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Biogeosciences Discussions

Interactive comment on "Globally significant yields of dissolved organic carbon from small watersheds of the Pacific coastal temperate rainforest" *by* Allison A. Oliver et al.

Anonymous Referee #2

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Review: Globally significant yields of dissolved organic carbon from small watersheds of the Pacific coastal temperate rainforest. Oliver et al.

General comments: This manuscript describes fluxes in DOC along with measurements of DOM composition (UV absorbance and fluorescence and carbon isotopes) in several catchments in the Pacific coastal temperate rainforests of North America. Overall, the data presented are interesting and important in improving our DOC flux estimates to coastal environments. A large amount of interesting data are presented however, they are not fully exploited to unpick specific research questions further than underlining the important role the catchments studied play in DOC export. I would have liked to see further analysis of the DOM compositional proxies as at present the

manuscript doesn't benefit significantly from the addition of the compositional measurements.

Specific comments:

140-142. For those not familiar with mapping software a definition of GIS would be useful. Also were catchments delineated using watershed analysis?

156-158. While less frequent sampling due to logistical constraints is understandable, have you considered how this may impact you load estimations given that large quantities of DOC that are mobilised during periods of intense rainfall? As estimates of load can be skewed significantly if large events are under represented.

218. What wavelength range did you scan over and at what interval?

219. Were high absorbing samples diluted if they breached an absorbance threshold?

228. What settings were used for your fluorescence scans (ex/em wavelengths etc.)?

240. Define PARAFAC

301. Table listed in brackets should be Table 1 not Table 2

327. The range of SUVA254 values reported in the literature is large. Elevated SUVA254 values are commonly found in both tropical rivers (Mann, P. J., et al. (2014), The biogeochemistry of carbon across a gradient of streams and rivers within the Congo Basin, J. Geophys. Res. Biogeosci., 119, 687–702, doi:10.1002/2013JG002442.) and also have been found upland peat catchment of the UK (Austnes, Kari; Evans, Chrisptoher D.; Eliot-Laize, Caroline; Naden, Pamela S.; Old, Gareth H.. 2010. Effects of storm events on mobilisation and in-stream processing of dissolved organic matter (DOM) in a Welsh peatland catchment. Biogeochemistry, 99 (1-3). 157-173. 10.1007/s10533-009-9399-4). However, lower values (<3) are also observed in groundwater dominated catchments (Yates, C, Johnes, P & Spencer, R, 2016, 'Assessing the drivers of dissolved organic matter export from two contrasting

lowland catchments, U.K'. Science of the Total Environment, vol 569-570., pp. 1330-1340).

333-347. Discussion is creeping in to the results section. Consider deleting or moving some text.

372. Could this variability be quantified in some way?

420-430. I agree with reviewer 1 one on this point. The data could be better exploited to evaluate temporal shifts in DOC/DOM composition as all the data were collected for this purpose. For example it would have been interesting if changes in DOM composition could be in some way evaluated in relation to these change in flow conditions (using either the optical measurements of 13C values). This would have given the paper more of a focus, as reviewer 1 states to investigate 'DOC flushing'.

432. Was any work done on investigating the implications of elevated DOC yields on marine foodwebs? If not then remove

490-492. What do you mean by DOC-source pools? Are you referring to the flushing of different soil horizons or the mobilising of material from a different source i.e. a source that under normal flow conditions would not be hydrologically connected to the main channel of the river? Also you have not calculated retention time for your catchments? Smaller catchments will always respond quicker than larger ones as they are simpler systems.

353. Work has already been carried out investigating long term trends in DOC flux from a wide range of catchments in relation to changes in global temperatures. See Worrall (2003). Long term records in riverine DOM. Biogeochemistry 64(2), 165-178. Or Freeman (2001) Export of organic carbon from peat soils. Nature. 412(6849) 785-785.

Figure 2. Caption is too long and bordering on discussion. Consider making more concise.

Figure 3. Are the box-whisker plots showing 1.5*IQR?

Figure 7. This also applies to the discussion but did you study catchments dominated by organic vs mineral soils or is this referring to the soil horizons? If so then consider re naming for clarity.

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