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## ZonalMetrics - a Python toolbox for zonal landscape structure analysis

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### Abstract

We present a Python toolbox for the calculation of zonal landscape metrics. Instead of global calculations focusing on the whole landscape, the proposed ZonalMetrics toolbox allows the calculation of landscape metrics for user-defined zones. Such zones can be defined through regular units (e.g. hexagons, grids) that can be created within the toolbox. In addition, any polygonal set specified by the user (e.g. administrative units) can be used. The implemented set of landscape metrics is specifically selected and valid for calculations within zones. The tool is demonstrated based on a case study for the Warsaw metropolitan area and the possibilities of applying the toolbox for different zonal layers are illustrated. The implementation is based on the Python toolbox introduced in ArcGIS 10.1, offering an easy to use graphical user interface and batch calculation possibilities. The source code is free and open to the community and extendable to specific needs.

### Keywords

Landscape metrics, Zonal metrics, Geographic Information Systems (GIS), ArcPy site package

### 1. Introduction

Landscape metrics were originally developed to characterize landscape patterns in an ecological context (McGarigal and Marks, 1995). Nowadays their applications are continuously growing in this field, and operational applications related to regulation and information functions continue to emerge (Uuemaa et al., 2012).

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