

# Challenges to Westchester's Waste Reclamation Future



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Water Quality Program Director

**Clean Water Westchester**  
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# Acknowledgments

Jen Epstein, Riverkeeper

Tracy Brown, Save the Sound

Anjali Sauthoff, Columbia University / Westchester County GIS

David Kvinge, Bob Funicello, Westchester County

Jerry Faiella, Historic Hudson River Towns

DEC Hudson River Estuary Program

# Challenges

Lots of infrastructure

Lots of owners

Lots of money needed to maintain and upgrade

Combined Sewer Overflows (CSOs)

Inflow and Infiltration (I&I)

Water quality

Climate Change: Sea-level rise and precipitation

Photo: Bob Hoebermann  
Courtesy of Bob Boyle

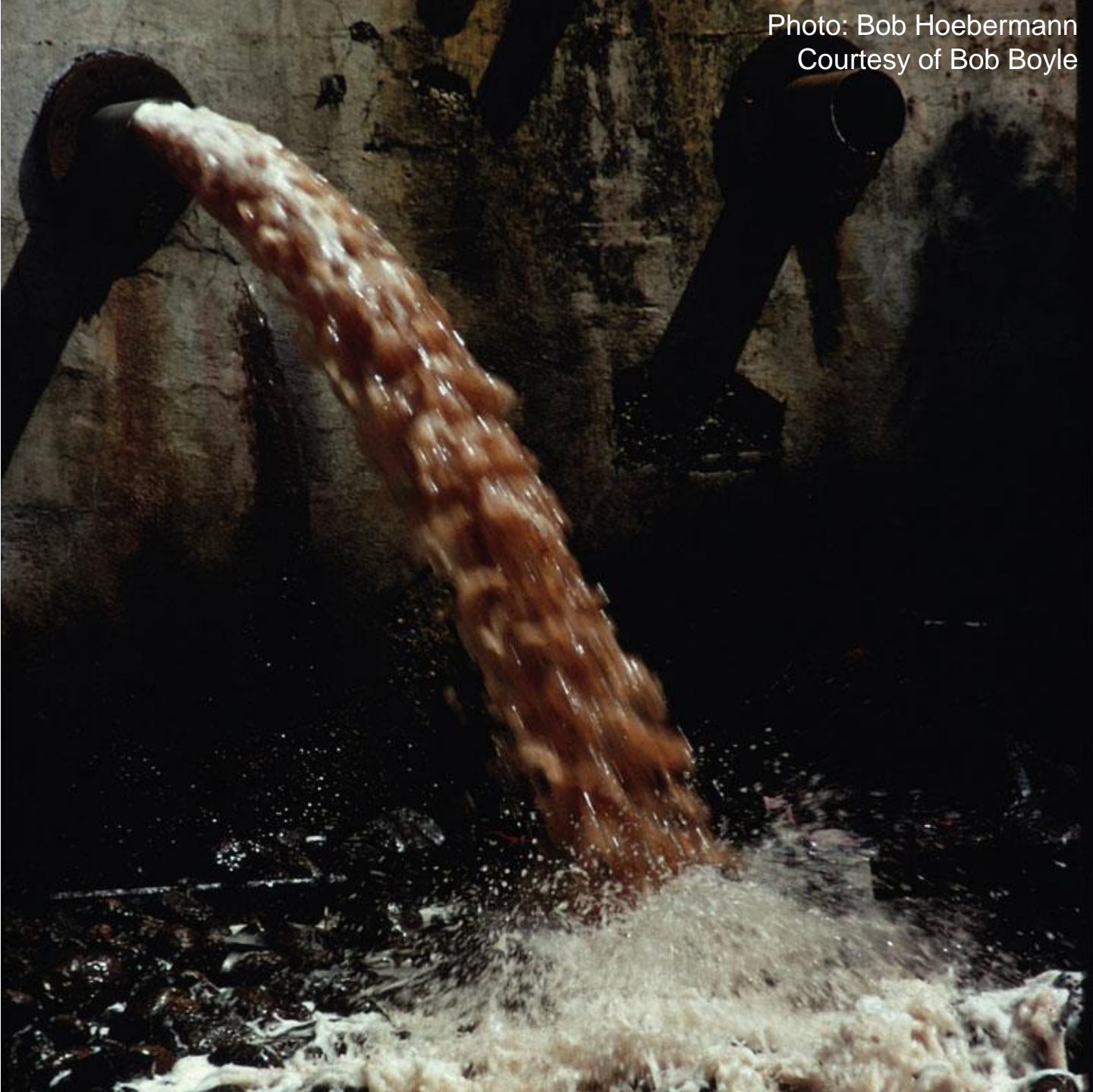






Photo: Eva Deitch



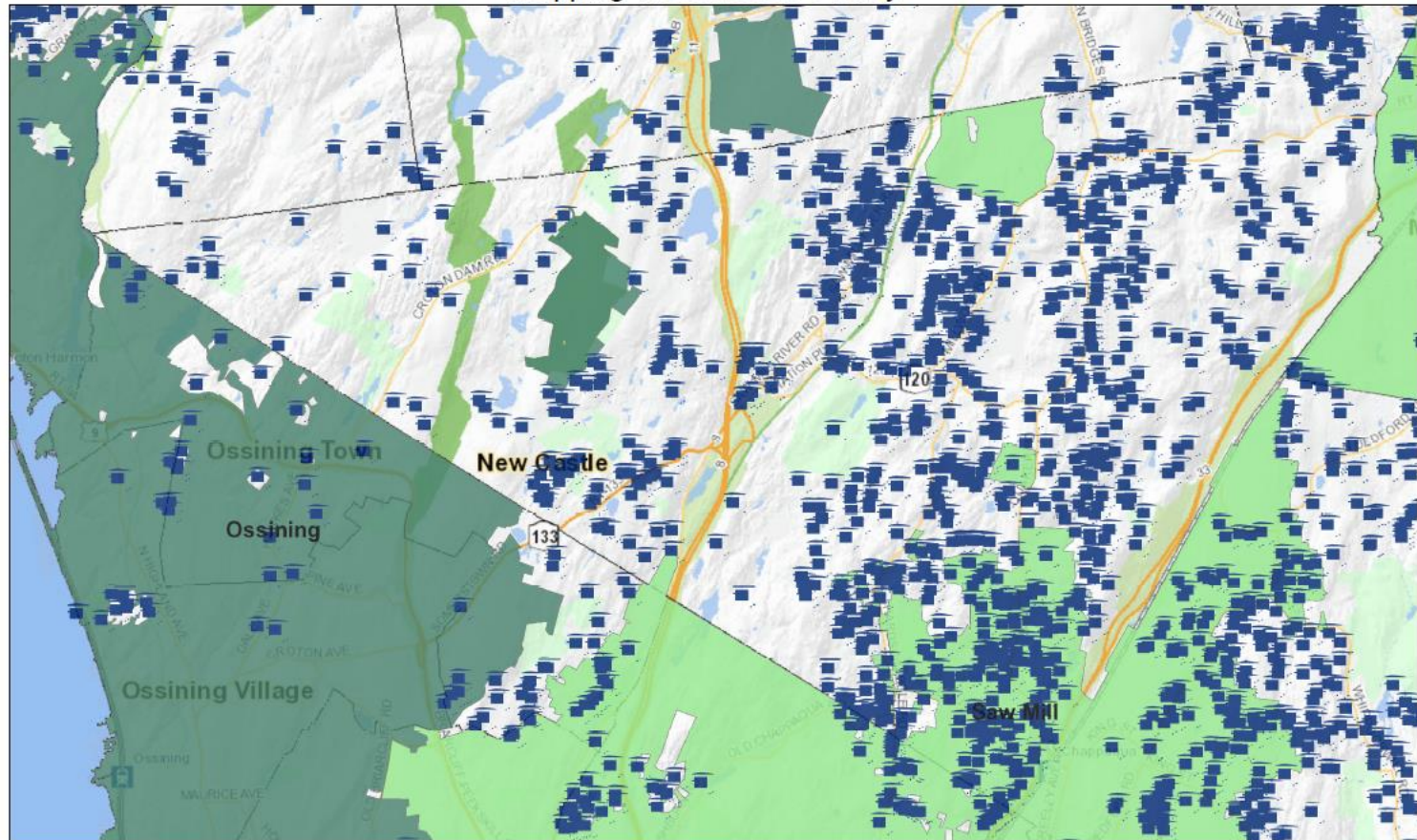






# Private Septic Systems

Mapping Westchester County



January 14, 2019

■ Septic Pump Out 2017

## County Sewer Districts

■ Blind Brook

