Supplementary material

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

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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 ($a_{254}$, m$^{-1}$) was used as a surrogate for DOM concentration.$^{[1]}$ 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-µm filter passing fraction. Positive correlation between the two parameters is observed in the 0.84–7.51-mg C 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 [2] 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
