A high spatial resolution dataset of ecosystem services of 2000-2020 in China

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Ecosystem Service Assessment Methods

Net primary productivity

Net primary productivity (NPP) refers to dry matter produced by green vegetation per unit area and per unit time, and NPP of vegetation represents the carbon sequestration capacity of vegetation. Several typical models for estimating NPP have been developed, including the statistical model, parameter model and process-based models. The CASA model ecosystem model based on estimating light use efficiency (LUE) is a process-based model appropriate for the estimation of NPP on a global or regional scale. In the CASA ecosystem model, the NPP was obtained with the following formula and Fig. S1:

$$NPP(x,t) = APAR(x,t) \times \varepsilon(x,t) \tag{1}$$

Where $NPP(x,t)$ is the NPP of a specific location x and time t. $APAR(x,t)$ means the absorbed photosynthetically active radiation (APAR) by the vegetation (MJ m^{-2}/month). $\varepsilon(x,t)$ is the LUE of the vegetation (g C $(MJ)^{-1}$).

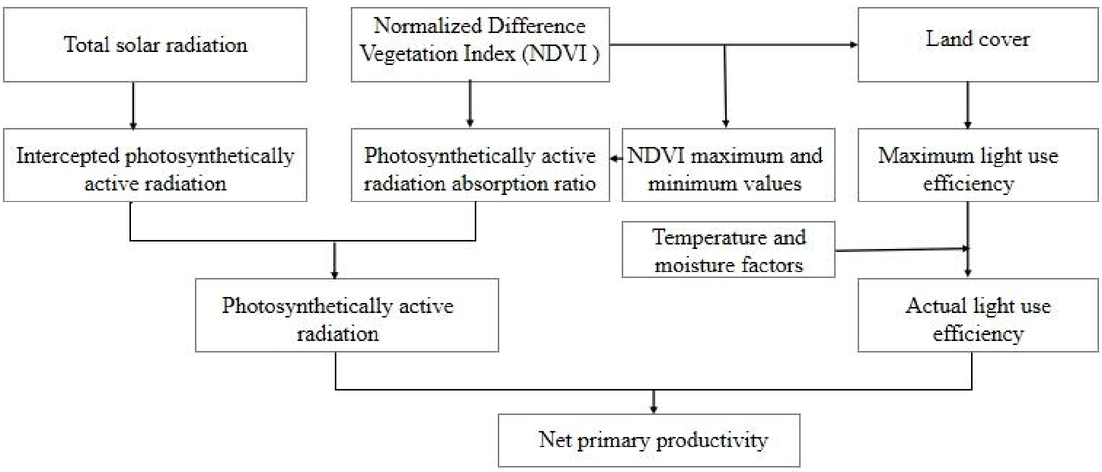

Figure S1: Net Primary Productivity assessment framework

The $APAR(x,t)$ is derived with the following formula:

$$APAR(x,t) = SOL(x,t) \times FPAR(x,t) \times r \tag{2}$$

Where $SOL(x,t)$ is the monthly total solar radiation (MJ m^{-2}/month), $FPAR(x,t)$ is the fraction of photosynthetically active radiation (FPAR) at position x and time t, and r is the ratio of the solar radiation that can be used by the vegetation with the total solar radiation, which is generally considered to be 0.5.

$$FPAR(x,t) = \alpha FPAR_{NDVI}(x,t) \times (1-\alpha) FPAR_{SR}(x,t) \tag{3}$$

The $FPAR(x,t)$ is derived with the following formula:

Where

$$FPAR_{NDVI}(x,t) = \frac{[(NDVI)(x,t) - (NDVI)_{i,min}] \times (FPAR_{max} - FPAR_{min})}{NDVI_{i,max} - NDVI_{i,min}} + FPAR_{min} \tag{4}$$

$$FPAR_{SR}(x,t) = \frac{[(SR)(x,t) - (SR)_{i,min}] \times (FPAR_{max} - FPAR_{min})}{SR_{i,max} - SR_{i,min}} + FPAR_{min} \tag{5}$$

$$SR(x,t) = \frac{1 + (NDVI)(x,t)}{1 - (NDVI)(x,t)} \tag{6}$$

Where $NDVI_{i,min}$ and $NDVI_{i,max}$ are the statistical minimal and maximal NDVI values, respectively. The values of $FPAR_{min}$ and $FPAR_{max}$ are independent of vegetation type and are the minimal (0.001) and maximal (0.95) FPAR, respectively. $SR_{i,min}$ and $SR_{i,max}$ are calculated using $NDVI_{i,min}$ and $NDVI_{i,max}$ as the values for the NDVI, respectively, and α is set to 0.5.