■ Bronx Valley

■ Central Yonkers

■ Hutchinson

■ Mamaroneck

■ New Rochelle

■ North Yonkers

■ Ossining

■ Peekskill

■ Port Chester

■ Saw Mill

■ South Yonkers

■ Upper Bronx

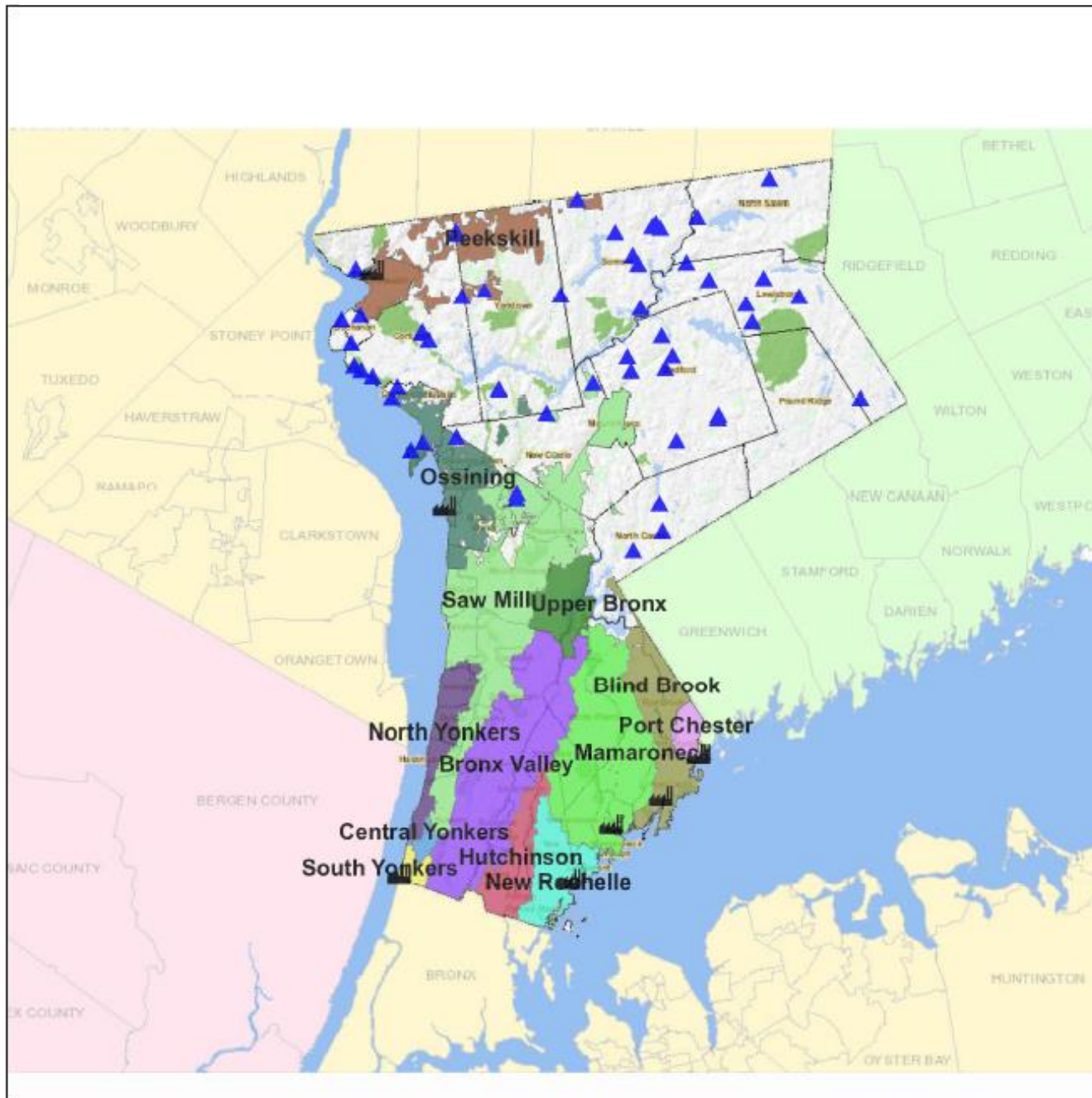
1:44,664

0 2,000 4,000 8,000 Feet  
Westchester County GIS



GIS  
<http://giswww.westchestergov.com>  
Michaelian Office Building  
148 Martine Avenue Rm 214  
White Plains, New York 10601

# Private wastewater treatment plants





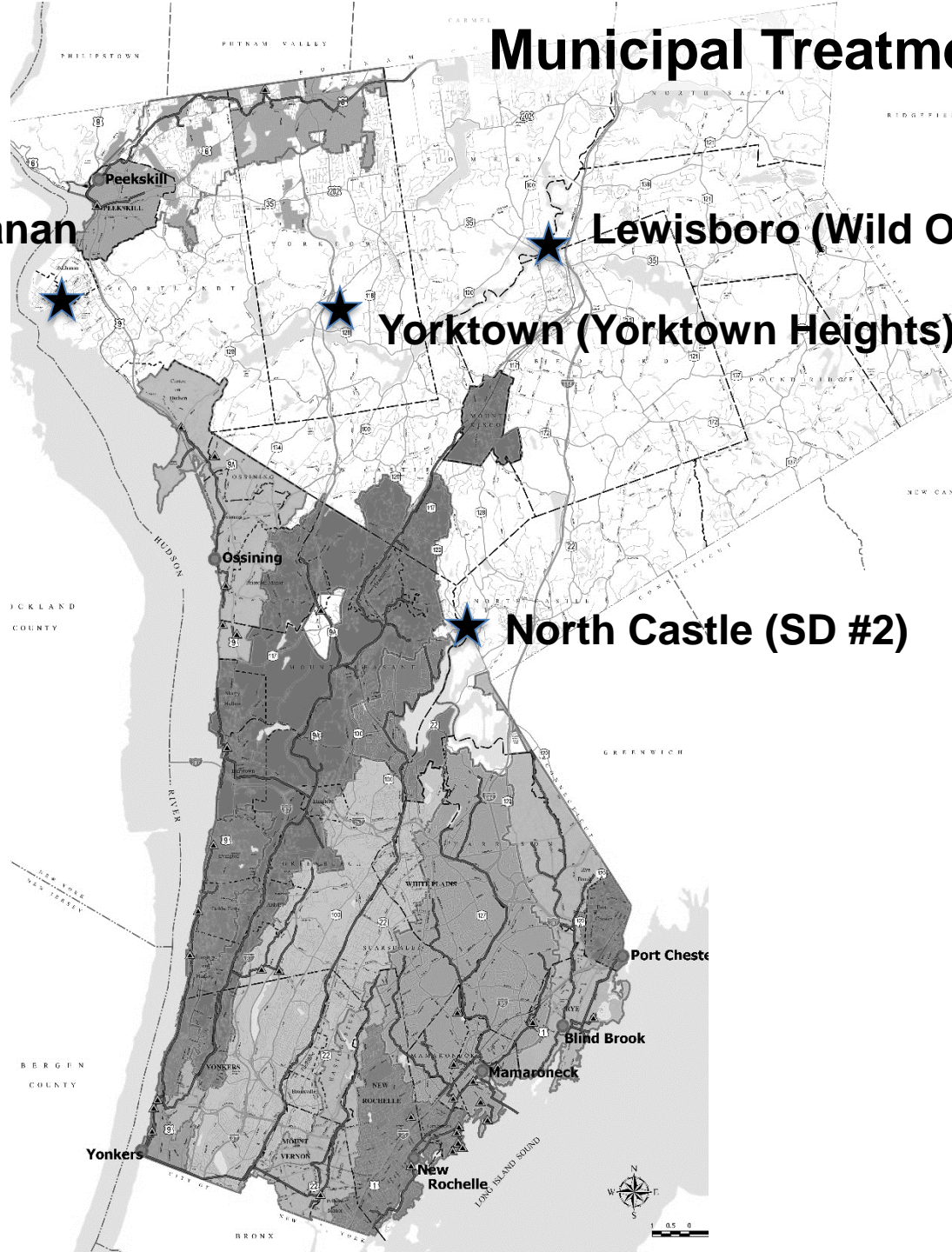
# Municipal Treatment Plants

**Buchanan**

**Lewisboro (Wild Oaks)**

**Yorktown (Yorktown Heights)**

**North Castle (SD #2)**



# County Sewer Districts County Treatment Plants

**Peekskill**

**Ossining**

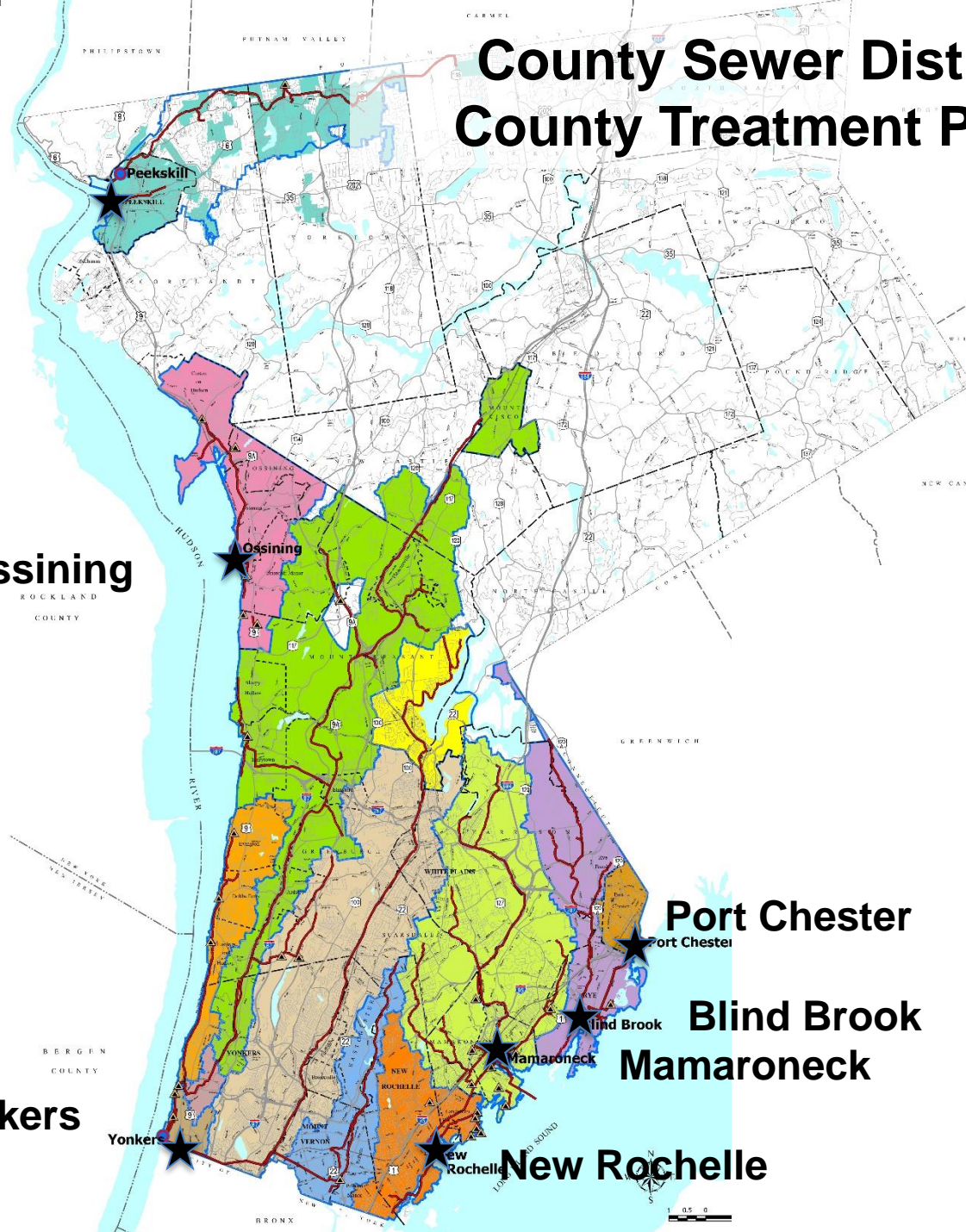
**Yonkers**

**Port Chester**

**Blind Brook**

**Mamaroneck**

**New Rochelle**





## Peekskill

(C) Peekskill  
(T) Cortlandt  
(T) Somers  
(T) Yorktown

**41,349**

## Ossining

(V) Briarcliff Manor  
(V) Croton-on-Hudson  
(V) (T) Ossining  
(T) Mount Pleasant

