

OBIA (Object Based Image Analysis)

Rationale:

This tool creates a segmented vector polygon output file which characterises and segments the combination of imagery raster images (grids). Segmentation is a method to aggregate pixels together to create a thematic map. The segmentation process creates a set of polygons defined by the statistics associated with the input images. Clusters of the imagery pixels are created in n-dimensional space and created into classes. Aggregation into geographic regions (polygons) is done according to a minimum polygon size rule, and clustering rules.

The segmentation process uses a technique of k-means clustering and uses the iterative removal of outliers via a sieving process.

The resulting shapefile of polygons may take some time depending on the data complexity, file sizes, and number of clusters. Each polygon will have attributes of:

- VALUE – The Class Number of each polygon
- fileX_mean – The average of all pixel values in the polygon from input file X (1 to 5)
- fileX_stde – The standard deviation of pixel values in the polygon from input file X (1 to 5)

Usage:

There are two parameters required for this analysis:

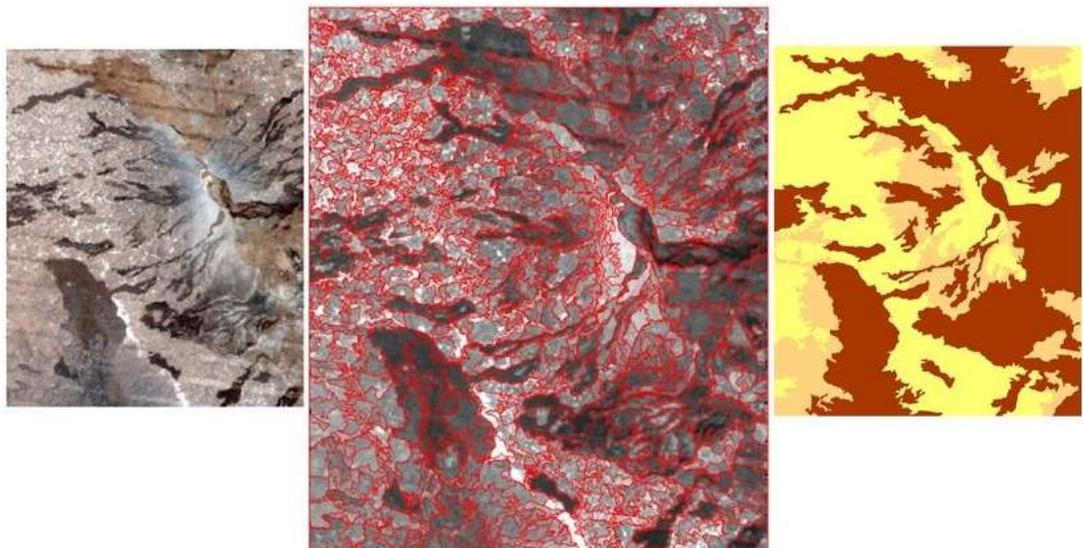
- The number of classes is the number of expected characteristic clusters of data in n-dimensional space. A default value of 10 is suggested but can be altered by the user. Often the number of output classes actually produced is less than the number entered due to the small areal extent of a particular class and therefore deemed insignificant.
- The minimum size is a value in pixels for the smallest areal extent of any polygon class. Small polygons are merged with the largest neighbouring polygon.

Inputs are single layered files – not geodatabases. A maximum of 5 input files are allowed.

