

Interactive comment on “Adaptation tipping points of urban wetlands under a drying climate” by Amar V. V. Nanda et al.

Anonymous Referee #2

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This is an interesting study that uses the ATP framework to assess wetland management strategies under uncertainty. While there are some aspects of the paper that are promising, the paper requires a large amount of revision to be publishable. I have made some suggestions for improving the paper in the comments below.

- The paper centres on the authors' modified ATP framework, however the only deviation from the framework by Kwadijk et al (2010) seems to be that the authors did not complete all the original steps. To be able to present itself as a new modified method, the authors need to provide a stronger argument for reducing the original approach and a better demonstration of its application (more suggestions below).

- The paper is quite difficult to follow due to its organisation and language. The paper needs to be carefully edited for grammar and choice of terms. Some parts of the paper

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are repetitive or are not very informative, whilst other parts are unclear and missing key information (examples in minor comments below). This editing should have been done before submission, especially given the number of authors.

- Here are a couple of examples of inadequate descriptions for critical values/points of time, which were simply stated without any supporting evidence. For example, where did the minimum threshold values (21.6mAHD and 22.0mAHD in lines 226-229) come from? What values do they represent? How was 1995 identified as the critical point of change?

- In terms of the paper's structure, some of the text needs to be reorganised. Currently much of the text in Methods (particularly 2.2) belongs either before Methods (perhaps a new section describing the case study) or in the Results section.

- Given the aims of the paper, I expected the paper to have better demonstrated the ATP framework, by including a more detailed discussion (in Sections 4 and 5) about the effectiveness of the policy and management strategies in the case study, rather than simply stating that the policies were assessed.

- Table 2: It is unclear what the water levels (1978-1995 and 1996-2012) represent and how the ATPs were determined from Table 1 and Eq 1. More information is needed in the caption and text.

- Fig 5: this figure is quite confusing and a bit misleading. Firstly because of two different definitions of drought are given for the two contrasting periods (ie we are not comparing like with like). Secondly the layout is not logical (why are the "prior" years plotted after the "post" years") - what do the secondary x-axis represent? The summer months are highlighted, presumably to show that the drying of the wetland in critical periods - however, if my interpretation of the plot is correct, wouldn't the two bars in Oct (10 months) and Nov (8 months) also represent periods when the drought extended over the critical summer period? It seems the main point of Fig 5 is to show that drought frequency has increased since 1995. It would make more sense to me to have

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a figure that simply shows inundation as a time series instead - this would more clearly show that the wetland has shifted from a being permanently to seasonally inundated than the current plot.

- Section 4.1/line 332-333: the authors claim that their framework assesses resilience of the hydrological system across spatial and temporal scales. How were spatial scales addressed in the framework?

- One of the critical issues with the approach/framework relates to the identification of the ATP in time. Often it is not known whether a tipping point/threshold has been crossed until after the fact (this is somewhat implied by the authors e.g. lines 65-72). Furthermore, there are time lags associated with management and ecological responses (this was only mentioned by the authors in the very last sentence of the paper). These issues and their implications on the approach/framework need to be discussed.

Minor comments: - Line 154 "Despite high resilience, the wetland shows a rapid decline.." This sentence is contradictory.

- lines 296-298: The values 5x and 16x and their definitions do not make sense.

- lines 300-303: although contrary to regulation, it is completely logical that drying is more likely to occur over summer.

- line 321-322: what is meant by "existing water requirements"?

- line 370-372: this sentence contradicts itself. Firstly it implies that the management interventions were not triggered due to a gradual transition in the system, but on the other hand it described the processes in the ecosystem as being rapid.

- line 372-374: What is the evidence of this claim? The author has provided no information that suggests that shifts in the social system stem from the scale and level of policy and legislation.

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- The discussion seems to frequently shift between talking about the specific case study to talking about cases in general, without clarification. Eg. line 377-381: Are these ineffective policies for the same study area or elsewhere?
- line 401-402: This sentence is not informative - it simply says reversing conditions in the ecosystem requires measures that reverse the conditions.
- line 421: What do you mean by "coupled system"?
- line 418-420: This sentence states that "With the involvement of stakeholders in our assessment we can account for the exploration of future hydrological events and provide decision-makers time periods for when the expiry of current policies occur?" This did not seem to be done in this current study. Furthermore, given that the authors modified framework only examines historical data, it seems the original ATP assessment frameworks is needed to achieve those outcomes, not the authors' version.

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