

Spatial aggregation: the full power of MADE in your hands

FAO Africover distributes a public domain spatially aggregated version of the full resolution land cover data set.

The public domain spatially aggregated data set retains the full power of the original data set because it is based on the LCCS coding system: you can exploit all the power of the LCCS coding to perform complex queries and you can re-aggregate the data thematically to extract exactly the information you need.

The thematic content of the spatially aggregated data set is very similar to the original data set: the aggregation is performed at a spatial level setting a threshold under which the polygons (with a surface below the threshold) are dissolved in the polygons containing them. The land cover classes of the spatially aggregated public domain data base are the same of the ones contained in the full resolution one but are characterized by a reduced level of spatial detail.

Under the thematic view point only the classes assigned to units (polygons) characterized by a maximum surface that is minor than the aggregation threshold for the specific group are eliminated. The spatial aggregation and its implications on the thematic contents of the data base depend on the cartographic standards adopted for each country.

The spatial aggregation of the country data bases is performed identifying an area threshold for each of the 8 major LCCS land cover classes:

- 1) Cultivated and managed terrestrial areas
- 2) Natural or semi natural terrestrial vegetation
- 3) Natural or semi natural aquatic vegetation
- 4) Cultivated aquatic or regularly flooded areas
- 5) Artificial surfaces and associates area(s)
- 6) Bare area(s)
- 7) Natural and artificial water bodies
- 8) Snow and ice

All the units (polygons) below the threshold are dissolved in the unit (polygon) in which they are contained.

This process is fully documented so that the user can exactly determine the information content of the spatially aggregated data base in relation to the full resolution one. You can analyze the table comparing the characteristics of full resolution and spatially aggregated national databases and further analyze the information content of each data base in the country specific pages.

Starting from this data set you can query it or re-aggregate it thematically or spatially depending on the specific information needs (e.g. rangeland, forest etc.).

To understand the characteristics of the MADE read the inside MADE or visit the technical insight section.

You can refer to the procedure used to aggregate the full resolution data base to understand how to produce your queries and aggregations.

TANZANIA (mapping scale 1:200 000)

PROCEDURE FOR SPATIAL AGGREGATION

- 1. Project view to Albers equal area and calculate area and hectares**
- 2. Using the Africover extension, recalculate codes using lccode. This will divide the lccode into code1, code2 and code3 indicating the classes for mixed units.**
- 3. Identify the major land cover groups and the area cut-offs for each group to achieve a 30 % aggregation (i.e. a 30 % reduction in the number of polygons)**

a) Agriculture (A11; A23) – Minimum mappable area = 150 ha

If an agriculture class occurs in the 2nd and 3rd class of a mixed unit, the whole polygon is considered agriculture and the area cut-off value for agriculture is applied. It does not matter what is in the first class.

$([Code1] = "1*") \text{ or } ([Code1] = "3*") \text{ or } ([Code2] = "1*") \text{ or } ([Code2] = "3*") \text{ or } ([Code3] = "1*") \text{ or } ([Code3] = "3*") = 11636 \text{ polygons}$

Add a field called 'lc' and with the above selection active, calculate lc = "AG". This field will be used in the elimination process.

$([Code1] = "1*") \text{ or } ([Code1] = "3*") \text{ or } ([Code2] = "1*") \text{ or } ([Code2] = "3*") \text{ or } ([Code3] = "1*") \text{ or } ([Code3] = "3*") \text{ and } ([Hectares] < 580) = 3482 \text{ polygons}$

$3482/11636*100 = \text{approx. } 30 \%$

Agriculture < 580 ha are eliminated in the spatial aggregation.

b) Waterbodies (B27; B28) – Minimum mappable area = 90 ha

$([Lccode] = "8*") \text{ or } ([Lccode] = "7*") = 433 \text{ polygons}$

Agriculture does not occur as a mixed unit with Waterbodies.

With the above selection active, calculate lc = "WAT". This field will be used in the elimination process.

$([Lccode] = "8*") \text{ or } ([Lccode] = "7*") \text{ and } ([Hectares] < 110) = 131 \text{ polygons}$

$131/433*100 = \text{approx. } 30 \%$

Waterbodies < 110 ha are eliminated in the spatial aggregation.

c) Bare Areas (B16) – Minimum mappable area = 400 ha

([Lccode] = "6*") = 82 polygons

Agriculture does not occur as a mixed unit with bare areas.

