Hydrologic Ensemble Forecasts for Flash Flood Warnings at Ungauged Locations

J. Demargne, P. Javelle, D. Organde, Maria-Helena Ramos

Geophysical Research Abstracts
Vol. 15, EGU2013-12767, 2013
EGU General Assembly 2013

Hydrologic Ensemble Forecasts for Flash Flood Warnings at Ungauged Locations

Julie Demargne (1), Pierre Javelle (2), Didier Organde (1), and Maria-Helena Ramos (3)
(1) HYDRIS Hydrologie, Saint Mathieu de Tréviers, France, (2) Irstea, Aix-en-Provence, France, (3) Irstea, Antony, France

Development of operational flash flood warning systems is one of the challenges in operational hydrology: flash floods are devastating but difficult to monitor and predict due to their nature. To provide flash flood warnings for ungauged basins, Météo-France and Irstea (formally Cemagref) have developed a discharge-threshold flood warning system called AIGA, which combines radar-gauge rainfall grids with a simplified distributed rainfall-runoff model run every 15 minutes at a 1-km^2 resolution. Operational since 2005 in the Southern part of France, the AIGA system produces, every 15 minutes, a map of the river network with a color chart indicating the range of the estimated return period of the ongoing flood event.

To increase forecast lead time and quantify the forcing input uncertainty, the rainfall-runoff distributed model ingests the 11 precipitation ensemble members from the PEARP ensemble prediction system of Météo-France. Performance of the experimental probabilistic precipitation and flow forecasts is evaluated from a variety of ensemble verification metrics (e.g., Continuous Ranked Probability Skill Score, Relative Operating Characteristic score) for different French basins. We also discuss planned enhancements and challenges to assess other sources of hydrologic uncertainty and effectively communicate the uncertainty information to forecasters for better risk-based decision making.