Analysis of Accuracy of Differential Global Positioning System (DGPS) and Google Earth Digital Terrain Model (DTM) Data using Geographic Information System Techniques

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Key words: KEYWORDS: Field survey, Google Earth, DEM, Correlation analysis

SUMMARY

Abstract

The argument over the accuracy of DEM data from Google Earth as compared to DEM generated from field survey have created a lot of uncertainty among research communities and even in the field of geo sciences domain for various applications. To some SRTM DEM data deviation from other DEM data may not support most application areas and others suggest that the deviation of Google Earth DEM is reasonable to support most application areas including researches. This research paper give an illumination of the level of relationship between field survey DEM and Google Earth DEM carried out on a section of ADAMA farm project site located in Etche Local Government Area, Rivers State, Nigeria. The study utilized field survey elevation data obtained using Promark 3 DGPS at 50m x 50m grid interval and Google Earth elevation data obtained using KML. The KML file was first created in ArcGIS 10.1 before exporting to Google Earth and the elevation of each point was extracted using GPS visualizer. Spatial database was created from the two elevation datasets and the following DEM surfaces; TIN, and contour map were produced. The study concluded that TIN model produced from field survey and Google Earth elevation represent uniform topographic surface but the major difference is the inability of Google Earth elevation to show steep slope, a situation that was accounted for by field survey DEM. Also the linear relationship between field survey elevation and Google Earth elevation data resulted in correlation coefficient (r) 0.665 indicating perfect positive relationship as tested using Pearson's correlation algorithm. DEM data from Google Earth elevation with improvement in technology may come to a stage of no argument or if exist will be negligible for topographic modelling.