

Responses to referee's Comments

The authors appreciate the careful review and constructive suggestions and thank the reviewers for the effort and time put into the review of the manuscript. Each comment has been carefully considered and responded in *italic* format. It is our belief that the manuscript is substantially improved after making the suggested edits.

5

Interactive comment on “Accuracy assessment of real-time flood forecasting of coupled hydrological and mesoscale meteorological models” by Aida Jabbari et al.

Anonymous Referee #2

10 **Received and published: 19 April 2018**

Response to Referee 2:

Thank you for your review of our paper. We have answered each of your points below in italic format.

15 The paper describes evaluation of WRF-downscaled driving data used in a hydrological model in a catchment on the border between North and South Korea. The paper sets out to analyse the optimal setting of temporal and spatial resolution of the precipitation modelling to produce a good hydro-meteorological forecast for the area. However, the analysis is only done over three case studies and the results do not support the conclusions. The sample size is simply too small. Further, the paper is not well organized and I am often confused by the description of the methods and results; and there is not enough relevant references. I therefore do not recommend
20 the paper to be published in its current form.

➤ *The present study has two objectives. The first objective of this study is to find proper hydrological model to couple with a meteorological model. We used the real-time forecast data of the WRF model to find the proper
25 hydrological model. The second objective of this study is to evaluate the effects of lead time, spatial and temporal resolution variation of the WRF model data on the performance of coupled hydro-meteorological models. A variety of tests are conducted to support our objectives in this study.*

Specific comments.

30 1. As stated already the paper would be more interesting if the study were done over a longer time period to support a robust statistical analysis of the results. It is OK to highlight certain features through case studies, but you cannot build your results on only three cases.

➤ *The authors partially agreed with reviewer’s comment. We totally used nine events in this study, six events
35 for the calibration and verification of the hydrological model and three events used for the real-time flood forecasting by coupling SURR-WRF model. The number of events used in hydro-meteorological studies strongly depends on the purpose of the study. In this study we have two objectives. The first objective is*

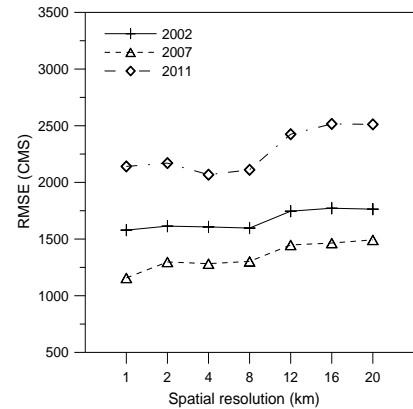
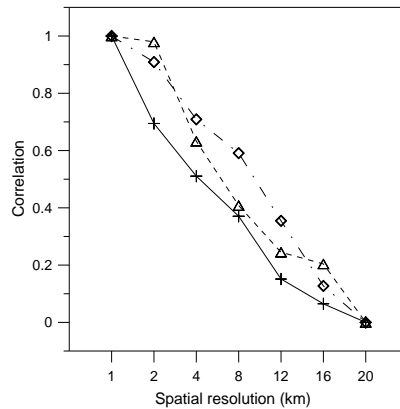
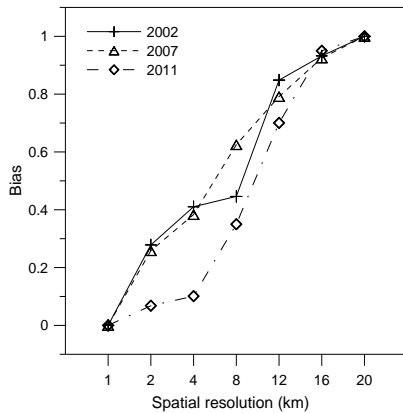
grounded on the idea to find the proper type of the hydrological model to couple with a meteorological model for a real-time flood forecasting. The results of this part led to choose the semi-distributed hydrological model. The results of the comparing the point scale and catchment scale of the precipitation analysis supports our first objective to find the proper hydrological model. In order to follow our first objective the number of events provided the required information to get a judgment for choosing the proper hydrological model.

