Master of Science Project

Water Resources Management / Geoscience and Remote Sensing

Theme: Flooding

Assessment of flooding scenarios: influence of dynamic elevation models

Summary

Flooding models, which predict how water will be redistributed after a dike breach, are highly dependent on accurate and precise elevation data. Such elevation data can be obtained from different sensors, both terrestrial, airborne or spaceborne.

In the Netherlands, the AHN (Actueel Hoogtemodel Nederland) is the state of the art information on elevation. The first version, AHN-1, had a spatial resolution of 1 point each 16 m^2 and an elevation precision of 15 cm. For the second version, AHN-2, these numbers are 4 points each m^2 and 5 cm, respectively. However, the typical DEM used by the water authorities is a regular 50m x 50m grid.

As the Dutch topography is very flat, the influence of small errors in the elevation combined with the coarse cells on the simulated results can be enormous. Errors influence ofcourse the extent of the area flooded, but more important also the time it takes before an area is flooded. The latter is extremely important for fast emergency response and available time to evacuate.

The main goal of this MSc thesis study is to investigate whether simulations with contemporary elevation models such as AHN2can be further improved. Moreover, the availability of even more precise and dense information on changes in elevation over time will be investigated using recent radar satellite observations. This will probably lead to improved predictions of how fast an area fills up.

The study is of high importance, as flooding models and scenarios are crucial for the Netherlands, and new satellite technology is in able to improve dynamic elevation models.

Objective

investigating the influence of dynamic (time variable) elevation models to improve the quality of flood scenarios

Students profile

We are looking for a Water Resources Management student with apparent interest in Remote Sensing and Geodesy.
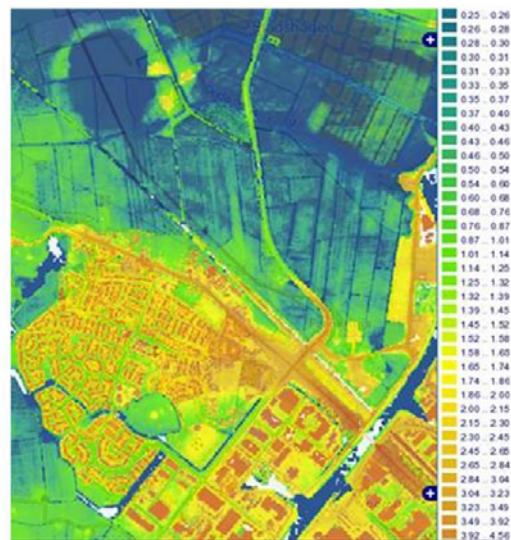
AHN elevation data. The elevation precision influences flooding scenarios significantly

Obligatory committee members:
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For students of Water Resources Management or Geoscience and Remote Sensing

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