$$\varepsilon(x,t) = T_{\varepsilon 1}(x,t) \times T_{\varepsilon 2}(x,t) \times W_{\varepsilon}(x,t) \times \varepsilon_{max} \tag{7}$$

$$T_{\varepsilon 1}(x,t) = 0.8 + 0.02 \times T_{opt}(x) - 0.0005 \times [T_{opt}(x)]^2 \tag{8}$$

$$\begin{aligned} T_{\varepsilon 2}(x,t) = 1.184/\{1 + \exp\left[0.2 \times \left(T_{opt}(x) - 10 - T(x,t)\right)\right]\} \\ \times 1/\{1 + \exp\left[0.3 \times (-T_{opt}(x) - 10 + T(x,t))\right\} \end{aligned} \tag{9}$$

$$W_{\varepsilon}(x,t) = 0.5 + 0.5 \times EET(x,t)/EPT(x,t) \tag{10}$$

Where $\varepsilon(x,t)$ is the LUE, $T_{\varepsilon 1}(x,t)$ and $T_{\varepsilon 2}(x,t)$ are low and high temperature stress coefficients, respectively. $W_{\varepsilon}(x,t)$ is the moisture stress coefficient, and ε_{max} is the maximal LUE of the vegetation in ideal conditions, the value of ε_{max} in this study is show in Tab.S2. $T_{opt}(x)$ is the optimum temperature for plant growth. $EET(x,t)$ and $EPT(x,t)$ are estimated evapotranspiration and potential evapotranspiration, respectively.

Soil conservation

Soil conservation refers to the capacity of the ecosystem to prevent soil erosion and retain sediment. Soil conservation was calculated using the Revised Universal Soil Loss Equation (RUSLE) model, and we localized the key parameters to improve the model applicability. The soil conservation was obtained with the following formula:

$$Ap = R \times K \times LS \tag{11}$$

$$Ar = R \times K \times LS \times C \times P \tag{12}$$

$$A = Ap - Ar \tag{13}$$

Where *Ap*, *Ar* and *A* are the annual average potential soil loss (Mg ha^{-1} yr^{-1}), annual average soil loss (Mg ha^{-1} yr^{-1}), and soil conservation (Mg ha^{-1} yr^{-1}). *R*, *K*, *LS*, *C* and *P* indicate the rainfall erosivity factor (MJ mm $ha^{-1}h^{-1}$ yr^{-1}), the soil erodibility factor (Mg ha h ha−1 MJ^{-1} mm^{-1}), the slope length and slope steepness factor, the soil cover and management factor, and the support practices factor, respectively.

$$R = \sum_{i=1}^{12} 1.735 \times 10^{[1.5log(\frac{pi^2}{p}) - 0.8188]} \tag{14}$$

Where pi and p were monthly precipitation and annual precipitation, respectively.

$$\begin{aligned} K = &\{0.2 + 0.3 \times exp[-0.0256 m_s(1 - m_{silt}/100)]\} \times [m_{silt}/(m_c + m_{silt})]^{0.3} \\ &\times \{1 - 0.25 m_{oc}/[m_{oc} + \exp(3.72 - 2.95C)]\} \\ &\times \{1 - 0.7(1 - m_s/100)/\{(1 - m_s/100) + exp[-5.51 + 22.9(1 - m_s/100)]\}\} \end{aligned} \tag{15}$$

Where m_s, m_{silt}, m_c, m_{oc} are the mass-based percentages of sand, silt, clay, and organic carbon, respectively.

