**A geospatial technique for estimating urban built volume using remote sensing data**

Ronald C. ESTOQUE* and Yuji MURAYAMA

Division of Spatial Information Science, Faculty of Life and Environmental Sciences
University of Tsukuba, 1-1-1 Tennodai, Tsukuba City, Ibaraki 305-8572, Japan

*Contact email address: <estoque.ronald.ga@u.tsukuba.ac.jp, rons2k@yahoo.co.jp>

**Introduction**

Geospatial techniques based on remote sensing and GIS are important in urban studies. However, the analysis of the intensity and spatial pattern of urban land use is, in most cases, based only on the lateral extent of built-up lands (two-dimensional) (Koomen et al. 2009).

The increasing availability of geospatial data, such as remote sensing satellite imageries and digital surface models, provides an opportunity to integrate into urban studies the third dimension in urban analysis, i.e., height of urban features such as high-rise buildings, and thus enables the estimation of urban built volume (UBV). This study introduces a geospatial technique for estimating UBV, focusing on the use of a digital surface model (DSM) derived from ALOS PRISM data. It also presents a method for deriving a digital terrain model (DTM) from a DSM. This presentation presents the application of the proposed technique in Makati City, Metro Manila, Philippines.

**Methodology**

Flowchart of the proposed geospatial technique for estimating UBV from remote sensing data.

**Results**

The resulting DTMs were labelled DTM100, DTM150, and so on. Likewise for the resulting SFH and UBV maps (see Figs. 5-8).

**Conclusion & Prospect**

- The proposed technique for estimating UBV is capable of taking into consideration the height dimension in urban analysis.
- Future prospects: development of validation methods for the results and implementation of the proposed technique in other cities.