THERMALLY DESTRATIFYING LAKES AGAINST BLUE ALGAE WITH RISING AIR BUBBLES

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Abstract

Mixing systems are used in deep lakes to prevent blue algae from rapidly growing. Air bubbles rise from the bed, dragging water from below upwards. The resulting vertical circulation suppresses blue algae growth. However, these systems demand electricity of about €25,000 per km² per year. The airlift promises to mix the water more efficiently, using a vertical tube wherein the bubbles rise.

Small-scale laboratory experiments presented in this thesis show that the airlift is slightly slower in completely removing stratification than a single bubble plume with the same air flow. 3D schematisations hereof using Delft3D are indifferent. A case study using 3D schematisations of Lake Haarlemmermeerse Bos also shows that the airlift is not more efficient. Hence generally the airlift is not better for lake destratification than a bubble plume system.

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