

Using the landform tool to calculate landforms for hydrogeomorphic wetland classification at a country-wide scale

H. Van Deventer^{a*}, J. Nel^a, A. Maherry^a and N. Mbona^b

^aDepartment of Natural Resources and the Environment, Council for Scientific and Industrial Research (CSIR), South Africa;

^bSouth African Biodiversity Institute (SANBI), Pretoria 0001, South Africa

Abstract

Hydrogeomorphic approaches to wetland classification use landform classes to distinguish wetland functionality at a regional scale. Space-borne radar technology enabled faster regional surveying of surface elevations to digital elevation models, which allowed for automated terrain attribute and landform classification using geographical information systems. Country-wide mapping of landforms remain a challenge though, because of the diversity of landscapes and non-exclusive attributes of each landform class. This article presents the approach, method and steps taken to calculate a country-wide data-set of landforms for wetland-type classification in South Africa, using a freely available Landform Tool. The Landform Tool primarily uses standard deviation from the average elevation, calculated for both small and large neighbourhood distances. The results were compared with 2820 random points, classified manually using Google Earth imagery and topographical maps, and showed a 43% accuracy within 50m of the manually identified landform class. The Landform Tool tended to overestimate benches and valley floors, and underestimate the extent of the slope class, regardless of changes made in the neighbourhood settings or standard deviation settings. Though the data-set was acceptable as a general reference framework at national scale, improvements will be essential for fine-scale wetland delineation and classification.