

***Interactive comment on “Seasonal stratification and property distributions in a tropical estuary (Cochin estuary, west coast, India)” by A. Shivaprasad et al.***

**Anonymous Referee #1**

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General Comments: The study examines the influence of tides and river discharge forcing in water column stability using potential energy anomaly and stratification parameter. In the study authors try to enhance the understanding of impact of a stratified system on water quality and ecosystem ecology. One of the interesting findings from this study is that there is an influx of hypoxic water into the system from the coastal ocean along with the salt wedge intrusion during the high tides. This salt wedge plays an important role in distribution of chemical and biological variables which affects the water quality.

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Overall the paper is well written and the results are valuable for publication.

My recommendation: The manuscript can be accepted for publication in HESS provided the authors address the following concerns.

Specific Comments: (1) One major drawback of this paper is the lack of velocity data in studying stratification/mixing processes. The authors say that they have compensated this with PEA calculation. But a quantitative explanation is needed.

(2) Potential energy anomaly computed for a single fixed station is not going to represent the whole estuary when figures of longitudinal section of salinities depict large spatial variations in stratification. This has to be explained.

(3) The stability factor needs to be computed for all stations to represent seasonal stratification.

(4) Sec 2.2 Synoptic Observations, page 8, line 7: Write flushing time equation separately from text and give an equation number.

(5) Sec 3.1.4 Stability factor and stratification parameter, page 10-11: Only results should be described here. Detailed explanation of PEA and stratification parameter should be written in sec. 4 Discussions and Summary.

Technical corrections: (1) Sec 3.1.2 Temperature, page 9, line 18: Correct the grammar mistake.

(2) Acknowledgments, page 19, line 9-10 : Repetition of sentence on line 3-4.

(3) In Figure 2b: The scale of X-axis starts from January to December but you have written in the legend Jun 2008 to May 2009. Please start the scale of X-axis from Jun 2008.

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