

Table S1. Threat factors and their stress intensities.

Threat Factor	Maximum Stress Distance (km)	Weight Spatial	Decay Type
Cropland	4.0	0.7	Linear
Building land	6.0	1.0	Exponential
Unused land	3.0	0.5	Exponential

Table S2. Habitat suitability and sensitivity of land use types.

Land Use Type	Habitat Suitability	Threat Factors		
		Cropland	Construction land	Bareland
Woodland	1.0	0.5	0.5	0.8
Grassland	0.8	0.8	0.4	0.8
Cropland	0.3	0.1	0.5	0.6
Water	0.3	0.3	0.3	0.2
Unused land	0.3	0.1	0.4	0.1
Building land	0.0	0.0	0.0	0.0

Table S3. Carbon storage parameter

Land use type	C_above	C_below	C_soil	C_dead
Woodland	51.08	37.51	174.95	6.71
Grassland	1.02	6.15	128.51	3.30
Cropland	4.56	7.45	106.30	3.67
Water	0.00	0.00	170.27	0.00
Unused land	0.12	1.57	52.96	0.00
Building land	0.00	0.00	0.00	0.00

Table S4. Soil conservation parameter

Land use type	usle_c	usle_p
Woodland	0.06	1
Grassland	0.07	1
Cropland	0.22	0.35
Water	1	0
Unused land	1	1
Building land	0.2	0

Table S5. Biophysical table of Water conservation

Land use type	root_depth	Kc	lulc_veg
Woodland	3000	1	1
Grassland	2000	0.65	1
Cropland	1700	0.65	1
Water	1	1.00	0
Unused land	1	0.50	0
Building land	1	0.30	0

Table S6. Population density and GDP in Shibing karst WNHs

	2000	2010	2020
Population Density	97.6529	84.2837	81.1190
GDP	0.1808	0.9670	2.9091

Table S7. Population density and GDP in Libo-Huanjiang karst WNHs

	2000	2010	2020
Population Density	61.7127	59.9682	64.6066
GDP	0.2771	1.2230	4.3551

Table S8. Abbreviated list

Abbreviations			
WNHS	World Natural Heritage Site	WC	Water conservation
ESs	Ecosystem services	SC	Soil conservation
CS	Carbon sequestration	HQ	Habitat quality
WL	Woodland	GL	Grassland
CL	Cropland	WB	Water
BL	Building land	UL	Unused land

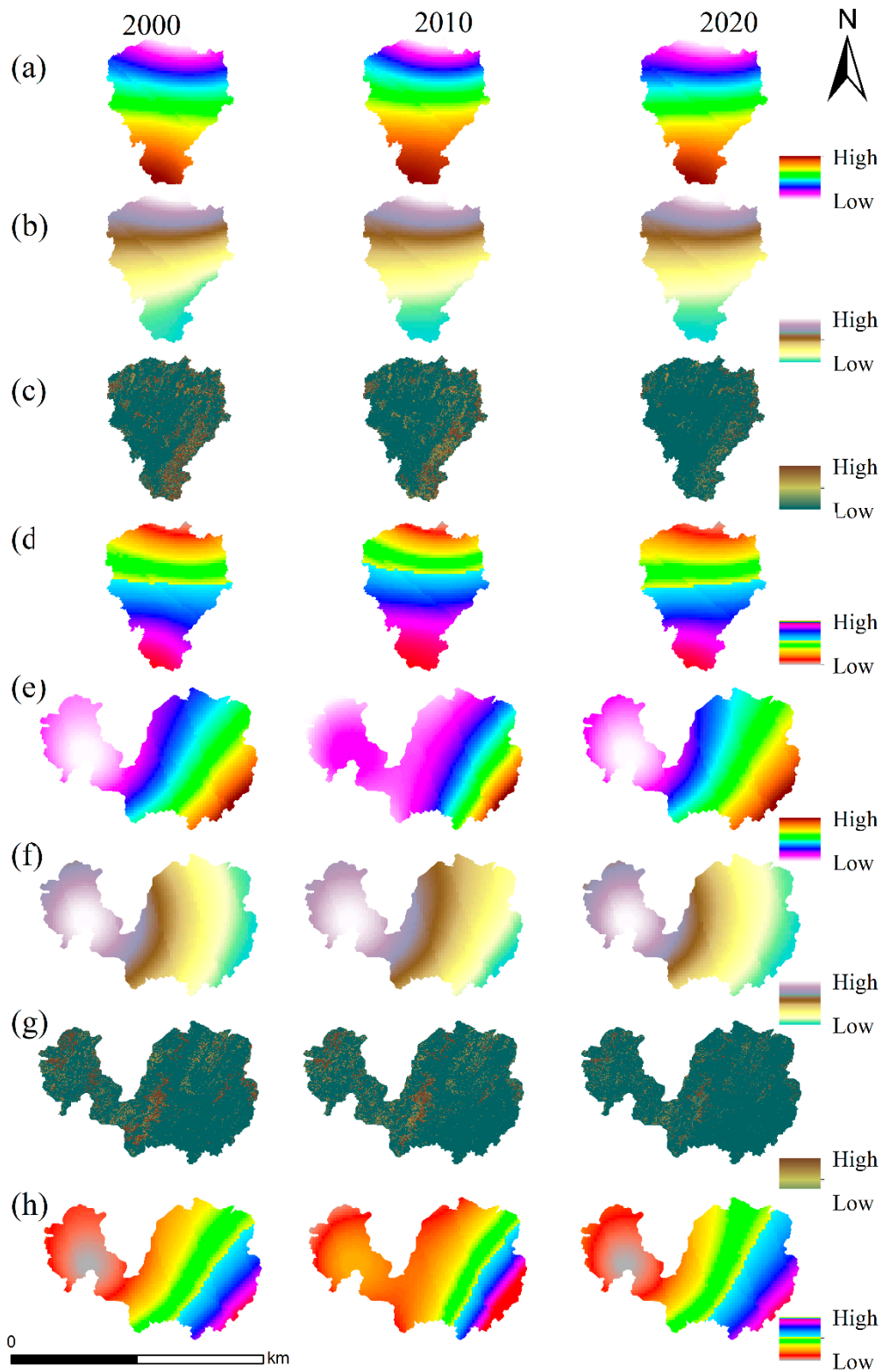


Figure S1. Spatial parameters of ecosystem services, (a) (b) (c) (d) precipitation, evapotranspiration, surface runoff coefficients, rainfall erosion factors for 2000, 2010 and 2020 at Shibing WNHS; (e) (f) (g) (h) precipitation, evapotranspiration, surface runoff coefficients, rainfall erosion factors for 2000, 2010 and 2020 at Shibing WNHS