$$L = \left\{\frac{\lambda}{22.13}\right\}^{[\beta/(1+\beta)]} \tag{16}$$

Where

$$\beta = (\sin\theta/0.089)/[3.0 \times (\sin\theta)^{0.8} + 0.56] \tag{17}$$

$$S = \begin{cases} 10.8sin\theta + 0.03 & \theta < 5° \\ 16.8sin\theta - 0.5 & 5° \le \theta < 10° \\ 21.91sin\theta - 0.96 & 10° \le \theta \end{cases} \tag{18}$$

Where θ and λ are the slope gradient (°) and the horizon slope length (m), respectively.

$$C = \begin{cases} 1 & (Cov = 0) \\ 0.6508 - 0.3436 \times lgCov & (0 < Cov \le 78.3\%) \\ 0 & (Cov > 78.3\%) \end{cases} \tag{19}$$

Where Cov is the vegetation coverage.

The ratio of soil loss to soil loss when planting along the slope reflects the difference in soil loss caused by differences in vegetation management measures, and its range is 0-1. This study adopts the following classification, as shown in Tab.S3.

Sandstorm prevention

Sandstorm prevention refers to the inhibition and fixation of wind and sand by ecosystem vegetation, which is an important protective service provided by natural ecosystems in aeolian regions. The Revised Wind Erosion Equation (RWEQ) model has been proved reliable under various conditions in China (Fu et al., 2017). This study used RWEQ model to estimate the sandstorm prevention services of China from 2000 to 2020, and formula are as follow:

$$SP = S_{LQ} - S_L \tag{20}$$

$$S_{LQ} = \frac{2z}{S_Q^2} Q_{max\_Q} \times e^{-(z/S_Q)^2} \tag{21}$$

$$Q_{max\_Q} = 109.8\ (WF \times SEF \times SCF \times K') \tag{22}$$

$$S_Q = 150.71\ (WF \times SEF \times SCF \times K')^{-0.3711} \tag{23}$$

$$S_L = \frac{2z}{S^2} Q_{max} \times e^{-(z/S)^2} \tag{24}$$

$$Q_{max} = 109.8\ (WF \times SEF \times SCF \times K' \times C) \tag{25}$$

$$S = 150.71\ (WF \times SEF \times SCF \times K' \times C)^{-0.3711} \tag{26}$$

Where SP is the amount sandstorm prevention of an ecosystem (kg/m^2). S_{LQ} and S_L are the amount of potential wind erosion and wind erosion respectively (kg/m^2). z is downwind distance (m), and z is 50 m in this study (Meng et al., 2021). Q_{max_Q} and Q_{max} are the potential maximum transport capacity and maximum transport capacity respectively (kg/m). S_Q and S are the potential key plot length and key plot length respectively (m). WF, SEF, SCF, K', C are the weather factor, soil erodibility factor, soil crust factor, soil roughness factor, vegetation factor, respectively.

$$WF = Wf \times SW \times SD \times \frac{\rho}{g} = \left[\sum_{i=1}^{N} u_2(u_2 - u_1)^2 \times N_{wd}\right] \times \left[\frac{ET_p - (R + I)(R_d/N_{rd})}{ET_p}\right] \times \left[\frac{ET_p - (R + I)(R_d/N_{rd})}{ET_p}\right] \times \frac{\rho}{g} \tag{27}$$

Where

$$\rho = 348 \times \left(\frac{1.013 - 0.1183L + 0.0048L^2}{T}\right) \tag{28}$$

Where Wf, SW, SD, ρ, g are the monthly average wind factor (m/s)^3; the monthly average soil moisture factor, snow cover factor, the air density (kg/m^3), the gravitational acceleration(m/s^2) respectively. u_1 and u_2 are the sand-moving wind speed and monthly monitoring wind speed of the weather station(m/s) respectively. N_{wd} is the number of days when the wind speed is greater than 5m/s in each month. R is the monthly average rainfall (mm); I is the irrigation amount, which is set as 0 in this study. R_d is the monthly average rainfall days. N_{rd} is the monthly average rainfall days; ET_p is the monthly average potential evaporation (mm). L is the altitude (km). T is the monthly absolute temperature (K).

