

The Accuracy of SRTM Water Body Data over the Turkish Territory with Respect to Topographic Maps

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SUMMARY

On February 2000, in terms of the Shuttle Radar Topography Mission (SRTM), Space Shuttle Endeavour was launched into space. With its onboard radars, SRTM acquired data during ten days of operation to gather the most complete near-global high-resolution digital elevation data. The SRTM Water Body Data (SWBD) was subsequently created by data editing that are performed by the National Geospatial-Intelligence Agency (NGA) to produce the finished SRTM Digital Terrain Elevation Data Level 2 (DTED 2). In accordance with the DTED 2 specification, the elevation data have been edited to describe water bodies that satisfy minimum capture criteria. The lines delineating water bodies are attained from one-arc-second DEM, and were organized in vector format by using ESRI 3-D Shapefile format. This data is publicly available since 2015. The horizontal datum of the SRTM data is WGS84, vertical EGM96 geoid.

The accuracy of the data depends on its source, i.e. the digital elevation model (DEM). The height accuracy of SRTM has been investigated in a number of studies. But there are few reports about the horizontal accuracy. The SWBD is a rich data source, and its horizontal accuracy needs to be checked. Since the lines attained from the DEM grid, they go along pixels of 1x1 arc-seconds size. Therefore the data contain straight lines in meridian and parallel directions, representing an orthogonal structure. In order to use this data in geographical information system applications, line simplification is necessary. Due to orthogonal straight lines within the data, common line simplification techniques are not applicable, special attention is needed. Another aspect is the data collection time. SRTM data dates back to February 2000. The SWBD data represents the water bodies at that time. Therefore change detection studies can be undertaken.

In this study the SWBD data is compared to coast line data digitized by using 25K National Topographic Maps of Turkey. Considering the data collection time of the SRTM, coast lines, whose

temporal changes are minimal, are selected for comparison. Preliminary results show that the accuracy of SWBD is below one and half times of the spatial resolution (1" or ~30m). The 25K coast line data was collected by manual digitizing and assumed as ground truths or reference line. Differences between SWBD lines and reference lines are computed by using in-house software developed with C programming language. Digitizing and datum conversions were performed with NetCAD GIS programming package.

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