

## Supplementary material

### **Evaluation of centrifugal ultrafilters for size fractionation of total mercury and methylmercury in freshwaters**

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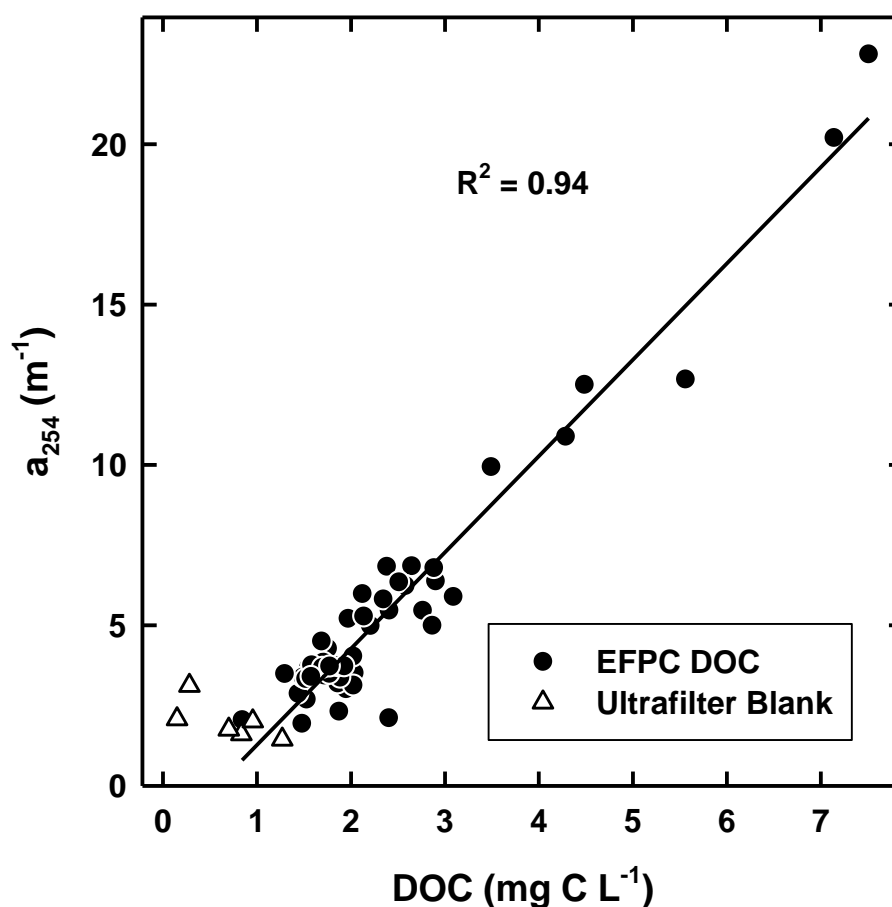
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#### **Relationship between DOM and UV absorbance**

