

Interactive comment on “Scenario-based numerical modelling and the palaeo-historic record of tsunamis in Wallis and Futuna, Southwest Pacific” by G. Lamarche et al.

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Thank you for your comment and requirement for clarification.

The inversion for the Tohoku earthquake was generated using a very different approach than for the other scenarios. In particular, we did not use the empirical regression of Hanks and Kanamori (1979) to derive the fault length from the earthquake magnitude as we did for the other scenarios. In the case of the Tohoku earthquake, the source model is a collection of 190 sub-faults as defined by Okada (1985), and published by Popinet et al. (2012) (this is all stated in the manuscript). The slip given in Table 4 is

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therefore an average and should not be compared with that for the other scenarios. All the other models use the same approach and are coherent. It is therefore misleading to compare the ratio of values parameters for Tohoku and the other earthquakes. The footnote in Table 4 highlight this issue.

Re. Figure 15 and 12. Clearly this indicates that the Tonga Mw9.1 scenario is the most dominant hazard for W&F. While not surprising considering (as you note) the proximity of the source, this result needed to be validated. In particular because from its orientation, the Tonga Trench is not focusing tsunami waves directly toward Wallis (more so for Futuna) whist sources like the Vanuatu back arc does.

Providing another maximum elevation model without the influence of Tonga 9.1 could be of value as would be many other scenarios. The aim of the paper was to concentrate on the worst case scenario hence that of Tonga 9.1. The contribution of the 13 other scenarios can be analysed by looking at each scenario individually

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