

## **Prediflood: A French research project aiming at developing a road submersion warning system for flash flood prone areas**

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Accurate flood forecasts are crucial for an efficient flood event management. Until now, hydro-meteorological forecasts have been mainly used for early-warnings in France (Meteorological and flood vigilance maps) or over the world (Flash-flood guidances). Forecasts are also often limited to the main streams or to specific watersheds with particular assets like hydropower dams, leaving aside large parts of the territory.

Distributed hydro-meteorological forecasting models, able to take advantage of the now available high spatial and temporal resolution rainfall measurements, are promising tools for anticipating and quantifying the short term consequences of storm events all over a region. They would be very useful, especially in regions frequently affected by severe storms with complex spatio-temporal patterns. They would provide the necessary information for flood event management services to identify the areas at risk and to take the appropriate safety and rescue measures: prepositioning of rescue means, stopping of the traffic on exposed roads, determination of safe accesses or evacuation routes.

Some preliminary tests conducted by the LCPC within the European project FLOODsite have shown encouraging results of a distributed hydro-meteorological forecasting model. It seems possible, despite the limits of the available rainfall measurements and the shortcomings of the rainfall-runoff models, to deliver distributed forecasts of possible local flood consequences – road submersion risk rating at about 5000 different locations over the Gard department in the tested case - with an acceptable level of accuracy. The PreDiFlood project (<http://heberge.lcpc.fr/prediflood/>) aims at consolidating and extending these first results with the objective to conduct pre-operational tests with possible end-users at the end of the project.

Such a tool will not replace, but complement existing flood forecasting approaches in time and space domains that have not been covered until now (short term forecasting at a regional scale). It will produce a completely new type of forecasts and the usefulness of such data for the emergency services for their real-time decision making will be assessed within the project. Beyond the direct operational objectives, this project aims at demonstrating, on a specific application (the now-casting of road submersions), the possibilities and also the limits and hence the needed improvements of tools that are still underused: radar quantitative precipitation estimates but also precipitation now-castings, distributed rainfall-runoff models, and the recent knowledge acquired on flash-floods consequence evaluation as well as event management.