Verification of a probabilistic flood forecasting system for an Alpine Region of northern Italy

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Nowadays, probabilistic hydrometeorological forecasting chains are becoming an operational tool used for civil protection purposes and for issuing flood alerts. For this reason it becomes important to have a reliable system and so to validate its predictive performances.

The aim of this work is to validate a probabilistic flood forecasting system: Flood-PROOFS. The system works in real time, since 2008, in an alpine Region of northern Italy, Valle d'Aosta. Flood-PROOFS supports decision makers through the forecast phase and it's useful to manage critical situations. It is used by the Civil Protection regional service to issue flood warnings and by the local water company to protect its facilities.

Flood-PROOFS uses as input Quantitative Precipitation Forecast (QPF) derived from the Italian limited area model meteorological forecast (LAMI) and forecasts issued by regional expert meteorologists. Furthermore the system receives real time meteorological and satellite data and real time data on the maneuvers performed by the water company on dams and water captures. The main outputs produced by the computational chain are deterministic and probabilistic discharge forecasts in different cross sections of the considered river network.

The validation of the flood prediction system has been conducted on a 25 months period considering different statistical methods such as Brier score, Rank histograms and verification scores.

The results highlight good performances of the system as support system for emitting warnings but there is a lack of statistics especially for huge discharge events.