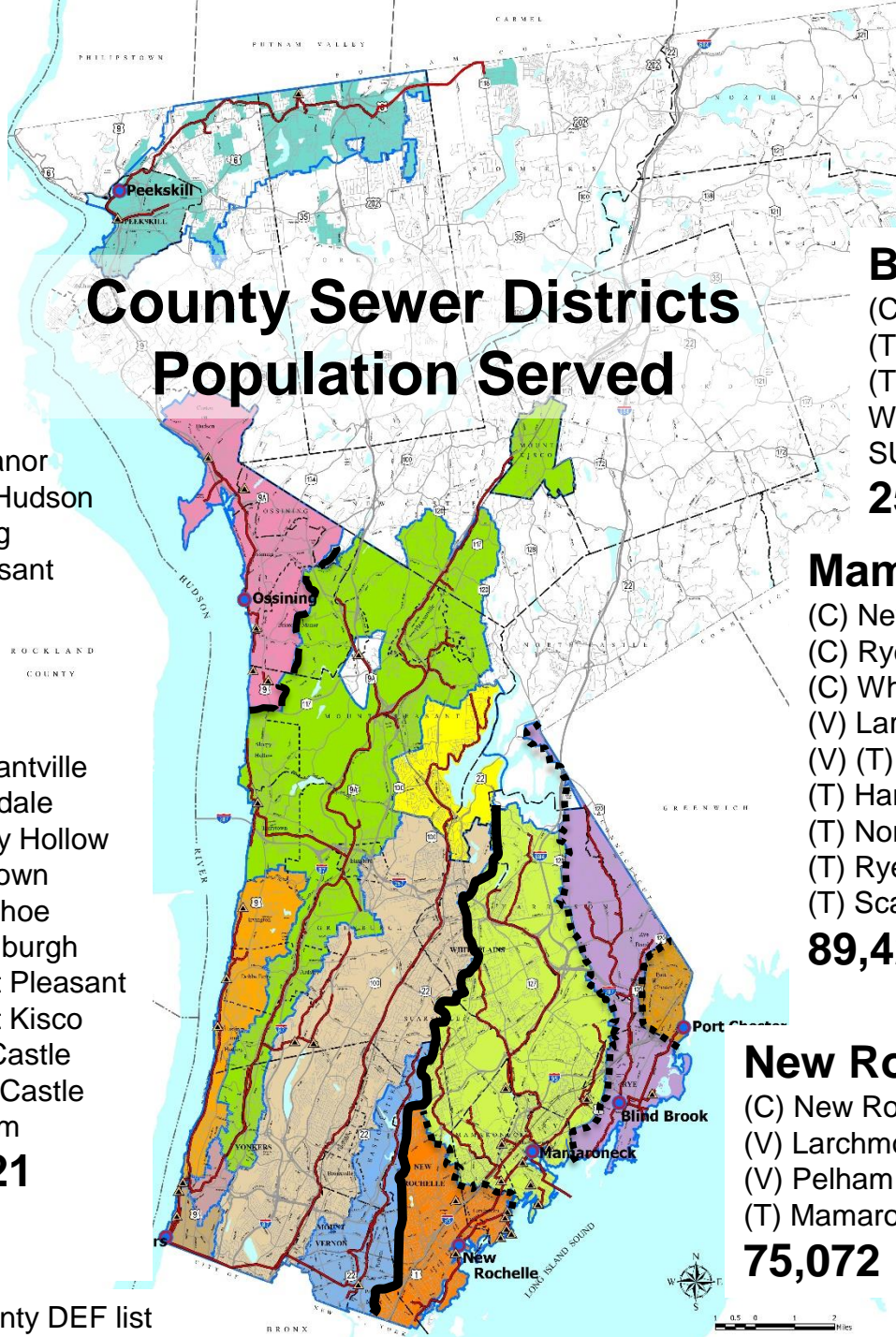
**39,415**

## Yonkers

(C) Mount Vernon	(V) Pleasantville
(C) New Rochelle	(V) Scarsdale
(C) White Plains	(V) Sleepy Hollow
(C) Yonkers	(V) Tarrytown
(V) Ardsley	(V) Tuckahoe
(V) Briarcliff Manor	(T) Greenburgh
(V) Bronxville	(T) Mount Pleasant
(V) Dobbs Ferry	(T) Mount Kisco
(V) Elmsford	(T) New Castle
(V) Hastings	(T) North Castle
(V) Irvington	(T) Pelham

**509,921**

# County Sewer Districts Population Served



## Port Chester

(V) Port Chester  
(T) Rye

**30,116**

## Blind Brook

(C) (T) Rye  
(T) Harrison  
(T) North Castle  
Westchester County Airport  
SUNY Purchase

**25,855**

## Mamaroneck

(C) New Rochelle  
(C) Rye  
(C) White Plains  
(V) Larchmont  
(V) (T) Mamaroneck  
(T) Harrison  
(T) North Castle  
(T) Rye  
(T) Scarsdale

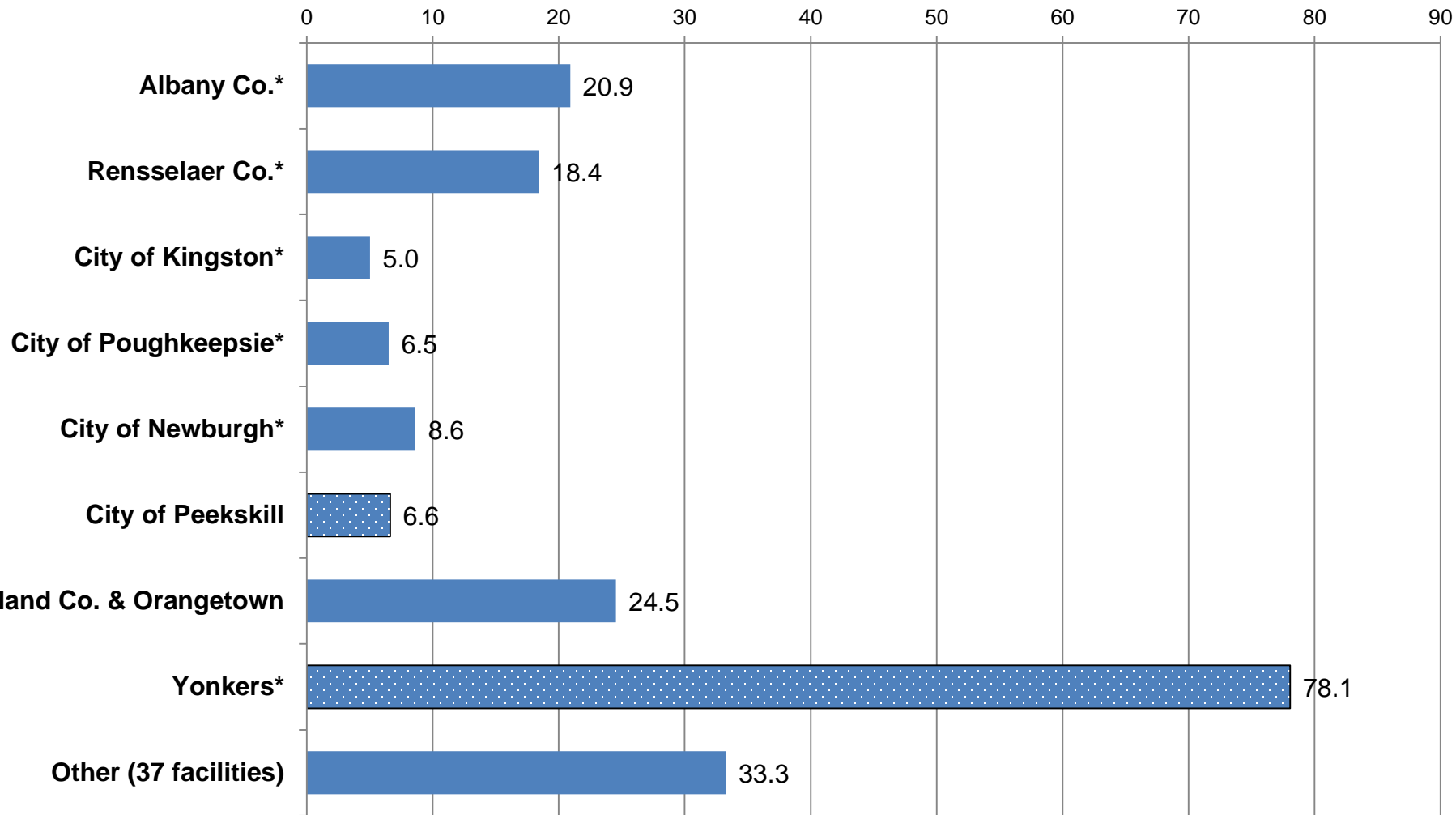
**89,423**

## New Rochelle

(C) New Rochelle  
(V) Larchmont  
(V) Pelham Manor  
(T) Mamaroneck

**75,072**

# Municipal Wastewater Discharge Direct to Hudson River Estuary (MGD)



Plants serving combined sewer systems (whole or in part) are marked with an asterisk. Rockland County SD No. 1 (16.5 MGD) and Orangetown SD No. 1 (8.0 MGD) discharge at the same point, and are combined in this chart. At 78.1 MGD, the Yonkers treatment plant, which serves 506,000 people in 22 Westchester County municipalities, accounts for 39% of all municipal discharges direct to the Hudson River Estuary, and 22% of all discharges to the Hudson River Watershed overall.