$$SEF = \frac{29.09 + 0.31m_s + 0.17m_{silt} + 0.33(m_s/m_c) - 2.59m_{om} - 0.95Ca}{100} \tag{29}$$

$$SCF = 1/[1 + 0.0066(m_c)^2 + 0.021(m_{om})^2] \tag{30}$$

Where m_s, m_{silt}, m_c, m_{om}, Ca are the mass-based percentages of sand, silt, clay, organic matter and $CaCO_3$ respectively.

$$K' = (1.86K_r - 2.14K_r^{0.934} - 0.127C_{rr}) \tag{31}$$

$$K_r = 0.2 \times \frac{(\Delta H)^2}{L} \tag{32}$$

$$C = e^{a_i Cov_i} \tag{33}$$

Where K_r is the terrain roughness (m). C_{rr} is the random roughness factor (m), which is set as 0 in this syudy. L is the terrain relief parameter, the value is shown in Tab.S4. ΔH is the altitude difference within the distance L.

Where a_i is the coefficient of different vegetation types, the forest, grassland, shrubland, barren and Cropland are −0.1535, −0.1151, −0.0921, −0.0768, −0.0438, respectively. Cov_i is the maximum annual vegetation coverage of different vegetation types.

Water yield

Water yield refers to the amount of water that is formed by rainfall as runoff (mm). We used Water yield model in InVEST, building on the Budyko curve (Budyko, 1974), to estimate the annual water yield in China. The formula are as follow:

$$Y(x) = \left(1-\frac{AET(x)}{P(x)}\right) \cdot P_x \tag{34}$$

$$\frac{AET(x)}{P(x)} = 1+\frac{PET(x)}{P(x)} - \left[1 + \left(\frac{PET(x)}{P(x)}\right)^w\right]^{1/w} \tag{35}$$

$$PET(x) = K_c \times ET_0(x) \tag{36}$$

$$W(x) = Z \times \frac{AWC(x)}{P(x)} + 1.25 \tag{37}$$

$$AWC(x) = Min\,(Rest.Layer.depth, root.depth) \cdot PAWC \tag{38}$$

$$AET(x) = Min\,(Kc(lx) \cdot ET_0(x), P(x)) \tag{39}$$

$$PAWC = 54.509 - 0.132m_s - 0.003m_s^2 - 0.055m_{silt} - 0.006m_{silt}^2 - 0.738m_c + 0.007m_c^2 - 2.688m_{om} + 0.501m_{om}^2 \tag{40}$$

Where $Y(x)$ is annual water yield in pixel x (mm). $AET(x)$, $P(x)$ and $PET(x)$ are the annual evapotranspiration, the annual precipitation and the potential evapotranspiration on pixel x (mm), respectively. $W(x)$ is the land surface properties of catchments. $ET0(x)$ is reference evapotranspiration (mm). Kc is plant evapotranspiration coefficient (mm). $AWC(x)$ and $PAWC$ are the available water content and the plant available water content, respectively. The m_s, m_{silt}, m_c, and m_{om} are the proportion of sand, silt, clay, and organic matter in the soil. The biophysical coefficients of each landcover class used in the model can be found in Tab. S5.

