Devastating flash-floods, which are triggered by heavy rainfall events, regularly occur in the Mediterranean coastal regions. These floods represent a significant hazard to human safety and a threat to property, especially in urbanized watersheds. Thus, hydrologic forecasts are needed to generate effective warning guidance and to notify at-risk populations. It would be useful to improve the simulation of the amount of runoff produced during a precipitating event in order to locate exposed areas. Forecasting river discharges needs to be improved especially up to a 6h range, which is a relevant lead time for emergency services in crisis time.

The ultimate objective of the present work is to benefit from the improvement of nowcasting and probabilistic flood forecasting at very short range over Mediterranean watersheds.

**Questions which will be addressed**

1. How to better predict the risk of severe runoff over Mediterranean urbanized watersheds?
2. Do radar quantitative precipitation estimates (QPE) and associated uncertainty information allow to move forward in nowcasting of river flow and flood events in the Mediterranean region?
3. To which extend numerical weather nowcasting (NWC) rainfall can be relevant for very short term Mediterranean flash floods prediction?
4. How to combine probabilistic QPE and NWC quantitative precipitation forecast to predict the risk of runoff at very short range?

**Two hydrological models are used:**

- **ISBA-TOP** coupling
- **MARINE**: a rainfall-runoff model

Both are physically-based, distributed, and single-event models.

**Precipitation nowcasting**

Three primary approaches exist for precipitation nowcasting depending on the length of prediction and the forecast skill. These approaches are:

- Based on observational data: extrapolating radar echoes (cross-correlation tracking) and centroid tracking techniques
- Generating an ensemble of precipitation fields to characterise the residual errors in radar precipitation estimates
- Based on numerical weather prediction (NWP) models and rapid update cycle approach used in NWC systems
- Merging of radar-based extrapolation with NWP-based forecast

**Study area and datasets**

Extreme downpours and flash-floods have wreaked havoc in areas around Cannes on October 3, 2015. More than 100mm of rain fell in Cannes in just one hour. Intense flash floods were observed on many rivers. 21 fatalities and high damages notably due to the density of urban areas were reported.

To answer question 1, the impact of physiographic maps on simulated hydrological response (runoff production and discharges) over the study area (S) during this episod, is assessed via 6 datasets at different scales used to describe the soil in the hydrological models:

**Cumulated rainfall from September 30 to October 5 2015**

**First conclusions and perspectives**

The spatial distribution of runoff and values of peak discharge varied substantially depending on the soil mesh used. These differences still need to be explained. Proxy data will be helpful to evaluate the relevance of simulated runoff.