**Appendix S1**

The detailed formulas of RSEI and its component indexes are as follows:

(1) Greenness indicators

$$NDVI = (\rho_{nir} - \rho_{red})/(\rho_{nir} + \rho_{red}) \quad (1)$$

NDVI takes values in the range [-1, 1]. $\rho_{nir}$、$\rho_{red}$ are the reflectance in the near-infrared band and red light band.

(2) Wetness indicators

$$WET = 0.2626\rho_1 + 0.2141\rho_2 + 0.0926\rho_3 + 0.0656\rho_4 - 0.7629\rho_5 - 0.5388\rho_7 \quad (2)$$

where $\rho_i(i = 1, \dots, 5,7)$ is the reflectance of each corresponding band of the ETM+ image, respectively.

(3) Heat Indicator

$$LST = T/[1 + (\lambda T/\rho)\ln\varepsilon] \quad (3)$$

where $T$ is the temperature value at the sensor, $\lambda$ is the center wavelength of the ETM+ 6 band ($\lambda$ = 11.45 μm), and $\varepsilon$ is the surface specific emissivity, $\rho = 1.438 \times 10^{-2} mk$.

(4) Dryness indicators

$$NDBSI = (IBI + SI)/2 \quad (4)$$

$$IBI = \left\{\frac{2\rho_5}{\rho_5+\rho_4} - \left[\frac{\rho_4}{\rho_4+\rho_3} + \frac{\rho_2}{\rho_2+\rho_5}\right]\right\} / \left\{\frac{2\rho_5}{\rho_5+\rho_4} + \left[\frac{\rho_4}{\rho_4+\rho_3} + \frac{\rho_2}{\rho_2+\rho_5}\right]\right\} \quad (5)$$

$$SI = [(\rho_5 + \rho_3) - (\rho_4 + \rho_1)]/[(\rho_5 + \rho_3) + (\rho_4 + \rho_1)] \quad (6)$$

(5) Construction of a composite index

Since the four indicators calculated by (1)-(4) do not have the same scale, these four indicators must be standardized using equations (7) and (8) before doing the principal component transformation. In order to make a large value of PC1 represent a good ecological condition, PC1 can be further subtracted from 1 to obtain the initial ecological index $RSEI_0$.

Positive indicators: $NI_i = (I_i - I_{min})/(I_{max} - I_{min})$ (7)

Negative indicators: $NI_i = (I_{max} - I_i)/(I_{max} - I_{min})$ (8)

$$RSEI_0 = 1 - \{PC1[f(NDVI, WET, LST, NDBSI)]\} \quad (9)$$

Where, $NI_i$ is the value of an indicator after regularization, $I_i$ is the value of the indicator in pixel $i$, $I_{max}$ is the maximum value of the indicator, and $I_{min}$ is the minimum value of the indicator.

In order to facilitate the measurement and comparison of the indicators, the regularization of $RSEI_0$ can be similarly carried out as follows:

$$RSEI = (RSEI_0 - RSEI_{0_min})/(RSEI_{0_max} - RSEI_{0_min}) \quad (10)$$

RSEI is the constructed Remote Sensing Ecological Index (RSEI), whose value is between [0, 1]. The closer the RSEI value is to 1, the better EQ is, and vice versa, the worse EQ is.

## Appendix S2

The formulas for Gi* and Z-value are as follows:

$$G_i^* = \frac{\sum_{j=1}^{n} W_{ij} X_j}{\sum_{j=1}^{n} x_j} \tag{11}$$

$$Z(G_i^*) = \frac{\sum_{j=1}^{n} W_{ij} X_j - \bar{x} \sum_{j=1}^{n} W_{ij}}{S \sqrt{\frac{\left[n \sum_{j=1}^{n} W_{ij}^2 - (\sum_{j=1}^{n} W_{ij})^2\right]}{n-1}}} \tag{12}$$

Where $G_i^*$ is the agglomeration index of patch $i$; $W_{ij}$ is the weight matrix between patches $i$ and $j$; $x_i$, $x_j$ are the attribute values of patches $i$ and $j$; $n$ is the total number of patches; $\bar{x}$ is the mean value of all the patches in the space; and $S$ is the standard deviation of all the patch attribute values. The spatial clustering characteristics of low value zones (cold spots) and high value zones (hot spots) can be determined by the $Z$ value.

