Nat. Hazards Earth Syst. Sci. Discuss., 3, C2770–C2772, 2015
www.nat-hazards-earth-syst-sci-discuss.net/3/C2770/2015/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Evaluating flood potential with GRACE in the United States" *by* T. Molodtsova et al.

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Received and published: 22 December 2015

Comments on: Evaluating flood potential with GRACE in the United States

T. Molodtsova, S. Molodtsov, A. Kirilenko, X. Zhang, and J. VanLooy

This paper presents work to evaluate a flood-potential index using observations of TWSA from the GRACE satellite mission. Because the original index as written was not quantitatively validated, these authors attempt to do so here with more rigor. They surmise that the gravity-based flood potential index works well in some cases, especially long-duration floods during the summer season.

This is a very nice paper. The authors employ a clever and intelligent statistical method to test the flood index, one that I never thought of. I think it shows good results, and is

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a necessary step in advancing the science of gravity-based flood prediction. I applaud the authors on their creative and technical approach.

Because the practice of quantitative flood prediction is essentially stuck at the timescales of weather forecasts, floods remain one of the most costly natural disasters in the world today. Long lead-time methods show promise, but a lack of rigorous validation still leaves many operational hydrologists quite skeptical of the use of satellite gravimetry for flood potential prediction. This paper is important to advance the understanding and appreciation of these methods by applying better statistics. It therefore supports a significant change of thinking in the field, and does so in a thorough and thoughtful way.

The paper should be published in my opinion.

Some very minor points and suggestions follow:

1) Though the authors mention the use of RL05 GRACE data, the actual GRACE data set used is not described in detail. The authors should have something like "GRACE RL05 from the CSR processing center was used an is available at grace.jpl.nasa.gov".

2) Scale factors are now commonly applied to GRACE data to get something that is effectively at 1-deg resolution. These are available on the GRACE Tellus website. Have these been applied here? If so please describe briefly.

3) The results for the Juba-Shabelle region are an interesting addition, and Figure 7 nicely shows the maps and the timeseries of events. Would it be worthwhile to show any maps or timeseries examples within the US for consistency?

Sincerely,

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 6977, 2015.

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3, C2770–C2772, 2015