



National Estuarine Research Reserve System

Estuary Data Mystery

Title: What caused a dissolved oxygen spike in Nag Creek?

Reserve, State: Narragansett Bay Research Reserve, Rhode Island

SWMP Station: Water Quality (WQ) Nag Creek

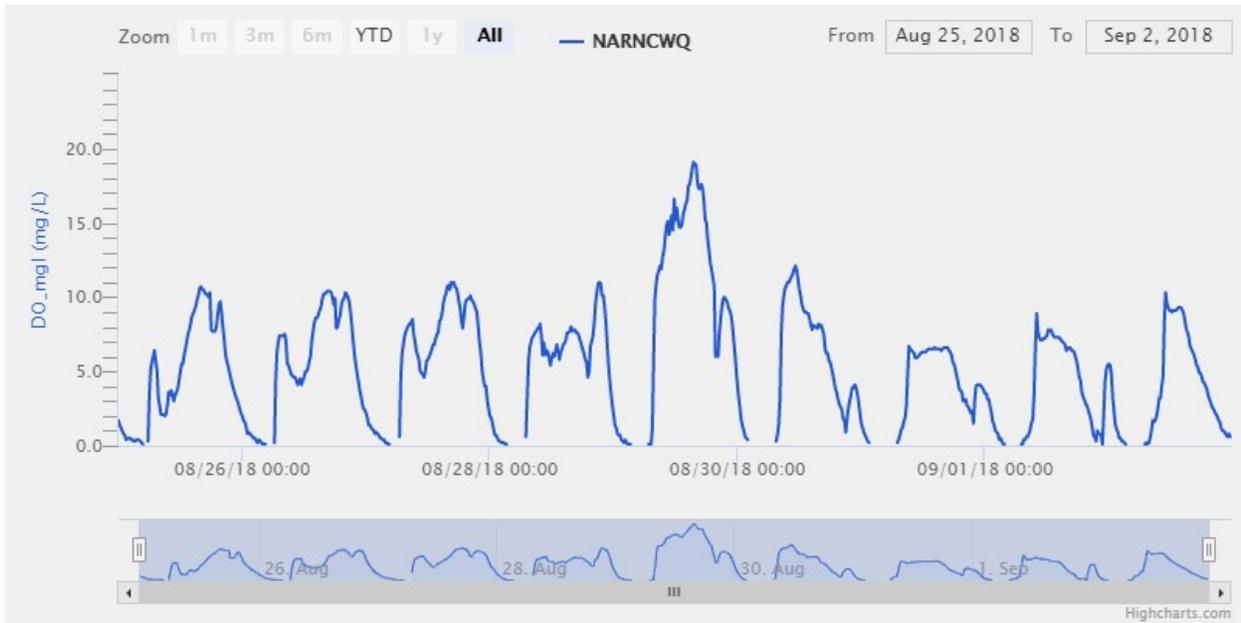
Parameters: Dissolved oxygen concentration (mg/L) and water temperature

Start and End Dates: August 25, 2018, to September 2, 2018

Data: Available and easy to graph at nerrsdata.org

Investigate This: Narragansett Bay National Estuarine Research Reserve sees fluctuations in [dissolved oxygen \(DO\)](#) in the salt marsh tidal creeks on a daily basis. Typically, dissolved oxygen is higher during the daylight hours when plants, including phytoplankton and algae, are photosynthesizing and thus contributing oxygen to the water. At night, photosynthesis is not occurring, and we see a corresponding dip in dissolved oxygen during these hours. This is shown in **Figure 1**, which charts dissolved oxygen from August 25, 2018, to September 2, 2018. Note that there is a significant spike in dissolved oxygen on August 29. What could have caused this spike in dissolved oxygen?

Figure 1: Dissolved oxygen levels over the course of several days.



Temperature can affect the amount of dissolved oxygen (DO) in the water; warmer water holds less DO and colder waters holds more DO. **Figure 2** shows the water temperature in relationship to the DO for the time period of August 25-September 2, 2018. Was there a decrease in the water temperature that could help explain the spike in dissolved oxygen? If not, what else could explain an increase?

Figure 2: Relationship between water temperature and dissolved oxygen

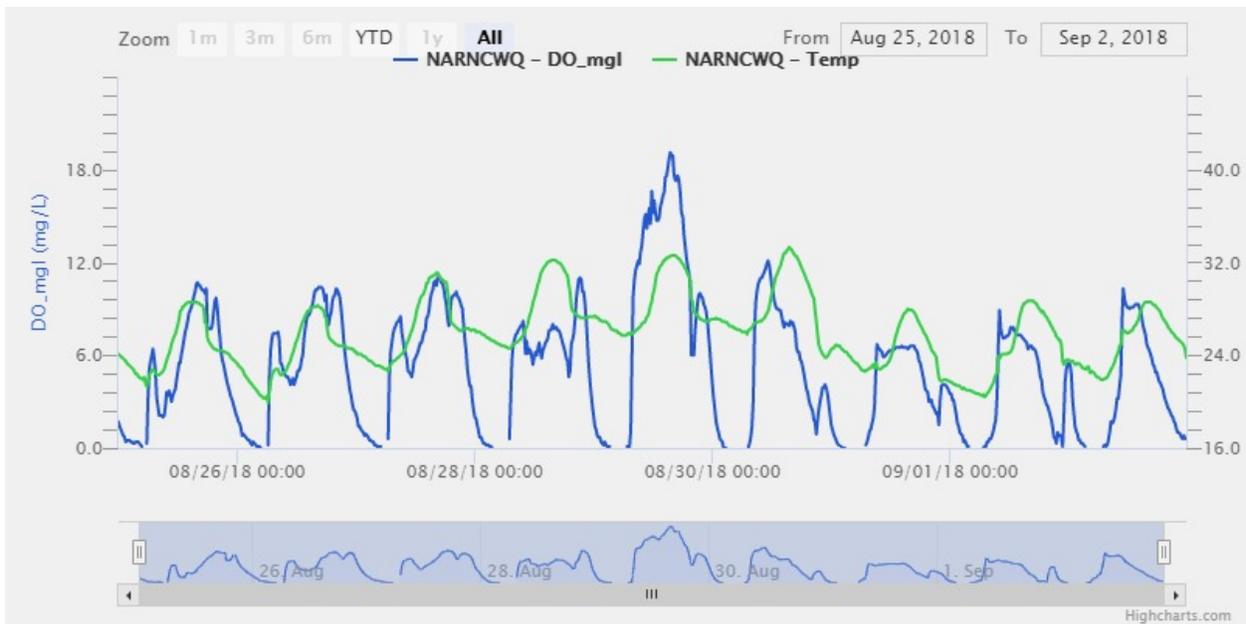


Photo A: Drift algae on the sonde at Nag Creek

Take a look at Photo A for a clue. As you can see, there is a large amount of algae gathered around the sonde, the instrument used to collect our water quality data, like DO. When the tide comes in and out twice daily, it can bring with it large clumps of algae, what we call drift algae. This algae might get stuck on the sonde for a period of time (perhaps several hours, until the next tide comes in and washes it away). Could this drift algae be the cause of the spike in DO during this time at Nag Creek? Why or why not?



Explanation: Yes! The drift algae is very likely the cause of the spike in DO on August 29. Drift algae comes in with the tide and can get stuck on the sonde for a period of time; when this happens, the algae is photosynthesizing and leads to a spike in the DO, which has been captured in our data collected by the sonde. Why does the DO go back to “normal” after the 29th? The drift algae was likely washed away from the sonde during the next tide cycle.