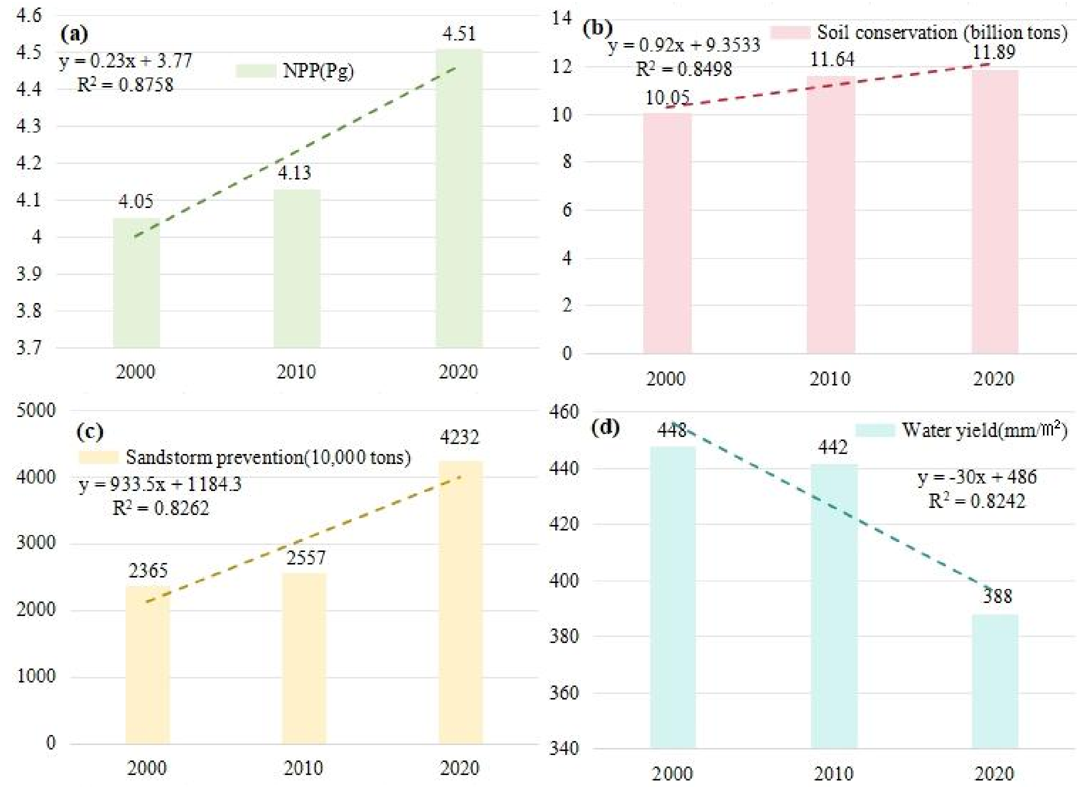

Figure S2: Changes of ecosystem services in China from 2000 to 2020. (a) Net primary productivity (NPP), (b)Soil conservation, (c)Sandstorm prevention, (d)Water yield

Table S1: The datasets for assessing the four ecosystem services

Ecosystem services	Model	Parameter	Dataset	Spatial resolution	Temporal resolution	Source
Net primary productivity	CASA	NDVI	/	30 m	Monthly	https://developers.google.com/earthengine/
		Temperature	/	1 km	Monthly	http://www.geodata.cn/data/
		Precipitation	/	1 km	Monthly	http://www.geodata.cn/data/
		Landcover	GlobeLand 30	30 m	Yearly	http://globeland30.org/
		Solar radiation	/	1 km	Monthly	https://developers.google.com/earthengine/datasets/
		Evapotranspiration	MOD16A2	500 m	Monthly	https://modis.gsfc.nasa.gov/
		Potential evapotranspiration	MOD16A2	500 m	Monthly	https://modis.gsfc.nasa.gov/
Soil conservation	RUSLE	NDVI	/	30 m	Quarterly	https://developers.google.com/earthengine/
		Precipitation	/	1 km	Monthly	http://www.geodata.cn/data/
		Soil properties	SoilGrids	250 m	/	https://soilgrids.org/
		Digital elevation model	USGS_SRTMGL1_003	30 m	/	https://developers.google.com/earthengine/datasets/catalog/USGS_SRTMGL1_003
Sandstorm prevention	RWEQ	Wind speed	/	0.01°	Monthly	https://developers.google.com/earthengine/datasets/
		Soil properties	SoilGrids	250 m	/	https://soilgrids.org/
		Snow cover	MOD10A2	0.05°	Monthly	https://modis.gsfc.nasa.gov/
		Potential evapotranspiration	MOD16A2	500 m	Monthly	https://modis.gsfc.nasa.gov/
		Precipitation	/	1 km	Monthly	http://www.geodata.cn/data/
		Temperature	/	1 km	Monthly	http://www.geodata.cn/data/

