# Interactive comment on "Concentrations and ratios of Sr, Ba and Ca along an estuarine river to the Gulf of Mexico – implication for sea level rise effects on trace metal distribution" by S. He and Y. J. Xu

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The authors present an overview of Ca, Sr, and Ba concentrations in the Calcasieu River estuary in southwest Louisiana. I see several fundamental problems with the manuscript, some of which are addressable while others may not be. In particular, there is a fair amount of literature on estuarine Ba geochemistry (see Joung & Shiller, GCA 141: 303 doi: 10.1016/j.gca.2014.06.021, and references therein), as well as Sr (e.g., Xu & Marantonio, doi:10.1016/j.marchem.2007.01.004), that the authors seem unaware of. Most of these previous papers also provide higher quality data than that

of the authors. Some specific comments:

1. The methods section contains little information regarding detection limits or accuracy. I am astounded by their reported 0.05% reproducibility: it's difficult in this sort of work to get 1% reproducibility. And, Fig. 6 would seem to imply that for Ba they could only determine concentrations to +/- 100 nM which is about 25% of their typical Ba concentration. This makes the Ba data fairly worthless, especially when compared to the many other estuarine Ba papers which have uncertainties for this element in the low nM range.

2. Although these elements are not especially contamination-prone, some information on clean techniques used would be relevant (e.g., types of samples bottle and how they were pre-cleaned).

3. There can be significant desorbable Ba on suspended particles. Even at 30 mg/L SPM concentrations, acidification of unfiltered samples could have significantly increased the 'dissolved' Ba concentrations reported by the authors.

4. Many of the concentrations are reported to four significant figures, which seems an unlikely level of precision.

5. Much of the correlation analysis (Table 3) is not particularly useful in helping understand the geochemistry. Demonstrating that specific conductivity and salinity are highly correlated is simply stating the obvious. Likewise, the results section contains obvious statements of trends in the data that are unlikely to be helpful for a reader and aren't really used in the discussion.

6. In the beginning of the discussion, the authors use gram units for concentration while elsewhere they use mole units. This is unnecessarily confusing. 7. Overall, the discussion is vaguely descriptive and speculative. As mentioned above, much of the prior work on estuarine chemistry of these elements (especially Ba) is uncited. Consultation with that literature might provide the authors with insight not only to the

geochemistry of their system but also as to what questions remain unanswered in studies of the estuarine behavior of these elements.

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