## sd ingénierie

## Reassessment of flood risk for DMB project with high resolution 2D model

The project "Delémont Maré Basse", called DMB, has the goal to protect the population against flood of the river Sorne. After the flood event of 2007, the city of Delémont has launched a big project which was split in different sectors. In 2020, the city asked us a quality control to have a global view of the project. The final goal was to have an updated hazard map with the partial execution.





As a lot a calculation has been made with 1D model but also with a physical model at EPFL, we have suggested to build a big model in 2D. An actual model was first build and then all the execution plans were integrated in the 2D model. A lot of drone flights were also made to have the actual Digital Elevation Model. As the project was updated (four times in total), the mesh size was refined according to the expected level of details. Thanks to the collaboration with different engineer companies, we were able to build a 3D model of the river with HecRas geometry conversion but also with dwg of the different sectors. Our HQ-relation files have been updated according to the 1D model but also linked to standard bridge relation. We have highlighted some differences because of the specific geometry.

Today, we are updating the 2D model with suggestion for the last sector with the global 2D model with Basement 3.2.0. Our 2D model have a huge mesh with 16 bridges (with linked boundary conditions) and two hydrographs for the inflow. After this, we have also extended our model with a surface runoff model (in green below) in the same mesh for the South part of the city linked to meteorological data from MeteoSwiss. We have added 7 other bridges with HQrelation file. In the next month, we will also extend the model for the West part of the city with a second runoff model. In the 2D Model, we have around 15 types of materials and we have also different source of rain according to the runoff coefficient that we have evaluated with a geology partner. Today, the model is still running, and we are still updating the model each week. The model is part of 4.2mio of elements with the smallest resolution of 25cm.

