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Hydrology and Earth System Sciences Discussions

Interactive comment on "The benefit of high-resolution operational weather forecasts for flash flood warning" *by* J. Younis et al.

S. Drobot (Referee)

drobot@colorado.edu

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Flash floods continue to be a severe problem; they are difficult to forecast and can have considerable negative impacts on humans, animals, and infrastructure. This paper presents a novel method to incorporate high resolution operational weather forecasts for flash flood warning, and it promises lead times of up to 24 hours. I see no major errors in the paper, and if the research in this paper can be operationalized, then the potential benefit to society, in terms of reductions in loss of life and property, would be notable.

Specific Comments: 346:11 – I believe that the term "ground truth" is a misnomer, as we can be neither sure that the in situ data is accurate nor precise. A better term would be "surface validation".

347:11 – Numerous studies have already looked at the potential change in flood occurrence under climate change [Milly et al., 2002; Palmer and Räisänen, 2002]. I suggest the authors use either these or some more up-to-date references to back up this statement. Milly, P.C.D., Wetherald, R. T., Dunne, K. A., and Delworth, T. L., 2002. Increasing risk of great floods in a changing climate. Nature 415, 514–517. Palmer, T. N., and Räisänen, J., 2002. Quantifying the risk of extreme seasonal precipitation events in a changing climate. Nature 415, 512–514.

347:24 – The danger in a flash flood is also strongly related to the human element. Depending on how many people live in an area, land-use patterns, and issues surrounding vulnerability, resiliency, and the availability/status of warning systems, flash flood impacts can range from minimal to disastrous.

348:1 – The Austin (1987) reference is fine but slightly out of date. A more recent and thorough report on weather radars and flash flood forecasting is “Flash Flood Forecasting over Complex Terrain: With an Assessment of the Sulphur Mountain NEXRAD in Southern California” by the US National Research Council [available at http://www.nap.edu/catalog.php?record_id=11128]

354:3 – The authors note that they are using thresholds based on a previously tested approach. Can the authors provide more details on how the various thresholds relate to flash flood impacts? The idea is that if we are developing a new flash flood warning system and using thresholds such as "severe", "high", etc., it would be good to assess how the various threshold levels relate to the impacts in terms of property damage and loss of life.

355:17 – I think the comparison of the number threshold exceedances between simulations and observations is important. This should also be quantified in terms of a correlation coefficient or coefficient of determination.

Figure 5 – I have some concerns with the scatterplots, particularly for discharges above 50 m3/s (which admittedly are rare, but are also the ones that are most likely to have

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the biggest impact). It seems to me that if I simply plot the simulated versus observed discharges for the values 50 and higher, the coefficient of determination will be greatly diminished, and possibly nonexistent in the case of Virdourle. I suggest the authors perform this analysis and see if this turns out to be true. If so, this is a potential problem that would need to be addressed.

Technical Comments: – Please simply go through the article and pay particular attention to the grammar. There are several errors that need to be adjusted before this paper can be considered publication worthy.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 345, 2008.

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