

Fractal tools to analyse the spatial variability of Blue Green Solutions in an urban area

Gustavo Otranto Silva¹

¹Fortification and Construction Section, Military Institute of Engineering



Introduction

The increase of the grey areas in the urban areas has increased in the last few years. Thereby, the runoff coefficient has also increased and brought the need of a solution to minimize this impact.

The objective of this study is to analyse the influence of the spatial distribution of the Blue Green Solutions, such as green roofs, in the urban area of Melun, in France.

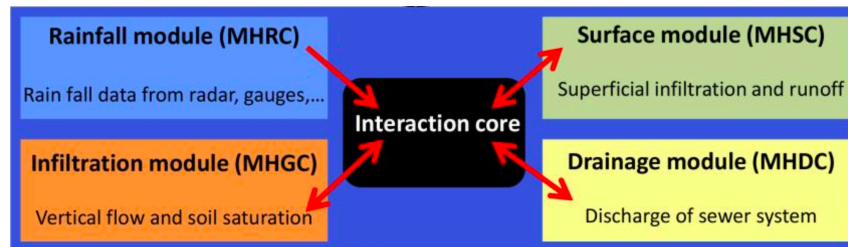
The aim is to achieve the best distribution of the green spaces in these areas, using the fractal model and simulate it on the Multi-Hydro software.



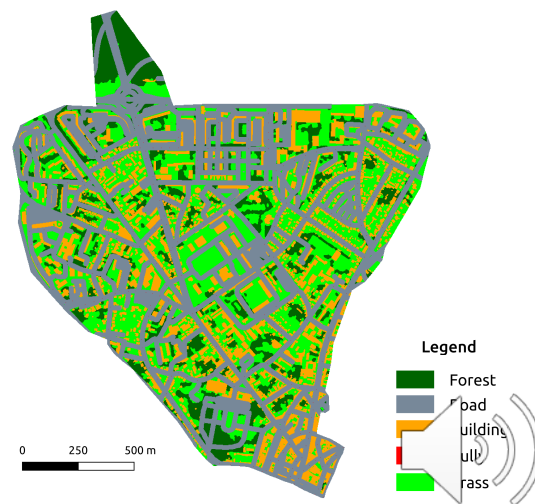
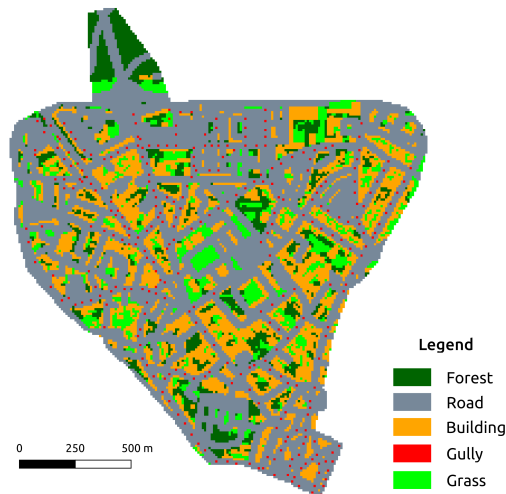
Method

The Multi-Hydro is a fully-distributed model that combines:

- Rainfall Module (MHRC)
- Infiltration Module (MHGC)
- Surface Module (MHSC)
- Drainage Module (MHDC)

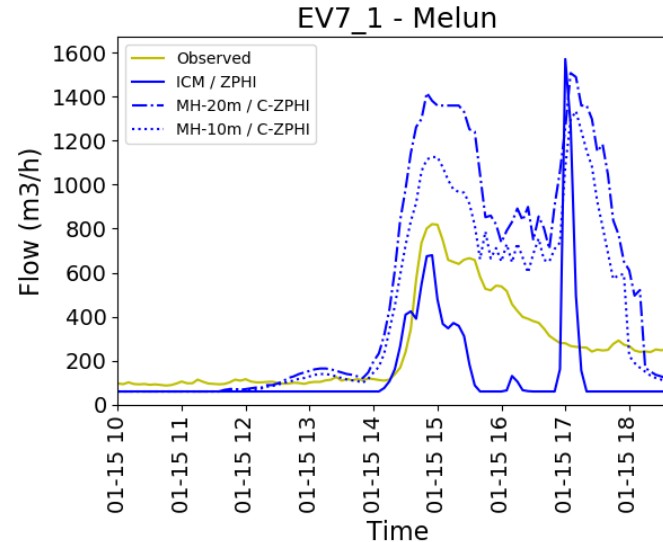


It uses the raster representation of the landuse and some resolutions are being tested to pick the best representation of the catchment.



Results

The results obtained on the simulations of the model on Multi-Hydro (10 and 20 meters resolution) were compared with the real data measured in some parts of the sewer system and also with the InfoWorks simulation and the results were the following:



Final considerations

- Choice of the best resolution for the simulation
- Validation of the model
- Implementation of the green roofs using the fractal model
- Analysis of the impacts of the GBS on the runoff coefficient

Thanks to

Ioulia Tchiguirinskaia, Daniel Schertzer, Auguste Gires, Igor Paz

References

Paz, Igor. (2018). Quantifying the rain heterogeneity by X-band radar measurements for improving flood forecasting.

