



Estuary Data Mystery

Title: What causes the massive fish die-offs at Loosin Creek?

Reserve, State: North Carolina Research Reserve, North Carolina

SWMP Station: Water Quality (WQ) Research Creek

Parameters: Dissolved Oxygen, pH

Start and End Dates: January 8 to 10, 2013

Data: Available and easy to graph at nerrsdata.org

Investigate This: This is designed to show how scientists look at water quality data to try and assess what happens in the water when a localized die-off of fish or a fish kill has occurred.

Part of the mission of the North Carolina National Estuarine Research Reserve is to monitor the waters surrounding Masonboro Island for 24 hours, 7 days a week. This program is called the System-Wide Monitoring Program, or SWMP, and is conducted at 29 National Estuarine Research Reserve (NERR) sites around the country. Water quality instruments called sondes are put in the water where they measure temperature, [pH](#), [turbidity](#), [dissolved oxygen](#), and [salinity](#). Scientists rely on this information to gauge the health of our coastal waters.

In the early morning hours of January 8, 2013, something mysterious happened in the water of Loosin Creek near the Masonboro Island. Thousands of fish washed up dead all along the banks of the creek. Scientists in the area were immediately contacted by concerned citizens who wanted to know why this had happened. Reserve research scientists immediately turned to SWMP data for answers.

What do you think caused the fish kill event to occur? Review dissolved oxygen and pH data for the day before (**figure 1**), the day of (**figure 2**), and the day after (**figure 3**) the fish kill event.

Figure 1: Day Before Fish Kill Event (blue line is dissolved oxygen and green line is pH)



Figure 2: Day of Fish Kill Event (blue line is dissolved oxygen and green line is pH)



Figure 3: Day After Fish Kill Event (blue line is dissolved oxygen and green line is pH)



Explanation: Fish kills unfortunately happen in North Carolina's waters for various reasons: algal blooms, pollution, hypoxia and others. Possibilities for the event could be one of the following:

- **Harmful Algal Blooms (HAB)** happen when there is a rapid increase of microscopic algae growing in the water, which can block sunlight that organisms need to survive and can deplete oxygen levels.
- **Pollution/Poison** is when a chemical or non-natural substance is released into the water and has harmful and poisonous effects.
- **Hypoxia** is a deficiency in the amount of oxygen reaching the tissue in aquatic animals.