

LiDAR derived digital terrain model: A comparative assessment of Streams with NAMRIA and SRTM data

Jerald L. Ruta, Jojemar Bantugan, Nycel S. Barbadillo

Abstract— Extraction of hydrological features from digital terrain models (DTMs) using geographic information system (GIS) is more convenient because of its accuracy and quicker processing. The accurate extraction of streams are very much important since many urban areas situated near the bodies of water and serves as a drainage system within the area. The accuracy of 1-meter resolution of light detection and ranging (LiDar) derived DTMs was compared against that of DTMs from synthetic aperture radar (SAR) and topographic maps of national mapping and resource information authority(NAMRIA) for extracting drainage line of a pre-selected rural watershed in municipality if Alubijid, Misamis Oriental, Philippines. All DTMs are process and generate features using Hydrology tools of ArcGIS. The method of accuracy assessment primarily uses the concept of root-mean-square error (RMSE) to estimate positional accuracy. The result shows that the wide differences of the delineated streams from LiDAR-DTMs compared to those derived from NAMRIA contour topographic map and SAR-DTMS. It is therefore justified to conclude that the DEM derived from LiDAR-DTM is more accurate and precise as DTMs from other sources.

Keywords—Digital terrain models, LiDAR-DTMS, NAMRIA, Stream extractions.