

Interactive comment on “Non-linear power law approach for spatial and temporal pattern analysis of salt marsh evolution” by A. Taramelli et al.

Anonymous Referee #2

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The authors analyze the Scheldt estuary salt marsh. In particular, the authors focus on the distribution of vegetation patches, and analyze its deviation from power law behavior and the climatic and hydrodynamic controls on such deviation. The paper is very hard to read to the point that I struggled understanding what was actually done. Many statements are vague, and most need rephrasing. It is not clear what the goals are, and what is achieved with the proposed approach.

Some specific comments follow:

- I suggest rewriting the abstract. It is very hard to understand what the main points of the paper are.
- Line 11: What does it mean that “For each patch, its area was calculated to test the

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plausibility of the power law distribution”?

- Line 18: the skeletonization algorithm gives several artifacts particularly when channels are wider than a few pixels. Since the purpose is to analyze channel sinuosity, I would be very careful and would run some test cases to make sure the sinuosity measured corresponds to what observed in nature. Moreover, I struggle understanding the physical role channel sinuosity plays within this analysis.

- Many statements are vague and others need rephrasing. For example, line 19: Any deviation from the steady state can grow to the increases of the sizes”... of what?

- Can the authors explain further what the physical meaning of the power law in this context is? Why is it expected? What does a deviation from it mean? I’m also not convinced about the deviation in the tail and what’s that telling in terms of salt marshes processes not known otherwise.

- “20 The high complexity and uncertainty associated with ecological systems under power law tail, can be then treated using a combination of fuzzy logic and a naïve Bayes compiler.” I don’t understand what this statement means. Can the authors explain in simple and detailed terms what is the role played by this approach?

In general I feel like a discussion on the physical aspects of the analysis, the meaning of the methods and findings are missing in this manuscript. I don’t exclude there is some new element of interest for the community proposed by the authors, but in the current stage it is very hard to assess it.

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