

CHLOROPHYLL

What is chlorophyll?

Chlorophyll is the green pigment that allows plants to convert sunlight into sugar during photosynthesis. Of the several kinds of chlorophyll, *chlorophyll a* is the predominant type found in microscopic algae in fresh and saltwater ecosystems, and is therefore used as a measure of microalgae abundance.

How is chlorophyll measured?

Chlorophyll concentration ($\mu\text{g}/\text{L}$) of a water sample collected in the field is measured through lab analysis using various procedures, such as spectrophotometry, high performance liquid chromatography, and fluorometry. Different types of pigments can be quantified when *pheophytin*, a chlorophyll degradation product, is also measured.

What can chlorophyll tell us about the Bay?

Chlorophyll helps us determine if there are too many nutrients in the Bay. Algae form the base of many food webs and are a natural part of tidal ecosystems; however, excess algae leads to algal blooms. Excess algae can reduce water clarity and dissolved oxygen and can cause aesthetic problems. In some cases excess algae can harm aquatic organisms and create public health concerns. Water with high concentrations of chlorophyll is likely to have high levels of nutrients, which fuel algal growth. These nutrients come from sewage treatment plants, agricultural and urban runoff, and air pollution. Having the right level of chlorophyll generally means there are enough algae to fuel the food web. Lower algae levels promote cleaner, clearer water, more available habitat, and fewer harmful algal bloom effects. Monitoring chlorophyll over time enables us to track nutrient pollution and draw conclusions about overall ecosystem productivity and water quality in local waterways.

Top: Sampling chlorophyll *a* in the field involves pumping water through a special filter that collects chlorophyll residue, and is later processed in a lab (C. Donovan). Bottom: Chlorophyll filters of varying colors show the different amounts of chlorophyll in the water sample (L. Fabien).