## Appendix S3

**Appendix S3.** Original and normalized values of PD, LPI, AI, COHESION, FLSCC and CD from 2000 to 2020.

| Year | Type of indicator | Original | | | Normalized | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Mean | Max | Min | Mean |
| 2000 | PD | 9.734 | 0 | 1.254 | 1 | 0 | 0.129 |
| | LPI | 100 | 0 | 46.085 | 1 | 0 | 0.446 |
| | AI | 100 | 0 | 81.297 | 1 | 0 | 0.813 |
| | COHESION | 100 | 0 | 81.801 | 1 | 0 | 0.818 |
| | FLSCC | 1.731 | 0 | 1.176 | 1 | 0 | 0.713 |
| | CD | 86310.616 | 0 | 1982.581 | 1 | 0 | 0.023 |
| 2010 | PD | 9.739 | 0 | 1.266 | 1 | 0 | 0.130 |
| | LPI | 100 | 0 | 44.716 | 1 | 0 | 0.447 |
| | AI | 100 | 0 | 80.708 | 1 | 0 | 0.807 |
| | COHESION | 100 | 0 | 81.227 | 1 | 0 | 0.812 |
| | FLSCC | 1.723 | 0 | 1.169 | 1 | 0 | 0.712 |
| | CD | 78036.644 | 0 | 2100.381 | 1 | 0 | 0.026 |
| 2020 | PD | 9.739 | 0 | 1.268 | 1 | 0 | 0.130 |
| | LPI | 100 | 0 | 44.582 | 1 | 0 | 0.446 |
| | AI | 100 | 0 | 80.466 | 1 | 0 | 0.805 |
| | COHESION | 100 | 0 | 81.006 | 1 | 0 | 0.810 |
| | FLSCC | 1.723 | 0 | 1.166 | 1 | 0 | 0.711 |
| | CD | 88402.703 | 0 | 2402.598 | 1 | 0 | 0.027 |

**Appendix S4**

**Appendix S4.** Principal component analysis of forest landscape structural connectivity index from 2000 to 2020.

| **Year** | **2000** | | | | **2010** | | | | **2020** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Principal component | PC1 | PC2 | PC3 | PC4 | PC1 | PC2 | PC3 | PC4 | PC1 | PC2 | PC3 | PC4 |
| PD | −0.081 | 0.216 | 0.963 | 0.136 | −0.082 | 0.228 | 0.959 | 0.147 | −0.083 | 0.229 | 0.959 | 0.147 |
| AI | 0.618 | −0.322 | 0.220 | −0.683 | 0.617 | −0.323 | 0.234 | −0.678 | 0.618 | −0.322 | 0.234 | −0.679 |
| COHESION | 0.628 | −0.301 | 0.019 | 0.717 | 0.628 | −0.299 | 0.014 | 0.718 | 0.628 | −0.298 | 0.016 | 0.718 |
| LPI | 0.466 | 0.871 | −0.151 | −0.038 | 0.467 | 0.869 | −0.160 | −0.044 | 0.466 | 0.869 | −0.161 | −0.043 |
| Eigenvalue | 0.136 | 0.024 | 0.002 | 0.000 | 0.138 | 0.023 | 0.002 | 0.000 | 0.139 | 0.023 | 0.002 | 0.000 |
| Eigenvalue contribution rate | 83.665 | 14.926 | 1.212 | 0.197 | 84.312 | 14.295 | 1.194 | 0.199 | 84.417 | 14.182 | 1.204 | 0.198 |

**Appendix S5**

Moran's $I$ calculated as follows:

$$\text{Moran's } I = \frac{n\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}(x_i-\bar{x})(x_j-\bar{x})}{\left(\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}\right)\sum_{i=1}^{n}(x_i-\bar{x})^2}, (i \neq j) \quad (13)$$

Where: $x_i$, $x_j$ are the RSEI of the geospatial units; $n$ is the number of spatial units; $W_{ij}$ is the spatial weight, defined by the queen neighbor standard. The value of global Moran's $I$ is generally (-1,1), If it approaches -1, it indicates that the spatial negative correlation of RSEI is stronger. If it approaches 0, it indicates that RSEI is distributed randomly. If it approaches 1, it indicates that the RSEI spatial positive correlation is stronger.

## Appendix S6

**Appendix S6.** Changes of RSEI, forest landscape structural, and functional connectivity from 2010 to 2020.

| City | Districts and Counties | RSEI | LSC | LFC | CD |
|---|---|---|---|---|---|
| Xiamen City | Siming District | up | down | down | up |
| | Huli District | up | down | down | up |
| | Xiang 'an District | up | up | up | down |
| | Jimei District | up | down | down | up |
| | Haicang District | up | up | up | down |
| | Tong'an District | up | down | up | down |
| Zhangzhou City | Hua 'an County | up | down | down | up |
| | Dongshan County | up | up | up | down |
| | Longhai District | up | up | up | down |
| | Zhangpu County | up | down | down | up |
| | Longwen District | up | down | down | up |
| | Xiangcheng District | up | down | up | down |
| | Changtai District | up | down | down | up |
| | Zhao 'an County | up | up | down | up |
| | Nanjing County | down | down | up | down |
| | Yunxiao County | up | down | down | up |
| | Pinghe County | up | up | up | down |
| Quanzhou City | Dehua County | down | down | down | up |
| | Luojiang District | up | down | down | up |
| | Yongchun County | up | down | down | up |
| | Shishi City | up | down | down | up |
| | Hui'an County | up | down | up | down |
| | Jinjiang City | up | up | up | down |
| | Quangang District | up | down | up | down |
| | Nan'an City | up | down | down | up |
| | Anxi County | up | down | down | up |
| | Licheng District | up | down | up | down |
| | Fengze District | up | up | up | down |