		NDVI	/	30 m	Monthly	https://developers.google.com/earthengine/
		Digital elevation model	USGS_SRTMGL1_003	30 m	/	https://developers.google.com/earthengine/datasets/catalog/USGS_SRTMGL1_003
		Precipitation	/	1 km	Yearly	http://www.geodata.cn/data/
		Potential evapotranspiration	MOD16A2	500 m	Yearly	https://modis.gsfc.nasa.gov/
Water yield	InVEST	Soil properties	SoilGrids	250 m	/	https://soilgrids.org/
		Landcover	GlobeLand 30	30 m	/	http://globeland30.org/
		Watersheds	/	/	/	http://www.mwr.gov.cn/

Table S2: The $\varepsilon_{\max}$ of each vegetation type

Vege_code	ε_{max}	VI_max	VI_min
10	0.542	0.7	0.05
20	0.605	0.7	0.05
30	0.532	0.7	0.05
40	0.429	0.68	0.05
50	0.542	0.68	0.05
60	0	0	0
70	0.542	0.66	0.05
80	0	0	0
90	0.2	0.5	0
100	0	0	0

Note: Vege_code is vegetation type of GlobeLand 30. 10, Cropland; 20, Forest; 30, Grassland; 40, Shrubland; 50, Wetland; 60, Water; 70, Tundra; 80, Impervious surface; 90, Barren; 100, Snow/Ice. VI_max and VI_max refer to the maximum and minimum of vegetation index respectively.

Table S3: P value for different landcover

Landcover	P
Cropland	0.2
Forest and Shrubland	0.5
Grassland	0.2
Water and Wetland	0
Impervious surface	1
Barren, Tundra and Snow/Ice	0.2

Table S4: The value of L in different terrain grade

Terrain grade	Terrain relief within $16km^2$（m）	L (km)
Slight relief	＜30	5
Slowly relief	30～150	5
Moderate relief	150～300	10
Mountainous terrain	300～600	10
Alpine terrain	＞600	50

Table S5: Biophysical table used for the baseline INVEST water yield model.

lucode	LC_desc	LC_veg	Kc	Root_depth(mm)
10	Cropland	1	0.82	400
20	Forest	1	0.82	1000
30	Grassland	1	0.48	300
40	Shrubland	1	0.47	2000
50	Wetland	1	1.2	200
60	Water	0	1	1
80	Impervious surface	0	0.3	1
90	Bareland	0	0.5	1
100	Snow/Ice	0	0.31	1
255	Sea	0	0.61	1

Note：The LC_desc is the descriptive name of landcover class. The LC_veg contains the information on which AET equation to use. The root depth is often the depth at which 95% of root biomass occurs.

Table S6: The proportion of ecosystem services in each province in China (2020).

Province	Net primary productivity (%)	Soil conservation (%)	Sandstorm prevention (%)	Water yield (%)
Beijing	0.27	0.10	0	0.12
Tianjin	0.13	0.01	0	0.08
Hebei	2.28	1.30	0	1.48
Shanxi	2.43	2.76	0	1.40
Inner Mongolia	7.76	6.49	42.39	5.65
Liaoning	2.16	1.22	0	1.92
Jilin	2.62	1.05	0	2.15
Heilongjiang	5.97	1.85	0	5.28
Shanghai	0.06	0.0037	0	0.14
Jiangsu	1.24	0.10	0	2.10
Zhejiang	1.76	0.45	0	3.06
Anhui	2.16	0.49	0	3.69
Fujian	2.69	0.36	0	3.47
Jiangxi	3.22	0.60	0	5.46
Shandong	2.25	0.59	0	2.13
Henan	2.75	0.56	0	2.65
Hubei	3.03	1.54	0	5.19
Hunan	3.59	1.94	0	6.51
Guangdong	3.80	0.50	0	5.56
Guangxi	4.86	1.59	0	6.65
Hainan	0.91	0.03	0	0.98
Chongqing	1.32	1.31	0	2.18
Sichuan	8.48	11.75	0	7.24
Guizhou	2.87	3.33	0	4.37
Yunnan	9.00	3.89	0	6.90
Tibet	6.50	24.35	0.51	5.01
Shaanxi	3.29	2.95	1.84	2.32
Gansu	2.97	5.06	8.76	1.69
Qinghai	4.46	13.54	3.41	1.63
Ningxia	0.35	0.68	1.61	0.22
Xinjiang	3.40	9.47	41.49	0.92
Hongkong	0.02	0.01	0	0.03
Macao	0.0003	0.00001	0	0.0006
Taiwan	0.88	0.12	0	1.81

Table S7: Changes of ecosystem services from 2000 to 2020.

