Geophysical Research Abstracts
Vol. 21, EGU2019-8197, 2019
EGU General Assembly 2019

An innovative approach for an integrated hydrological nowcasting chain: application on Liguria Region

Maria Laura Poletti (1), Francesco Silvestro (1), Silvio Davolio (2), Flavio Pignone (1), and Nicola Rebora (1)
(1) CIMA Research Foundation, Savona, Italy (laura.poletti@cimafoundation.org), (2) ISAC-CNR

In recent years, the Liguria Region of Italy has been affected by several flash floods that have caused significant losses in terms of damage to infrastructure and human lives. The forecast of this kind of events is a critical issue for civil protection. The suitable approach to deal with this problem starts from the most accurate forecast of the rainfall field to be the input of the hydrological model. For this purpose, it is possible to take advantage of the output of the nowcasting, that is a forecast at short lead time (0 to 6 hours), but also of the forecast of the Numerical Weather Prediction Systems. The realization of an integrated hydrological nowcasting chain coupling the combination of different rainfall fields and the hydrological model can improve the discharge forecast.
Within this study this coupling is performed joining in a unique tool the nowcasting technique PhaSt, a spectral-based nowcasting procedure, the NWPS MOLOCH corrected with data assimilation and the hydrological model Continuum, a continuous distributed hydrological model. The connection between the output of the forecasting models is performed through a technique called blending, that tries to linearly combine the rainfall fields according to their reliability function of the lead time. The blending has been approached in a novel way in this study exploiting the information retrieved from the NWPS both in terms of indication regarding the variation of total volume on the domain considered and in terms of location of the rainfall structures. An evaluation of the performances of the chain has been performed on some case events of autumn 2014 all over Liguria Region, northern Italy. A distributed analysis, executed on the entire domain on which the hydrological model is computed, has been possible obtaining representative results for all the basins involved in the events (more than 600 hydrological sections have been considered). According to the results obtained with the case studies it remains an open challenge the definition of a blending function that takes the best from every forecasting method.