NHESS-2014-196, Reply to referee #2 comments

Please find below the line-by-line response to the comments of referee #2 to the paper entitled "Simulating tsunami propagation in fjords with long wave models", by Finn Løvholt, Sylfest Glimsdal, Patrick J. Lynett, and Geir Pedersen. We thank the reviewer for his comments, and we find that they have contributed improving the overall quality of the paper. We note that in the response below, we only discuss the most important points. However, we note that all the points of editorial nature have been taken into account and corrected.

Referee comment P4860 L4: it appears that breaking is never discussed in the paper
Reply: This is true, although treatment of breaking is necessary for simulating the run-up.
Authors changes: We have revised the sentence, but mention breaking explicitly when the Coulwave model is introduced below.

Referee comment P4862 L9: Please indicate the dimension of alfa, beta and Wi(xi). Based on the values provided in page 4863, it seems to me that Wi(xi) should have the dimension of m-1. Is this correct? Please explain and clarify.
Reply: Good point, we agree with the reviewer that this needs clarification and revision. However, we would like to keep the weighting function dimensionless, meaning that α has dimension [1/s].
Authors changes: Dimensions of α, β, and W are listed, and dimensions for α are revised.

Referee comment P4862 L25: any reason for this particular choice?
Reply: Being a mid-fjord location, it is fairly representative for the along-fjord propagation. The locations towards the sides are more influenced by reflections.
Authors changes: The reason for selecting B4 is described in the revised version of the paper.

Referee comment P4862 L29 – P4862 L4: This part is not immediateley understandable and may generate some confusion. I suggest to be more detailed. For example, to my understading the text is saying that three different forcing signals are used for Coulwave:
1) B4 is assigned to all B gauges
2) B4 with tapering between 4-5 s is assigned to all B gauges
3) B4 with tapering between 6-7 s is assigned to all B gauges.
Tsunami simulations are run with Coulwave for the three cases.
In particular, for case 2, the tsunami field computed at t=5.07 s is used as input condition for GloBouss. Similarly, the tsunami field computed in case 3 at 7.1 s is used as initial condition for another independent simulation with GloBouss.
Is all this correct?
Reply: We understand that this paragraph may be confusing and has attempted to revise it. The reviewer is correct in his assumptions. However, we note that a similar thing is done for the inundation simulations, using the D and F bridge respectively.
Authors changes: We provide a more explicit description of the different cases with B4 as suggested above to clarify. In a new subsection (3.1), the different uses of models and data are further detailed.

Referee comment P4864 L22: A table would be extremely useful here, summarising and putting in relation the codes used, the input provided, the particular feature to simulate (propagation or run-up) and the relevant parameter values used in the different simulations. I think it is possible to conceive such a table: as I said, the reader would receive great benefit from it.
Reply: We agree with the reviewer that such a table would be clarifying.
Authors changes: We have included a new table listing the different simulation tools and their purpose into the new section (3.1).

Referee comment P4865 L13: at 7.10 s
Reply: Actually both taperings are justified. The point is that in both cases, the main wave characteristics are captured, although not completely accurately.
Authors changes: No changes.

Referee comment P4876 (figure): The location of the gauges is hardly visible, as the gauge labels. Pòease improve the readability.
Authors changes: We have increased the gauge labels and gauge sizes.

Referee comment P4876 (caption): It is not clear to me whether the locations indicated here are a subset of the physical gauges used by Lindstrom et al. (2014) or not. Can you specify better?
Reply: Yes, the gauge points comply with a subset the Lindstrøm et al. (2014) data
Authors changes: The figure caption rephrased to say exactly this.

Referee comment P4877 (figure): I would suggest exchanging the colours of the blue and green curves, so that the B4 curve is blue exactly as in the upper right panel. It is probably just an aesthetic change, but it can improve immediate readability.
Authors changes: Done.

Referee comment P4880 (figure): What is this?
Reply: This is an artificial feature due to the scan. It does not affect the simulations as the run-up does not reach this high.
Authors changes: We have removed the artificial feature to avoid confusion.

Referee comment P4881 (figure): What are these spikes due to? Why aren't they seen in the other panels?
Reply: The spikes are dropouts that appeared for this particular type of sensor when the waves were too steep.
Authors changes: We have explained the reason for the spikes in the revised manuscript.