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Vertical Accuracy Evaluation of Indian National DEM (CartoDEM v3) Using Dual Frequency GNSS Derived Ground Control Points for Lower Tapi Basin, Western India

Authors : Jaypalsinh B. Parmar, Pintu Nakrani, Ashish Chaurasia

Abstract : Digital Elevation Model (DEM) is considered as an important data in GIS-based terrain analysis for many applications and assessment of processes such as environmental and climate change studies, hydrologic modelling, etc. Vertical accuracy of DEM having geographically dynamic nature depends on different parameters which affect the model simulation outcomes. Vertical accuracy assessment in Indian landscape especially in low-lying coastal urban terrain such as lower Tapi Basin is very limited. In the present study, attempt has been made to evaluate the vertical accuracy of 30m resolution open source Indian National Cartosat-1 DEM v3 for Lower Tapi Basin (LTB) from western India. The extensive field investigation is carried out using stratified random fast static DGPS survey in the entire study region, and 117 high accuracy ground control points (GCPs) have been obtained. The above open source DEM was compared with obtained GCPs, and different statistical attributes were envisaged, and vertical error histograms were also evaluated.

Keywords : CartoDEM, Digital Elevation Model, GPS, lower Tapi basin
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