

# **AUTOMATIC DETECTION OF BURIED CHANNEL DEPOSITS FROM DENSE LASER ALTIMETRY DATA**

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## **ABSTRACT:**

The formation of the current Rhine-Meuse delta mainly took place during the last 12 000 years. Consecutive avulsions, i.e. sudden changes in the course of river channels, resulted in a complicated pattern of sandy channel deposits, surrounded by peat and clay. Knowledge of this pattern is not only interesting from a geohistorical viewpoint, but is also essential when planning and maintaining constructions like roads and dikes. Traditionally, channel deposits are traced using labor intensive soil drilling. Channel deposits are however also recognizable in the polder landscape by small local elevation changes due to differential compaction. The purpose of this research is to automatically map channel deposits based on a structural analysis of high resolution laser altimetry data. After removing infrastructural elements from the laser data, local feature vectors are built, consisting of the attributes slope, curvature and relative elevation. Using a maximum likelihood classifier, 75 million gridded laser points are divided into two classes: buried channel deposits and other. Results are validated against two data sets, an existing paleographic map and a set of shallow drilling measurements. Validation shows that our method of channel deposit detection is hampered by signal distortion due to human intervention in the traditional polder landscape. Still it is shown that relative young deposits (4 620 to 1 700 years Before Present) can be extracted from the laser altimetry data.

**TOPIC:** Lidar and laser scanning

**ALTERNATIVE TOPIC:** Lidar and laser scanning