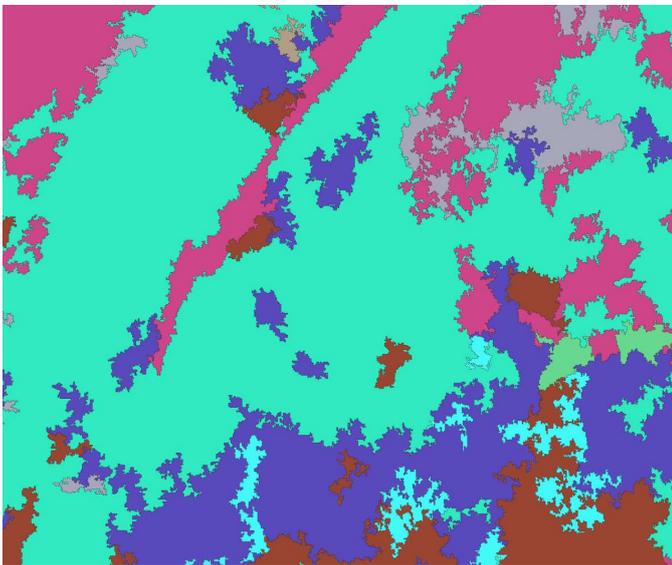
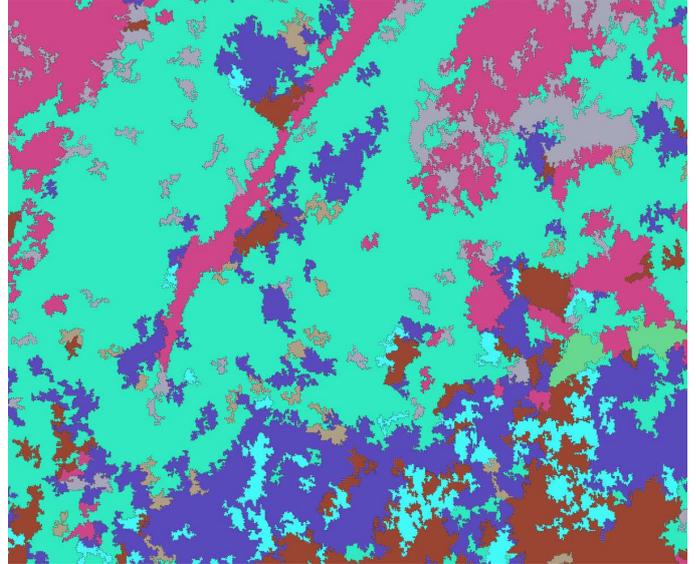
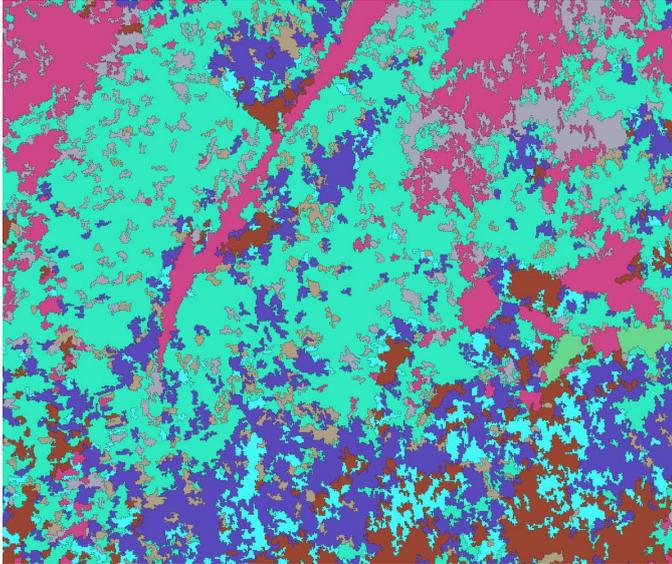
Output is a single polygon vector shapefile and its default filename is the same as the first input filename with “_OBIA” added to the name. Format output is .shp (plus its associated companion files).

Examples:

Satellite imagery bands – Before, Segmented boundaries, and Final Interpretation.



It is envisioned that this tool may be run several times to get the level of interpretation desired. Example below shows 10 classes but a change in the minimum size of polygons (from 30 to 100 to 400).



If the number of classes is reduced from 10 to 5 the classification boundaries are changed, and the analysis gives a similar but differing result:

