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## ***Interactive comment on “Seasonal contribution of terrestrial organic matter and biological oxygen demand to the Baltic Sea from three contrasting river catchments” by H. E. Reader et al.***

### **Anonymous Referee #2**

Received and published: 17 March 2014

Review of Reader et al. for Biogeosciences

Subject: Characterization of dissolved organic matter inputs from three rivers in the Baltic Sea and its possible consequences.

General comments: The present work of Reader et al. shows several interesting ideas, both the conceptual topic (biogeochemistry and future climate scenarios), how in the methodological issue (use of index BOD), which make it a suitable work for this journal.

The work focuses on the characterization of inputs from dissolved organic matter (DOM) in three basins of three rivers flowing into the Baltic Sea. The Introduction of the paper clearly shows the problems that previous studies have shown, on increasing

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inputs from DOM and specifically coloured or chromophoric organic matter (CDOM), these increases have important effects throughout the marine ecosystem and especially in ecosystems seas inland as the Baltic Sea, where the processes of autotrophy and heterotrophy share a delicate balance.

In the last part of the work, an interesting reflection on the influence of DOM and CDOM contributions in future scenarios of climate change in the Baltic Sea and Scandinavia is included.

One of the interesting points of work by Reader et al., is the use of a simple and widely used methods. The characterization of the DOM are performed based on spectrophotometric measurements and particularly the use of BOD index or “biological oxygen demand”, as an indicator of the degree of reactivity of the organic matter (labile or reactive) and thus its possible use by the biological community (microbial). The BOD is widely used by government services how indicator of water quality (surface and groundwater). However, its use is not widespread in biogeochemical or oceanographic studies.

One of the aspects that complicate the job, in my opinion, is the disparity of characteristics of the three selected rivers, area, climate, vegetation, hydrology, ... make that almost every one of the rivers as a special case.

Specific comments:

1. Introduction: good. Many citations see References.
  2. Methods 2.1. Sampling and measurements Fig 1. Put the name of the rivers on the map
- Table 1. To complete characteristics watershed, would be interesting to put flow means and range for the study period would suffice.

I think it would be easier to divide the dialects studied methods for each parameter: DOC, CDOM, BOD, ...

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P1360 L13-19, would have to go along with the other information on the watersheds  
P1359 L14-24

3. Results The description of the results could be more specific. No discharge data are given and extrapolate from figures is difficult. The same results for DOC and CDOM (3.2) and DOM quality (3.3). Only in 3.4 DOM loadings, a comprehensive description of the results is made.

A graph that relating the discharge to DOC, discharge to CDOM and-BOD discharge for each river, give much information about the behaviour of these parameters with respect to the flow.

In Figures 2 and 3, the red dots are difficult to place in time, possibly to connect the dots with lines help to better visualize the temporal variations.

#### 4. Discussion

P1364-L5. Change the past by previous works. P1365-L11, L15,.... In this section behind the names of the rivers "älv" is set, previously not done. Uniform. P1365-L16. "annual" or "mean annual"? P1366-L10. "flow on" or "flow of"? P1367The process of autotrophy vs heterotrophy, is one of the important discussions of work. Changing autotrophic to heterotrophic communities is due to changes in the community or the appearance of opportunistic heterotrophic communities, may need more?

Section 4.3, I think is very interesting, but a little disconnected from the rest of the work. For example, to connect this section of climate change with the earlier discussion on autotrophy and heterotrophy. In the objectives of work, hypoxia is mentioned, which then does not appear in all the work. I think this would be a good opportunity to take up the subject.

References. Perdue, 1998 not in references

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**BGD**

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