With the above selection active, calculate lc = "BA". This field will be used in the elimination process.

([Lccode] = "6*") and ([Hectares] < 150) = 25 polygons

$25/82*100 = \text{approx. } 30 \%$

Bare areas < 150 ha are eliminated in the spatial aggregation.

d) Artificial Surfaces and associated areas (B15) – Minimum mappable area = 90 ha

([Lccode] = "5*") = 604 polygons

Exclude classes where agriculture occurs in a mixed unit = 496 polygons

([Lccode] = "5*") and (not ([Code2] = "1*") and (not ([Code2] = "3*")
and (not ([Code3] = "1*") and (not ([Code3] = "3*")))))

With the above selection active, calculate lc = "UR". This field will be used in the elimination process.

([Hectares] < 90) = 163 polygons (select from above selection set)

$163/496*100 = \text{approx. } 30 \%$

Artificial surfaces < 90 ha are eliminated in the spatial aggregation.

e) Natural Vegetation – Aquatic (A24) – Minimum mappable area = 180 ha

([Lccode] = "4*") = 4783 polygons

Exclude classes where agriculture occurs in a mixed unit = 4323 polygons

([Lccode] = "4*") and (not ([Code2] = "1*") and (not ([Code2] = "3*")
and (not ([Code3] = "1*") and (not ([Code3] = "3*")))))

With the above selection active, calculate lc = "NVW". This field will be used in the elimination process.

$([\text{Hectares}] < 315) = 1291$ polygons (select from above selection set)

$1291/4323 * 100 = \text{approx. } 30 \%$

Natural Vegetation - Aquatic < 315 ha are eliminated in the spatial aggregation.

f) Natural Vegetation – Terrestrial (A12) – Minimum mappable area = 250 ha

$([\text{Lccode}] = "2*") = 21676$ polygons

Exclude classes where agriculture occurs in a mixed unit = 15721 polygons

$([\text{Lccode}] = "2*") \text{ and } (\text{not } ([\text{Code2}] = "1*") \text{ and } (\text{not } ([\text{Code2}] = "3*") \text{ and } (\text{not } ([\text{Code3}] = "1*") \text{ and } (\text{not } ([\text{Code3}] = "3*")))))$

With the above selection active, calculate lc = "NVT". This field will be used in the elimination process.

$([\text{Hectares}] < 475) = 4734$ polygons (select from above selection set)

$4734/15721 * 100 = \text{approx. } 30 \%$

Natural Vegetation - Terrestrial < 475 ha are eliminated in the spatial aggregation.

4. Start the elimination process

a) Convert to coverage

arc> &amlpath d:\workspace\aml

Use shparc.aml developed by Harold Weepener

arc> &r shparc <landcover> <lc> poly

b) Give the outer boundary lines negative ids so that they are kept in the elimination process

arc> build <lc> line

arc> tables

tables> sel lc.aat

tables> res lpoly# = 1 or rpoly# = 1

tables> calc lc-id = -1

tables> q

c) Recalculate the ids

arc> idedit <lc> line

d) Start eliminating each major group

This process can be run using tz-spatial-agg.aml

```
arc> eliminate <lc> <lc-a> nokeepedge poly # area  
res lc = 'AG' and hectares lt 580
```

```
n  
n
```

```
arc> eliminate <lc-a> <lc-b> nokeepedge poly # area  
res lc = 'WAT' and hectares lt 110
```

```
n  
n
```

```
arc> eliminate <lc-b> <lc-c> nokeepedge poly # area  
res lc = 'BA' and hectares lt 150
```

```
n  
n
```

```
arc> eliminate <lc-c> <lc-d> nokeepedge poly # area  
res lc = 'UR' and hectares lt 90
```

```
n  
n
```

```
arc> eliminate <lc-d> <lc-e> nokeepedge poly # area  
res lc = 'NVT' and hectares lt 475
```

```
n  
n
```

```
arc> eliminate <lc-e> <lc-f> nokeepedge poly # area  
res lc = 'NVW' and hectares lt 315
```

```
n  
n
```