

Why are thousands of dead fish washing up on the shore of Flanders Bay?

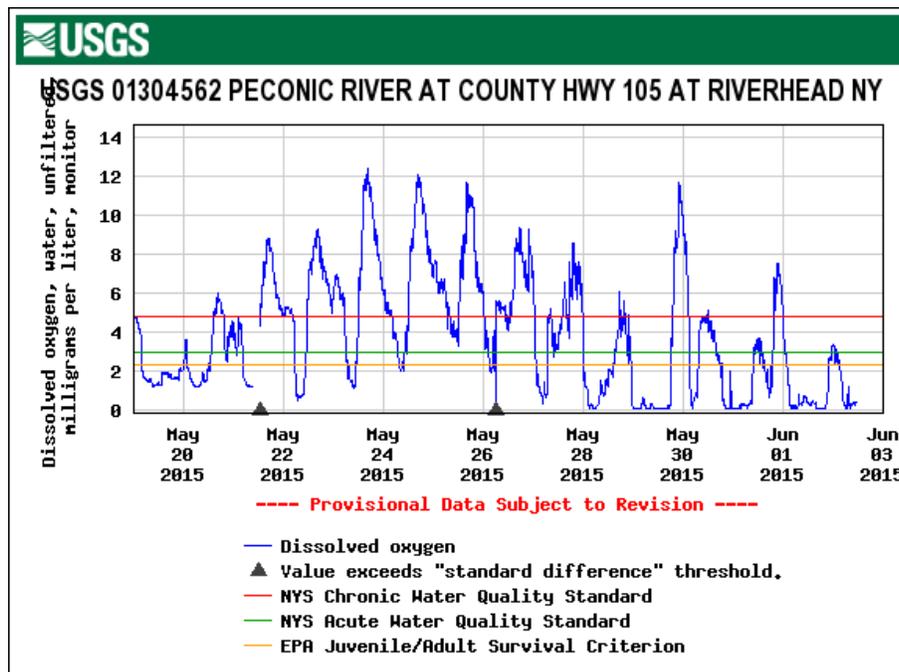
- Bunker fish (Atlantic Menhaden) are dying from low dissolved oxygen in the water.
- Dissolved oxygen is low because:
 - A bloom of non-toxic algae (*Prorocentrum*) is drawing down night-time oxygen. Blooms like this are fueled by excess nitrogen loading.
 - This condition is exacerbated by poor flushing in the western estuary and seasonally rising water temperatures.
 - This already stressed system was then flooded with thousands of fish, in high densities, that used up whatever oxygen was left. Predators, like bluefish, herd fish into shallow waters where they can't escape low oxygen conditions and fish perish, washing up on the shores.

What can we do to prevent it from happening again?

- Reducing the loads of nitrogen to the Peconic Estuary from septic systems, fertilizer use, and sewage treatment plants will, over time, help to reduce the frequency and severity of algal blooms and their adverse impacts.

MORE DETAIL:

- Thousands of “bunker” or Atlantic menhaden are washing up on the shores around Flanders Bay in the Peconic Estuary. Bunker are a filter-feeding fish that are important food source for many predatory fish, such as striped bass and bluefish, in local waters.
- These fish are likely being chased into shallow waters by predators, but the fish are dying because dissolved oxygen levels in the waters of the western estuary are very low. This phenomenon is called hypoxia.
- A monitoring station maintained by US Geological Survey (USGS), near the 105 bridge in Riverhead and funded by Peconic Estuary Program, NY State, Suffolk County and USGS, shows dissolved oxygen levels falling below biological thresholds for much of the day and reaching zero for sustained periods over the last few days: http://waterdata.usgs.gov/nwis/uv/?site_no=01304562
- During the day, algae photosynthesize more than they respire, resulting in increased dissolved oxygen in the water column. At night, without sun to fuel photosynthesis, respiration draws down the dissolved oxygen in the water column. This pattern results in the day night cycle visible in the monitoring data below. Dissolved oxygen in the western Peconic Estuary has been getting very low at night, for the last couple of weeks due to algal blooms typical of spring in the western Peconic Estuary in recent years.
- This already stressed system, then saw an influx of thousands of fish at extremely high densities, that used up what little oxygen was left.
- The widespread bloom currently occurring in Flanders Bay is caused by a non-toxic genus called *Prorocentrum*, according to Stony Brook University researchers.



- Although algae blooms can occur naturally in spring, they are made worse by excess nitrogen loading to our estuaries.
- Nitrogen loading in the Peconic Estuary comes primarily from treated sewage, but fertilizer and atmospheric deposition are also significant sources. In Flanders Bay, land-based sources are roughly made up of ¼ from sewage treatment plants, ¼ from septic systems and cesspools, ¼ from fertilizer, and ¼ atmospheric deposition, according to a recent Nature Conservancy study.
- Nothing can be done in the short term to stop this fish kill, or an algae bloom from happening. But to reverse this trend of degradation, and prevent future problems, we should redouble our efforts to upgrade our wastewater treatment and minimize fertilizer use.
- Thanks to the Peconic Estuary Total Maximum Daily Load (TMDL; a pollution diet for the estuary), and funding from the Town of Riverhead, Suffolk County, NY State, and the US Environmental Protection Agency, the Riverhead Sewage Treatment Plant is currently undergoing a treatment upgrade, and will work with Indian Island County Golf Course to reuse effluent for irrigation, to reduce nitrogen loading even further.
- An equally important source of nitrogen comes from on-site wastewater treatment, like septic tanks and cesspools. The Peconic Estuary Program is working with the US Environmental Protection Agency, NY State, Suffolk County, local governments and Stony Brook University's new Clean Water Technology Center to develop new regulations, funding sources, and technologies to facilitate the upgrade of on-site wastewater treatment systems on Long Island.
- The Towns of Riverhead and Southampton are coordinating with health and environmental officials at the State level to determine the safest method to dispose of the dead fish.

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