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Interactive comment on "Photochemical mineralisation in a humic boreal lake: temporal variability and contribution to carbon dioxide production" *by* M. M. Groeneveld et al.

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Dear Dr. Cory,

thank you for your comment on our discussion paper 'Photochemical mineralisation in a humic boreal lake: temporal variability and contribution to carbon dioxide production'.

We fully agree with your comment, and revised the wording in the manuscript to correctly refer to your publication "Sunlight controls water column processing of carbon in arctic fresh waters" (Science 345, 925-928, 2014).

Specifically, we revised previous P17126/L7-9 to:

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“However, the temporal variability of AQY spectra within inland waters remains poorly constrained. ”

Previous P17127/L22-25 was revised to:

“The AQY is a sensitive model parameter but until now spectra have only been published from a small number of lakes (Vähätalo et al., 2000; Vähätalo & Wetzel, 2004; Koehler et al., 2014; Cory et al., 2014), and temporal variability of AQY spectra within individual systems is even less studied (Cory et al., 2014). Given the limited knowledge on spatial and temporal variability of AQY spectra the first large-scale modelling study of photochemical CDOM mineralisation in inland waters assumed that AQY spectra determined for single systems and on single occasions represented photochemical reactivity on larger spatial and temporal scales (Koehler et al., 2014).”

Previous P17138/L26-27 to P17139/L1-8 was revised to:

“So far, AQY spectra for photochemical DIC production have only been reported for a small number of Arctic, boreal and temperate lakes (Vähätalo et al., 2000; Vähätalo and Wetzel, 2004; Koehler et al., 2014; Cory et al., 2014). Information about temporal variability in AQY spectra across seasons within single lakes is even more rare, with only one study so far where lake AQY spectra were repeatedly determined over three summer seasons (Cory et al., 2014).”

Previous P17139/L18-21 was revised to:

“Hence, depending on scale and scope of the study as well as feasibility, it may be recommendable to conduct repeated measurements of AQY spectra throughout the season for more accurate simulation of annual photochemical DIC production in lakes, as recently conducted in a study in the Arctic (Cory et al., 2014). ”

Yours sincerely,

M. Groeneveld and co-authors

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Interactive comment on Biogeosciences Discuss., 12, 17125, 2015.