

**Urban Geology in Central-Europe – Concept and Practice in Budapest**

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In the past decades a regular urban geological research program has been initiated in the Hungarian state geological research institute (present official name: Mining and Geological Survey of Hungary, 'MBFSz').

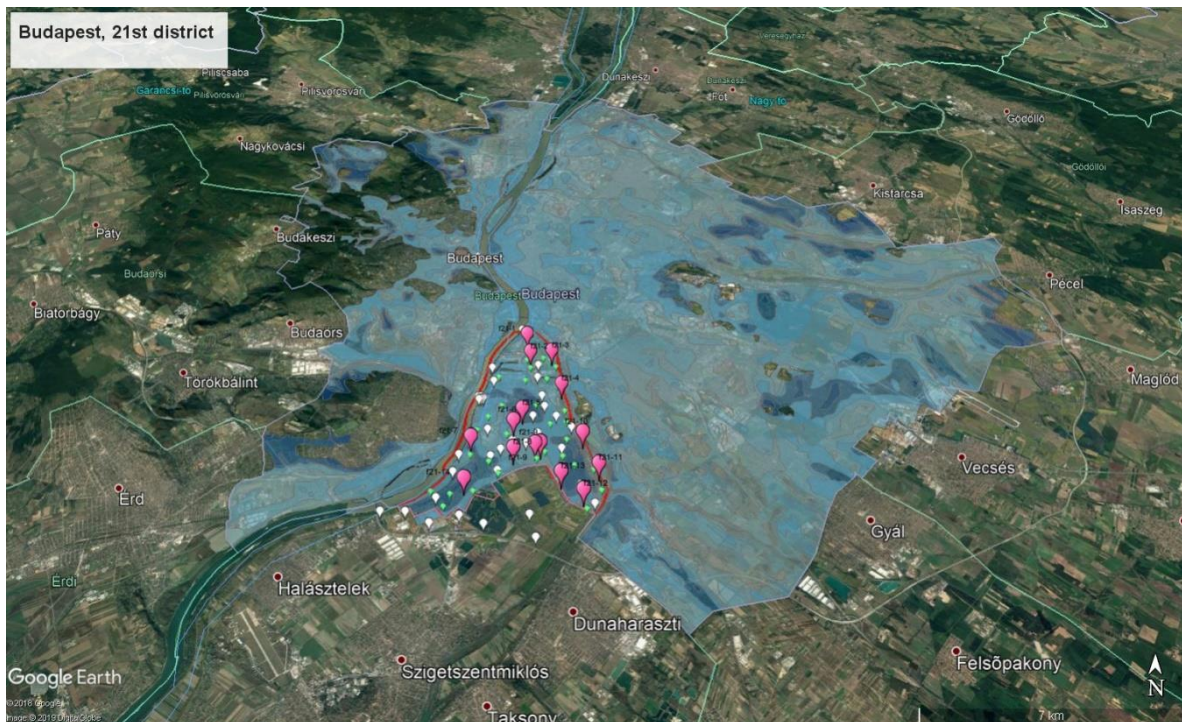
Budapest, capital of Hungary was chosen as target area, because of its complex environmental, social effects which have an extensive interaction with the geological environment under the city. Moreover lots of archive data of previous on-field detections are also available here, which provides an excellent reference base for a comprehensive comparison.

Here we present a comprehensive (a) and a small-scale, multi-location aspect (b) of this research program.

Two aspects of the urban geological program are presented here, as follows:

- a) An overview of the detailed urban geology research program, on example of 21st district of Budapest;
- b) A special sub-research, targeting urban parks' physical features, including underlying shallow geology, soil-temperature and soil-moisture content measurements.