## Peekskill

15 miles trunk sewer  
4 satellite systems  
2 pump stations  
6.5 MGD (5%)  
**\$34.9 million**

## Ossining

8 miles trunk sewer  
5 satellite systems  
10 pump stations  
4.6 MGD (3%)  
**\$4.4 million**

## Yonkers

100 miles trunk sewer  
22 satellite systems  
12 pump stations  
84.6 MGD (64%)  
**\$140.5 million**

# Infrastructure Snapshot

## Port Chester

0 miles trunk sewer  
2 satellite systems  
0 pump stations  
4.6 MGD (4%)  
**\$25.7 million**

## Blind Brook

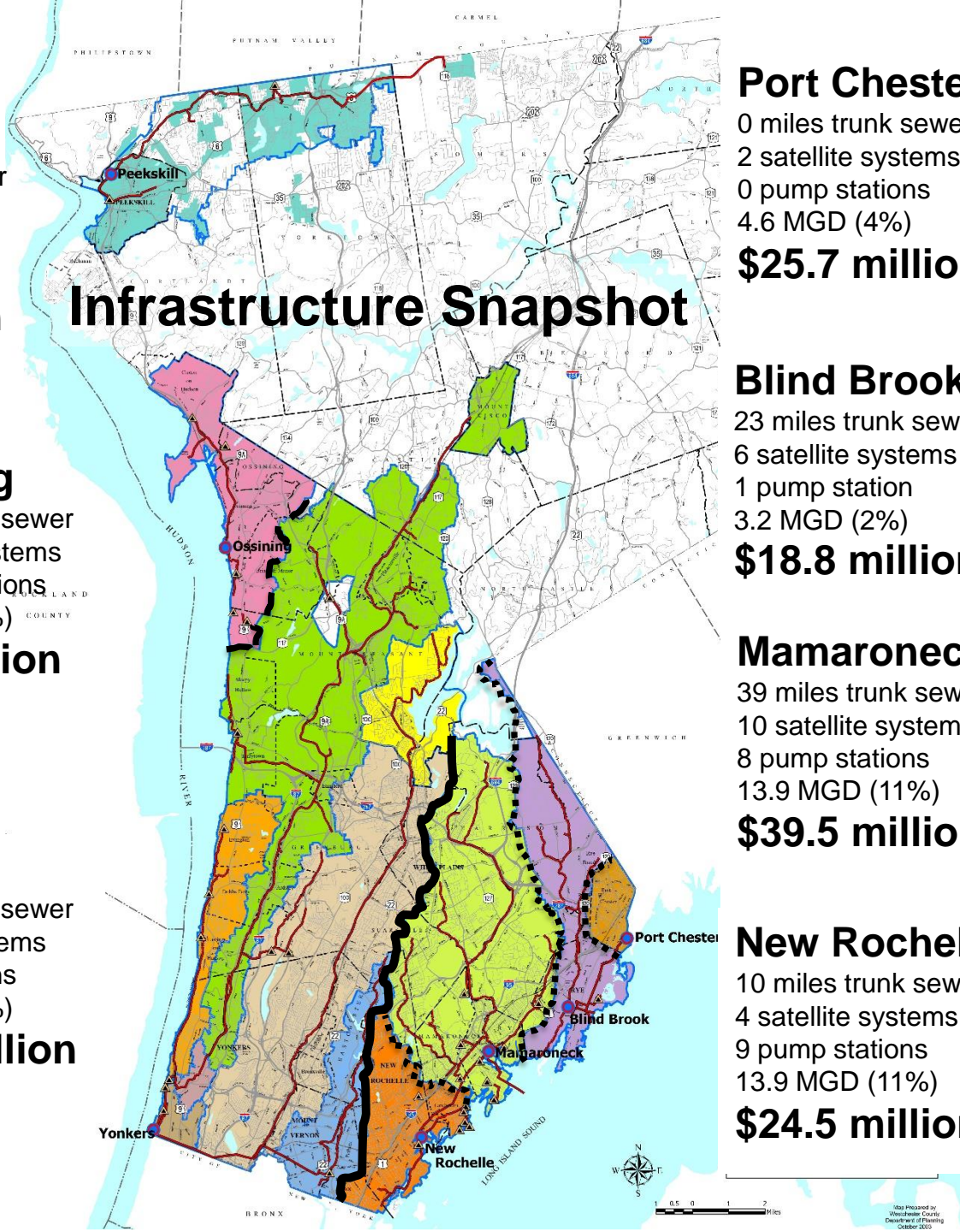
23 miles trunk sewer  
6 satellite systems  
1 pump station  
3.2 MGD (2%)  
**\$18.8 million**

## Mamaroneck

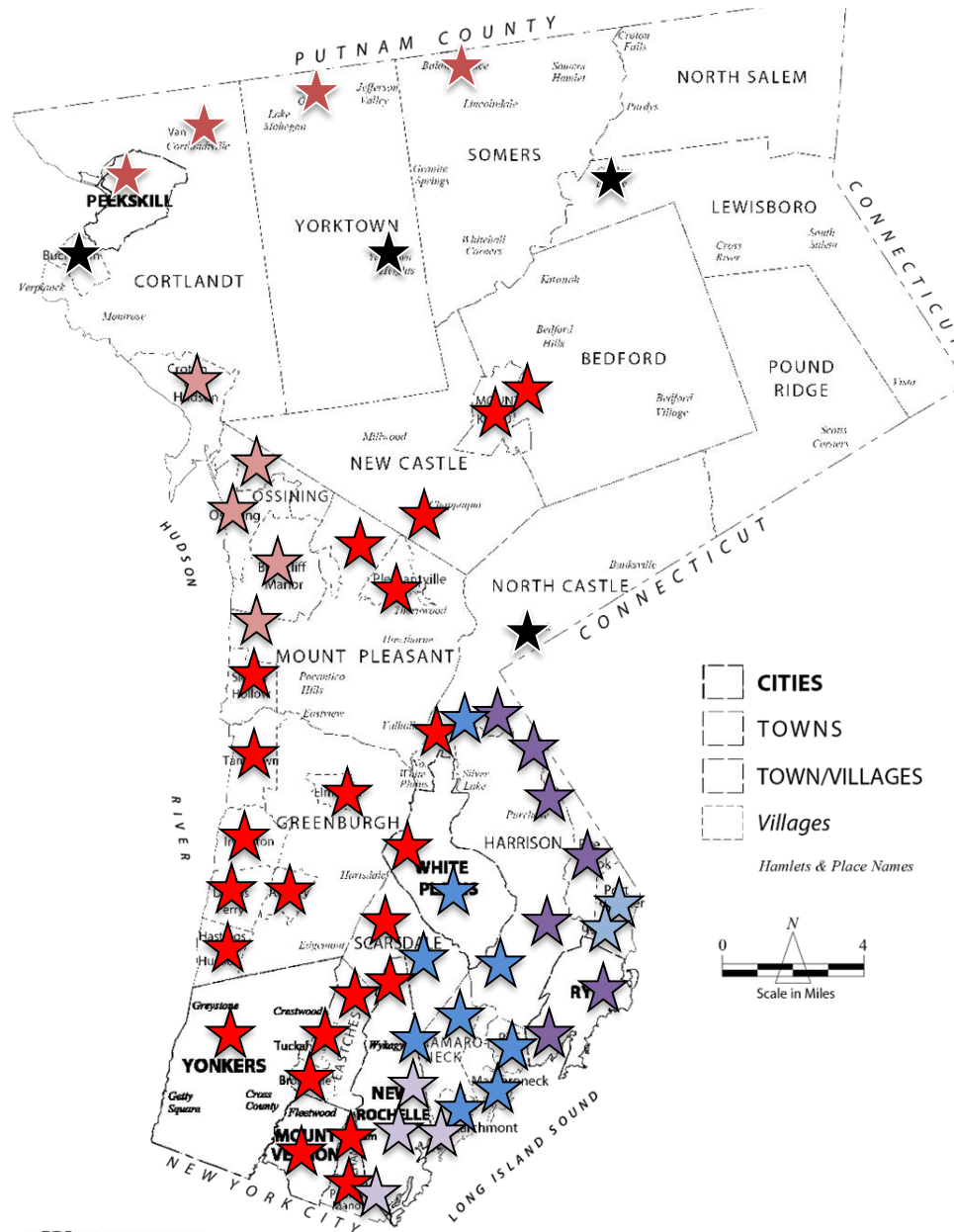
39 miles trunk sewer  
10 satellite systems  
8 pump stations  
13.9 MGD (11%)  
**\$39.5 million**

## New Rochelle

10 miles trunk sewer  
4 satellite systems  
9 pump stations  
13.9 MGD (11%)  
**\$24.5 million**



