

Application of in situ fluorescence probes for real-time cyanobacteria monitoring in Australian water treatment plants

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Abstract

Climate change and increased nutrient runoff into recreational and drinking water sources have exacerbated the frequency and severity of cyanobacteria blooms. Operators have expressed a need for a real time detection method to monitor cyanobacteria to anticipate the formation of potential events developing near water treatment plants. A potential tool to monitor cyanobacteria at the source and throughout the treatment process is an in situ fluorescence probe.

In this study, the probes were used to monitor treatment processes throughout various water treatment plants. The plants and sampling locations were chosen based on 1) climate (semi-arid, temperate to tropical) and 2) type of treatment processes used (such as pre-ozonation). During the sampling period, the probes were able to detect changes in cyanobacteria concentration at the raw water intake. Additionally, the probes were able to show the extent of cyanobacteria removal at different stages of the treatment process. For instance, a probe showed a 95% reduction of cyanobacteria from the intake to the end of the dissolved air flotation stage at one of the water treatment plants. This study showed that these probes can be applied as a real time monitoring tool for cyanobacteria removal in water treatment plants.