

Pilot location: Sucy-en-Brie Catchment, Paris area (France)

Monitoring

Rain gauges: Thirty tipping bucket rain gauges with a 0.2 mm resolution are deployed in the Val-de-Marne County; most of them provide measurements in real time. The rain gauge located in the centre of the study area is not operated in real time because of its local environment. Another rain gauge, that is 1 km away from Sucy basin, can be used.

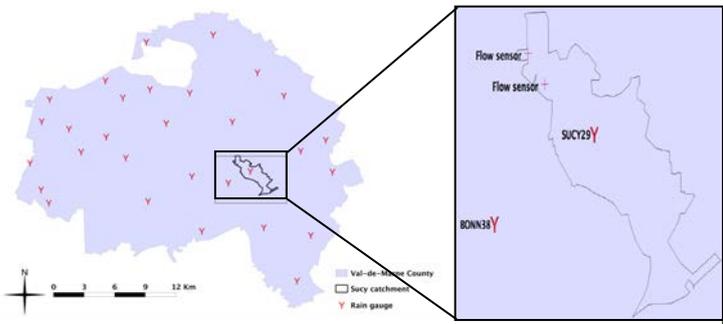


Figure 4: The rain gauge network in Val-de-Marne County.

Flow sensors
In the Val-de-Marne County, several real time flow sensors are installed in the network. They are used in the management of the sewer network as well as in hydrological modelling studies. Two of those flow sensors are located in Sucy-en-Brie Catchment (see their locations in Figure 4).



Figure 5: Example of a rain gauge installed in Val-de-Marne.

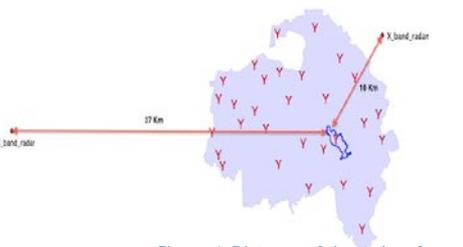


Figure 6: Distance of the radars from Sucy Catchment.

Radars:
A C-band radar is located in Trappes, at approximately 37 km West from Sucy basin. It's a dual polarisation and Doppler radar. The resolution is 1 km in space and 5 min. in time.
An X-band radar will be installed, in the framework of the INTERREG RainGain project, in front of Ecole des Ponts ParisTech, at 10 km North-East from the catchment. The resolution will be 100 m in space and 2.5 min in time.

Spatial datasets

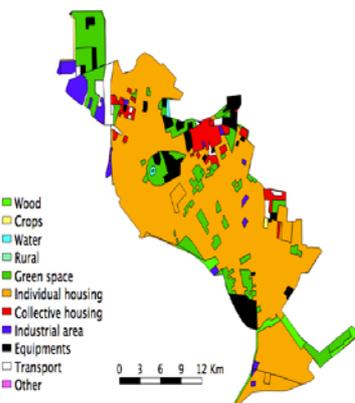


Figure 7: Land use in the Sucy-en-Brie catchment.

The spatial data, used for the Sucy-en-Brie case study, come from the French National Institute of Geography (IGN):
- Land use cover: the spatial resolution is 50 cm x 50 cm and it is divided into 11 categories;
- Digital elevation model: the current spatial resolution is of 25 m x 25 m with a vertical precision of 1 m, a better data resolution (1m*1m) will be available soon.

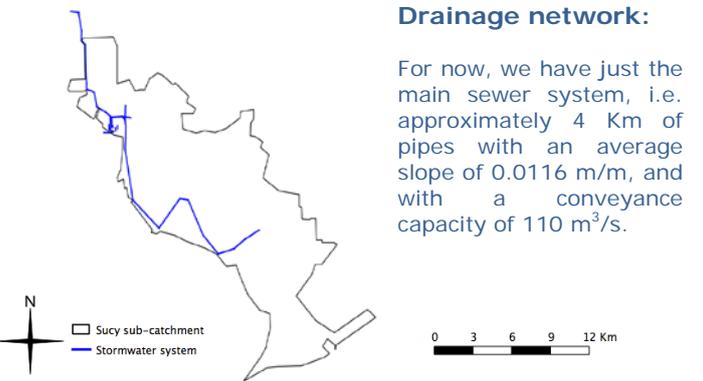


Figure 8: The main sewer system used within the CANOE model.

Drainage network:
For now, we have just the main sewer system, i.e. approximately 4 Km of pipes with an average slope of 0.0116 m/m, and with a conveyance capacity of 110 m³/s.

Urban pluvial flood models

CANOE model:
The CANOE model is a semi-distributed model, currently used by the General Council of Val-de-Marne County for the purposes of hydrologic modelling.
In this model, flow sensors and retention basin have been added and the whole model was already calibrated. A library of precipitations is available and it is easy to input a gridded radar data.

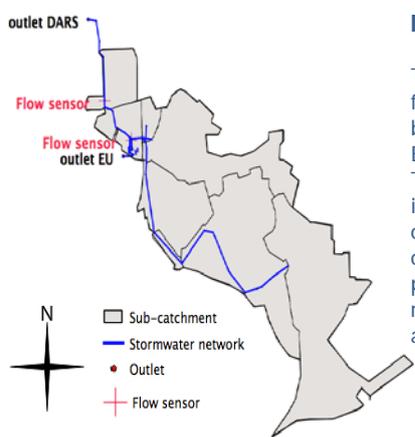


Figure 9: The CANOE model of Sucy-en-Brie catchment.

MULTI-HYDRO model:
The MULTI-HYDRO model is a fully distributed physically based model, developed at Ecole des Ponts ParisTech. This model allows interactions between several open source modules, each one of them represents a portion of the water cycle: rainfall, runoff, infiltration and drainage.

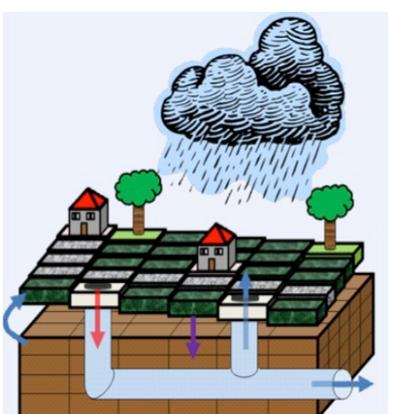


Figure 10: The Multi-Hydro fully distributed model, planned to be used in this case study.