APPLICATION OF 3D CITY MODELS IN SOLAR ENERGY ASSESSMENTS

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Abstract

Solar energy applications in urban areas are becoming increasingly popular. However, the efficiency of solar systems is dependent on many factors. Careful planning of installations requires plenty of geographic information including natural and human induced factors. These factors often exhibit strong spatial and temporal variations that need to be properly modelled and predicted. New geospatial technologies including data collection methods (LiDAR, digital photogrammetry) contribute to a wider availability of 3-D city models and their application in urban and environmental analyses. The aim of this paper is to present the application of 3-D city models in the planning of solar system installations. 3-D city models are defined with various levels of detail. The poster deals with the applications of solar energy assessments for 3-D city model at 3 levels of detail for the chosen research area in the city of Presov. The results present processing and modeling data tools using 3-D GIS functionality implemented in GRASS GIS, 3D Analyst of ArcGIS, and supplemented with the CAD 3-D functionality by Google Sketch-Up. Final models show the accuracy of the solar energy assessment based on these levels of details. In the wider point of view, the presented results can be considered as a sample of 3-D city model applications in urban planning and environmental analyses. Keywords: solar energy, urban areas, 3-D city models, GIS

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