

Interactive comment on “Relationships between environmental governance and water quality in growing metropolitan areas: a synthetic view through the coupled natural and human system lens” by H. Chang et al.

Anonymous Referee #3

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I am very supportive of this paper overall. I very much appreciate the effort to link governance practices and water quality (in both directions). The comparative study design also makes this especially fruitful and constructive to be able to tease out key relationships.

I do have a few rather large queries related to the piece however. Since these are core to what the piece is doing, and the major insights derived from the piece, they are potentially consequential for the question of whether the piece should be published.

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First, on a more minor point, there are way too many questions that the paper introduces early on. I understand that these are the overarching framing questions of the project on the whole, but consider that they should be treated much more summarily since they are not the major concerns of this piece.

Second, and more consequentially, I am not convinced by the use of temperature as a proxy for water quality. Presumably there is other data available (even from government sources) that would give us a more complete sense of changing water quality—could this be used to provide a more nuanced and complex picture? I would suggest to the editor at least that this specific question be put to a hydrologist or similar expert in the context of this review (in terms of what data might be available and whether it might be mobilized to provide a stronger picture of change in these two stream systems). As well, I wonder about not using a broader data set, including other non-governmental data. There could be a concern about quality of that data, but it would also be worthwhile to run some analyses to see what different picture one might get either by including more indicators (e.g. suspended sediments, or others that might be more meaningful for water quality impacts of urbanization processes or for understanding impacts of riparian buffers), or including other types of data that might be collected at more regular intervals.

Third, the other element I am puzzled by is the effort to connect these data to property values. It is the case that property values post-CWA were rising considerably in many markets across North America. The authors do not discuss how the general trend of rising home prices was accounted for in the analysis. As well, some of the results are peculiar—why would certain quality parameters (note that here in this analysis more parameters are included) be significant only at more than a mile from the water source? These results are discussed much too summarily and need to be analyzed and discussed more fully. As well, the very effort to link home prices needs to be theorized more fully. The authors simply say that other studies have linked water quality to home values. But how does this connect to the SES-governance linkage that is the main

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focus of the research effort? I think a bit more justification about why this is a particular focus of this paper is needed.

What I am most impressed by here is the overall design and effort, including the ability to derive some very important results related to governance and water quality. I wish the authors luck in clearing up some of these weaknesses and bringing the paper to fruition.

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