Ecohydraulics
HYD254

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AUTOTUTORIAL 1: QUICKSTART

Background: This is the first autotutorial learning how to use 2D modeling.

Objective: Learn how to run a simple 2D hydrodynamic model

Materials: download the 2DMEHA_qs.zip file. That has the model boundary shapefile, the topographic points, the _DIP.dat file, an SRH template file for use in SMS, and SRH v 2.1 .exe files.

Homework assignment:

1) Follow the steps in Chapter 2 of the textbook, "2D Modeling and Ecohydraulic Analysis" to yield the 2D model results shown on p. 25 of the textbook. Be sure to use a time step of 1.

2) If your results do not look like the results in the textbook, then try using a smaller time step, such as 0.1. If it still does not work, contact Prof. Pasternack.

3) Repeat the exercise three more times, but this time when you redistribute the vertices, try the following values: 0.5 m, 3 m, and 10 m. Does the model yield similar results regardless of mesh resolution? Compare and contrast.

   * For the 0.5 m mesh, I recommend making a new rectangular boundary using the Map module and cutting the area of the mesh roughly down to the evident wetted area from the 1m model simulation. The reason is that the 0.5 m mesh is only twice the resolution, but requires 4 times the elements (i.e. each 1-m square gets divided into four 0.5-m squares). By eliminating most of the unnecessary dry areas, the model will run faster. Also, you might have to try a substantially smaller time step, like 0.001.

4) Write up a brief summary of your work, including the map graphics for WSE, depth, and velocity for each simulation as well as your evaluation of the mesh-resolution test.

Helpful info:

Please read the README text file to get the latest updates and troubleshooting tips before starting the tutorial.