

METHODOLOGY: CONTROLLED LABORATORY STUDY USING AQUARIA

In a controlled laboratory study, researchers from PWN's daughter company PWNT investigated the effect of reduced light input on water quality after storage of surface water in open reservoirs. The study was performed at a full-scale drinking water facility treating water from the shallow Lake IJssel, stored in an open reservoir with a depth of 20m and with vertical air mixing. Two large glass aquaria were fed with lake water with a residence time in the aquaria similar to the average residence time in the full-scale reservoir. One aquarium was illuminated with a day/night cycle by a lamp with a light spectrum and intensity close to day light to simulate normal light conditions (Figure 1). The other aquarium was made of black glass and kept in the dark for the entire study, to simulate conditions under the floating solar panels.

Water quality was monitored for one year from the raw water, from the effluent of both the full-scale reservoir and the two aquaria. The algal concentration was monitored through total chlorophyll and a grouping into four different algal groups (green algae, diatoms and dinoflagellates, cyanobacteria and cryptophyta) was made once per hour with an online sensor. Water quality was controlled biweekly based on organic matter concentration and composition, as well as phosphate, nitrate, ammonium, bicarbonate and silicate concentrations.

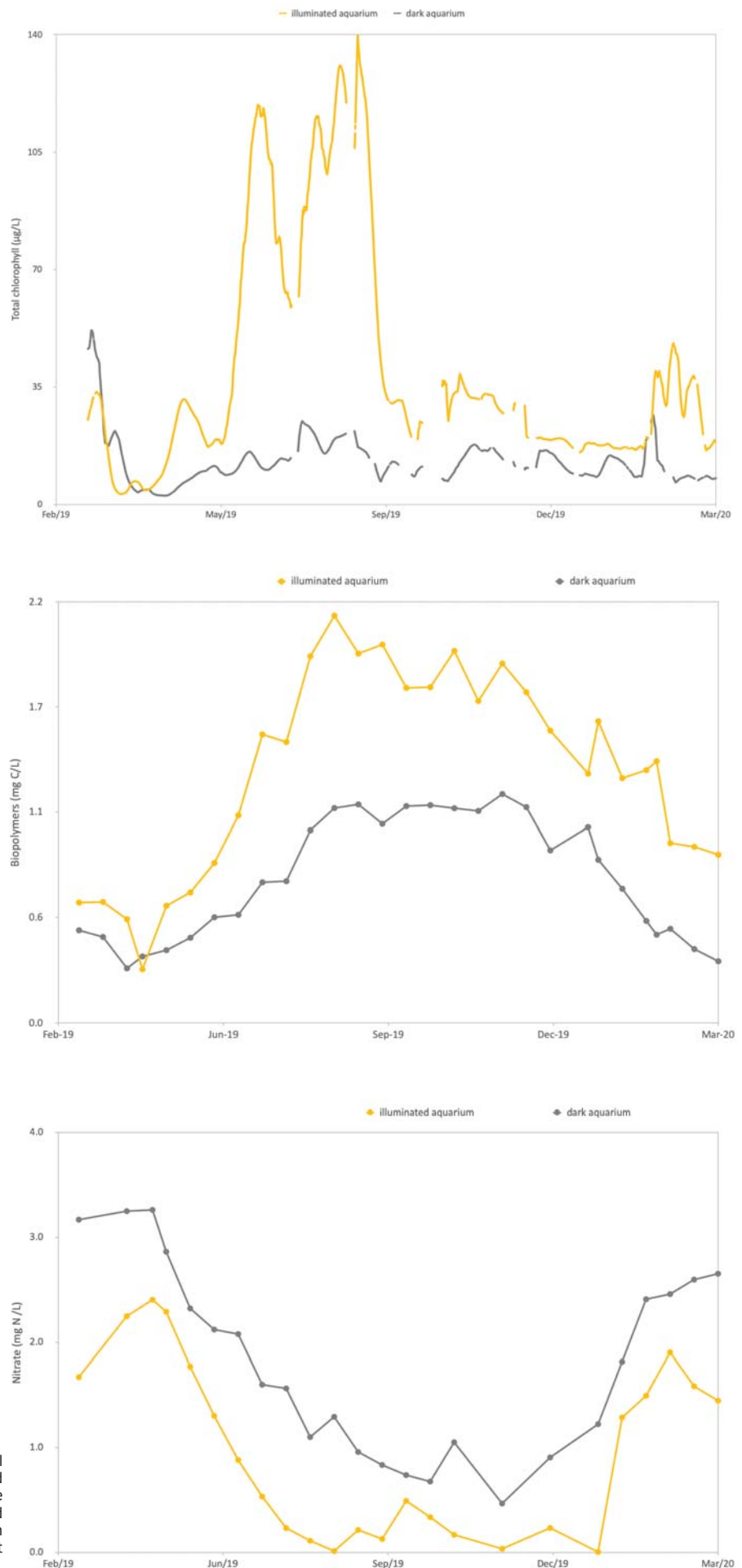


Figure 2 Comparison of total chlorophyll, biopolymers, and nitrate concentrations in the effluents of the illuminated aquarium and the dark aquarium over the duration of the experiment