# BISCAYNE BAY WATER WATCH

## Nutrients

### What are *nutrients* and why do we test for them?

You may have noticed that one of the samples that you collect for the Biscayne Bay Water Watch (BBWW) monitoring program is sent to a certified laboratory for something called nutrient testing. Nutrients, particularly macronutrients – such as nitrogen (N) and phosphorous (P), are key water quality indicators for Biscayne Bay.

Some sources of nutrients include:

- Urban runoff (from streets, lawns, etc.)
- Pet wastes and leaking septic tanks
- Fertilizer and/or manure runoff
- Natural erosion of land that is rich in phosphates and nitrates

Some nutrients are essential for aquatic plant growth—carbon, nitrogen, phosphorus, iron, calcium and silica, to name a few. However, if the level of nutrients that are present are too high, they can have significant negative impacts on a number of things such as aquatic plant growth, oxygen concentrations, and water clarity. Nitrogen and Phosphorus are of important concern because they are essential for the growth of aquatic plants and the concentration of these nutrients in water bodies has increased significantly.

*Eutrophication: An increase in the nutrient concentration of a body of water.*

One of the conditions that we are very concerned about is something called eutrophication, which occurs when there is an excessive amount of nutrients in the water body. Having too many nutrients, when combined with a number of other factors, can lead to the uncontrolled growth of phytoplankton (*aka* algal blooms). These uncontrolled blooms may prevent light from penetrating the surface of the water, resulting in the death of aquatic plant species. Also, algal blooms tend to quickly deplete the oxygen content in the water when the algae decomposes – creating conditions where there is either little oxygen (hypoxia) or no oxygen present at all (anoxia)! If there is not enough oxygen in the water column, much of the aquatic life (including fish and shellfish populations) may be harmed, leave the area or die; thereby resulting in both ecological and economic damage.


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Nitrogen and Phosphorus come in many different chemical forms. Measuring each of these forms can help identify the source from which it came. Water collected by the BBWW program gets analyzed for:

- Total Phosphorus (TP)
- Orthophosphate
- Total Nitrogen (TN)
- TKN—the total concentration of organic N and ammonia
- Ammonium ($NH_4$)
- Silica