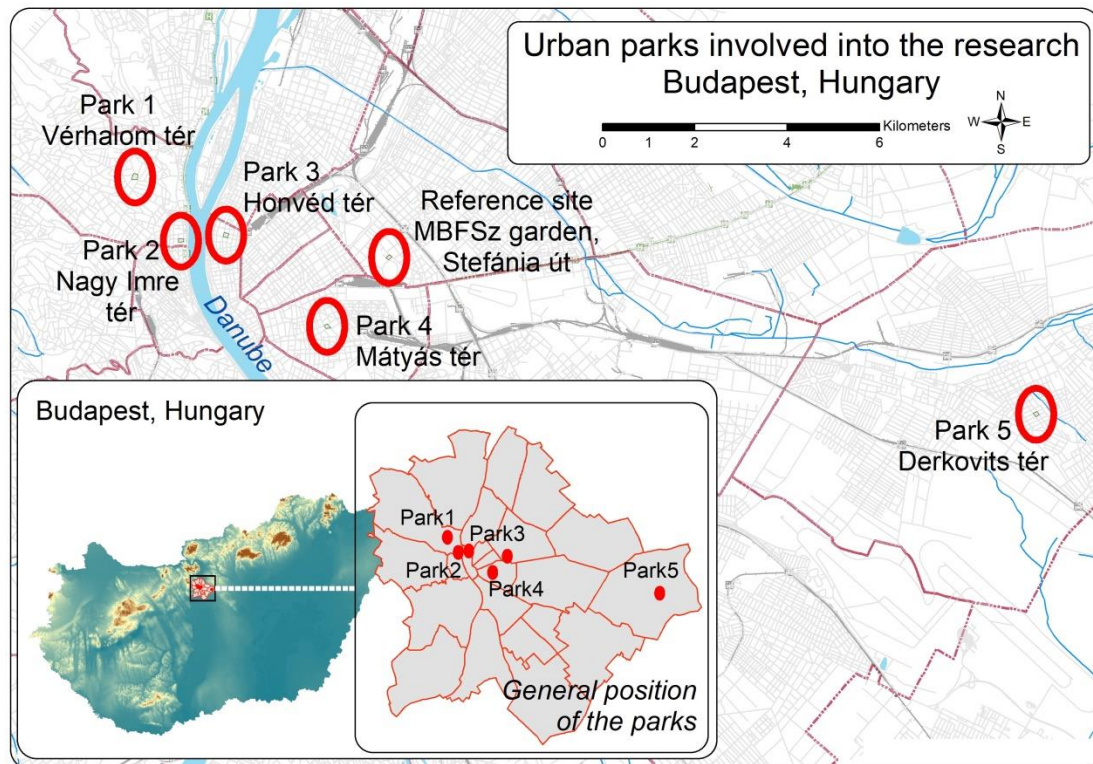
a.) Research program concerning 21st district of Budapest follows a general method which was used in case of other districts of the capital, in the past years. The method is not equal with putting a general geological map under the city in GIS, but much more a detailed relation revealing process among different natural (geological, hydrogeological etc.) and manmade features (street network, built-up areas, green sites etc.), based on archive and fresh on-field data, laboratory examination of soil and groundwater samples, detecting groundwater levels. Using modern data processing tools, we have compiled multi-thematic map-series, accompanied by an explanatory report. Since one map-series contains 15-20 basic and derived, computed themes, a comprehensive, scientific analyses and investigation based picture of the district can be provided for leaders, decision makers, and stakeholders of municipalities.



**Figure 1. A Google Earth draft of Budapest, capital of Hungary, with on-field research (sampling) points of 21<sup>st</sup> district, and distribution of groundwater.**

b.) The objective of the sub-research is to understand better natural processes, interactions among natural and human factors, and so: long-term sustainability of the urban parks. Role of the parks in everyday life of a city should be more and more important in mirror of the climate change, especially if their social relevance is also considered. If we approach this role, it is essential to find a clear connection between the natural and human factors; to interpret properly needs of a park for the society, and needs of the society for a park. A systematic

observation of natural factors of a park can be a strong support to get closer to this connection. In our sub-research, a more than 2.5-year long dataset of air and soil temperature, soil moisture content, and precipitation is available for now, gained by manual data collecting, with weekly frequency. However, in one of the detected parks (Park 3, 'Honvéd tér') new, automated soil temperature meters have been installed at the beginning of this year, providing data from 4 points of the park, 7 different subsurface levels, hour by hour. This tool provides much higher data-resolution, both in time and space. First results of comparison of the two, different time-scale datasets will be presented.



**Figure 2. Position of urban parks of Budapest involved into the research.**

### **Acknowledgements**

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