# Non-county Wastewater Collection Systems





## CSOs

11 Yonkers

## Pump Station Bypasses

Dobbs Ferry

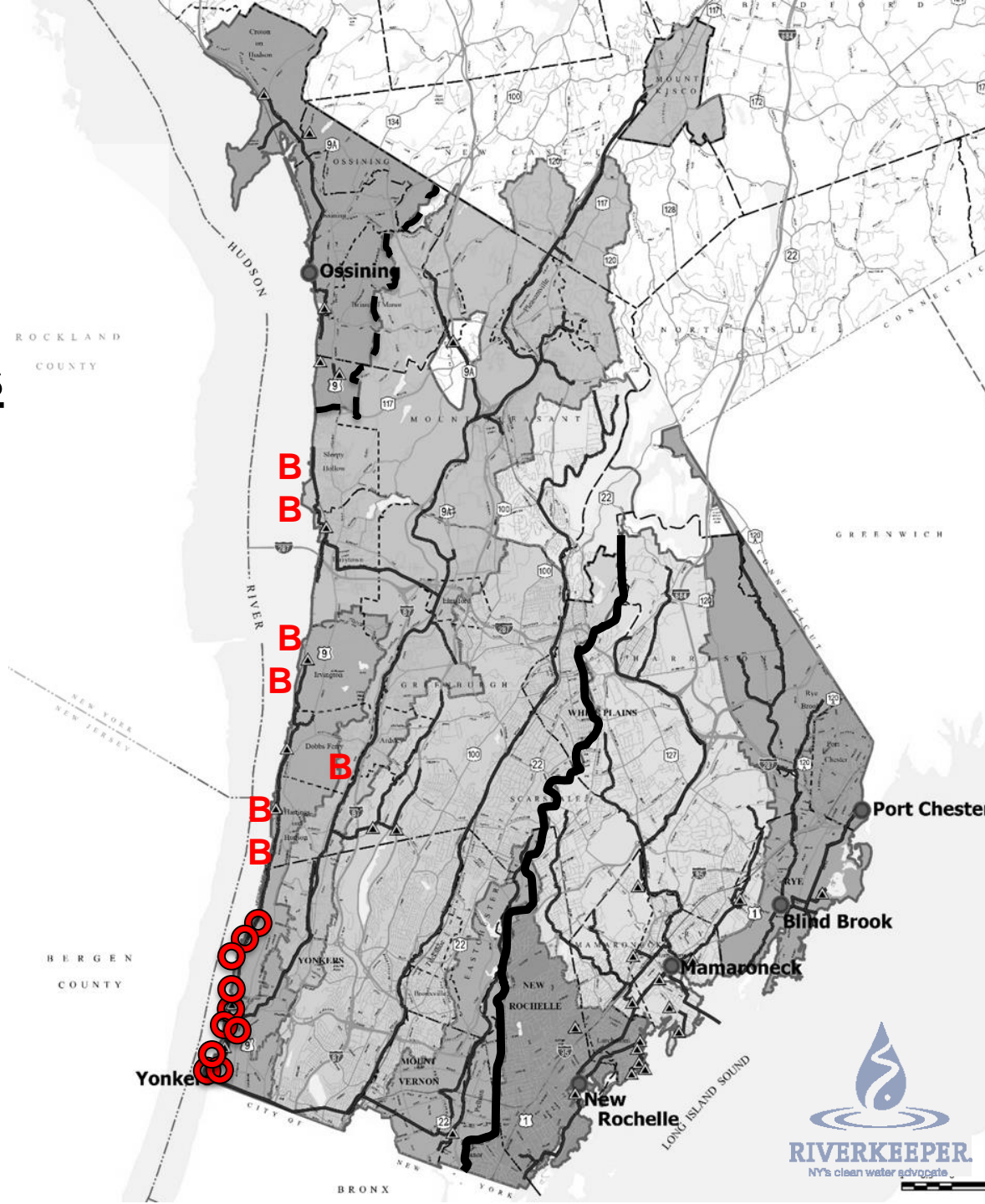
2 Hastings-on-Hudson

Irvington

Tarrytown

North Tarrytown

Greenburgh

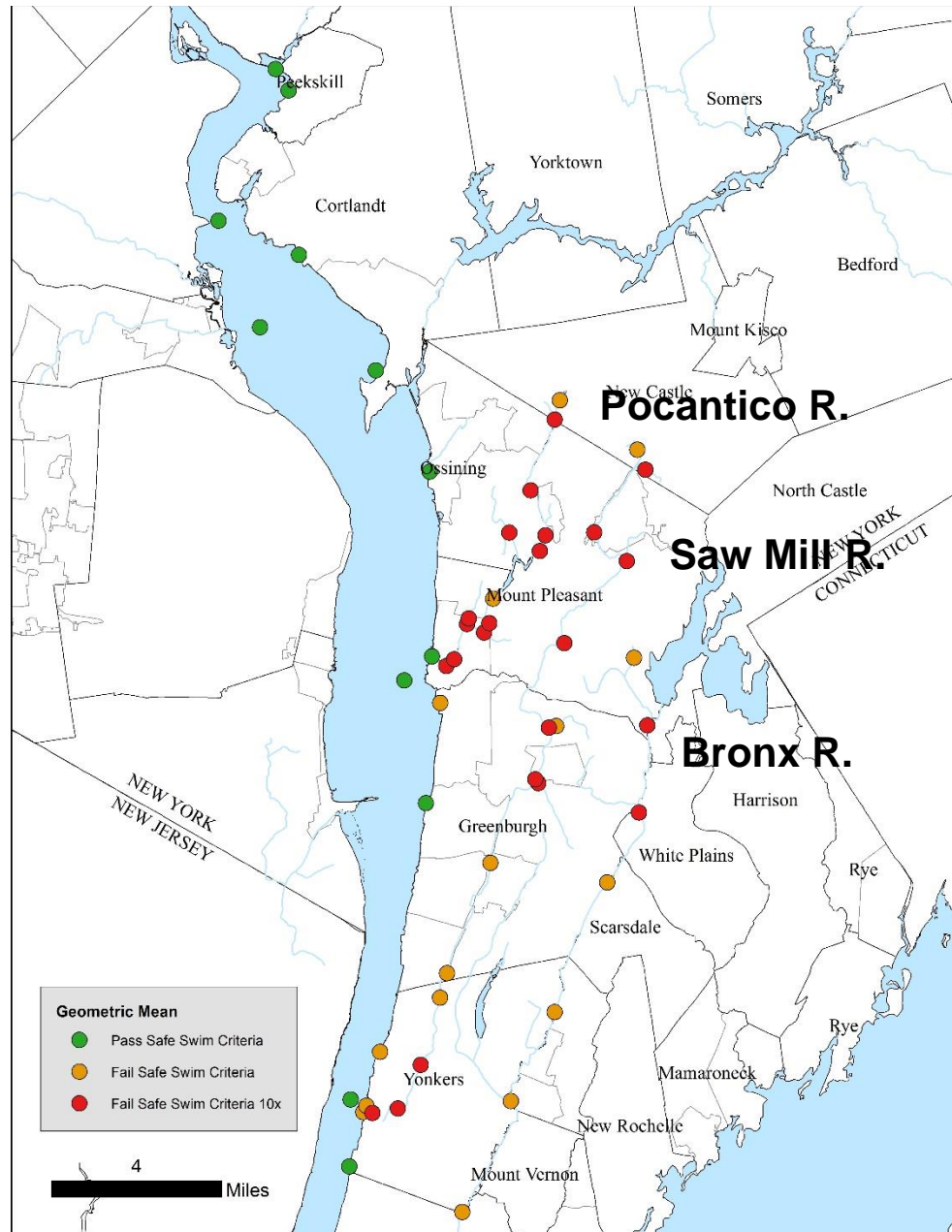




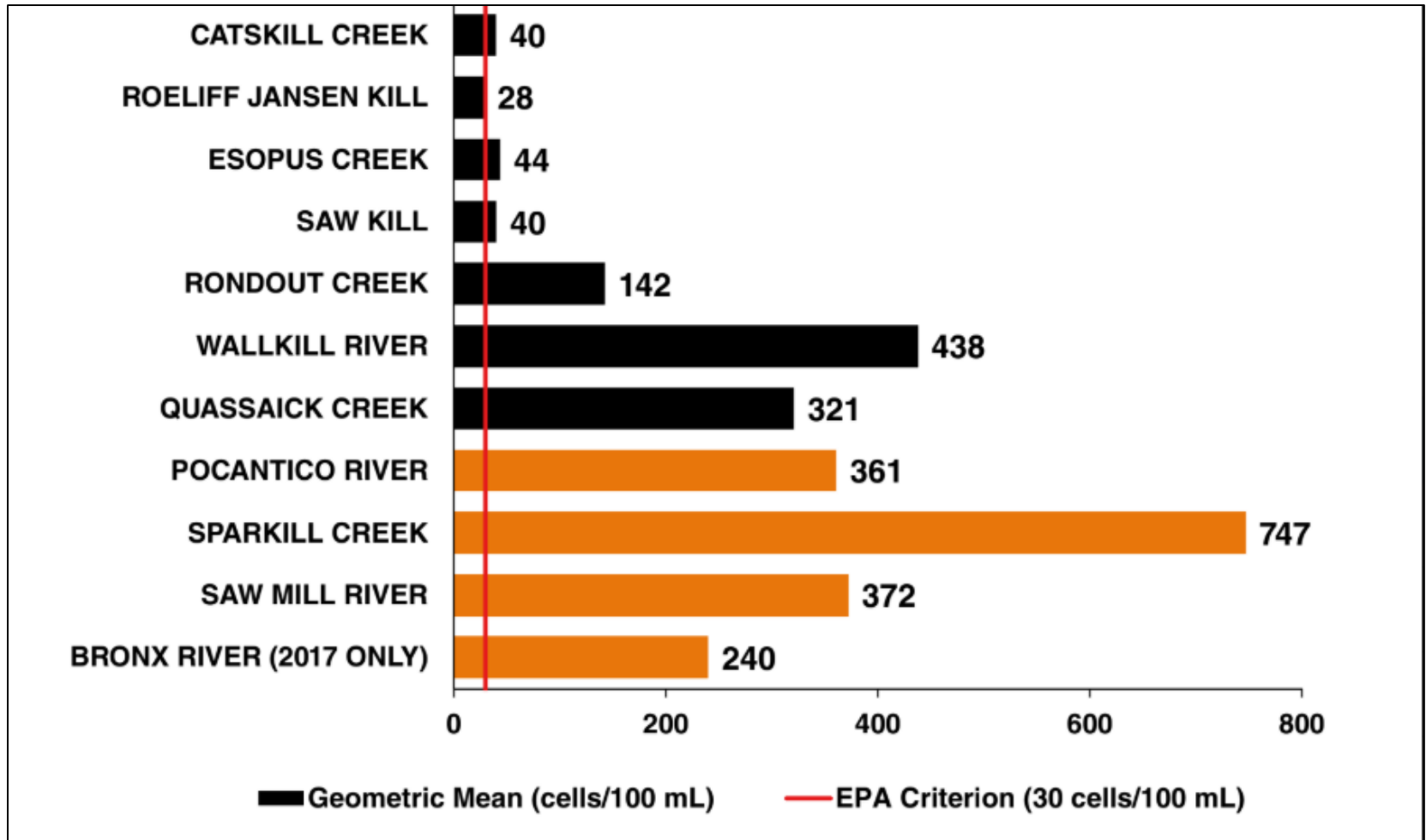


# Water Quality: Fecal Bacteria Monitoring Results

## Hudson River Estuary and Tributaries

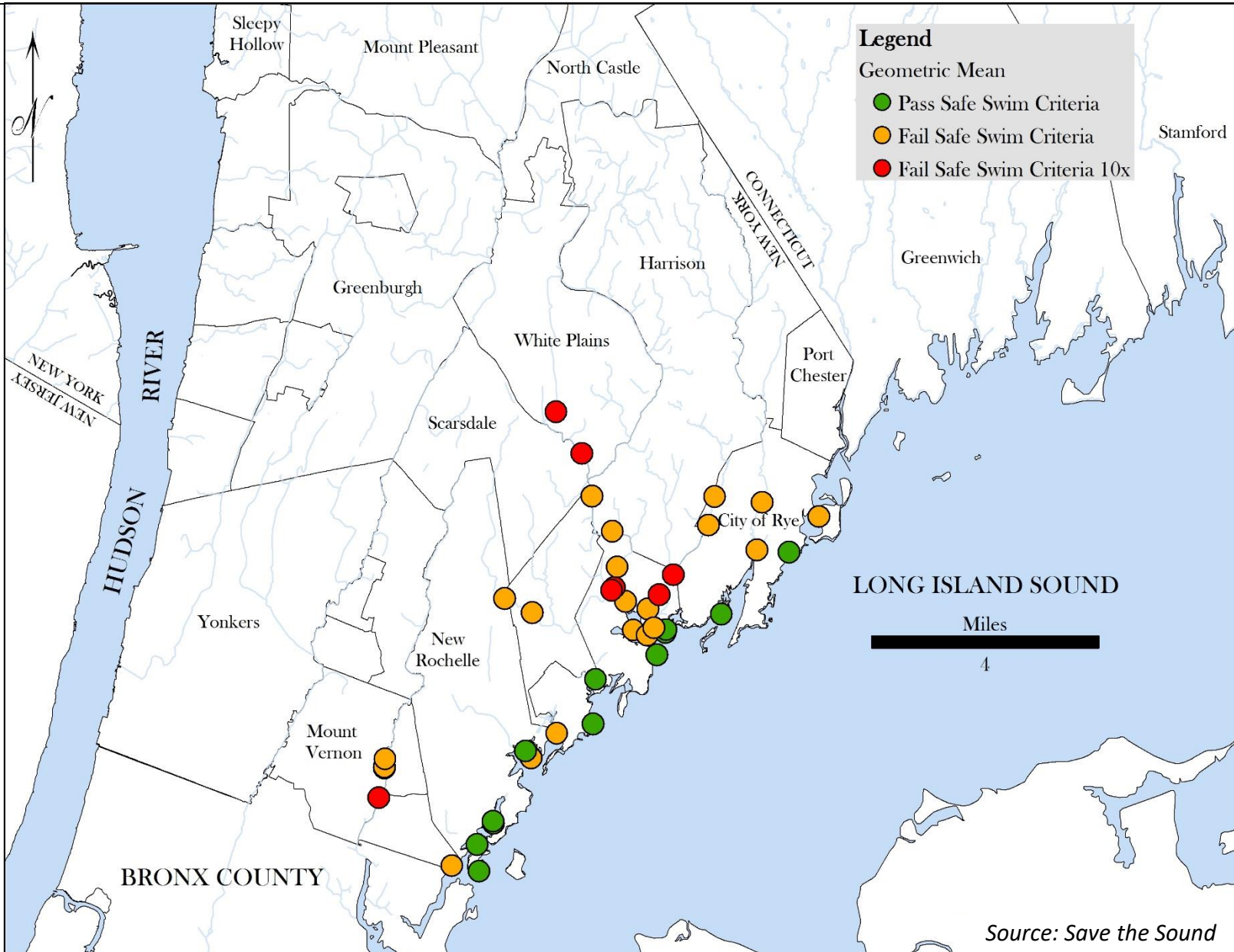


# Water Quality: Fecal Bacteria Monitoring Results Hudson River Tributaries (2010-2017)



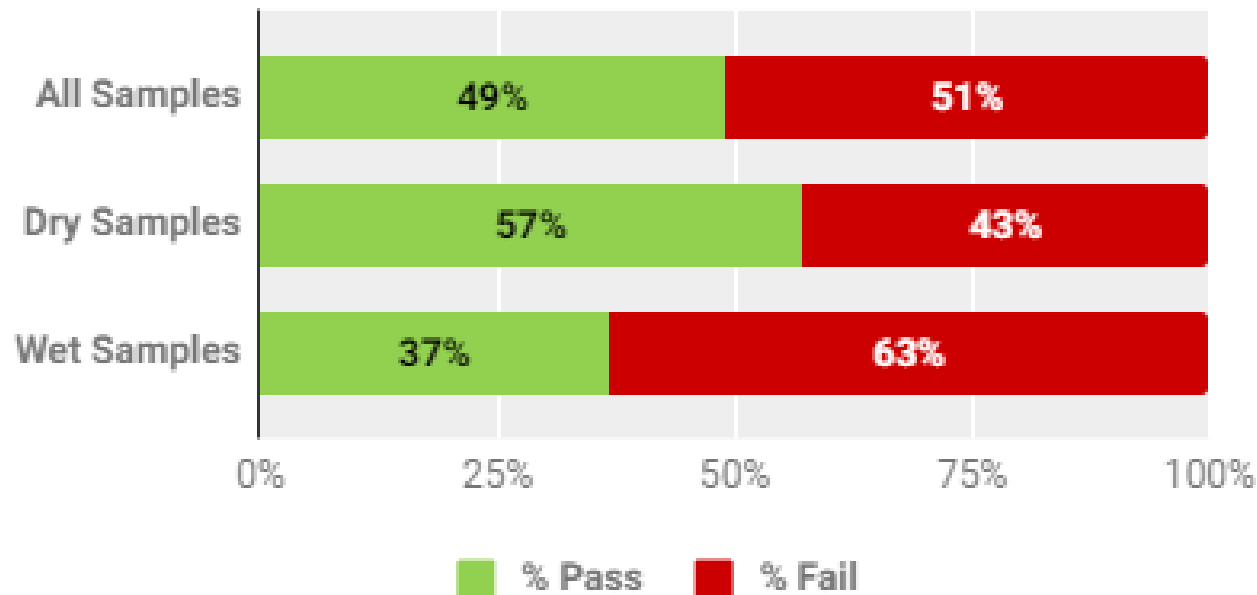


