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Hydrology and Earth System Sciences
Discussions



# *Interactive comment on* "Hydro-climatological non-stationarity shifts patterns of nutrient delivery to an estuarine system" *by* A. L. Ruibal-Conti et al.

**Anonymous Referee #2**

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Review of "Hydroclimatological non-stationary shifts patterns of nutrient delivery to an estuarine system." Ruibal-Conti et al.

This paper attempts to understand the factors that govern long term changes in nutrient delivery from 3 subcatchments in WA. Unfortunately this paper, while presenting some interesting analyses requires a re-write to enable the reader to fully understand the implcations of the findings. There were a lot of correlations and associations between rainfall, streamflow and anthropogenic factors presented but these were not clearly related to the overall objective of the work. In addition the mechanisms for the different relationships were not clearly identified – particularly the relationship with change in population growth. (for example). Im unconvinced that the relationship between non-stationary hydroclimatological shifts and nutrient delivery was well described or



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explored in this paper.

The paper states data from some years was not analysed (e.g. low DIP, years with insufficient data points). It would be good to know which years these were and were they the same years for all the nutrients.

Some of the suggested relationships might be backed up with simple mass balance calculations. For example pg 11059 lines 20-30. The discussion about reduction in fertilizer – this data should be available and allow testing of the two potential mechanisms. In addition (particularly) in this section, results of modelling scenarios are used as evidence. The results of a model will be based on the assumptions going into the model – are these correct? And does this paper suggest anything about the model assumptions?

In summary, the paper has presented some interesting analysis/results that should be presented more clearly in another draft. Perhaps a number of papers might be better than trying to cram all the data into this one.

Other minor edits include: tyr-1 should be t yr-1

Don't present changes in landuse as an #fold increase or decrease- this is meaningless. Also present this data in a consistent manner – for example mining increase was presented as 100 fold increase in one section but then as 6% of land for ag and mining later (line 15, pg11059)

Explain the different indices – SIO, IPO, etcwhy are they different and why would correlations be expected.

Last line pg11051 – Water and mining. . . . . I think this should be water storage.

Line 16 pg 11054 coast should be coastal Line 9 pg 11050 – target load? What target? Water quality objectives?

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 11035, 2013.