Accepted Manuscript

Fluorescence probes for real-time remote cyanobacteria monitoring: a review of challenges and opportunities

Edoardo Bertone, Michele A. Burford, David P. Hamilton

PII:	S0043-1354(18)30363-4
DOI:	10.1016/j.watres.2018.05.001
Reference:	WR 13764
To appear in:	*Water Research*
Received Date:	08 November 2017
Revised Date:	02 May 2018
Accepted Date:	02 May 2018

Please cite this article as: Edoardo Bertone, Michele A. Burford, David P. Hamilton, Fluorescence probes for real-time remote cyanobacteria monitoring: a review of challenges and opportunities, *Water Research* (2018), doi: 10.1016/j.watres.2018.05.001

Fluorescence probes for real-time remote cyanobacteria monitoring: a review of challenges and opportunities

Edoardo Bertone [a,b] *, Michele A. Burford[c], David P. Hamilton[c]

[a] *Griffith School of Engineering and Built Environment, Griffith University, Parklands Drive, Southport, Queensland 4222, Australia*

[b] *Cities Research Institute, Griffith University, Parklands Drive, Southport, Queensland 4222, Australia*

**Corresponding author: edoardo.bertone@griffithuni.edu.au*

[c] *Australian Rivers Institute, Griffith University, Kessels Road, Nathan, Queensland 4111, Australia*

Abstract

In recent years, there has been a widespread deployment of submersible fluorescence sensors by water utilities. They are used to measure diagnostic pigments and estimate algae and cyanobacteria abundance in near real-time. Despite being useful and promising tools, operators and decision-makers often rely on the data provided by these probes without a full understanding of their limitations. As a result, this may lead to wrong and misleading estimations which, in turn, means that researchers and technicians distrust these sensors. In this review paper, we list and discuss the main limitations of such probes, as well as identifying the effect of environmental factors on pigment production, and in turn, the conversion to cyanobacteria abundance estimation. We argue that a comprehensive calibration approach to obtain reliable readings goes well beyond manufacturers' recommendations, and should involve several context-specific