Metric Definitions (Patch Analyst Help Menu)

Class Area

Sum of areas of all patches belonging to a given class.

Example: Conifer Class Area (CA) = 359047.844+......+65819.984

CA = 69.6626 hectares

If the map units are not specified (i.e., View Properties) and State Area in Hectares or Acres has not been selected from the [Advanced box](#) in the Spatial Statistics Menu, then the resulting statistics will be reported in native map units (vector themes only).

In the example; CA = 696626.012 (map units). This is the case for most statistics.

Landscape Area

Sum of areas of all patches in the landscape.

Example: Landscape Area (TLA) = 46872.719 + 359047.844 +... + 62423.574

TLA = 184.11 hectares

Number of Patches

Total number of patches in the landscape if 'Analyze by Landscape' is selected, or Number of Patches for each individual class, if 'Analyze by Class' is selected.

Example: Class Level: Number of Patches (NumP)

Mixedwood = 5, Conifer = 4, Deciduous = 5

Landscape Level: Number of Patches (NumP) = 14

Mean Patch Size

Average patch size.

Example: Mean Patch Size of Conifer Patches (Class Level)

MPS = (359047.844 + 139531.484 ...+ 65819.984)/4

MPS = 17.42 hectares

Example: Mean Patch Size of Patches (Landscape Level)

MPS = (46872.719 + 359047.844 + ... + 62432.574)/14

MPS = 13.15 hectares

Median Patch Size

The middle patch size, or 50th percentile.

Example: Median Patch size of Conifer Patches (Class Level)

MedPS = 13.22 hectares

Example: Median Patch size of all patches (Landscape Level)

MedPS = 7.59 hectares

Patch Size Standard Deviation

Standard Deviation of patch areas.

Example: Patch Size Standard Deviation of Conifer Patches (Class Level)

PSSD = 11.05 hectares

Example: Patch Size Standard Deviation of all patches (Landscape Level)

PSSD = 9.51 hectares

Patch Size Coefficient of Variance

Coefficient of variation of patches.

Example: Coefficient of Variation of Conifer patches (Class Level)

PSCoV = PSSD/MPS = (11.05 hectares / 17.42 hectares) *100 = 63

Example: Coefficient of Variation of all patches (Landscape Level)

PSCoV = (9.51 hectares / 13.15 hectares)*100 =72

Total Edge

Perimeter of patches.

Example: Total Edge Conifer (Class Level)

TE = Sum of perimeter of all conifer patches.

TE = 10858.88 metres

Units are expressed in native maps units.

Example: Total Edge all patches (Landscape Level)

TE = Sum of perimeter of all patches

TE = 28607.27 metres

Important

In the case of vector themes, edge calculations include all the edge on the landscape including boundary edge. The contrasted weighted edge feature allows edge weight at the boundaries to be set to zero. In the case of grid themes, edge calculations do not include the edges that surround the landscape boundary edge or any interior edges that include pixels classified as No Data.

Edge Density

Amount of edge relative to the landscape area.

Example: Edge Density Conifer (Class Level)

ED = TE / TLA

ED = 10858.88 metres/184.11 hectares = 58.98 metres/hectare

Example: Edge Density of all Patches (Landscape Level)

ED = 28607.27 metres/184.11 hectares = 155.38 metres/hectare

Mean Patch Edge

Average amount of edge per patch.

Example: Mean Patch Edge Conifer (Class Level)

MPE = TE / NumP

MPE = 10858.88 metres/4 patches = 2714.72 metres/patch

Example: Mean Patch Edge all Patches (Landscape Level)

MPE = TE / NumP

MPE = 28607.27 metres/14 patches = 2043.38 metres/patch

Mean Perimeter-Area Ratio

Shape Complexity.

Example: Mean perimeter-area ratio Conifer (Class Level)

MPAR = Sum of each patches perimeter/area ratio divided by number of patches.

MPAR = (132 m/ha + 112 m/ha + 201 m/ha + 84 m/ha)/4 patches

MPAR = 182 metres/hectare

Example: Mean perimeter-area ratio all patches (Landscape Level)

MPAR = (200 m/ha + 132 m/ha + ... + 175 m/ha)/14 patches

MPAR = 185 metres/hectare

Mean Shape Index

Shape Complexity.

