

## ***Interactive comment on “The Norwegian forecasting and warning service for rainfall- and snowmelt-induced landslides” by Ingeborg K. Krøgli et al.***

### **Anonymous Referee #2**

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The paper “The Norwegian forecasting and warning service for rainfall- and snowmelt-induced landslides” gave detailed descriptions of the history, developments, scientific results, applications and case study of the warning service. Besides, this paper not only addressed essential components of Early Warning System (EWS) e.g. meteorological forecasts, hydrological models, landslide database, thresholds and verifications, but also pointed out some challenges that need to be overcome. Therefore, this paper fitted in with this special issue as well as NHES journal.

However, there were still several issues need to be clarified/revised before publication:

(1) What types of landslide does this EWS deal with? Considering different types of

C1

landslide (e.g. deep-seated landslide, shallow landslide, rockfall, debris flow or any others) should refer to different early warning models, if there were not just only one type of landslide included in this EWS, the authors might need to add a table to tell readers the types of landslide, the early warning models and the parameters used in this system.

(2) Page 6, Line 3~4: The authors listed several dates of important landslide events, however, readers might not be able to understand how important or how special they were. A table with more detailed information such as rainfall intensity, accumulated rainfall, duration, geological and geomorphological conditions might need to be added.

(3) Section 3: Although several references were provided throughout section 3, the authors are recommended to briefly explain some important methods such as warning models and thresholds with equations or figures so that the readers might be able to get a picture of the theory running in the system more quickly.

(4) Page 9, Section 3.2.4: It is suggested that at least probability of detection and probability of false alarm should be demonstrated here or in section 5.

(5) Page 18, Line 1~4: The authors mentioned that over 95% of the assessment were considered as correct during 2013-2016, but the methods and data for the validations of threshold values, hydrological simulations, weather forecasts and the judgements of forecasters in duty were not shown here.

(6) Page 20, Table 3: How many days ahead does this EWS provide landslide/flood forecasting warnings? In section 3.2.1, the authors mentioned that AROME forecasts the weather for the next 66 hours while EC forecasts for nine days ahead. On the other hand, in page 11, line 9~10, the authors said forecasting weather are provided for the next 6 days on the website Xgeo.no while in page 12, line 31, the authors said forecasting warnings are provided for the next 3 days on the website varsom.no. If this EWS provides forecasting warnings only for the next 3 days, then it is suggested that the days beyond 3 days should not fill in green color in table 3 since this might lead

C2

to the misunderstanding that warning level of 4th Oct. can be predicted on 28th Sep. Besides, in the table of flood warning, the “day for which the warning was valid for” might be typos because 4th followed by 30th and 1st.

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