5

➤ The second objective is to evaluate the effects of lead time, spatial and temporal resolution variation of the WRF model data on the performance of coupled hydro-meteorological models. For our second objective the real-time forecast accuracy variation assessment is done by considering the effects of the lead time forecast, spatial and temporal resolution of the meteorological model. We used three flood events which are the most important floods for the study area. We considered these events to have a reasonable chance of seeing such that effects and to provide the required sample size for comparative analysis for this research. The precipitation analysis and discharge evaluation for different spatial resolutions showed that by decreasing the spatial resolution the accuracy of the forecast decreased (following figures). Therefore it can be found that by increasing the number of events this trend will not change.

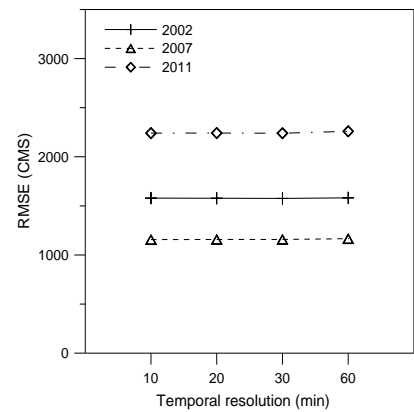
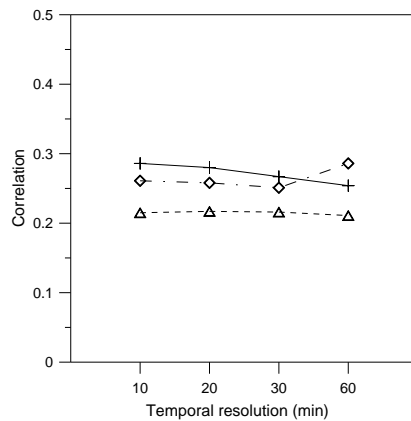
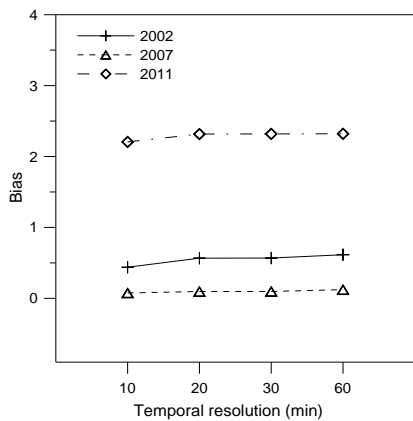
10

15

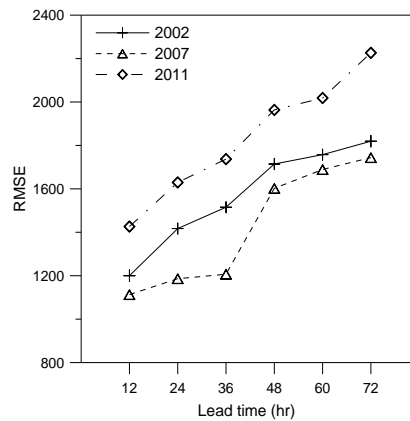


➤ Also the temporal resolution variation showed that the forecast accuracy in precipitation and discharge analysis did not change (following figures). Therefore increasing the number of events will not change this trend of accuracy variation.

20



➤ Also for the forecast lead-time assessment, the forecast skill decreases with the increase in lead time (following figure) and increasing the number of events will follow this trend too.



5 ➤ These events are considered to support the second objective and proposed analysis of our research. The number of three events is considered for comparison of the results and this number provides the specific aims of the analysis.

2. The text is often too long and some details described to carefully. I also sometimes struggle to understand what the authors mean, so the paper would need a thorough language revision.

➤ The manuscript is edited previously by English Language Editing Service. However it is necessary to rearrange the sentences by breaking the long sentences into shorter ones and simplifying the sentences to reduce the confusion. The modified sentences are shown in red colour in the manuscript text. After this review process we will again send the manuscript to the English editing.

3. There is a lack of relevant references to support the statements made in the introduction, and the references are often too old.

- 5 ➤ *Some of the old references are deleted and instead newer references related to this study are added to the manuscript. The modified sentences are shown in red in the manuscript text.*