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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Ambiguities in the classification of Cochin Estuary, West Coast of India" *by* A. Shivaprasad et al.

Anonymous Referee #1

Received and published: 19 June 2013

General comments

This manuscript describes a study which uses a new and comprehensive data set in order to develop a new classification for Cochin Estuary, W-India.

In its present state, the manuscript is very difficult to read and the structure requires significant improvement. Hence I recommend careful major revision of the paper. What is primarily missing is a clear introduction of the clear objectives of each section, which methods and data have been used for the analysis and for which reason and how the different investigations are linked. Below I list some suggestions which may help to clarify the structure of the paper (more details: see also specific comments):

Introduction:

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- Add summary and discussion of existing nomenclatures for Cochin Estuary and methods they are based on to this section (= most of the content of section 6)
- Add more detailed outline about applied methods and data to objectives paragraph (P 3597, L 24 - P 3598, L 1)
- P 3597, L 24- P 3598, L 5: This paragraph would be better suited for the abstract than the current one. The content of P 3598, L 1-5 fits better into the conclusions section. For the objective be more specific about the methods that will be presented and in which way they are combined in order to develop a new classification. You can also briefly itemize the differents steps that will be presented in the following analysis.

Section 2:
Rename this section into "Materials and Methods“ section. This can be subdivided into a "data“ section including a description of all data sets and measurement techniques“ (without interpretation) and a "data analyses“ section describing the theory of the statistical approach etc. All interpretation of data should be moved to the results and discussion section.

Statistical Analysis:
Again: here only describe the pure theory and move all interpretation to the results and discussion section. Also here: make sure that the order of the different steps is well organized.

Section 6:
- Move P 3613, L 21 - P 3614, L 18 to introduction
- Add P 3614, L18 – 24 to conclusions

The manuscript urgently requires comprehensive language revision. Hence, language corrections have not been done by the reviewer.

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Specific comments:

Title of the article: "Ambiguities“ does not really represent the content of the manuscript. Suggestion: "Development of a new classification for Cochin Estuary, West Cost of India“

P 3596, L 7-8: Be more specific: Summarize briefly which data, methods and analyses have been used.

P 3569, L 9-11: Sentences too weak for an abstract. Remove them from the abstract and add a summary of existing nomenclatures to the introduction. This statement also needs to be substantiated in a later section of the paper.

P 3596, L 26: suggestion: replace "irrelevant“ by "not applicable“

P 3596, L 7: Please correct reference: Dyer, 1995.

P 3597, L 8-9: replace "... have a special flavour that is derived from occurece of monsoon and they are referred as ...“ by "... are influenced by monsoon rainfall and, hence, are referred to as ...“

P 3597, L 14: Replace last sentence by "This way, an estuary can be categorized appropriately.“

P 3597, L 21-23: These two sentences require clarification: What exactly is the "peculiar“ behaviour of the estuary, which are the existing names (or better: classifications) for the estuary and what are they based on? Please refer to the relevant literature. I think, a large part of this information is currently provided in section 6.

P 3597, L 24: suggestion: replace "coin“ by "find“ or "establish“

P 3597, L 28: I would classify river runoff as a hydrological factor.

P 3598, L 8-9: Please clarify what is meant by "one of the three Ramsar sites in Kerala (November 2002)“

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P 3599, L 9: Add one sentence about which kinds of data are used in the complete study (runoff data, temperature and salinity data from transect, CTD and velocity data at 5 stations). Clearly distinguish between the three different data sets. The description as it is now is quite confusing.

P 3599, L 10: What is meant by "Viz“?

P 3599, L 13: Again: runoff is hydrology

P 3599, L 13-21: This is interpretation and should be moved to the "Results“ section.

P 3599, L 22: What is the programme "Ecosystem Modelling“? Either explain or remove.

P 3600, L 1: As far as I understand, CTD profiles were measured at fixed locations (boat stopped). Hence, remove speed of boat to avoid confusion.

P 3600, L 22: Very weak sentence: What exactly are the objectives of the statistical analysis? Please specify.

P. 3600, L 25: Here, first the theory for the prediction of the plynomial is required. As far as I understand, the time series analysis (Holt-Winters; Fig. 2b) is required prior to the prediction of the polynomial (Fig. 2a). Please adjust.

P 3601, L 8: The model is called Holt-Winters (please add reference)

P 3603, L 7-19: Does this section refer to Fig 2a?

P. 3604, L 26, Fig 2b : I do not even see an approximate period of 12 month in the cyclical variation in Fig 2b.

P 3605, L 15: Remove sentence.

P 3605, L 15-16: This should be Figs 3 and 4. For clarity, I suggest to merge both figures into one continued figure (3 a-l).

P 3605, L 17: I would prefer having ISM spelled out.

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P 3605, L 21-23: I suggest to write "...could be attributed to the greater measurement depts at inlet 2.“ since only the measurement point at inlet 1 is at a shallower location.

P 3605, L 24: Add sentence: "These conditions remained stable until September 2008 (Fig. 3b-d)“.

P 3606, L 8: Remove section number

P 3606, L 9: This should be figure 5

P 3606, last paragraph: Again: I would prefer having ISM and NEM spelled out.

P 3607, L14-25, Fig 6: Figure 6 only contains values for stations B and E for the dry period. What about the other periods? Please explain.

P3608, L 1: The title of the section is somewhat cumbersome and should be related to the analysis presented, e.g., "Evaluation of runoff dynamics“

P 3608, eq 11 and 12: Please define n_R and n_T.

P 3608, L 16-17: As far as I understand the equation, it implies that the total volume of the estuary is exchanged 42 times/year. However, this does not necessarily mean that it turns fresh that often.

P 3608, eq 12: This equation is not required as it is not used in Fig. 7. Alternative: Plot n_T instead of discharge in Fig 7a.

P 3609, eq 14: T_T should be Z_T. The definition of nominator and denominator is somewhat cumbersome. Do the authors mean maximum daily runoff devided by mean daily runoff for the sum of all rivers contributing to the estuary. Then one could place the reference to all rivers in the text related to the equation.

P 3609, L13-17: Please cite exact numbers.

P 3609, L 19-22: If I understand the figure correctly, the Z_R values of Tamar, Delaware and Thames are about an order of magnitude lower. I do not understand the discussion

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of the standard deviation at this place. Should it not better be the range in Z_R?

P 3610, L 20: Citation is Ketchum and Rawn (1951).

P 3619, Table 1: F statistic not discussed in text. Either add discussion or remove from table.

P 3620, Fig 1: please mark location of paddy fields in Fig 1a and improve quality of river 1b; indicate two parts (northern arm and southern arm)

P 3621, Fig 2: a) caption: please add information on which method the polynomials are based on (reference to text/method); b) caption: what is meant by "spline smoothing“ (not explained in the text); b) please adjust time axis such that years can be separated more easily and the same months/year are indicated.

P 3622, 3623, Figs 3, 4: Caption: add that grey shaded area shows the bathymetry of the estuary. Add positions of river sections A-E (required for Fig. 6). Increase font of labels. Figure appears to be squeezed in vertical direction (maybe due to page layout of HESSD)

P 3625, Fig 6: Insert Hansen and Rattray classes into figure and add definitions to figure caption. Add legend for shaded area and dashed line.

P 3626, Fig 7: Figure caption not self explaining: Add captions for 7a, b, c. Adjust font size of figure legends.

P 3627, Fig 8: Add y-axis label

P 3628, Fig 9: Increase fonts in graphs. Caption: What ist meant by "average“ salinity variations? This in not explained in the related section.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 3595, 2013.