Capability of Google Earth Imagery to Produce Topographic Maps: Prospective Review

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Abstract:

Topographic maps are essential for a variety of surveying and civil engineering applications. Although many surveying techniques: terrestrial and remote are available for collecting data to produce topographic maps, it has been challenging to obtain such data from Google Earth (GE) Imagery.

This paper intends to review the possibility of deriving topo maps data from GE Data. An attempt is made to review published research on the issue, mainly regarding accuracy for both planimetric and height results to be used as input for topo map production.

According to the results obtained by several researchers it can be concluded that GED can provide horizontal accuracy of RMSE nearly 1.0m that can be feasibly used for planimetric maps of up to 1:3000 scale. On the other hand, vertical accuracy obtained from GED would provide data of less accuracy. The elevation data provided by GE are more accurate in areas of small height differences or flat terrain than undulating one. In flat areas vertical RMSE values range from 1.2m to 1.8m. For areas of height variation from 5m to 25m would have vertical accuracy of RMSE values ranging from 1.85 to 5.69 m, that can be used to produce 10-m contour interval topographic maps.

Overall, although it is obvious that for high accurate results from GE it is very important to use accurate control points.