Natural Hazards
and Earth System
Sciences

Open Access

Discussions

EGU

# *Interactive comment on* "The Floodwater Depth Estimation Tool (FwDET v2.0) for Improved Remote Sensing Analysis of Coastal Flooding" *by* Sagy Cohen et al.

### Anonymous Referee #2

Received and published: 29 July 2019

This paper documents an incremental improvement to the FwDET tool making it more suitable for flood depth estimation along coastal or permanent water body locations. Additionally, the paper documents substantial improvement in the technical aspects of the tool by converting it to Python and making it more open for community use. While the tool is good the presentation of it in the paper could use some improvement to show the true value of the 2.0 version of FwDET.

Specific comments:

Pg 2, line 13: This sentence is unsupported here and hard to believe given the uncertainty present in the depth estimates. Is a depth estimate with uncertainty +/- 0.33 m

more useful to rescue and relief efforts than a map of low water crossings? How will this information be used by decision makers in real time?

Pg. 4 line 2: It may be helpful to talk about how much work is necessary to prepare the cost raster from the land-cover map. Is this a quick process, or will these need to be precomputed for real use?

Pg. 5 line 8: Is the QGIS version of the script really FwDET 2.0 or is it FwDET 1.0? Either way this is an excellent improvement, but clarification on the version may be useful to the readers.

Pg. 6 line 2: It would be helpful to express the error as a percentage of the overall depth. A error of 0.18m sounds small, but it is an error of about 50% of the observed heights. For the Brazos River, the depths quadruple to about 2 m, but the error stays constant at around 0.16 m. So this method performs much better for deeper water situations, or there is an inherit limitation to the method that results in a lower bound on the error of around 0.15 m?

Pg. 7 line 5: Very impressive performance speed up!

Pg. 8 line 5: Is the fragmentation due to cloud cover? If so should future work proposed be how to extrapolate with FwDET to regions between fragments?

Overall: While the Brazos River example is compared for both FwDET 1.0 and FwDET 2.0, there is no example illustrating the problem at coast lines for FwDET 1.0 and how FwDET 2.0 solved the problem. The description of the improvements to the method could also benefit from better clarity on how locations are being chosen. For example, the line artifacts are attributed to this too so it may be useful to have a map showing just the locations used for the depth estimation with the FwDET 1.0 vs 2.0. Another example is a float-integer-float trick is mentioned, but not described what it is or how it is used. The methodology is also missing a description of how the modeled inundation rasters were converted to polygons for FwDET? Simply water depth > 0.0, or is there

smoothing applied or another threshold chosen?