

Spatiotemporal Changes and Trade-Offs/Synergies in Island Ecosystem Services: A Case Study of the Zhoushan Archipelago

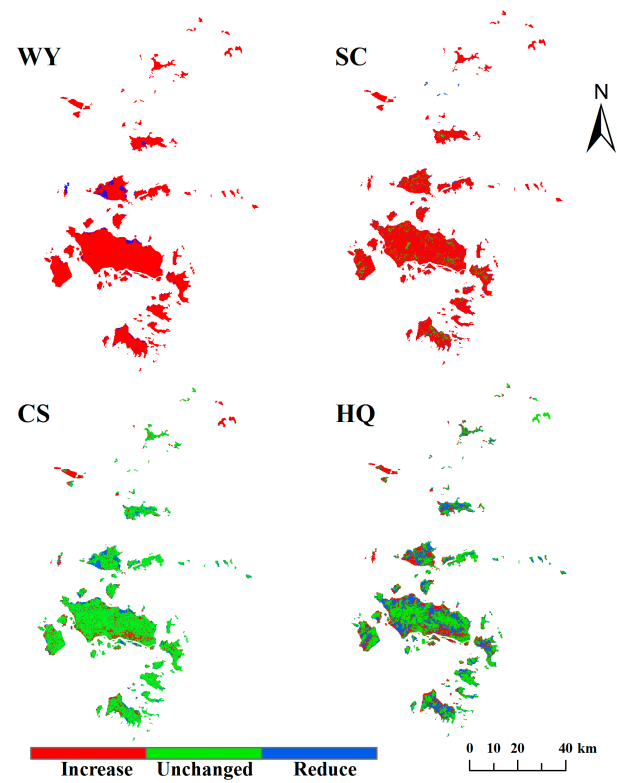


Figure S1. The map of spatial changes in four ecosystem services in the Zhoushan Islands from 2000 to 2020

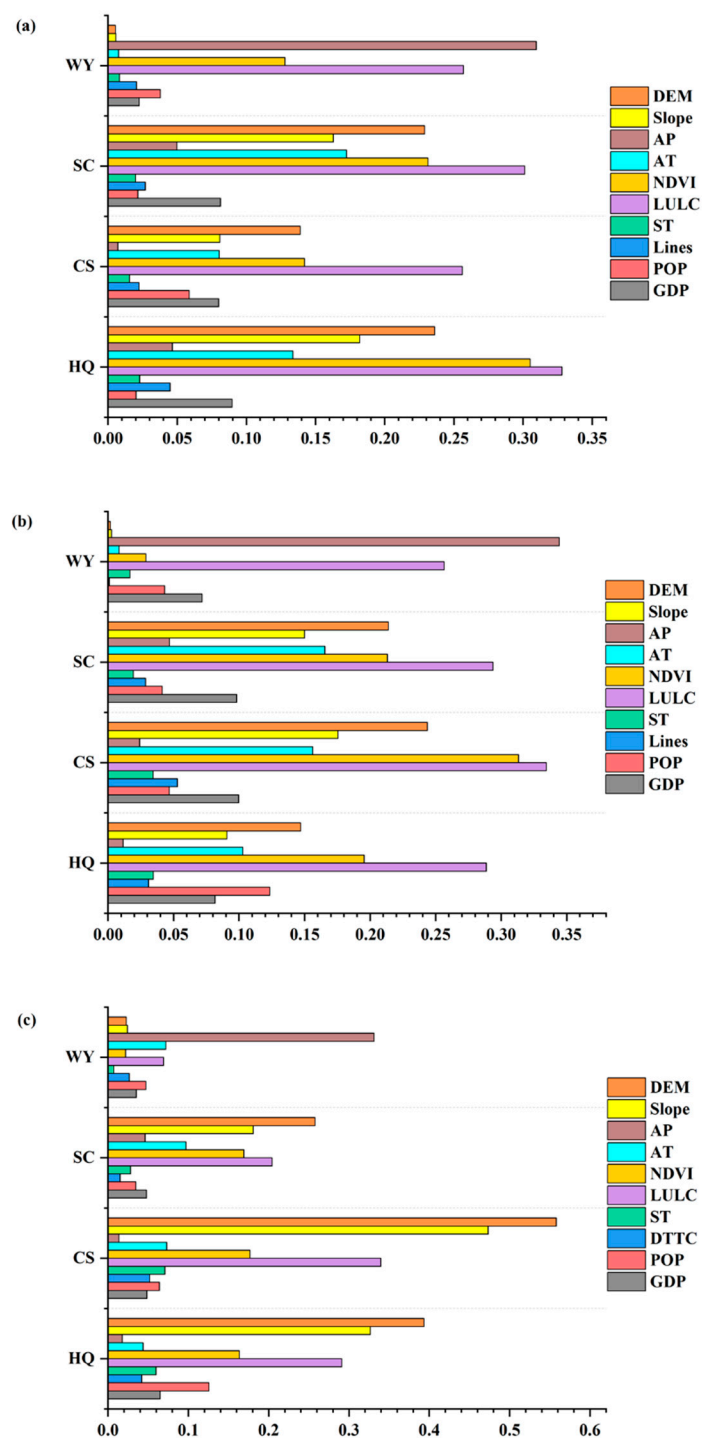


Figure S2. The driving factors analysis of four ecosystem services (ESs). (a) The driving factors analysis in 2000. (b) The driving factors analysis in 2010. (c) The driving factors analysis in 2020.