# Water Quality: Fecal Bacteria Monitoring Results Long Island Sound and Tributaries (2018)



# Water Quality: Fecal Bacteria Monitoring Results Long Island Sound and Tributaries (2018)

## Wet vs. Dry: Percent Pass/Fail 2018





# Westchester Beaches



## Hudson River

1 private beach  
1 public beach

## **Croton Point Park**

Croton-on-Hudson

## Long Island Sound

19 private beaches  
4 public beaches

## **Glen Island Park**

New Rochelle

## **Playland Beach**

Rye

## **Harbor Island Park**

Mamaroneck

## **Hudson Park**

New Rochelle

Source: Save the Sound  
[soundhealthexplorer.org](http://soundhealthexplorer.org)





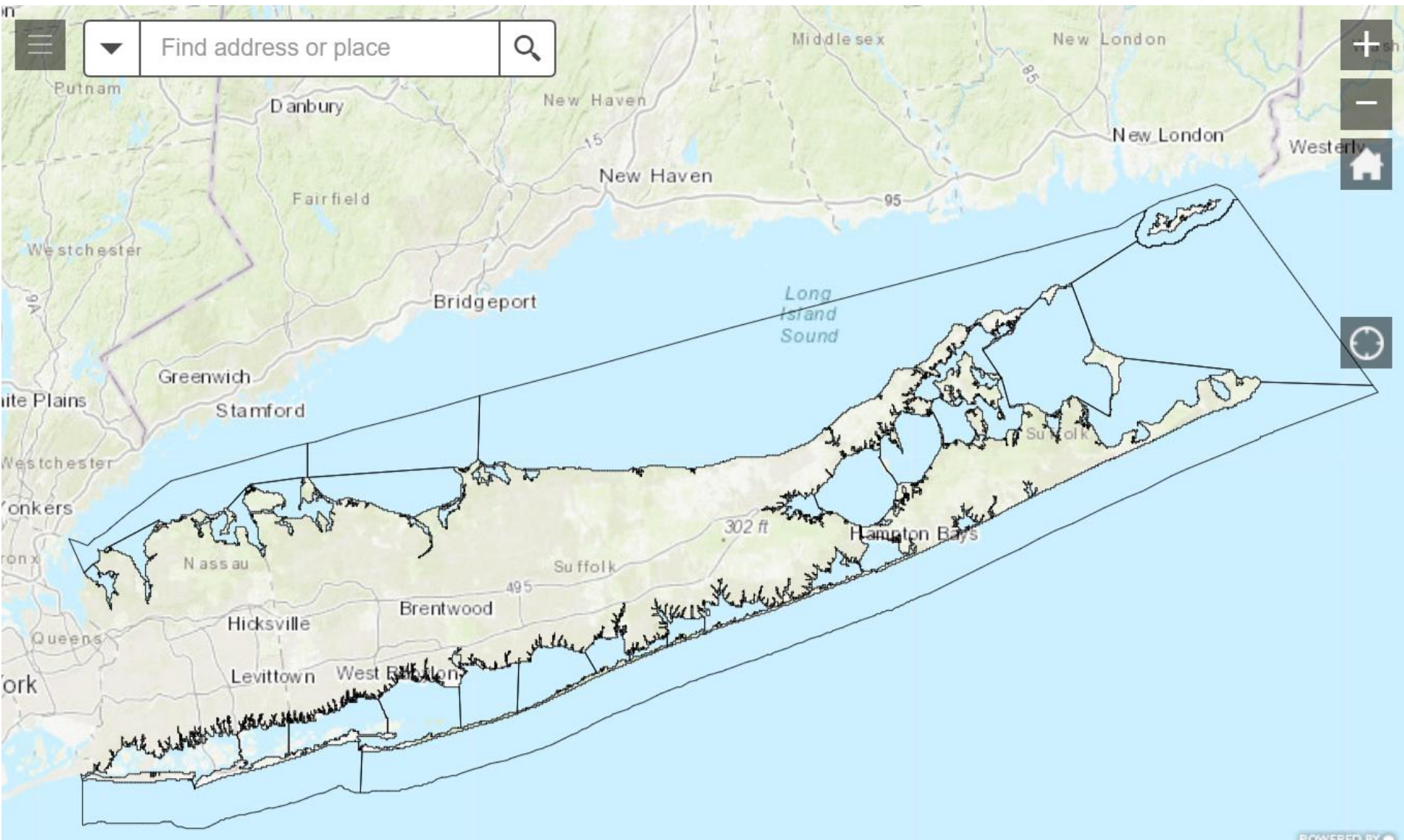


Ossining High School  
teachers and students  
who sample water  
quality at Ossining  
Beach.





