On this moment there are two new mesh grids that are used to model rivers, estuaries etc. These two mesh grids are Flexible mesh, which is still in active development and mesh 3DI. Both are used for all kind of projects. However, there is no reason why one chooses to uses one or the other. Both Witteveen + Bos and Deltares want to know the answer to the question 'When do you use which mesh grid?'. Let's give a quick look at the two mesh grids.

Flexible mesh is a mesh grids that works in such a way that a very detailed mesh can be produced that clearly shows the characteristics of the water system[1]. The results can be given in 1D-2D and in depth. Hence, a realistic image is the result which can show in detail the impact of measures at every level. This version is still under improvement. Until now, hydrodynamics is the only element couples to these flexible meshes.

3Di is a dynamic water model where the motion of water is described by the conservation of mass and momentum. The first one is of extreme importance in 3Di and is calculated in machine-precision. The latter uses the The Saint Venant equations in 1D and 2D flow to describe the watermovement. 3Di is known to model flows and flooding. In the paper 3Di explained[2] it is written that "A 3Di area model can consist of one or several model layers, namely: a raster terrain layer, a raster subsoil layer, a 1D open water network layer and a 1D sewer network layer." Each of these model layer is suitable for different concepts.

The idea for this graduation project is to find out how both mesh grids work in great detail and look for the differences and similarities. These differences will be among other things in the physics of both types. Physics like how the turbulence is modelled for example, or how the friction is taken into account. When this is done, a sort of scheme can be set up such that when working on a project one can use this scheme to see which of the mesh grids is the best option. When this is known, it can give a great improvement in the usage of both of these mesh grids.

Though no precise research question can be formulated yet, it will be something like "When do you use Flexible Mesh or Mesh 3DI when working on different projects?".

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[1] Deltares, Next Generation Hydro Software (Current Developments)
[2] 3Di watermanagement (2014), 3Di explained