

Review

Flash-flood early warning using weather radar data: from nowcasting to forecasting
by Liechti et al.

The paper describes the comparison of precipitation forecast products for probabilistic forecasting in the Swiss alpine region using a rainfall runoff model. In general the paper is well structured and in general well written. It is clear a lot of work and analysis went into this manuscript.

In the comparison several forecast chains are compared. In the experiment setup effects of initial conditions, boundary conditions (forcing) and model bias due to calibration dataset are mixed. From the experimental setup and description it is not clear which effects are taken into account or are studied in this manuscript. It is also not made clear or mentioned what the limitations are of the experimental setup. This leads to 'surprising' results and information that was not given or at least not highlighted as limitation in the material&methods section (see page 2311 where the effect of the model calibration is mentioned). It also leads to results and conclusion that cannot be generalized. It stays unclear what the reader should learn from this work. This may be caused by the fact that the aim of the paper is not clear or that the experimental setup does not match the aim posed by the authors

The authors need to rethink/write what can be learned/deduced from comparing chain x with chain y and clear write this down. I see two different experiments:

- The experiment with the three chains with same initial condition (RADAR) and different forecast products can say something about the performance of the different forecasts products (NORA, C2, PERS) relative to each other;

-The experiment with the three chains with different initial conditions (REAL, RADAR, PLUVIO) but same det. forecast product (C2) can be compared to say something about the importance/effect of different initial conditions (and model calibration data) using the same forecast product. Maybe using an approach as recently was put forward by Rakovec et al (2012) where based on pluviometer data a historic precipitation ensemble was created could be a recommendation or future line of research.

The authors need to separate the results and discuss the results in this manner to reach meaningful conclusions that can be generalized in same way. They should also attempt to relate to other similar work that is focused on the different effects of initial conditions and forecast products on forecast quality.

This will also require a reshape/write of the introduction and formulation of the aims of the manuscript. The effect of initial conditions is not mentioned in the introduction nor are relevant references provided in the introduction

Specific:

-The aim of our study is to explore the space between radar-based nowcasting and radar-based forecasting and, in particular, to investigate the potential of purely radar-based flash flood forecasting.

-The main objective of our study was to investigate a possible added value of NORA for flash-flood early warning.

What is the real objective? And how does the experimental setup matches/serves this aim?

-Is the using the persistence of the radar field at T0 a realistic forecast scenarios otherwise leave this out of the comparison/manuscript;

-combine chapter 2/3/4/5 into one chapter 2 Materials & Methods

- Is hourly time step enough for hydrological modeling/forecasting? What is the rational for choosing this model time step?

Ref:

Generating spatial precipitation ensembles: impact of temporal correlation structure, O. Rakovec, P. Hazenberg, P.J.J.F Torfs, A.H. Weerts, R. Uijlenhoet, Hydrol. Earth Syst. Sci., 16, 3419–3434, doi:10.5194/hess-16-3419-2012.