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Natural Hazards and Earth System Sciences
Discussions



# *Interactive comment on* "High-resolution modeling of tsunami run-up flooding: A case study of flooding in Kamaishi City, Japan, induced by the 2011 Tohoku Tsunami" *by* Ryosuke Akoh et al.

**Anonymous Referee #1**

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This is a very valuable work, taking flood inundation modeling to the next necessary step of highly detailed modeling where the flow can pass through buildings. This is very realistic, as buildings are indeed permeable, due to flow passing through doors, windows, and broken away walls. Furthermore, the determination of building permeability for wooden buildings will be a useful parameter for future work by practicioners and researchers. I hope this work inspires others to formalize such values for other building types as well.

In general, the English needs some work, so the paper should be corrected by a native speaker before final publication.



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P2 L21-22. I do not understand the meaning of "... with 2 grid sizes...".

P2 L37. Why was Z=HU used as the indicator of flow intensity? This is flowrate. Wouldn't momentum flux HUˆ2 be a better indicator, as this is what forces on structures usually depend on? Either way, the authors should justify their choice of the parameter they choose to use.

P3 L11. Is Kamaishi really reliant on marine products? Isn't the city's main industry its factory for production of steel products?

P6 L6 you should cite the joint research group in a proper reference such as Mori N, Takahashi T, Yasuda T, Yanagisawa H. Survey of 2011 Tohoku earthquake tsunami inundation and runâĂŘup. Geophysical research letters. 2011 Apr 1;38(7).

Table 1. The Manning's n roughness values shown look too small, especially for Forest, Factory, Residential areas. Bricker et al shows up to 0.15 for high-density urban, and greater than 0.1 for forests (up to 0.2 for dense forests with branches submerged).

P6 L13 if the local resident's video is available (i.e., YouTube), you should cite that reference here.

P6 L28 The fact that the Kamaishi bay-mouth breakwater was ignored should be justified more, as the breakwater had an effect on delaying tsunami arrival time onshore, and also mitigated flood elevation and speed onshore. See for example, Tomita et al. 2012. Effect of breakwaters on reducing flow depth during the Great East Japan Tsunami. Journal of JSCE, series B2 (Coastal Engineering).68(2):I_156-60.

Section 5.3. The protection given to inland buildings due to shielding by concrete buildings near the coast reminds me of a paper I saw by Takagi et al (2015) Assessment of the effectiveness of general breakwaters in reducing tsunami inundation in Ishinomaki. Coastal Engineering Journal. 2014 Dec;56(04):1450018. They may have discussed similar effect.

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