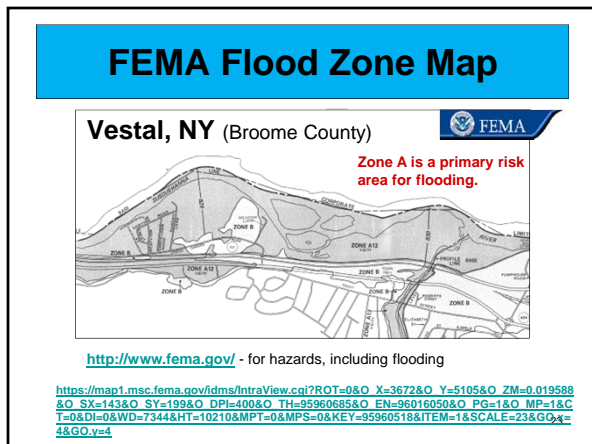


## Flooding in the Catskills

Summer 2011

[http://www.newyorkstate.com/weather/2017/11/aenesse\\_river\\_lethworth\\_rochester\\_sinkhole\\_western\\_new\\_york\\_flooding.html](http://www.newyorkstate.com/weather/2017/11/aenesse_river_lethworth_rochester_sinkhole_western_new_york_flooding.html)

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## Land Use Planning in Flood Zones

**Westchester County Flooding and Land Use Planning Conference (2012)**

<http://www.dos.ny.gov/watershed/2012presentations/Flooding--Flood%20Manual.pdf>

**Mamaroneck, NY 2007**

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**NYC Coastal Flooding:  
"Sandy" 2012**

<http://floodzonenyc.com/>

<https://www.nytimes.com/2018/01/07/nyregion/new-york-city-flood-maps-fema.html>

**Nature of the  
New York  
Bight**

**What do you see when  
assessing the shape of  
the coastline?**

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