INTEGRATION OF MULTI-SOURCE DATA FOR CARTOGRAPHIC OBJECT EXTRACTION TO SUPPORT URBAN SETTLEMENT MANAGEMENT

Jonathan Li

Department of Geography

University of Regina

Regina, SK S4S 0A2, Canada

E-mail: junli@cas.uregina.ca

Heinz Rüther

Department of Geomatics

University of Cape Town

Rondebosch 7701, South Africa

E-mail: heinz.ruther@eng.uct.ac.za

Effective management of urban settlements in developing countries requires adequate geospatial data. To date, the acquisition of spatial models of urban settlements has been based on con-ventional mapping techniques, and mostly on photogrammetry. Data are compiled using ana-logue or analytical methods. These are manual and hence require both considerable expertise and expensive equipment. Moreover, these methods are uneconomical over the rapid developing areas covered by urban settlements and are also too expensive to employ with a regularity required to support such tasks as change detection. Alternative imaging sources and mapping tech-niques are therefore needed.

In this article we examine the problem of geospatial information acquisition for urban settlement management from three perspectives: geospatial information requirements, the role which imagery can play in satisfying these geospatial information requirements, and effective imaging options. We focus on the potential of new generation high-resolution commercial satellite imagery, small-format digital aerial imagery and digital multispectral video systems for rapid settlement mapping. We also discuss the examples of automated extraction of cartographic objects from airborne remote sensing data for 3D city modeling and environmental visulization.