

## Solinst Eureka offers a wide range of fluorometers:

### Chlorophyll Sensors

Chlorophyll, the green pigment in phytoplankton and algae, indicates the level of photosynthesis occurring. This primary production forms the base of the aquatic food web, supporting everything from zooplankton to fish. While moderate chlorophyll levels suggest a healthy ecosystem, excessive levels can signal eutrophication, leading to unpleasant aesthetics, drinking water taste and odour issues, and potential fish kills.

Solinst Eureka offers two chlorophyll sensors: blue and red excitation. The blue version is commonly chosen because algae absorb blue light well, providing high sensitivity for fluorescence detection. However, dissolved and particulate organic matter (DOM/POM) can reduce the sensitivity of the blue sensor. The red chlorophyll sensor, designed to minimize interference from DOM/POM, allows for accurate detection of algal abundance since red light doesn't excite these materials. While it is less sensitive for detecting eukaryotic algae, its effectiveness against interference may outweigh this drawback. Additionally, red excitation fluorometry is more sensitive to prokaryotic algae (cyanobacteria), making it ideal for freshwater systems rich in DOM and blue-green algae.



### Blue-Green Algae Sensors

Blue-green algae, actually bacteria known as cyanobacteria, are photosynthetic and responsible for over 20% of the earth's photosynthesis. While cyanobacteria contribute to the oxygen cycle, they can proliferate and exhaust their nutrients, leading to decay that lowers oxygen levels and causes fish kills. Additionally, dying cyanobacteria may release toxins harmful to humans and animals.

Phycocyanin and phycoerythrin are key indicators of harmful cyanobacteria blooms; therefore, Solinst Eureka offers two blue-green algae sensors available for monitoring in marine and freshwater applications: Phycoerythrin, which is dominant in marine species such as *Synechococcus* spp., and Phycocyanin, which is abundant in freshwater taxa such as *Anabaena*, *Microcystis*, and *Spirulina*.

### CDOM/FDOM Sensors

Dissolved Organic Material (DOM) encompasses various forms, including humic acids and organic secretions. It is a significant reservoir of reactive carbon and serves as a dynamic substrate for bacteria, plants, and animals. DOM can photodegrade into volatile compounds that harm the environment and contains chromophores that absorb light, leading to the term Chromophoric Dissolved Organic Materials (CDOM).

CDOM also fluoresces (FDOM), allowing researchers to measure its abundance in water systems through fluorometry. Monitoring DOM levels is crucial for understanding changes in primary productivity, phytoplankton dynamics, algal blooms, and overall environmental conditions. Because there are different CDOM sources that may emit a range of wavelengths, Solinst Eureka chose a broad band emission filter that will detect various types of CDOM found in the natural environment.

### Optical Brightener Sensors

Optical brighteners indicate potential contamination from detergents and other human activities. Solinst Eureka's optical brightener sensor has a large dynamic range (>5000 parts per million) which allows it to operate in most aquatic environments, and its high resolution increases its accuracy. Optical brightener sensors may be used in studies to locate specific sites where on-site wastewater systems may be entering rivers or other waterways. Fluorometric determinations of brightener concentrations in natural water samples have been useful in finding wastewater sources and fecal coliform contaminations for Health Department studies, as well as in general research.

