



## **Analysing human impacts on the Earth's surface using spatial datasets**

**T. Podobnikar** (1)

(1) Institute of Anthropological and Spatial Studies, Scientific Research Centre of Slovenian Academy for Sciences and Arts, Slovenia (tp@zrc-sazu.si / Phone: +386-14706-493)

The objective of the paper is to show and discuss the impacts of human influences on the Earth's surface. Especially the karst surface is namely more irreversible vulnerable than the other areas. Our study area was Slovenia (that is mostly karstic). The primary data source was digital elevation model (DEM) as 3D data, supported with secondary sources as aerial and satellite images, and older topographic maps, some from the 18th century. For GIS-based analysis of surface changes, all data sources were prepared in a common coordinate system. Overall quality as very important property of the data was tested carefully. Geomorphically high quality DEM 12.5 of Slovenia shows many human influences to the terrain surface, which couldn't be perceived before. Particularly on the karst areas, changes of the surface as consequences of the highways construction and developing of stone quarries are well perceived. Many more surface changes were observed on detailed areas with LiDAR-DEM of 1 m resolution. We also produced a spatial database of natural and artificial features on the current terrain surface (natural: ridges, valleys, sinkholes and peaks; artificial: layer of stone and gravel quarries, layer of all standing waters, and layer of different types of roads and railways). Using and developing different visualisations as one of the most powerful techniques for experts in the GIS-based environment, we analysed human influences to the surface changes from prehistory until today. To avoid subjectivity of the results, the visualisation methods were supported with basic statistical methods. The results show that the human impact into Earth's surface is brutal and it grows exponentially by time.