

## ***Interactive comment on “A data based mechanistic real-time flood forecasting module for NFFS FEWS” by D. Leedal et al.***

### **Anonymous Referee #2**

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1. The manuscript is well written and clearly structured. The case study in the Eden shows the tool could be potentially useful for a short-range (up to 7 hours) flood level forecasting, in particular for high but in-bank stream flow.
2. The uncertainty level demonstrated in the case study seems too large to be effectively used for operational flood forecasting. Even for the 2hr-step ahead forecast, fig5 shows the uncertainty associated with the peak level is approximately +/- 1.5 metre. It is significant and hence decisions based on this may be very hard to make.
3. Fig 6: are the dotted lines in the 4 sub-figures supposed to represent the same observed flood levels? A small peak towards the end of the event can be seen in fig6 (f=2). Where did this small peak come from?

4. It is better for visual comparison if subfigures in Fig 5 and Fig 6 share the same vertical scales (0-8m, or 0-9m).

5. The manuscript is unsuitable for HESS, and the special issue. There are a couple of reasons. The method used is not new and it is only tested for one catchment. The manuscript focuses on the FEWS module design. The results of the case study only use 2 pages, whereas 7 pages were spent on Sec 2 (although most of these have been described and discussed elsewhere). With much elaborated description of the methods, I have expected more results that reflect proportionally the methods described in Sec 2. Authors didn't describe basic characteristics of the Eden catchment. Readers in the community of hydrology and earth science research will like to know what type of catchment is under study, e.g. the slope, average precipitation, temperature, rainfall runoff ratio, max water levels, bankfull levels, etc. Essentially, the relevant information about the catchment will help readers appreciate for what type of events and catchments, this method is most appropriate. Authors seem to have assumed all readers know the catchment well and there isn't any need to put the case study in perspective. The manuscript doesn't emphasize much on Hydrology and Earth System Sciences but really a preliminary development of the module used in the FEWS and one numerical experiment. The manuscript is perhaps more suitable for the journal of Environmental Modelling & Software as a short letter, but not a full research article because the case study contains only one experiment that doesn't convince people that the module developed can be yet used as a robust tool in flood forecasting.

6. P7273, L12 'remove' change to 'removes'

7. P7275, L15 'Takagi-Suginio' change to 'Takagi-Sugeno'

8. P7282, L7 'unprecedented' is not a very scientific term to be used in this context. Are the authors certain the magnitude never happened in the history? Please consider to rephrase.

9. P7282, L12 'This event occurred four years after the end of the calibration data

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period.’ Spelling is wrong for ‘occured’, change to ‘occurred’. What is the purpose of this sentence? Authors can easily figure out Nov 2009 is approximately 4.5 years after Mar 2005.

10. P7282, L15 ‘probability of detection (POD) and false alarm rate (FAR)’. Although authors mentioned ‘A description of POD and FAR calculation is given in Environment Agency (2006).’, the citation isn’t widely available. It is necessary to provide their definitions in the manuscript.

11. P7282, L16 ‘57 threshold crossing events’. What is the threshold used by the authors?

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