Province	Year	Net primary productivity change (Pg)	Net primary productivity change ratio (%)	Soil conservation change (billion tons)	Soil conservation change ratio (%)	Sandstorm prevention change (10,000 tons)	Sandstorm prevention change ratio (%)	Water yield change(mm)	Water yield change ratio (%)
Beijing	2000-2010	0.01	1.38	0.001	0.072			0.11	0.203
	2010-2020	0.002	0.55	-0.004	-0.340			0.03	0.477
	2000-2020	0.003	0.965	0.002	0.079			0.13	0.215
Tianjin	2000-2010	0.001	1.4	0.0001	0.007			0.08	0.148
	2010-2020	0.001	0.32	0.0004	0.034			0.04	0.636
	2000-2020	0.002	0.86	0.0005	0.020			0.12	0.198
Hebei	2000-2010	0.01	20.94	0.02	1.446			2.14	3.947
	2010-2020	0.02	6.15	-0.03	-2.549			0.3	4.768
	2000-2020	0.04	13.545	-0.006	-0.237			2.45	4.050
Shanxi	2000-2010	0.02	26	0.02	1.446			1.2	2.213
	2010-2020	0.02	5.78	-0.02	-1.699			1.12	17.800
	2000-2020	0.04	15.89	-0.005	-0.197			2.32	3.835
Inner Mongolia	2000-2010	0.006	8.69	0.01	0.723	21.43	11.16	4.06	7.488
	2010-2020	0.05	13.8	0.15	12.746	1073.6	64.09	5.76	91.545
	2000-2020	0.06	11.245	0.17	6.712	1095.04	58.65	9.82	16.234
Liaoning	2000-2010	0.005	6.23	0.1	7.229			4.82	8.890
	20102020	0.01	4.34	-0.1	-8.497			-2.02	-32.104
	2000-2020	0.02	5.235	0.003	0.118			2.79	4.612
Jilin	2000-2010	0.0002	0.29	0.09	6.506			4.57	8.429
	2010-2020	0.01	3.83	-0.12	-10.197			-1.91	-30.356
	2000-2020	0.01	2.06	-0.02	-0.790			2.66	4.397

Heilongjiang	2000-2010	0.002	3.71	0.05	3.615	5.97	11.011
	2010-2020	0.006	1.84	-0.03	-2.549	4.64	73.744
	2000-2020	0.009	2.375	0.01	0.395	10.62	17.556
Shanghai	2000-2010	0.0001	0.23	0.0001	0.007	-0.01	-0.018
	2010-2020	0.0003	0.1	0.00002	0.002	0.16	2.543
	2000-2020	0.0005	0.165	0.0001	0.004	0.14	0.231
Jiangsu	2000-2010	0.001	2.17	0.001	0.072	1.3	2.398
	2010-2020	0.004	1.12	0.0007	0.059	2.63	41.799
	2000-2020	0.005	1.645	0.0017	0.067	3.94	6.513
Zhejiang	2000-2010	0.0002	0.34	0.01	0.723	4.41	8.134
	2010-2020	0.001	0.5	0.02	1.699	-2.98	-47.362
	2000-2020	0.002	0.42	0.03	1.184	1.42	2.347
Anhui	2000-2010	0.006	8.27	0.02	1.446	5.47	10.089
	2010-2020	0.004	1.08	0.005	0.425	1.89	30.038
	2000-2020	0.01	4.355	0.025	0.987	7.37	12.184
Fujian	2000-2010	0.002	3	0.037	2.675	3.46	6.382
	2010-2020	0.01	3.2	0.09	7.648	-5.52	-87.730
	2000-2020	0.01	3.1	0.12	4.738	-2.06	-3.405
Jiangxi	2000-2010	0.008	11.05	0.03	2.169	8.38	15.456
	2010-2020	0.008	2.22	0.07	5.948	-6.16	-97.902
	2000-2020	0.02	6.535	0.1	3.948	2.21	3.653
Shandong	2000-2010	0.01	16.66	-0.01	-0.723	1.16	2.139
	2010-2020	0.01	4.83	0.02	1.699	1.81	28.767
	2000-2020	0.03	10.745	0.01	0.395	2.96	4.893
Henan	2000-2010	0.01	14.19	0.04	2.892	4.12	7.599
	2010-2020	0.02	5.82	0.03	2.549	1.92	30.515

