

NITROGEN



What is nitrogen?

Nitrogen naturally exists in both freshwater and saltwater in different chemical forms, including nitrate (NO_3^-), nitrite (NO_2^-), and ammonia (NH_3). Through the nitrogen cycle, it moves between the air, water, and living organisms, changing forms along the way. Different forms of nitrogen impact how plants and animals use it. While nitrogen is essential for supporting algae and plant growth, too much can harm water quality and disrupt ecosystems.

How do we measure it?

Nitrate and nitrite are typically monitored in non-tidal areas and can be measured in the field using test kits or portable meters. While other forms of nitrogen, like ammonia and total nitrogen (TN), are monitored in tidal areas and typically require lab testing for accuracy. Lab analysis provides more precise results, especially for total nitrogen, which includes all forms of nitrogen available in the water. Nitrogen levels are typically reported in milligrams per liter (mg/L) or micrograms per liter ($\mu\text{g/L}$).

Equipment	Cost	Monitoring Time
Colorimetric kit	\$	10–20 mins per site
Field colorimeter	\$\$	10–20 mins per site
Lab analysis	\$\$\$	5 mins per site

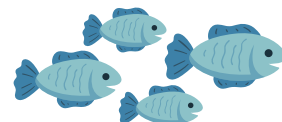


Photo by the Chesapeake Bay Program.

Why do we care?

Aquatic Life

Increased nitrogen can result in algae overgrowth and harmful algae blooms that cause fish kills and decrease habitat quality for organisms living in the Bay and its tributaries.



Pollution

High nitrogen levels in water indicate nutrient pollution. Excess levels of nitrogen often mean the ecosystem is unhealthy and the food web is unbalanced. Elevated nutrient levels are indicative of pollution flowing to the site.



Stream Health

Nitrogen is found at unnaturally high levels in fertilizers and wastewater. During storms, nitrogen-rich stormwater runs from lawns, farms, and overflowing sewers and septic systems into the Chesapeake Bay.



How is my water?

Nitrogen levels have different thresholds based on the type of nitrogen monitored and within different salinity regimes and geological features. Naturally occurring nitrogen amounts are higher in freshwater than saltwater. For example, in a Pennsylvania limestone stream, typical total nitrogen readings are around 3 mg/L for a healthy stream. In a tidal estuary, good total nitrogen levels would be less than 1 mg/L.

PLEASE NOTE:

This fact sheet provides general information about nitrogen, but water monitoring in specific locations may require more detailed methods and considerations.