Geophysical Research Abstracts
Vol. 19, EGU2017-12900, 2017
EGU General Assembly 2017

Constructing a paleo-DEM in an urban area by the example of the city of Aachen, Germany: Methods and previous results

Bernhard Pröschel and Frank Lehmkuhl

Physical Geography and Geoecology, Department of Geography, RWTH Aachen University, Germany
(proeschel@geo.rwth-aachen.de)

Reconstructing paleo-landscapes in urban areas is always a special challenge since the research area often witnessed constant human impact over long time periods. Dense building development is a major difficulty, particularly in regard to accessibility to in-situ soils and archaeological findings. It is therefore necessary to use data from various sources and combine methods from different fields to gain a detailed picture of the former topography.

The area, which is occupied by the city of Aachen today, looks back on a long history of human influence. Traces of human activity can be dated back to Neolithic time. The first architectural structures and the first road network were built by the Romans about 2000 years ago. From then on, the area of Aachen was more or less continuously inhabited forming today's city.

This long history is represented by archaeological findings throughout the city. Several meters of settlement deposits, covering different eras, are present in many locations. Therefore, it can be assumed that the modern topography significantly differs from the pre-roman topography.

The main objective of this project is a reconstruction of the paleo-topography of Aachen in order to gain new insights on the spatial preconditions that the first settlers found. Moreover, further attention is given to the question whether and to what extent a paleo-DEM can help to clarify specific open archaeological and historical questions.

The main database for the reconstruction are the archaeological excavation reports of the past 150 years, provided by municipal and regional archives. After analyzing these written accounts, we linked this information to drill data, provided by the Geological Service of North Rhine-Westphalia. Together with additional sources like geological and hydrological maps, we generated a GIS-based terrain model.

The result is a high-resolution terrain model, representing the undisturbed pre-roman topography of the inner city of Aachen without any human impact. By visualizing the differences between the actual surface and the paleo-topography, we are able to determine the thickness and volume of the settlement layers.

Based on this terrain model, the accumulation of anthropogenic deposits in distinct areas of the city can be linked to their historic periods. Furthermore, we reconstructed the natural course of the two creeks that are canalized today. For prospection purposes, the paleo-DEM provides information about undocumented early urban structures and helps to predict their location.