Kristian Spilling <u>kristian.spilling@syke.fi</u>

Eero Asmala, Noora Haavisto, Lumi Haraguchi, Kaisa Kraft, Anne-Mari Lehto, Aleksandra Lewandowska, Joanna Norkko, Jonna Piiparinen, Jukka Seppälä, Mari Vanharanta, Anu Vehmaa, Pasi Ylöstalo, Timo Tamminen SYK E



Brownification affects phytoplankton community composition but not primary productivity in eutrophic coastal waters: a mesocosm experiment in the Baltic Sea

Climate change is projected to cause brownification of some coastal seas due to increased runoff of terrestrially derived organic matter. We carried out a mesocosm experiment (15 d) to test the effect of this on the planktonic ecosystem. The experiment was set up in 2.2 m³ bags using four treatments, each with three replicates: control (Contr) without any manipulation and organic carbon additive HuminFeed (Hum; 2 mg L⁻¹), inorganic nutrients (Nutr; 5.7 µM NH4 and 0.65µM PO4), and combined Nutr and Hum (Nutr+Hum) additions.



Modest brownification did not affect primary production, and we hypothesize that brownification has a non-linear effect on primary productivity **Bacterial production was** elevated by brownification

Fig 1. Left: the absorption of colored dissolved organic matter (aCDOM) measured at 375 nm from filtered samples. Right: the Chlorophyll a concentration over time. The error bars represent standard error (n = 3).



Fig 2. The cumulative photosynthetic max (Pm) and bacterial production (BP) over time

Brownification shifted the phytoplankton community composition towards smaller species with potential effects on carbon fluxes, such as sinking rates and export to the sea floor





12

Time (d)

14



Inorg. nutrients

Treatments

Inorg. nutrients + brownification

Effects





