In the media…

**Australia**

UNSW News. Green alert: protecting Melbourne from harmful algae. 24th April 2019

The Conversation. Explainer: what causes algal blooms, and how can we stop them. 10th Jan 2019

CSIRO ECOS. Not the usual suspect: Understanding the cyanobacteria responsible for January fish kill. 28th April 2019

**International**

New York Times. Algae that can kill dogs is discovered in 3 N.Y.C. Parks. 25th August 2019

FOX13 Florida’s toxic algae crisis: Conditions ripe for years of blue-green algae blooms. 21st May 2019

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The Nuisance and Harmful Algae Science Practice Partnership

The Nuisance and Harmful Algae Science Practice Partnership is a multi-party initiative between the UNSW Global Water Institute, the University of Newcastle, the Walter and Eliza Hall Institute of Medical Research, Victoria State Government and Melbourne Water.

It seeks to more effectively manage nuisance and harmful algal blooms by introducing smart surveillance and evidence-based, cost-effective policy and asset design.

The presence of potentially harmful cyanobacteria and nuisance algae in natural and constructed water bodies, and within treatment plants, is an increasing problem faced by managers at Melbourne Water across its extensive catchment as well as regional suppliers in Victoria and across Australia.

Nuisance and harmful algal blooms impact multiple waterways, water bodies and bays around Melbourne and beyond each year, and appear to be growing more frequent due to climate change. These blooms affect the operation and design of many diverse water industry assets, and require the allocation of significant time and resources for effective communication with stakeholders and the public.
In this regular feature we give the low down on the top algal articles of the quarter.

01 Estimating the economic costs of algal blooms in the Canadian Lake Erie Basin
Harmful Algae, 87, 101624

02 First report of anatoxin-a producing cyanobacteria in Australia illustrates need to regularly update monitoring strategies in a shifting global distribution
Scientific Reports, 9, 10894

03 Optimization method for Microcystis bloom mitigation by hydrogen peroxide and its stimulative effects on growth of chlorophytes
Chemosphere, 228, 503-512

04 Control wildfire-induced Microcystis aeruginosa blooms by copper sulfate: Trade-offs between reducing algal organic matter and promoting disinfection byproduct formation
Water Research, 158, 227-236

05 The impact of cell morphology and algal organic matter on algal floc properties
Water Research, 163, 114887

06 CyanoFactory, a European consortium to develop technologies needed to advance cyanobacteria as chassis for production of chemicals and fuels
Algal research, 41, 101510

07 In-situ fluorescence monitoring of cyanobacteria: Laboratory-based quantification of species-specific measurement accuracy
Harmful Algae, 87, 101625

08 Seasonally varying effects of environmental factors on phytoplankton abundance in the regulated rivers
Scientific Reports, 9, 9266

09 An evaluation of measurement techniques for algal-derived organic nitrogen
Water research, 165, 114998

10 Characterization and causes analysis for algae blooms in large river system
Sustainable Cities and Societies, 51,

Florence completed her research career as a UNSW Chemical Engineering undergraduate via an industrial training program in Rita Henderson’s Algae & Organic Matter Laboratory (AOM Lab). Enjoying this experience, she decided to complete her Honours and then PhD on the topic of “Application of fluorescence probes for optimising coagulant and powdered activated carbon dosing”, associated with ARC Linkage Project LP130100033: On-line monitoring of cyanobacteria to predict coagulant doses and powdered activated carbon application in water. For her PhD research she was awarded the Water Research Australia’s Nancy Millis Scholarship. She published four papers during her PhD and attended many international conferences. Post PhD, Florence worked as a post-doc in the NHASP to further develop flow cytometry methods for algae and cyanobacteria characterisation and has now accepted a position at SA Water. Many congratulations to you Florence and all the best for your flourishing water career.

This Quarter’s #1 Algae Article


Estimating the cost of cyanobacteria blooms to industry and the tax payer is an important step in developing the business case for on-going research and development to improve: our understanding of the drivers for nuisance and harmful bloom development; methods for early detection of cells and metabolites; and mitigation and treatment methods. This article suggests that harmful algal blooms could incur costs of $272 million USD if not addressed, with the biggest hit to the tourism industry and recreational users.

“Algal blooms will impose equivalent annual costs equal to $272 million in 2015 prices over a 30-year period if left unchecked”

This study precedes a Water Research Australia study co-funded by the NHASP that will investigate the cost of algal blooms to the Australian water industry.
The Nuisance and Harmful Algae Science-Practice Partnership (NHASP) is pleased to announce the awarding of $450,000 by the Australian Research Council to researchers Prof Brett Neilan (University of Newcastle), A/Prof Aaron Jex (University of Melbourne), Prof Anas Ghadouanie (University of Western Australia) and Nicholas Crosbie (Melbourne Water) for the continued research into the mitigation of cyanobacterial bloom development in wastewater treatment ponds. To understand the causes of cyanobacterial blooms in pond-based wastewater treatment plants and the risk they pose, the $891,000 grant (including partner funding and university scholarships) will enable researchers to use the latest molecular techniques to examine how the microbial communities within these systems interact with each other and their surrounding environment to form blooms and produce toxins and other harmful metabolites.

“Melbourne Water is an incredible partner to work with; presenting real-world problems to engage with the university sector. Our research is directly feeding into the needs and concerns of Australians while also allowing for the growth and development of students that will eventually work in the water industry.”

– Prof Brett Neilan

The pressures imposed by climate change and increasing urban populations may be alleviated by increasing the volumes of treated wastewater supplied for agricultural and industrial use. Cyanobacterial blooms currently reduce wastewater treatment efficiency, limiting effluent quality and the utility of recycled water. This linkage grant will allow researchers to work directly with Melbourne Water to aid in managing this threat and strive towards safeguarding Australia’s water security.

Neilan, Jex and Crosbie began the strategic assessment of the cyanobacterial biodiversity in Melbourne Water’s Western Treatment Plant in 2017 and have presented preliminary findings at two international conferences, the International Conference on Harmful Algae in 2018 and the International Conference on Toxic Cyanobacteria in 2019. The project now includes two PhD students and post-doctoral researchers committed to developing strategies for the mitigation of future bloom events, improving the security of valuable recycled water resources.
Introducing the NHASP Team

Florence Choo  Nick Crosbie  Will Glamore  Trish Grant  Rita Henderson

Aaron Jex  Nijoy John  Fiona Johnson  Brett Neilan

Mellisa Steele  Richard Stuetz  Bojan Tamburic  Arash Zamyadi

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Please email your nomination for “Top 10 Algae Article” for the quarter to algae@unsw.edu.au