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| Logo, company name  Description automatically generated | Pocasset Water Quality Coalition  *White Paper*  **Nitrogen is the Enemy of our Salt Water**  *May 2023* |

*This is one in a series of White Paper documents created to help educate PWQC members on the issues with and in our saltwater. The PWQC Board of Directors, using research from our friends at Barnstable Clean Water Coalition, Buzzards Bay Coalition and the Association to Preserve Cape Cod, wants to share what we have learned.*

**The underlying issue**

Most of the Cape’s coastal embayments and many freshwater ponds and lakes are suffering from water pollution, based on years of studies and reports on water quality and water pollution. These studies indicate that the Cape’s waters suffer from pollution due to the following pollutants and pollution sources:

1. **Nutrient pollution:**Excess nutrients (nitrogen in coastal waters and phosphorus in fresh water) have caused severe eutrophication and severe ecological damage.

* **Nitrogen -** Nitrogen is a naturally occurring element and serves as an essential type of nutrient that controls plant production. Some nitrogen is an essential part of any waterway. But when there’s too much nitrogen in the water, it becomes [pollution](https://www.savebuzzardsbay.org/current-issues/nitrogen-pollution/).
* **Impact on Dissolved Oxygen -** Dissolved oxygen is the amount of oxygen in the water. Just like you and me, fish, shellfish, and plants all need oxygen to survive.Dissolved oxygen is an important factor for determining a waterway’s health. When oxygen levels are low, it’s an indication that there is too much nitrogen pollution in the water.

1. **Eutrophication** refers to the harmful effects of excess nutrients on an aquatic ecosystem, resulting in increased growth of phytoplankton and depletion of oxygen. Excess nutrients in water stimulate the growth of phytoplankton (microscopic algae), which depletes the water of oxygen. Oxygen depletion kills fish and impacts our shellfish and other aquatic life. Excess phytoplankton also causes water to become cloudy, reducing the amount of light in the water column, which impacts the growth of other beneficial aquatic plants such as eelgrass**.**

When algae die, their remains settle to the bottom and **decompose, causing more oxygen depletion** and releasing nutrients back into the water, feeding the nutrient cycle. Also, the buildup of decaying organic matter on the bottom of ponds, lakes and embayments often results in **thick muck that is unhealthy** for shellfish, fish and other aquatic organisms.Many of the Cape’s estuaries and embayments are suffering from eutrophication caused by excess nitrogen. **This is where the unpleasant muck comes from on the bottom of Hen Cove!**

**What can be done to break this cycle of degradation of our waters?**

Our cesspools and Title V septic systems **do not remove enough nitrogen**. The nitrogen that moves into ground water migrates into our salt water. Cape Cod’s porous soil allows nutrients like nitrogen to move quickly into the water.

When Title V was put into place in the 1990’s **nitrogen reduction was not part of the process**. In the past decade nitrogen reduction technology has been developed. There are several ways to eliminate most of the nitrogen using I/A (innovated alternative) septic systems.

The PWQC is following these developments closely, we will keep our members updated when news breaks.

Catch up with use at [www.PocassetWaterQuality.org](http://www.PocassetWaterQuality.org) or on Facebook at Pocasset Water Quality Coalition