Oxygen, an algae growth inhibitor in the historical Schelde?

Geerts Lindsay[1], Koen Ooms[2], Tom Maris[1+] and Patrick Meire[1]

[1] Ecosystem Management Research Group, University of Antwerp (UA), Universiteitsplein 1-C, B-2610 Wilrijk, Belgium
E-mail: lindsay.geerts@ua.ac.be; tom.maris@ua.ac.be; patrick.meire@ua.ac.be

[2] Agro- & Biotechnology, Katholieke Hogeschool Kempen (KHK), Kleinhoefstraat 4, B-2440 Geel, Belgium
E-mail : s5052951@stu.khk.be

Recent years have shown a remarkable increase of primary production in the tidal freshwater part of the Schelde Estuary (Cox *et al*., 2009). Light climate has been considered as major limiting factor in many estuaries (Desmit *et al*., 2005; Gameiro *et al*., 2011). However, light climate in the Schelde has not changed significantly since 1970 up till now (Omes reports). Nutrients and allochthoneous organic matter input on the other hand have clearly decreased with increasing water treatment efforts (Van Damme *et al*., 2005; Soetaert *et al*., 2006). A lowered phytoplankton production was actually expected from these efforts, however the opposite has shown to be true (Cox *et al*., 2009). Thereby, also a shift to morphologically larger diatoms is observed (personal comment Els Van Durm 2011, UGent). A mathematical model has shown the existence of two alterative stable states in the tidal freshwater of the Schelde of low and high phytoplankton biomass, with high and low ammonia concentrations respectively. Historical phytoplankton production could have been inhibited by low oxygen concentration and/or toxic substances in such a hypoxic/anoxic environment (e.g. ammonia, water sulphide) (Cox *et al*., 2009). Up till now the effect of multiple stressors on phytoplankton production is still not fully understood (Cloern, 2001).

To understand the effect of hypoxic/anoxic environments, an algae inhibition test is performed, whereby oxygen concentrations in the growth medium are reduced by continuous flowthrough of nitrogen. In a first step, green algae (*Pseudokirchnierella subcapitata*) are used, wherefore growth conditions are well known from previous experiments. Preliminary results already show a decline in algal growth. However, the experiment is still in its start phase. This poster wants to show further results on the process of this experiment. In a next step, diatoms will be used and tests for multiple stressors will be performed (hypoxy/anoxy combined with changes in light climate). A better understanding of multiple stressors, will eventually lead to a better understanding of also future evolution of the Schelde Estuary towards a possibly new trophic equilibrium.

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