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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Global scale human pressure evolution imprints on sustainability of river systems" *by* Serena Ceola et al.

Anonymous Referee #2

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This is a thoughtful and well written paper that demonstrates the effects of human activities on rivers around the world. The nightlight satellite data allow a more consistent and meaningful analysis of the changes of these effects than alternative data sources. The description is clear, the analysis complete, and the interpretation convincing.

I only have one concern with the paper. The authors introduce a "Human pressure index" based on nightlight data but are not clear what processes exactly this index is to capture and why. Is the index a surrogate of consumptive use of irrigation water? In this case, one would have to argue that irrigation differs immensely around the world for the same light intensity. Also, what is the process reasoning that consumption is proportional to the use of light? I do not disagree with the concept, but it would be good to extend the justification. In some regions the index may be a surrogate of contamina-

tion of rivers, or changes to river morphology perhaps? Again, a full discussion of the processes the index is supposed to represent would be useful. This justification would also help in the discussion section of the paper which is currently mainly focusing on the limitations of the method, while the implications for water management should be added.

Recommendation: I recommend publication of the paper with minor changes. I suggest the authors elaborate on the process basis of the index to further strengthen the paper.

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