

Interactive comment on “Impact of Hurricanes Irma and Maria on the PTWC Tsunami Warning Capability for the Caribbean Region” by Victor Sardina et al.

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Thank you for your careful review of our paper. We really appreciate your comments and suggestions. Please find below our answers to your comments and questions:

Q1: From the text in Ch.3 is not clear if data latency and station outage statistics (Figure 1b, upper right corner, – note! – “right“ not “left“ as written in line 29 page 2) reflects the overall network performance during the second half of 2017 disregarding individual stations (i.e., data latencies and outages might “jump“ from station to station within this time period), or latencies and outages are “bound“ to particular stations? In the first case, results (detection time maps accounting for data availability) will strongly depend

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on how Authors distribute outage and latency statistics between concrete stations. In the second case (which, I think, is valid), it is not clear why such a statistics has a persistent character – why not to repair non-working stations (persistent outages)? Why not to reduce problematic data latency at correspondent stations?

A1: We will edit the text to correctly reference the figure, as indicated. The listed median data latencies reflect the overall performance of the available network, as those values in seconds reflect the most common latencies of the member stations. In other words, we use the median latencies as a representation of the most likely status of the network within a certain time interval. The latencies and outages at each station depend on several factors, mostly out of our control. In many cases the stations have communication issues and it takes time to repair them. This turns rather common for stations located in isolated islands, or hard to access sites. Repairing problematic stations depends on the resources available to each of the contributing seismic networks. The Puerto Rico Seismic Network (PRSN) has come a long way since the hurricanes, with most stations already online. We still have, however, a seismic data gap north of the Virgin Islands, possibly due to the difficulty of reaching remote stations in that area.

Q2: Ch. 5: One mitigation measure can be reduction of number of P-wave registering stations from 8 down to 4 (Figure 9a). How much should that affect the epicentral offset?

A2: We reduced to 4 the number of P-picks as a temporary measure due to the lack of enough seismic stations to detect earthquakes with the require speed in the aftermath of the hurricanes. Reducing to 4 the number of P-picks required for a preliminary location aimed at releasing the preliminary locations for manual review by the analyst on duty faster than otherwise possible. Manual review would then increase the number of P-picks whenever possible. In this regard, however, the L-shape topology of the network, which leads to azimuth gaps of more than 180 degrees for a large number of events in the area seems to eclipse the number of P-picks as the main factor affecting the accuracy of the PTWC preliminary locations. We published some

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statistics regarding the accuracy of the PTWC preliminary earthquake parameters for Caribbean earthquakes as part of an article in Seismological Research Letters (SRL) in February of 2017 under the title “Evaluation of the Pacific Tsunami Warning Center’s Performance for the Caribbean Based on the Compilation and Analysis of Tsunami Messages Issued between 2003 and July 2017”. In addition to this study, further compilation of PTWC earthquake preliminary parameters and their cross-validation with the solutions listed in the NEIC catalog indicate that the median epicentral offset went from 11.8 km during 2016 to 16.2 km during 2017, which we could associate with the reduce number of stations due to the impact of both hurricanes. The median epicentral went down to 11.3 km during 2018, and 11.5 km up to April, 2019.

Q3: At least for Figure 1 I would suggest to start the caption with: "Hypothetical epicentre positions coloured by theoretical detection time A3: Indeed, the suggestion turns more technically accurate, but possibly more difficult to understand for people with less knowledge of the subject. Notwithstanding, we will consider the suggestion before submitting the final version of the paper.

Q4: Optional. Some figures could be send to Supplementary. For example, 2, 4, 5, 8, 10.

A4: In our opinion, leaving those figures out of the main text would make it harder to understand the results and follow along the narrative of the paper. For this reason, we ended up including them all, so that people can see where subsequent maps came from, and how we attained them.

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