

Abstract Submission Form

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Title

Seasonal characterisation of *Microcystis* bloom dynamics in the Hunter region through Metaproteomics

Short, Detailed Description

The metaproteome profile of a *Microcystis* bloom-prone wetland in the NSW Hunter region was examined. Samples collected from 2020-2021 were interrogated to track functional responses in the sediment and pelagic communities across 4 seasons. A 'three-step' metaproteomic approach combined with a site-specific 16S rDNA amplicon dataset were utilised to demonstrate seasonal taxonomic distribution, and also to construct a protein database yielding high-confidence peptide-spectrum matches (PSM). Protein assignments were grouped according to GO terms and were used to highlight variability in *Microcystis* community metabolic processing, showing an increase in nutrient uptake mechanisms during periods of bloom intensity within the pelagic zone. The regulation of nutrient acquisition and cellular compartment proteins in the benthos were also examined and used to help explain potential processes of toxic *Microcystis* benthic seeding and proliferation during periods of cyanobacterial dominance and senescence. Through functional characterisation of toxic *Microcystis* species in an environmental setting, methods are suggested for bloom control.