



# Sustainable algae control in a recreational lake

## Blue-green algae blooms

De Zoetermeerse Plas (Noord Aa) is a recreational area in Zoetermeer, The Netherlands. In addition to being utilized for recreation, the lake retains water from nearby reclaimed land. As a result, the lake would see blue-green algal blooms in the summer, resulting in the lake's closure to swimming during the busy season.

## Bloom prevention

In efforts to reduce blue-green algae blooms, the Zoetermeer Municipality, in partnership with the Rijnland Waterboard, deployed five MPC-Buoy units in Spring 2016 to monitor, predict and prevent excessive algae growth.

Key water quality and algae metrics are monitored by the units, enabling a water body's unique circumstances to be used to emit ultrasound at precise frequencies.



## How ultrasound works

Algae require sunlight and nutrients for growth and are characterized by a diurnal behavioural pattern in which they rise to the water's surface during the day and sink to the bottom at night.

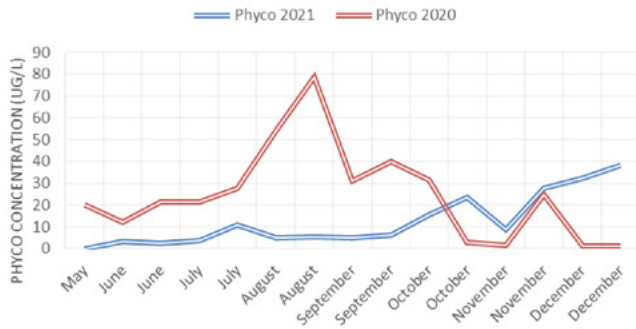
Buoyancy vesicles found within the algae cells control this ability to ascend and descend in a water column. The buoys emit ultrasound which interferes with these vesicles, creating a sound barrier on the surface of the water through which the algae struggle to access sunlight, limiting its growth.

Ultrasound refers to sound waves with frequencies higher than the upper audible limit of human hearing (20 kHz). At specific frequencies, these sound waves can be used to control algae growth.

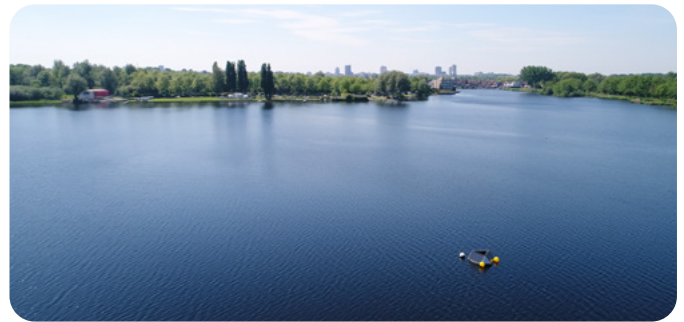
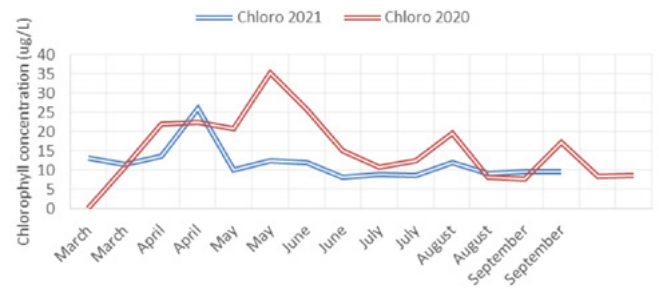
## Steep reductions in algae concentrations

The initial 2-year pilot project at the Noord Aa concluded in 2018. Treatment activities were resumed in 2020 following an evaluation of the LG Sonic MPC-efficacy Buoys by the Zoetermeer Municipality. The buoys kept an eye on the lake's water quality and algal growth. Algal concentrations were dramatically reduced in 2021, according to data from the water quality monitoring program MPC-Buoy. Summertime phycocyanin (a pigment found in blue-green algae) concentrations were 90% lower than in 2020.

### MEAN PHYCO PER MONTH



### CHLORO CONCENTRATIONS 2021 AND 2020



## Zooplankton research

The Rijnland Waterboard hired the research organization Ecofide to do fieldwork in the Noord Aa in 2021 to look at the impact of ultrasonography on zooplankton. Researchers found no evidence of the potentially harmful effects of the ultrasonic

soundwaves emitted on the zooplankton due to the study. This conclusion is consistent with the outcomes of a related field study conducted in 2017 at the Noord Aa.