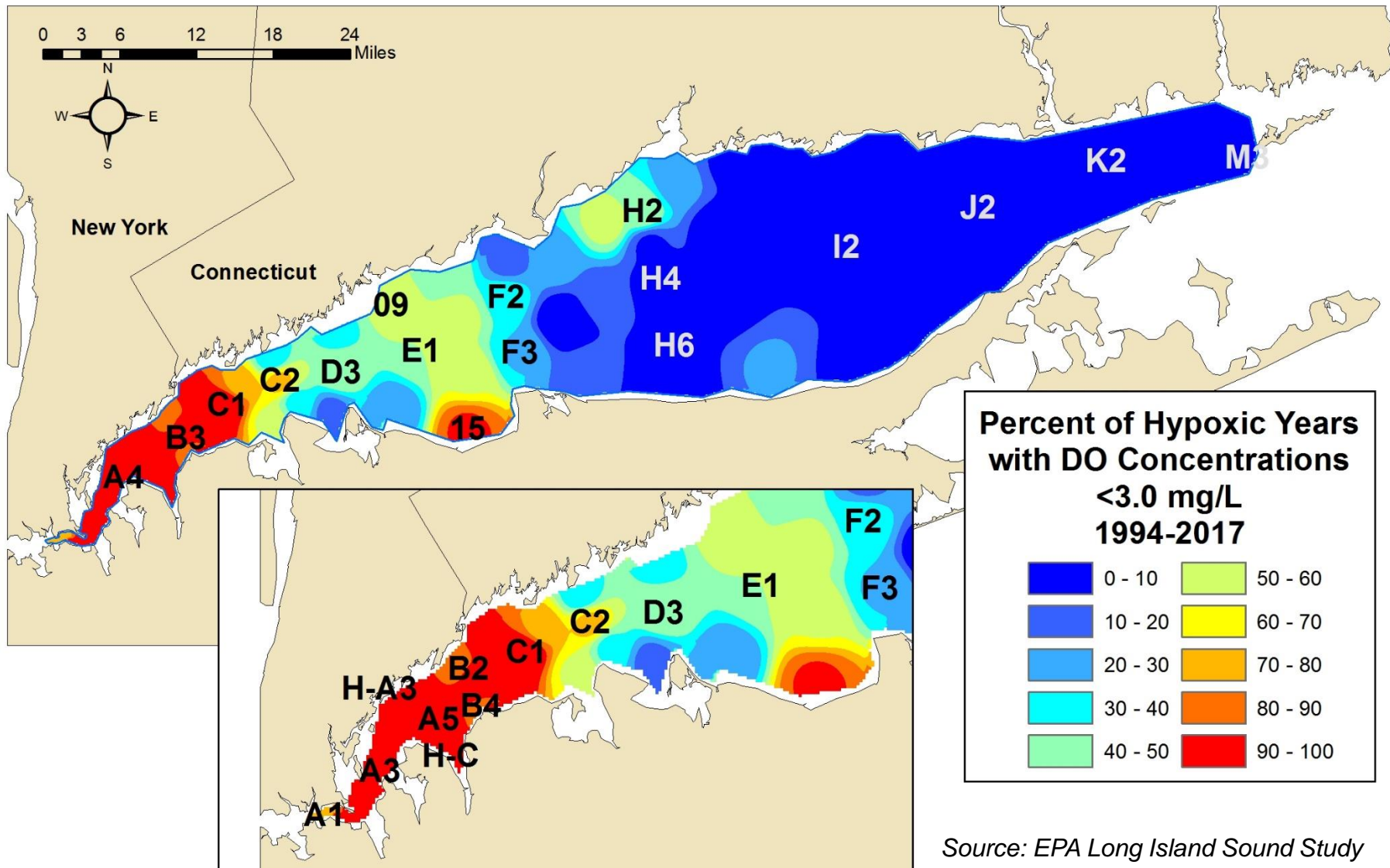
# Shellfishing Harvest Zones



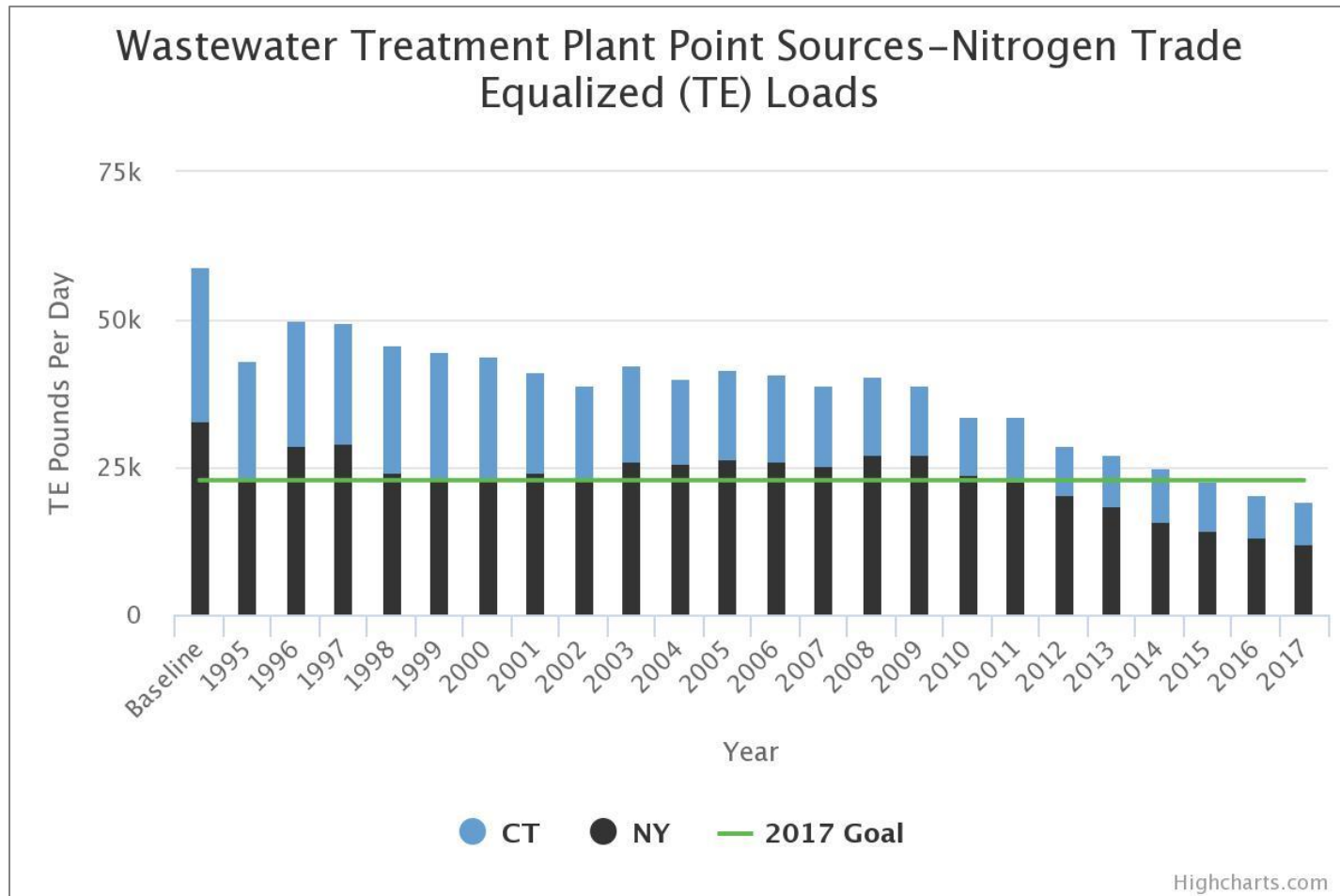
Source: NYSDEC

# Low Oxygen (Hypoxia) in LI Sound from Excess Nitrogen

## THE FREQUENCY OF HYPOXIA IN LONG ISLAND SOUND BOTTOM WATERS



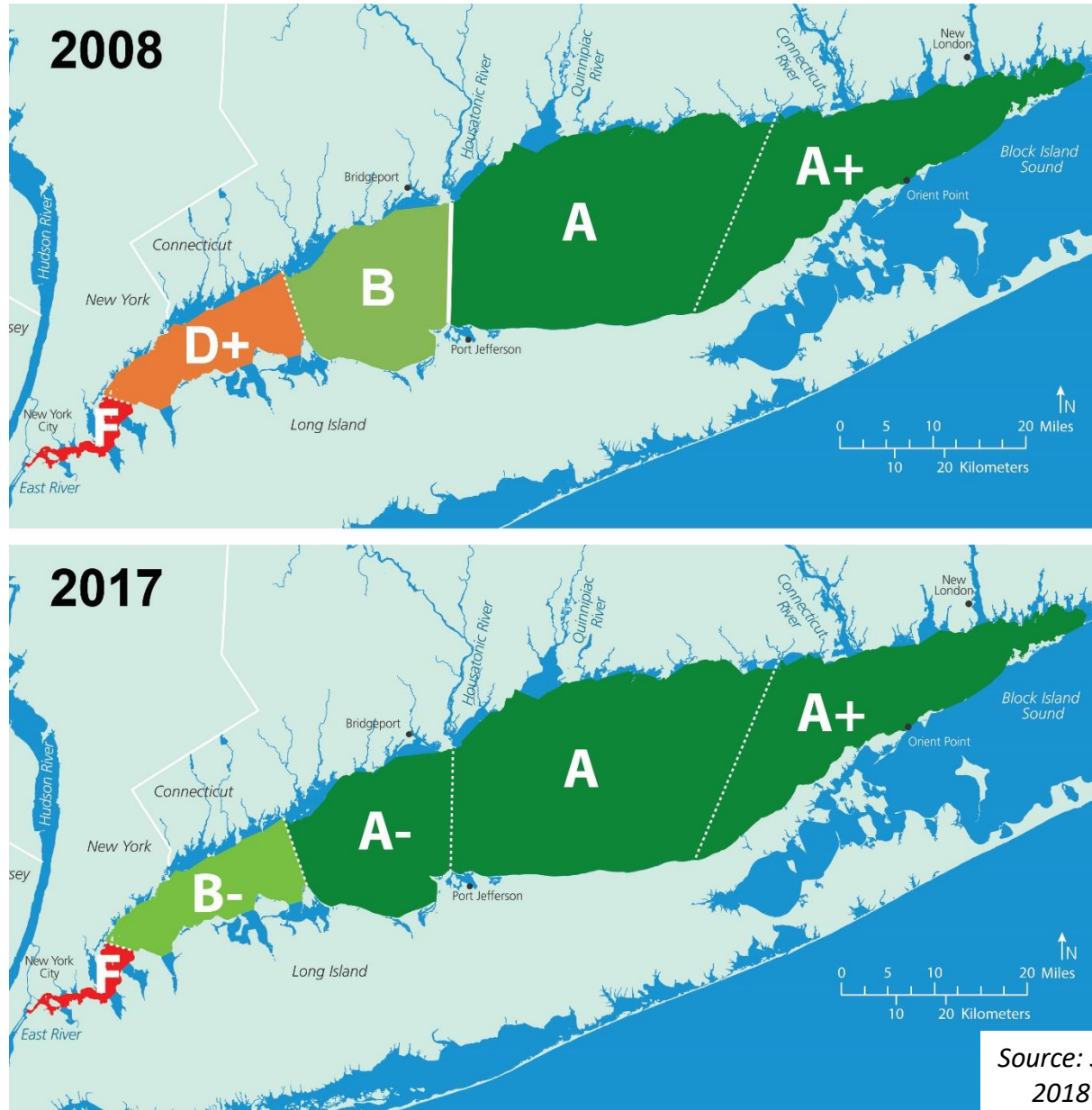
# 58.5%\* Nitrogen Reduction Achieved at LI Sound WWTPs