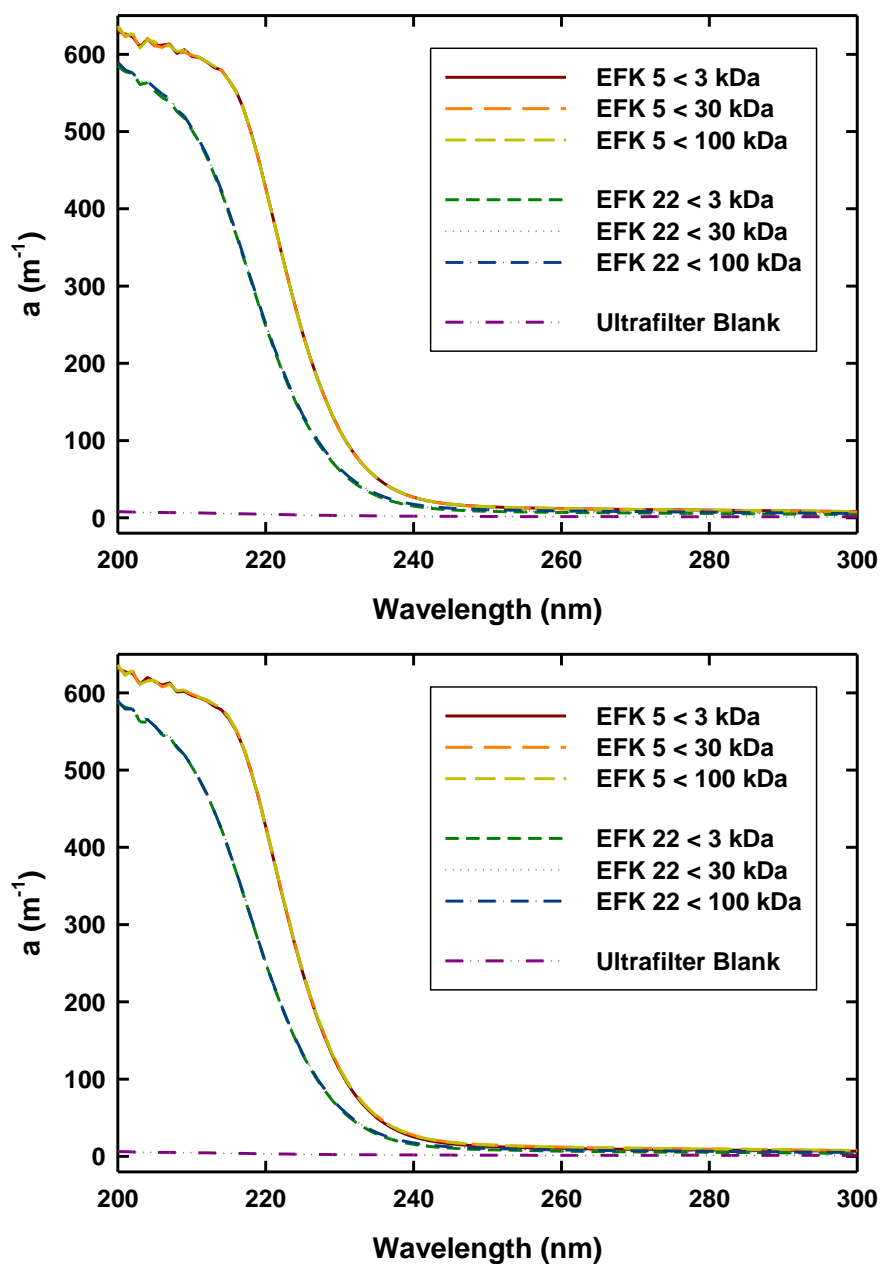
In this paper, ultraviolet-visible (UV-Vis) light absorbance was used to characterise DOM quantity and quality. Due to dissolved organic carbon (DOC) contamination of ultrafilters of all three molecular weight cut-offs (MWCO), the absorption coefficient at a wavelength of 254 nm ( $a_{254}$ ,  $\text{m}^{-1}$ ) was used as a surrogate for DOM concentration.<sup>[1]</sup> In Fig. S1, relationship between DOC and  $a_{254}$  is shown for water samples collected from multiple locations in the EFPC system (including tributaries) between October 2010 and 2011. All data presented in Fig. S1 correspond to 0.2- $\mu\text{m}$  filter passing fraction. Positive correlation between the two parameters is observed in the 0.84–7.51-mg C  $\text{L}^{-1}$  range. Ultrafiltration blanks (Milli-Q passed through the ultrafilters) showed variable but consistently low DOC concentration.  $a_{254}$  values (Fig. S1) indicate that whatever is contributing to the high DOC blanks is not UV absorbent.



**Fig. S1.** Relationship between dissolved organic carbon (DOC) and absorption coefficient at a wavelength of 254 nm ( $a_{254}$ ) for EFPC samples and ultrafiltration blanks. Regression line and  $R^2$  value determined using only values from EFPC samples.

#### Nature of DOM in ultrafiltrates from EFPC

When UV absorbance was measured in ultrafiltrates of EFPC samples (EFK 5 and EFK 22 site), differences in UV absolute absorbance between the two creek water samples are very clear (Fig. S2). This is a result of different DOC content that increases downstream in EFPC. However, no such differences can be seen for ultrafiltrates of different MWCOs within an individual sample suggesting that a majority of organic matter in these samples is associated with low molecular weights. Greater than 50 % of the DOC in freshwater systems can be present in the <3-kDa fraction (Guo and Santschi<sup>[2]</sup> and refs therein). Moreover, differences in  $a_{254}$  between the first and second ultrafiltration were in 0–12 % range. These results suggest that organic matter composition in these samples was not affected during ultrafiltration. UV absorption spectra of ultrafiltered Milli-Q water blank were negligible for all MWCOs, relative to absorption spectra of the samples (Fig. S2).



**Fig. S2.** Absorption spectra obtained for ultrafiltrates of creek water from two sites in EFPC (EFK 5 and EFK 22) and ultrafiltration blanks (UF blk) using first (above) and second (below) set of ultrafilters.

## References

- [1] K. J. Howe, M. M. Clark, *Coagulation pretreatment for membrane filtration* **2002** (AWWA Research Foundation and American Water Works Association: Denver, CO).
- [2] L. Guo, P. H. Santschi, in *Environmental Colloids and Particles: Behaviour, Separation and Characterisation* (Eds K.J. Wilkinson, J.R. Lead) **2007**, pp. 159–221 (Wiley: England).