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

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Probabilistic hydrometeorological forecasting chains are increasingly becoming an operational tool used by civil protection centres for issuing flood alerts. One of the most important requests of decision makers is to have reliable systems, for this reason an accurate verification of their predictive performances become essential.
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. It is used by the Civil Protection regional service to issue 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 (COSMO-I7) and forecasts issued by regional expert meteorologists. Furthermore the system manages and uses both real time meteorological and satellite data and real time data on the maneuvers performed by the water company on dams and river devices. 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.