QGIS Graphical Modeler on topographic beach surveys

Lucas Terres de Lima¹, Cristina Bernardes¹, Paulo Baptista¹

¹ Centro de Estudos do Ambiente e do Mar (CESAM), Departamento de Geociências, Universidade de Aveiro, Campus de Santiago, 3810-193 Aveiro, Portugal. lucasterres@ua.pt, cbernardes@ua.pt, renato.baganha@ua.pt

Abstract

The Graphical Modeler, a tool of QGIS 2.8.1 Wien allows to create complex models using a simple and easy-to-use interface. When working with a Geographical Information System (GIS), most analysis operations are not isolated, but rather part of a chain of operations (QGIS, 2014). Using the graphical modeler, that chain of processes can be wrapped into a single process, which makes it easy and convenient to execute – on a different set of inputs – just as a single process. No matter how many steps and different algorithms are involved, a model is executed as a single algorithm, thus saving time and effort (QGIS, 2014). In the present work, it is intended to create a model with Processing modeler tool in order to obtain surface images from topographic data, acquired in the aim of a seasonal monitoring program of sandy beaches on the northwest coast of Portugal. The beach topography is was monitored by the INSHORE system, a land based survey system in which Global Positioning System in Differential mode (DGPS) is combined with laser measurements (Baptista et al., 2011). The model created performs the standard procedure to the type of data collected. First, the model asks to add the table with the 3D survey coordinates (X, Y, Z). The table goes through the operation ‘Points layer from table’ that turns the table to points in shapefile format. After this procedure, the points with the value of elevation simultaneously pass through the algorithm ‘Ordinary Krigin (global)’ and ‘Fixed distance buffer’. The ‘Ordinary Krigin (global)’ tool creates the interpolated surface elevation of each point and the tool ‘Fixed buffer distance’ creates an area spanning ten meters around the points, generating a study limit to the beach. The results of the two operations follow through the ‘Clip grid with polygon’ tool, generating the final output with the clipping boundary of the beach. The volume of the surface using the algorithm 'Grid volume' is also calculated. The model created by QGIS 2.8.1 Wien generated good results and prove to be efficient. With this created model, any user can obtain reliable results without the need of specific knowledge about the processes involved. The trend for future projects is to optimize operations with the creation of models similar to this.
References