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Comment

## ***Interactive comment on “Large submarine earthquakes occurred worldwide, 1 year period (June 2013 to June 2014), – contribution to the understanding of tsunamigenic potential” by R. Omira et al.***

### **Anonymous Referee #2**

Received and published: 4 May 2015

This is an interesting examination of the generation of tsunamis by submarine earthquakes in relation with the actual records and scenario modeling of the very same tsunamis. This subject is well worth dealing with, but the way it is presented in this manuscript still needs further improvement, discussion and editing before publication.

#### Comments

Abstract: seems to me too long; there is no mention of the discussion about TWC (Tsunami Warning Centers); the statement "We also find that the tsunami generation

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is mainly dependent of the earthquake focal mechanism and other parameters such as the earthquake hypocenter depth and the magnitude." is a trivial notion. Please be more specific in formulating the finding of this work.

Section 1 "Introduction" – It is said that "Analysis of available sensors' records reveals that 39% of the considered earthquakes caused tsunami." – Were there any tsunami records (of earthquakes or other sources) at the given time frame that were not included in this analysis? That would give the reader a better perspective of the scope of this work.

Section 2: "earthquake events..." is mostly a technical description of the events discussed in this work and their plate tectonic environment. In my opinion it exhausts the reader. Instead, this section can be shortened and concentrate on the most important issues that are relevant to tsunami generation. The informative data can be summarized in a table and further descriptions can be presented in the form of a supplementary material.

Section 3.2: "Tsunami numerical modeling..." refers only to the tsunamigenic earthquakes, yet several of the non-tsunamigenic events, mainly the shallow ones, seem capable of producing tsunamis as well, but these are not discussed at all. What is the role of the shallow events that did not produce a tsunami in the overall analysis, especially in the tsunami warning process?

Section 4.2: "Tsunamigenic potential and sensitivity to earthquake parameters" Submarine earthquakes are also capable of generating submarine landslides that in turn may generate tsunamis as well. Were there any of the recorded tsunamis studied here of such origin?

Is there any role of the water depth at the epicentral area in tsunami generation?

At the end of this section it is said that "This is due to the fact that the thrust/reverse ruptures are the favorite earthquake mechanisms for tsunami generation as they are

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able to cause a vertical displacement of the ocean bottom." – I think this is too simplistic statement. In general, the dip of submarine thrusts tends to be smaller than that of the normal fault (see the fault plane solutions), and hence their vertical offset is smaller (for the same given magnitude), in contrary with the above statement. How would you explain the 'strike slip' tsunamis? In respect with this problem it would be interesting to compare the tsunami heights also with the vertical displacements of the events discussed in this work.

Section 4.3 "Tsunami warning": Alerts were also issued to the Hellenic and Aegean events by National Observatory of Athens (Greece) and Kandilli Observatory and Earthquake Research Institute (Turkey). They were Candidate Tsunami Watch Providers at that time.

Analyzing the performance of the TWC should be extended and discuss also the events that did not generate tsunamis. Were there any false warnings or missed alarms? Would also be of help to present al this data in a table in relation with all the eevents.

Section 5 "Conclusions": Earthquake depth is an important factor – that is well known, but what about the shallow events that did not generate tsunamis?

"TWCs around the world have performed well" – further analysis and discussion (such as mentioned above) should be added in order to support this statement.

"In summary the present study can help on the compilation of global tsunami catalog as well as the characterization of tsunami decision matrixes for the various oceanic regions." Please explain more specifically how this could/should be done.

Technical corrections The manuscript needs further editing in order to shorten the text and make it compact, clear mistakes and improve the language. Here are several examples only (in addition to the comments mentioned by reviewer #1): P. 1862, line 20: Should be 'on' instead of "... is mainly dependent of the ..."? P. 1863, Line 23: "Interpolate" (appears twice) – should be interplate and/or intraplate? P. 1864, line 18:

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Should be "... sensors' records..." instead of "... sensors'records...". P. 1864, line 6: "... (tides gauges (TD) ...)", Should be an even number of parenthesis ...; P. 1864, line 9: Please add the web address of USGS earthquake database. P. 1869, lines 15-16: Hellenic arc is in the Eastern side of the Mediterranean...

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