Glossary

In Degree

Out Degree

Betweenness Centrality

The betweenness centrality of planning unit v ($BC(v)$) in a graph $G := (V, E)$ with V vertices (*i.e.* planning units) and E edges (*i.e.* connections) is

$$BC(v) = \sum_{s \neq v \neq t \in V} \frac{\sigma_{st}(v)}{\sigma_{st}}$$

where σ_{st} is total number of shortest paths from planning unit s to planning unit t and $\sigma_{st}(v)$ is the number of those paths that pass through v.

Eigenvector Centrality

The Eigenvector centrality of planning unit v ($EVC(v)$) in a graph $G := (V, E)$ with V vertices (*i.e.* planning units) and E edges (*i.e.* connections), let $A = (a_{v,t})$ be the adjacency matrix

$$EVC(v) = \frac{1}{\lambda} \sum_{t \in M(v)} x_t = \frac{1}{\lambda} \sum_{t \in G} a_{v,t}$$

where λ is the leading eigenvalue.

Google PageRank

The Google PageRank centrality of planning unit v ($PRC(v)$) in a graph $G := (V, E)$ with V vertices (*i.e.* planning units) and E edges (*i.e.* connections), let $A = (a_{v,t})$ be the adjacency matrix

$$PRC(v) = (1 - d) + d \sum$$

where λ is the leading eigenvalue.

Self Recruitment

Local Retention

Influx

Outflux

Temporal Connectivity Covariance

Focus Area Recipients

Focus Area Donors

Avoidance Area Recipients

Avoidance Area Donors

More Coming Soon!

Boundary Definitions

Alternative `boundary.dat` calculations

Connectivity as Boundary

description

Minimum Planar Graph

description

Connectivity

description (with units)

Connectivity Categories

Demographic Connectivity

description

Genetic Connectivity

description

Landscape Connectivity

description

Connectivity Types

Each connectivity category has multiple types of data that can be used by Marxan with Connectivity:

Settlement

description

Local Immigration

description

Dispersal Flux

description

Migration

description

Data Formats

Marxan with Connectivity can accept 2 types of connectivity data, Matrices and Lists:

Connectivity Matrix

	1	2	3	4	...
1	0.1	0.02	0.005	0.01	...
2	0.006	0.2	0.007	0.009	...
3	0.01	0.003	0.25	0.02	...
4	0.022	0.017	0.001	0.2	...
...	...	...	...	...	...

Connectivity List

id1	id2	value
1	1	0.1
1	2	0.02
1	3	0.005
1	4	0.01
...	...	...

Connectivity List with Time

time	id1	id2	value
1	1	1	0.1
1	1	2	0.02
1	1	3	0.005
1	1	4	0.01
...	...	...	...

Conservation Feature

description

Vertex Degree

The vertex degree indicates the number of connections for each planning unit

Betweenness Centrality

Betweenness Centrality is an indicator of a planning unit's centrality in a network. It is equal to the number of shortest paths from all connections to all others that pass through that planning unit.

Eigen Vector Centrality

Eigen Vector Centrality is a measure of the influence of a planning unit in a network. It assigns relative scores to all planning unitin the network based on the concept that connections to high-scoring planning unit contribute more to the score of the planning unit in question than equal connections to low-scoring nodes

Self-Recruitment

Self Recruitment is the propotion of new recruits from a planning unit that will stay in that planning unit.

Temporal Connectivity Correlation

description

Focus Areas

For some of the connectivity metrics (e.g. Temporal Connectivity Correlation), it is important to consider 'focus areas' for which connectivity should be optimised. Such focus areas could include existing protected areas, important habitat for endangered species, and/or otherwise important habitats for connectivity (e.g. nursery grounds, genetically unique and potentially adaptively advantageous populations). Marxan with Connectivity assumes that the planning units within the 'focus areas' will otherwise be targeted as normal conservation targets in Marxan. Loading focus areas into Marxan with Connectivity allows users to set conservation targets for the areas that complement the 'focus areas'.

Planning Units

description

Shapefile

description