Table S1. Carbon density of the Zhoushan Archipelago

LUI	c_above	c_below	c_soil	c_dead
Farmland	18.90	12.50	85.50	2.40

Woodland	36.30	7.30	125.80	3.40
Grassland	17.40	20.80	112.20	2.90
Water area	0	0	81.10	0
Bare ground	24.30	4.90	74.60	2.20

Table S2. Sensitivity of different land use types in the Zhoushan Archipelago to threat sources

LUI	Habitat	Built-up land	Farmland
Farmland	0.40	0.40	0.35
Woodland	0.65	0.75	0.50
Grassland	0.70	0.45	0.45
Water area	0.80	0.80	0.60
Bare ground	0	0	0
Built-up land	0	0	0

Table S3. Impact of different land use types on habitat threats in the Zhoushan Archipelago

LUI	Maximum Threat Range	Weight	Distance Decay
Built-up land	10.00	1.00	Exponential
Farmland	4.00	0.60	Linear

Table S4. Cold and hot spot analysis area of water yield (WY) in the Zhoushan Archipelago

Type	2000		2010		2020	
	Area	Proportion	Area	Proportion	Area	Proportion
	(km ²)	(%)	(km ²)	(%)	(km ²)	(%)
Cold Spot 99% Confidence	322.11	22.78	362.27	25.62	361.56	25.57
Cold Spot 95% Confidence	32.24	2.28	27.15	1.92	26.02	1.84
Cold Spot 90% Confidence	17.11	1.21	12.58	0.89	14.28	1.01
Not Significant	339.08	23.98	323.10	22.85	359.16	25.40
Hot Spot 90% Confidence	86.40	6.11	67.59	4.78	51.19	3.62
Hot Spot 95% Confidence	155.68	11.01	122.74	8.68	101.53	7.18
Hot Spot 99% Confidence	461.39	32.63	498.58	35.26	500.27	35.38

Table S5. Cold and hot spot analysis area of soil conservation (SC) in the Zhoushan Archipelago

Type	2000		2010		2020	
	Area	Proportion	Area	Proportion	Area	Proportion
	(km ²)	(%)	(km ²)	(%)	(km ²)	(%)
Cold Spot 99% Confidence	401.66	28.40	404.29	28.59	535.60	37.87
Cold Spot 95% Confidence	71.43	5.05	75.17	5.32	53.70	3.80
Cold Spot 90% Confidence	39.09	2.76	41.6	2.94	24.59	1.74

Not Significant	430.93	30.47	428.04	30.27	244.91	17.32
Hot Spot 90% Confidence	40.85	2.89	39.20	2.77	23.40	1.65
Hot Spot 95% Confidence	70.30	4.97	73.49	5.20	47.13	3.33
Hot Spot 99% Confidence	359.96	25.46	352.29	24.91	484.84	34.29

Table S6. Cold and hot spot analysis area of carbon storage (CS) in the Zhoushan Archipelago

Type	2000		2010		2020	
	Area	Proportion	Area	Proportion	Area	Proportion
	(km ²)	(%)	(km ²)	(%)	(km ²)	(%)
Cold Spot 99% Confidence	479.57	33.92	490.96	34.72	498.26	35.24
Cold Spot 95% Confidence	38.77	2.74	38.48	2.72	35.3	2.50
Cold Spot 90% Confidence	21.60	1.53	21.39	1.51	19.01	1.34
Not Significant	223.94	15.84	224.13	15.85	210.44	14.88
Hot Spot 90% Confidence	23.64	1.67	22.82	1.61	24.45	1.73
Hot Spot 95% Confidence	46.77	3.31	44.48	3.15	45.45	3.21
Hot Spot 99% Confidence	580.20	41.03	571.84	40.44	581.22	41.11

Table S7. Cold and hot spot analysis area of habitat quality (HQ) in the Zhoushan Archipelago

Type	2000		2010		2020	
	Area	Proportion	Area	Proportion	Area	Proportion
	(km ²)	(%)	(km ²)	(%)	(km ²)	(%)
Cold Spot 99% Confidence	431.84	30.54	411.5	29.10	425.00	30.06
Cold Spot 95% Confidence	42.67	3.02	44.00	3.11	40.16	2.84
Cold Spot 90% Confidence	21.83	1.54	24.04	1.70	20.65	1.46
Not Significant	270.75	19.15	262.14	18.54	228.65	16.17
Hot Spot 90% Confidence	30.65	2.17	28.31	2.00	24.54	1.74
Hot Spot 95% Confidence	60.69	4.29	56.19	3.97	48.92	3.46
Hot Spot 99% Confidence	555.33	39.28	587.5	41.56	625.57	44.25

Table S8. Statistical area of ESs index zoning in the Zhoushan Archipelago region from 2000 to 2020

Region	2000		2010		2020	
	Area	Proportion	Area	Proportion	Area	Proportion
	(km ²)	(%)	(km ²)	(%)	(km ²)	(%)
ecological improvement zone	159.65	11.29	244.45	17.29	288.85	20.43
ecological rehabilitation zone	321.24	22.72	353.75	25.02	301.95	21.35
ecological general control zone	317.34	22.44	265.81	18.80	250.01	17.68

ecological priority control zone	597.09	42.23	536.49	37.94	555.87	39.31
ecological core protection zone	18.67	1.32	13.49	0.95	17.32	1.23

Table S9. Global spatial autocorrelation of main ESs in the Zhoushan Archipelago

Size	WY	SC	CS	HQ
30m×30m	0.43	0.51	0.63	0.18
100m×100m	0.61	0.56	0.58	0.28
300m×300m	0.22	0.12	0.08	0.17
500m×500m	0.28	0.17	0.05	0.10
1000m×1000m	0.30	0.09	0.09	0.05

Table S10. Global spatial autocorrelation of main ESs in the Zhoushan Archipelago from 2000 to 2020

Year	WY	SC	CS	HQ
2000	0.6046	0.5611	0.5760	0.2809
2010	0.6493	0.5633	0.5797	0.3208
2020	0.5928	0.5644	0.5642	0.5339