Nat. Hazards Earth Syst. Sci. Discuss., 2, C1055–C1057, 2014
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Natural Hazards and Earth System Sciences
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Discussions

Interactive comment on "*Brief communication* "The magnitude 7.2 Bohol earthquake, Philippines"" *by* A. M. F. Lagmay and R. Eco

Anonymous Referee #5

Received and published: 12 June 2014

This paper gives some information about the Oct. 15th 2013 Bohol (Philippines) earthquake. I must confess that the central point of this paper is not clear to me: is it that a new fault was discovered thanks to this earthquake? To be honest I am not sure that this enough for a scientific paper or a brief communication.

Detailed comments:

1) On p. 2 it is stated that the earthquake, initially pegged as MW = 7.2, was later revised to MW = 7.1, however throughout the paper the authors refer to MW = 7.2. What is the correct value?

2) On p. 3, l. 10 it is written that 2779 aftershocks where recorded, 75 of which were felt. What is the magnitude/depth threshold that makes the difference between a perceived

and a not perceived earthquake? Or on what other basis is the earthquake described as felt (when it is perceived by 1 man at least?)

3) On p. 4, l. 14, the number of aftershocks is 3198, 94 of which were felt. Are we talking about the same events of item 2)? Were the aftershocks 2779 or 3198?

4) Section 3: past earthquakes. Apparently this section has little to do with the rest of the paper (included the title) and does not seem to be relevant.

5) Section 4. Tectonic framework: maybe this section ought to be the first, rather than the last one.

6) Conclusions: quite incredibly the authors seem to support the time-predictable model (panel b below, from Shimazaki and Nakata, 1980) for earthquake occurrence which was abandoned long time ago (as well as the characteristic, slip-predictable and many other models). The fact that an earthquake releases some stress does not imply that the same fault is safe for a long time: this was an old conceptual model, abandoned for the simple reason that it does not work. Stating that that fault is safe for a long time might create wrong expectancies in the readers. The fact is that we do not have any working predictive model for earthquakes, therefore sentences like "will be quiet and will not pose imminent danger" should definitely be avoided.

In conclusion, I think that the contents of this brief communication are too poor for a scientific journal and – at the present state – they are also confusing and questionable. I cannot recommend this paper for publication.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 2103, 2014.

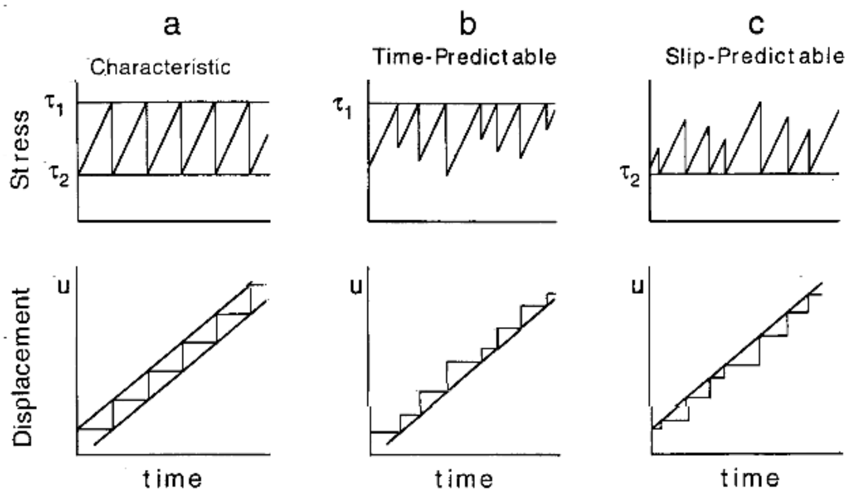

Figure 2. Models for earthquake prediction based on changes in fault stress for a constant loading rate. The upper box shows the stress history on the fault for the different predictive models. τ_1 is the shear stress at initiation of slip and reflects fault strength. τ_2 is the shear stress at which slip ceases and reflects fault friction. In the lower box, u is the slip or displacement on the fault that corresponds with the stress history. (a) Characteristic model of stick-slip faulting. Each earthquake is identical in stress history, recurrence interval and slip. (b) Time-predictable model. This model assumes the fault strength is constant and that slip initiates when the stress on the fault reaches τ_1. If slip is proportional to stress drop, and plate motions are steady, we can predict the time of the next earthquake based on the amount of slip during the previous earthquake. (c) Slip-predictable model. This model assumes the stress on the fault is always reduced to τ_2 by an earthquake. Knowing the time of the last earthquake and assuming steady plate motion, we can predict the size of an earthquake expected at a particular time. (Modified from Shimazaki and Nakata, 1980).

Fig. 1.