Using Phoslock® to control cyanobacteria in a shallow eutrophic Scottish reservoir- ecological responses across multiple trophic levels

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The ecology of many shallow lakes has been detrimentally affected by elevated phosphorus (P) and nitrogen enrichment as a result of human activity. This process is known as cultural eutrophication and often leads to a loss of biodiversity, increased operational costs for water companies and expensive lake remediation work. As such, eutrophication management is one of the biggest challenges facing aquatic ecologists; a fact that is recognised within European environmental policy (e.g. WFD and Habitats Directive).

When nutrient inputs are reduced at source, chemical and ecological recovery can be delayed for decades as a result of internal P loading. This problem is most pronounced in water bodies with a low flushing rate and may exist indefinitely in water bodies with no natural outflow. It is, therefore, essential that methods for the control of internal loading are examined and trialled at the whole lake scale.

We report on the use of a lanthanum-modified bentonite clay (Phoslock®) to control problem cyanobacteria blooms by disrupting internal P release in a shallow hydrologically isolated reservoir (Clatto Reservoir, Dundee). This talk will use Clatto Reservoir as a case study to (1) describe the current Phoslock® dose estimate and application methodologies, (2) discuss the physicochemical responses in the water column following an application of Phoslock® and (3) assess the ecological (macrophytes, benthic algae, benthic macroinvertebrates and phytoplankton) responses during a 1 year period of post-application monitoring.