MSI is greater than one, MSI = 1 when all patches are circular (polygons) or square (grids).

MSI = sum of each patches perimeter divided by the square root of patch area (hectares) for each class (Class Level) or all patches (Landscape Level), and adjusted for circular standard (polygons), or square standard (grids), divided by the number of patches (McGaril and Marks 1994).

Mean Patch Fractal Dimension

Shape Complexity.

Mean patch fractal dimension is another measure of shape complexity. Mean fractal dimension approaches one for shapes with simple perimeters and approaches two when shapes are more complex (McGaril and Marks 1994).

Area Weighted Mean Patch Fractal Dimension

Shape Complexity adjusted for shape size.

Area weighted mean patch fractal dimension is the same as mean patch fractal dimension with the addition of individual patch area weighting applied to each patch. Because larger patches tend to be more complex than smaller patches, this has the effect of determining patch complexity independent of its size. The unit of measure is the same as mean patch fractal dimension (McGaril and Marks 1994).

Mean Nearest Neighbor

Measure of patch isolation.

The nearest neighbor distance of an individual patch is the shortest distance to a similar patch (edge to edge). The mean nearest neighbor distance is the average of these distances (metres) for individual classes at the class level and the mean of the class nearest neighbor distances at the landscape level.

Interspersion Juxtaposition Index

Measure of patch adacency.

Approaches zero when the distribution of unique patch adjacencies becomes uneven and 100 when all patch types are equally adjacent.

Interspersion requires that the landscape be made up of a minimum of three classes. At the class level interspersion is a measure of relative interspersion of each class. At the landscape level it is a measure of the interspersion of the each patch in the landscape.

Mean Proximity Index

Measure of the degree of isolation and fragmentation.

Mean proximity index (MPI) is a measure of the degree of isolation and fragmentation of a patch. MPI uses the nearest neighbor statistic. The distance threshold default is 1,000,000. If MPI is required at specific distances, select Set MPI Threshold from the main Patch pull-down menu and enter a threshold distance.

Both MNN and MPI use the nearest neighbor statistic of similar polygons in their algorithm. Occasionally a blank or zero will be reported in MNN and MPI fields. This happens when one polygon vertex touches another polygons border but the two similar polygons do not share a common border. When this happens a manual edit (move) of the touching vertex will correct the problem in the theme. This problem will not happen when analyzing grid themes.

Shannon's Diversity Index

Measure of relative patch diversity.

Shannon's diversity index is only available at the landscape level and is a relative measure of patch diversity. The index will equal zero when there is only one patch in the landscape and increases as the number of patch types or proportional distribution of patch types increases (McGaril and Marks 1994).

Shannon's Evenness Index

Measure of patch distribution and abundance.

Shannon's evenness index is equal to zero when the observed patch distribution is low and approaches one when the distribution of patch types becomes more even. Shannon's evenness index is only available at the landscape level.

Core Area Density

Measure of relative distribution of core areas.

Number of disjunct core areas per hectare of total landscape area.

Important

Direct analyses of Core Area through the spatial statistics dialogue are only available for grid themes. If core area statistics are required for vector themes, first Create Core Areas (create a new core area theme) from the Patch pull-down menu and then calculate statistics for the new theme as you would for a normal vector theme. The results will be core area statistics.

Mean Core Area

The average size of disjunct core patches.

The mean size of disjunct core area patches (hectares).

Core Area Standard Deviation

Measure of variability in core area size.

The standard deviation of disjunct core areas (hectares).

Core Area Density

The relative number of disjunct core patches relative to the landscape area.

The total number of all disjunct patches divided by the landscape area (number of disjunct core patches/hectare).

Total Core Area Index

Measure of amount of core area in the landscape.

Total core area index is a measure of the amount of core area in the landscape. Total core area index is a proportion of core area in the entire landscape and is equal to zero when no patches in the landscape contain core and approaches one as the relative proportion of core area in the landscape increases.