Interactive comment on “Organic matter dynamics and stable isotopes for tracing sources of suspended sediment” by Y. Schindler Wildhaber et al.

Anonymous Referee #1

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<General comments> The reported study investigated spatio-temporal variations in the concentrations and stable isotope ratios of C and N in both suspended and infiltrated sediment and traced potential sources of sediment using sediment stable isotope and C/N ratios in the River Enziwigger watershed in Switzerland during a brown trout spawning season. Although similar approaches have been used in many other watersheds, the results on isotope tracers are unique because they were linked to hydrologic conditions to examine effects of rainfall and snowmelt on organic mater export from various sources. In addition, the mixing model tool (IsoSource) was very successfully used and the approach of showing potential source distribution rather than single values could attract a lot of attention among ‘isotope trackers’. I would therefore recommend this manuscript for publication in Biogeosciences. Below I provide some suggestions for the authors to improve the manuscript with delivering its key messages and editorial details.

<Specific comments> 1. Implications of major findings Both the abstract and conclusions sections end without explicitly mentioning implications of the major findings. For example, you mentioned that increasing winter temperatures and precipitation lead to a higher contribution of SS from arable land. Does this mean that any future warming trends in the study region could increase soil erosion and C export? Highlight implications of your findings. 2. Title needs to be more specific in terms of emphasizing major study findings and providing information about the study approach and site. Think about other options. At least, the current version should read “Dynamics of organic matter in sediment and source tracing……in XXXX” 3. Terminology The consistency of using terms and abbreviations should be checked through the manuscript. - C/N atomic ratios, C/N ratios, C/Na - “Factions” in fractions of organic matter are confusing. I would recommend “concentrations” when they are used for quantification purpose. - Organic matter or carbon in sediment is usually termed as POM or POC. 4. Statistical analysis From what you described in the methods and results (Tables 1, 3; P460 L13-14, 20-21), it is unclear how you compared differences among three sites. In my view, ANOVA and multi comparison tests would be the most efficient way in showing differences in the cases of two tables. Clarify how you did in the text and indicate any significance in the tables. 5. Structure of Results & Discussion Sections 3.1 – 3.4 could be more efficiently structured. For example, the four sections could be combined so that you could avoid repeated descriptions and the readers easily compare the patterns appeared for different monitoring parameters. 6. Differential mechanisms for DOC and POC export P462 L118: You need to distinguish DOC leaching by the well known ‘hydrologic flushing’ from POC export by surface soil erosion. Refer to the following papers and describe differences in hydrologic mechanisms driving DOC vs POC export. - Hornberger GM, Bencala KE, McKnight DM. 1994. Hydrological controls on dissolved organic carbon during snowmelt in the Snake River near Montezuma,


Otherwise, use easy words like “discharging” or “draining” 33. P469 L8-9. You could provide your opinion on the ultimate source of this riverbed sediment. Considering different isotope ratios, this bed sediment appear quite different from forest soils. 34. Fig. 2 captions: “mean values of all samples” from all three sites?

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/9/C47/2012/bgd-9-C47-2012-supplement.pdf

Interactive comment on Biogeosciences Discuss., 9, 453, 2012.