

Problem Statement

Report Number	23	RCA Owner	Brian Hughes
Report Date	6/9/2015	RCA Facilitator	Cory Boissoneau

Focal Point: Mass Fish & Turtle Die-Off in Peconic River

When

Start Date: 4/23/2015	End Date:
Start Time:	End Time:
Unique Timing	After algal bloom

Where

Location	East End of Long Island, New York
Location	Peconic River & Peconic Estuary

Actual Impact

Environmental	93% reduction in clam population over last 25 years	\$0.00
Environmental	Reduction in Terrapin population	\$0.00
Environmental	Reduction in Menhaden population. Menhaden are an important food source for many birds and predatory fish	\$0.00

Actual Impact Total: \$0.00

Frequency

Frequency Note: Actual frequency unknown, but this has been a recurring problem in recent years.

Potential Impact

Environmental	Nitrogen loading will continue to destroy tidal wetlands and other coastal ecosystems, as well as commercial fisheries.	\$0.00
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Potential Impact Total: \$0.00

Report Summaries

Cause and Effect Summary

In April 2015, large numbers of Menhaden and Terrapin turtles were found dead in the Peconic River off of Flanders Bay in Long Island, NY. The die-offs were attributed to massive algal blooms in the Peconic Estuary. The blooms were caused by excessive nitrogen in the water, which was caused by nitrogen seeping into the county's aquifers. The nitrogen seeped into the aquifers from homes, wastewater treatment plants, and through the use of fertilizers. Homes contributed to the nitrogen release due to 74% of homes in the county using outdated septic tanks and cesspools which are unable to contain the nitrogen. These homes are still using the tanks and cesspools because the county's population grew faster than expected over the last few decades and the government did not anticipate the impacts of the population growth.

The algae initially increases dissolved oxygen concentrations. However, as algal growth continues to increase, it then reduces dissolved oxygen concentrations through respiration and bacterial decomposition that occurs when the algae dies. As the dissolved oxygen levels decrease, fish and turtles begin to die off.

Corrective actions being put into place include a \$383 million expansion of the sewer system to reduce reliance on the outdated septic tanks and cesspools, and the creation of a center at Stony Brook University to develop affordable, high-tech nitrogen-removal technology for home wastewater systems.

Solutions

SO-0001	Solution	Suffolk County is implementing a \$383 million expansion of the sewer system to reduce the reliance on septic tanks and cesspools.	
	Cause(s)	Absence of proper infrastructure to support population	
	Note		
	Assigned	Jon Boisoneau;	Criteria Passed
	Due	12/10/2015	Status Approved
	Term	medium	Cost \$383,000,000.00
SO-0002	Solution	Gov. Andrew M. Cuomo announced in October the creation of the New York State Center for Clean Water Technology center at Stony Brook University to develop affordable, high-tech nitrogen-removal technology for home wastewater systems.	
	Cause(s)	Sufficient quantity of nitrogen leaches into the aquifers	
	Note	The state of New York has provided \$2M in initial seed money for the initiative through the 2015 budget.	
	Assigned	Jon Boisoneau;	Criteria Passed
	Due	4/1/2016	Status Approved
	Term	long	Cost \$2,000,000.00

Evidence

EV-0001	Evidence	Governor's Report on Solutions - provides specifics about spending
	Cause(s)	
	Location(s)	https://www.governor.ny.gov/news/governor-cuomo-announces-actions-strengthen-coastal-resiliency-against-future-storms-long
	Attachment(s)	
	Contributor	
	Type	URL
	Quality	★★★★★
EV-0002	Evidence	New York Times article
	Cause(s)	<p>Mass Menhaden die-off (tens of thousands)</p> <p>Mass diamondback terrapin die-off (approx. 100)</p> <p>Saxitocin causes paralysis and can lead to death</p> <p>Presence of saxitoxin in turtles</p> <p>Produced by red tide algae blooms</p> <p>Collects in shellfish eaten by turtles</p> <p>Algal respiration - uses dissolved O₂</p> <p>Many fish competing at once for available dissolved oxygen</p> <p>Likely chased up the river by larger fish</p> <p>Sufficient quantity of nitrogen leaches into the aquifers</p> <p>Aquifers connect to the region's surface water, rivers, and bays</p> <p>Nitrogen discharges from wastewater treatment plants</p> <p>Nitrogen fertilizer used on lawns, golf courses and agricultural lands</p> <p>Outdated tanks and cesspools can't contain nitrogen</p> <p>Nitrogen discharges from residential homes</p> <p>Population of Suffolk County grew rapidly last few decades</p> <p>Absence of proper infrastructure to support population</p> <p>Elevated nitrogen levels in water</p> <p>Reduced dissolved oxygen levels (nearly zero consecutive nights)</p> <p>Impacts of population growth not anticipated by government</p> <p>Elevated nitrogen accelerates algae blooms</p> <p>Large amount of algae</p>
	Location(s)	http://www.nytimes.com/2015/06/06/nyregion/long-island-sees-a-crisis-as-it-floats-to-the-surface.html
	Attachment(s)	
	Contributor	
	Type	URL

	Quality	★★★★★
EV-0003	Evidence	US National Library of Medicine National Institutes of Health
	Cause(s)	Saxitocin causes paralysis and can lead to death Saxitoxin is a potent neurotoxin
	Location(s)	http://www.ncbi.nlm.nih.gov/pubmed/10080350
	Attachment(s)	
	Contributor	
	Type	URL
	Quality	★★★★★
EV-0004	Evidence	Utah State University - Dissolved Oxygen Report
	Cause(s)	Fish require dissolved oxygen
	Location(s)	http://extension.usu.edu/waterquality/whats-in-your-water/do
	Attachment(s)	
	Contributor	
	Type	URL
	Quality	★★★★★
EV-0005	Evidence	University of Rhode Island - Environmental Data Center
	Cause(s)	Menhaden travel in large groups
	Location(s)	http://www.edc.uri.edu/restoration/html/gallery/fish/atl.htm
	Attachment(s)	
	Contributor	
	Type	URL
	Quality	★★★★★
EV-0006	Evidence	Article: Fundamentals of Environmental Measurements
	Cause(s)	Algal respiration - uses dissolved O2 Algal die-offs - bacterial decomposition uses dissolved O2
	Location(s)	http://www.fondriest.com/environmental-measurements/parameters/water-quality/dissolved-oxygen/#12
	Attachment(s)	
	Contributor	
	Type	URL
	Quality	★★★★★
EV-0007	Evidence	U.S. Environmental Protection Agency
	Cause(s)	

Location(s)	https://www.epa.gov/nutrientpollution/problem
Attachment(s)	
Contributor	
Type	URL
Quality	★★★★★

Chart Key

- T Transitory
- N Non Transitory
- Transitory Omission
- Non Transitory Omission
- Undefined
- ▲ Chart Quality Alert
- ★ Focal Point
- E Evidence
- N Notes
- S Solutions
- A Actions

