

***Interactive comment on* “Trace elements in mussel shells from the Brazos River, Texas: environmental and biological control” by Alexander A. VanPlantinga and Ethan L. Grossman**

Anonymous Referee #1

Received and published: 16 October 2019

Review of the manuscript “Trace elements in mussel shells from the Brazos River, Texas...”

The paper addresses environmentally important question potentially suitable for Biogeosciences.

The title is not correct: this work is about Mn essentially, rather than trace elements
Many references are incomplete

L10: does it simply mean that Sr correlated with Mn in shells?

Introduction: The novelty of this study and motivation behind this work are unclear.

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Why river Mn flux is important at all? Indirect assessment of this flux via shells is not the easiest way. . .

Methods: How the samples were processed after dissolution; were they filtered? Was the dissolution complete?

Eqn 1-3: Unclear why this information is needed

Sampling (L149-150): The water samples were not filtered and acidified. As such, metal concentration (except probably Ca and Sr) in river water could not be measured and distribution coefficients do not make sense. Moreover, the whole main motivation of this study - reconstruction of Mn flux in the river - becomes compromised. As such, the distribution coefficients given in Table 3 may not be usable.

In Fig 3C, use log scale for discharge. How good is this correlation? What about correlation with temperature?

L254-259: Another issue is what is Mn concentration in the lake hypolimnion? If the lake is seasonally stratified, then, during the overturn, the bottom Mn-rich waters can feed the river thus dramatically increasing the Mn concentration in the river water.

L257-258: The argument is unclear. In Fig. 3E, Mn/Ca is not inversely related to Sr/Ca. Please show the relationships.

L270-271: The low flow may provide enhanced Mn²⁺ input from the riparian and hyporheic zone

L277: notice here that the maximal suspended load is usually observed at high discharge

L288: Chl a of mg/L concentration is really high. May be a misprint here and the concentrations are in $\mu\text{g/L}$?

L293-295: As a conclusion to section 3.5, this is extremely discouraging. It looks like one cannot yet discuss the sources of Mn for shells, so this section is useless. . .

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L312 Owen1996 is not in the ref list

L325-329: May be place this information in the Introduction. Again, this sentence is very discouraging: how is it related to particulate case analyzed in this work? What is more important, according to authors, in Brazes River: physiological mechanisms or environmental factors?

Rewrite L 347-348

L349-350: This is not sufficiently discussed and the whole story of DMn can be compromised by inadequate sampling

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-323>, 2019.

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