\*based on 1990 nitrogen discharge levels



# LI Sound Water Quality (DO) is Rebounding

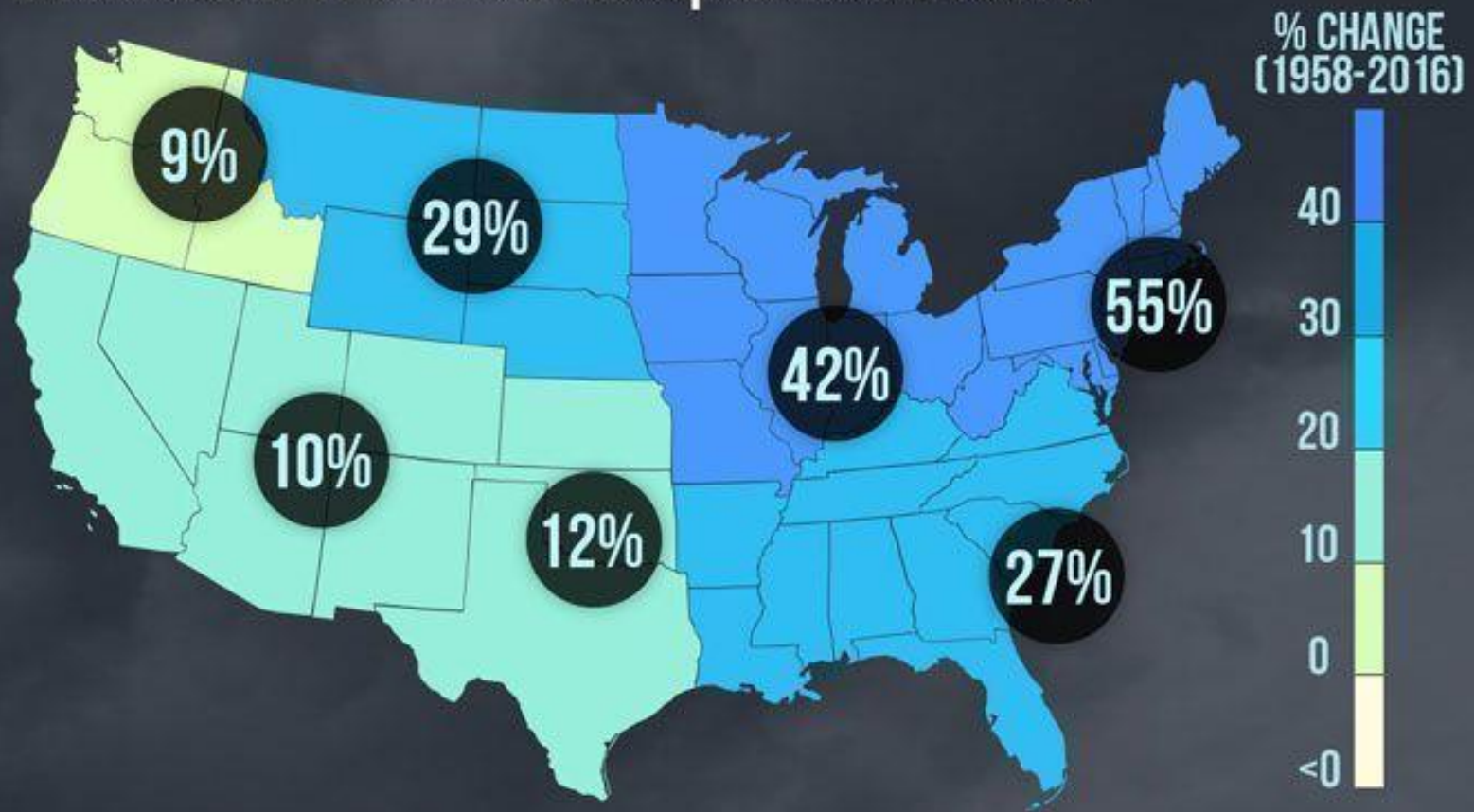


Source: Save the Sound  
2018 LIS Report Card



# MORE DOWNPOURS

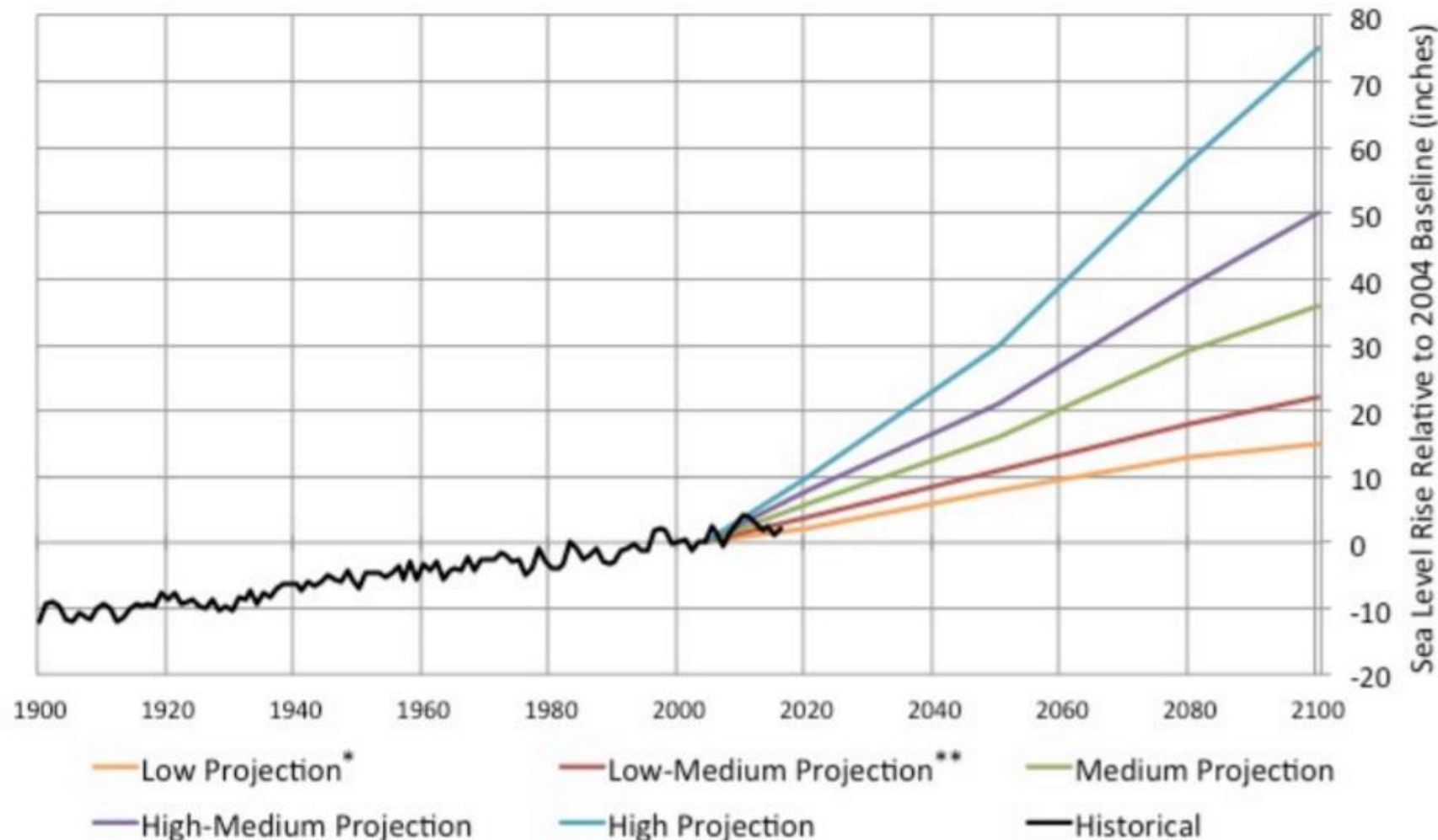
Increase in Heaviest Precipitation Events



Heaviest events defined as top 1% of events  
Source: USGCRP Climate Science Special Report 2017

CLIMATE  CENTRAL

# Official Sea Level Rise Projections for New York City



Graphics by Christian Termyn

\* Historical sea level rise sourced from Permanent Service for Mean Sea Level data for New York (the Battery), available at: <http://www.psmsl.org/data/obtaining/stations/12.php>

\*\* NYS Sea Level Rise Projections, 6 NYCRR Part 490. Projections represent inches of rise over baseline level, which is defined as the average level of the surface of marine or tidal water over the years 2000 through 2004.



# County-Owned Infrastructure Potentially Affected by Sea Level Rise

Infrastructure Category	Total	Affected by 1ft SLR	Affected by 3ft SLR	Affected by 6ft SLR
WC Sanitary Sewer Manholes (number, County-owned)	4005	6	38	306
WC Sanitary Sewer Lines (miles, County-owned)	200.5	4.70	9.59	29.69
Outfalls (est. number, County-wide; inventory not finalized)	3638	82	133	178
WC-Owned Roads (miles)	135	0	0	0.89
Bus Stops (number)	3334	0	0	14
Bus Routes (miles)	1073	21.2	23.2	58.1
Bridges (number)	298	9	9	15

Source: Westchester Co. / Columbia U

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