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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Representing hydrodynamically-important blocking features in coastal or riverine lidar topography" *by* B. R. Hodges

Anonymous Referee #2

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General comments

This discussion paper by Ben Hodges presents a new, automated methodology for the identification of positive elements in topographic datasets that are continuous enough that they may act to inhibit water flowing across the landscape. This research is important for the ability to predict the extent of riverine and coastal flooding using hydrodynamic models, particularly in the face of projected environmental change. Therefore this paper is highly suitable for publication in NHESS.

I would like to thank the author for the excellent presentation of this manuscript. I found

very few/no typological errors, the English is excellent, and the figures are clear and well explained. I find the discussion paper to be in the technical condition that would be required for publication, which is a rare experience for me as reviewer.

The requirement for the new technique is clearly set out and justified in relation to previous studies. The methodology presented by Hodges is logical and transparently documented such that a fellow scientist could reproduce it relatively easily. This is highly creditable.

It is unclear the extent to which the new technique represents a significant scientific advance without any implementation or validation. It is not sufficient to suggest that this should be the scope of future research. Through an example application it can be made clear to fellow scientists why incorporation of automatically mapped edge features is important, and knowledge gained through a test exercise may further inform the required methodology. The readers need to know how the technique changes predictions compared to previous methods or compared to not identifying blocking features at all. I would recommend that example hydrodynamic simulations be added (e.g. the Runcon Bayou site used for developing the technique). Without this it is difficult to reach substantial conclusions about the validity of the method.

Specific comments:

Line 52: Could incorporate footnote into main body.

Line 65-67: This is at odds with criticisms in lines 165-170 of the need for unstructured grids. Unstructured grids, like nested grids, allow us to represent different processes at different scales, which is vital for scaling up experiments, even with advances in parallel processing and cluster computing. I'd suggest reconciling these two sections.

Line 84: Quadtree subgrid nesting needs an explanation.

Line 91: This may be pedantic, but I prefer LiDAR to "lidar" since it is an abbreviation, not a word. That said, radar is now treated as a word so I guess the change is

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inevitable.

Line 125: Are these methods prohibitively difficult? Would there also be some merit to developing automated tools for identifying blocking features in the generation of unstructured grids?

Line 135: Highlight that your study aimed to automate this labourious task.

Line 150: This justification needs clarifying. If I've understood correctly you are arguing that the finer resolution used to identify blocking features, compared to the resolution at which modelling will take place somehow means that the effects of distortion are minimised? I don't follow the logic.

Line 184: I disagree with this. The impact of the blocking algorithm on hydrodynamic simulations is a fundamental requirement of presenting the new technique and cannot be left to future studies in a world where we don't publish null results. What if the edge blocking causes some unexpected hydrodynamic behaviour that requires the algorithm to need revisiting? An example application should be a requirement for publishing this work.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 1427, 2015.