**Appendix S7**

**Appendix S7.** Maximum, minimum and mean values of each regression coefficient at different scales from 2000 to 2020.

| Year | Scale/km | | Variate | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PD-RSEI | LPI-RSEI | AI-RSEI | COHESION-RSEI | FLSCC-RSEI | CD-RSEI |
| 2000 | 3 | Max | 4.95 | 1.81 | 0.89 | 0.83 | 1.14 | 520.73 |
| | | Mean | −0.11 | 0.35 | 0.29 | 0.28 | 0.38 | −12.84 |
| | | Min | −5.98 | −18.4 | −0.12 | −0.12 | −0.09 | −231.75 |
| | 4 | Max | 4.76 | 1.81 | 0.92 | 0.9 | 1.19 | 647.37 |
| | | Mean | 0.02 | 0.36 | 0.28 | 0.27 | 0.36 | −11.99 |
| | | Min | −4.91 | −1.37 | −0.13 | −0.13 | −0.1 | −152.86 |
| | 5 | Max | 4.44 | 1.4 | 0.95 | 0.88 | 1.23 | 203.35 |
| | | Mean | 0.19 | 0.4 | 0.3 | 0.29 | 0.37 | −12.05 |
| | | Min | −5.03 | −0.87 | −0.16 | −0.16 | −0.11 | −123.35 |
| 2010 | 3 | Max | 4.58 | 2.44 | 0.92 | 0.84 | 1.38 | 555.71 |
| | | Mean | 0.13 | 0.36 | 0.32 | 0.32 | 0.4 | −9.5 |
| | | Min | −4.49 | −2.64 | −0.2 | −0.2 | −0.14 | −177.74 |
| | 4 | Max | 5.03 | 1.5 | 0.9 | 0.89 | 1.19 | 1184.19 |
| | | Mean | 0.3 | 0.37 | 0.3 | 0.3 | 0.37 | −7.33 |
| | | Min | −3.33 | −1.43 | −0.3 | −0.3 | −0.27 | −217.85 |
| | 5 | Max | 5 | 1.41 | 0.95 | 0.9 | 1.02 | 173.65 |
| | | Mean | 0.47 | 0.4 | 0.33 | 0.32 | 0.39 | −8.95 |
| | | Min | −3.53 | −1.51 | −0.27 | −0.28 | −0.21 | −127.39 |
| 2020 | 3 | Max | 4.55 | 7.84 | 0.84 | 0.79 | 1.25 | 31.59 |
| | | Mean | 0.28 | 0.32 | 0.28 | 0.28 | 0.34 | −8.63 |
| | | Min | −3.51 | −1.82 | −0.12 | −0.12 | −0.11 | −112.98 |
| | 4 | Max | 4.59 | 3.3 | 0.81 | 0.8 | 0.94 | 9.26 |
| | | Mean | 0.44 | 0.34 | 0.28 | 0.28 | 0.34 | −7.23 |
| | | Min | −2.57 | −0.98 | −0.13 | −0.12 | −0.11 | −79.5 |
| | 5 | Max | 4.07 | 2.55 | 0.81 | 0.81 | 0.99 | 20.18 |
| | | Mean | 0.55 | 0.34 | 0.29 | 0.28 | 0.34 | −8.32 |
| | | Min | −3.42 | −3.23 | −0.12 | −0.11 | −0.07 | −127.44 |

## Appendix S8

**Appendix S8**. Sensitivity analysis of forest landscape structural and functional connectivity.

| Modes | Districts and Counties | RSEI change rate /% | LSC change rate /% | LFC change rate /% | CD change rate /% | The overall change of landscape connectivity | High sensitivity |
|---|---|---|---|---|---|---|---|
| RSEI up LSC up LFC down | Zhao 'an County | 6.5 | 0.01 | -1.1 | 1.1 | reduce | LFC |
| RSEI down LSC down LFC up | Nanjing County | −1 | −0.2 | 0.7 | −0.7 | enhance | LFC |
| RSEI up LSC down LFC up | Xiangcheng District | 1.9 | −0.4 | 6.9 | −6.9 | enhance | LFC |
| RSEI up LSC down LFC up | Tong'an District | 9.6 | −0.3 | 4.4 | −4.4 | enhance | LFC |
| RSEI up LSC down LFC up | Licheng District | 46.1 | −0.003 | 10 | −10 | enhance | LFC |
| RSEI up LSC down LFC up | Hui'an county | 23.7 | −0.6 | 1.3 | −1.3 | enhance | LFC |
| RSEI up LSC down LFC up | Quangang District | 17.7 | −1.2 | 4.2 | −4.2 | enhance | LFC |