

Table S1 Landscape metrics equations used in the study and explanations

Aspects of green-blue space	Indicator	Abbreviation	Formula	Unit	Range	Description
Size	Largest Patch Index	LPI	$LPI = \frac{MAX(a_{ij})}{A} (100)$ <p><math>a_{ij}</math> : area of patch <math>ij</math> (reclassified green-blue space land use class in this paper).  <math>A</math> : total area of landscape (community analytical unit paper).</p>	%	$0 < LPI \leq 100$	LPI equals the percentage of the landscape comprised by the largest patch. In this paper, the corresponding patches are the land use types reclassified into green-blue space.
	Percentage of Landscape	PLAND	$PLAND = \frac{\sum_{j=1}^n a_{ij}}{A} (100)$ <p><math>a_{ij}</math> : area of patch <math>ij</math> (reclassified green-blue space land use class in this paper)  <math>A</math> : total area of landscape (community analytical unit in this paper)</p>	%	$0 < PLAND \leq 100$	PLAND is the percentage the landscape comprised of the corresponding patch type. In this paper, the corresponding patch is the land use types reclassified into green-blue space.
Aggregation	Aggregation Index	AI	$AI = \left[ \frac{g_{ii}}{\max \rightarrow g_{ii}} \right] (100)$ <p><math>g_{ii}</math> : number of (joins) between pixels of patch type (reclassified green-blue space land use class in this paper) <math>i</math> using single count method.  <math>\max \rightarrow g_{ii}</math> : maximum number of joins between pixels of patch type (reclassified green-blue space land use class in this paper) <math>i</math> based on single-count method.</p>	%	$0 \leq AI \leq 100$	AI is to measure the aggregation level of focal patch (reclassified green-blue space land use type in this paper). AI equals 0 if the focal patch type is maximally disaggregated, which means no joint exists within the border of calculation. The higher AI, the more aggregated of focal patch type. AI reaches to the maximum value of 100 when all focal patch pixels are in a form of single patch.

Fragmentation	Patch Density	PD	$PD = \frac{N}{A} (10,000)(100)$ <p><math>N</math> : total number of patches (reclassified green-blue space land use patches in this paper) in the landscape (community analytical unit).  <math>A</math> : total landscape area (m<sup>2</sup>).</p>	Number per 100 hectares	PD > 0, constrained by cell size.	PD measures number of patches on a per unit area. The higher PD is, the more fragmented the patch of corresponding class is.
Complexity	Area-Weighted Mean Fractal Dimension Index	FRAC_AM	$FRAC = 2 \ln(0.25 p_{ij}) / (\ln a_{ij})$ <p><math>p_{ij}</math> = perimeter (m) of patch <math>ij</math>.  <math>a_{ij}</math> = area (m<sup>2</sup>) of patch <math>ij</math>.  FRAC equals 2 times the logarithm of patch perimeter (m) divided by the logarithm of patch area (m<sup>2</sup>); the perimeter is adjusted to correct for the raster bias in perimeter.</p>	None	$1 \leq FRAC \leq 2$	FRAC approaches 1 for shapes with very simple perimeters such as squares, and approaches 2 for shapes with highly convoluted, plane-filling perimeters.
	Area-Weighted Average Shape Index	SHAPE_AM	$SHAPE = 0.5 p_{ij} / \sqrt{a_{ij}}$ <p><math>p_{ij}</math> = perimeter (m) of patch <math>ij</math>.  <math>a_{ij}</math> = area (m<sup>2</sup>) of patch <math>ij</math>.  SHAPE equals patch perimeter (m) divided by the square root of patch area (m<sup>2</sup>), adjusted by a constant to adjust for a square standard.</p>	None	SHAPE $\geq 1$	SHAPE = 1 when the patch is square and increases without limit as patch shape becomes more irregular.
Diversity		SHDI	$SHDI = - \sum_{i=1}^m (P_i * \ln P_i)$ <p><math>P_i</math>: proportion of the landscape occupied by patch type (class) <math>i</math>. (the land use types considered as green-blue space) present in the landscape.</p>	None	SHDI $\geq 0$ , without limit	SHDI is a approach to measure composition of landscape.

Source: (McGarigal, Cushman, & Ene, 2012)

Table S2 Land use types to determine green-blue space diversity

Name	Code	Considered as green-blue space in this study.
Forest	20	Yes
Grassland	30	Yes
Shrubland	40	Yes
Wetland	50	Yes

Water	60	Yes
Cropland	10	No
Impervious	80	No
Barren	90	No
Snow/ice	100	No

Data source:

[http://www.globallandcover.com/Page/EN\\_sysFrame/dataIntroduce.html?columnID=81&head=product&para=product&type=dat](http://www.globallandcover.com/Page/EN_sysFrame/dataIntroduce.html?columnID=81&head=product&para=product&type=dat)  
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Note: there were no cloud, snow/ice, tundra, land use types in study sample.

### Reference

McGarigal, K., Cushman, S. A., & Ene, E. (2012). FRAGSTATS v4: spatial pattern analysis program for categorical and continuous maps. *Computer software program produced by the authors at the University of Massachusetts, Amherst. Available at the following web site: <http://www.umass.edu/landeco/research/fragstats/fragstats.html>.*