Urban Mining – a Geospatial data challenge

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SUMMARY

Regarding the worldwide demand on resources like minerals and metal the necessary of improving the mining of secondary raw material becomes clear. One of the biggest warehouses unlocked is the building stock. The approach of recovering resources from the anthropogenic stock is called 'Urban Mining'. Unfortunately, the effective potential is unknown yet, neither in a spatial nor in a temporal comprehension. The availability depends on the type of building and this leads to two main categories which have to be taken into account: On the one hand side space matters, since there is a specific spatial distribution of types of buildings. Concerning the industrial buildings for instance, an urban region with a high density of automotive industry will show a different potential than a rural area with less industry. On the other hand, the remaining life of buildings is based on both the constructional conditions and the specific use. This information could be merged by an urban mining cadaster. Thus, in a research project at Technische Universität Darmstadt a resource cadaster in the metropolitan region Frankfurt/Rhine-Main will be provided, comprising the industrial and trade buildings of the region. Based on single samples of building types, a projection of the spatial distribution as well as the temporal availability for the whole region will be given. This paper shows the methodical approach of gaining a cadaster of secondary resources using private, OpenData, and official geo- and building meta-data as well as modeling the resource inventory. The complex study is initially focused on the city region Darmstadt. Due to the fact different data sources, most of them in a spatial context, geo informatics' approaches can be used to combine and analyze these data. Different spatial data warehouses are providing information about building types in the target area, combined into a centralized data model, analyzed and harmonized to a described comparable value acting as a correlation function and finally will be the basic assembly to perform a resource inventory and statistic based extrapolation to the specific area.

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