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Green roof and storm water management policies: monitoring experiments on the ENPC Blue Green Wave

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Currently widespread in new urban projects, green roofs have shown a positive impact on urban runoff at the building/parcel scale. Nevertheless, there is no specific policy promoting their implementation neither in Europe nor in France. Moreover they are not taken into account (and usually considered as an impervious area) in the sizing of a retention basin for instance.

An interesting example is located in the heart of the Paris-East Cluster for Science and Technology (Champs-sur-Marne, France). Since 2013 a large (1 ha) wavy-form vegetated roof (called bleu green wave) is implemented. Green roof area and impervious areas are connected to a large retention basin, which has been oversized. The blue green wave represents a pioneering site where an initially amenity (decorative) design project has been transformed into a research oriented one. Several measurement campaigns have been conducted to investigate and better understand the hydrological behaviour of such a structure. Rainfall, humidity, wind velocity, water content and temperature have been particularly studied. The data collected are used for several purposes: (i) characterize the spatio-temporal variability of the green roof response, (ii) calibrate and validate a specific model simulating its hydrological behavior.

Based on monitoring and modeling results, green roof performances will be quantified. It will be possible to estimate how they can reduce stormwater runoff and how these performances can vary in space and in time depending on green roof configuration, rainfall event characteristics and antecedent conditions. These quantified impacts will be related to regulation rules established by stormwater managers in order to connect the parcel to the sewer network. In the particular case of the building of a retention basin, the integration of green roof in the sizing of the basin will be studied.

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