	2000-2020	0.03	10.005	0.07	2.764	6.04	9.985
	2000-2010	0.01	18.76	0.07	5.060	7.23	13.335
Hubei	2010-2020	-0.003	-0.8	-0.005	-0.425	4.01	63.732
	2000-2020	0.01	8.98	0.06	2.369	11.24	18.581
	2000-2010	0.009	12.45	0.01	0.723	5.32	9.812
Hunan	2010-2020	0.001	0.47	0.02	1.699	0.25	3.973
	2000-2020	0.01	6.46	0.03	1.184	5.57	9.208
	2000-2010	0.008	11.28	-0.01	-0.723	-2.58	-4.758
Guangdong	2010-2020	0.01	5.02	0.1	8.497	-3.27	-51.971
	2000-2020	0.03	8.15	0.09	3.553	-5.85	-9.671
	2000-2010	0.008	10.36	0.01	0.723	-5.25	-9.683
Guangxi	2010-2020	0.01	3.42	0.14	11.896	-0.77	-12.238
	2000-2020	0.02	6.891	0.15	5.922	-6.03	-9.968
	2000-2010	0.004	5.06	-0.005	-0.361	-1.17	-2.158
Hainan	2010-2020	-0.0001	-0.05	-0.001	-0.085	0.12	1.907
	2000-2020	0.003	0.505	-0.07	-2.764	-1.04	-1.719
	2000-2010	0.005	6.48	0.03	2.169	2.13	3.929
Chongqing	2010-2020	0.0003	0.1	0.001	0.085	1.12	17.800
	2000-2020	0.005	3.29	0.0037	0.146	3.26	5.389
	2000-2010	0.02	36.77	0.03	2.169	2.35	4.334
Sichuan	2010-2020	0.01	4.87	0.15	12.746	2.41	38.303
	2000-2020	0.04	20.82	0.19	7.502	4.77	7.885
	2000-2010	0.01	15.48	-0.07	-5.060	0.97	1.789
Guizhou	2010-2020	0.001	0.48	0.03	2.549	2.85	45.296
	2000-2020	0.01	7.98	-0.03	-1.184	3.82	6.315
Yunnan	2000-2010	0.03	48.28	0.33	23.856	-8.54	-15.751

	2010-2020	0.03	7.97	0.16	13.596			-0.78	-12.397
	2000-2020	0.07	28.04	0.5	19.741			-9.33	-15.424
	2000-2010	-2.01	-268.12	0.019	1.374	0.53	0.28	-0.9	-1.660
Tibet	2010-2020	0.02	6.27	0.4	33.990	28.35	1.69	-0.5	-7.947
	2000-2020	-0.18	-130.925	0.42	16.582	28.89	1.55	-1.4	-2.314
	2000-2010	0.01	24.41	0.04	2.892	-12.94	-6.74	2.25	4.150
Shaanxi	2010-2020	0.01	4.48	0.07	5.948	85.96	5.13	-0.04	-0.636
	2000-2020	0.03	14.445	0.12	4.738	73.02	3.91	2.2	3.637
	2000-2010	0.01	19.81	0.13	9.398	59.99	31.25	0.67	1.236
Gansu	2010-2020	0.02	5.04	0.13	11.047	151.7	9.06	0.55	8.741
	2000-2020	0.03	12.425	0.27	10.660	211.69	11.34	1.22	2.017
	2000-2010	0.03	43.42	0.01	0.723	49.53	25.8	0.81	1.494
Qinghai	2010-2020	-0.004	-1.28	-0.009	-0.765	11.43	0.68	0.6	9.536
	2000-2020	0.03	21.02	0.007	0.276	60.96	3.26	1.41	2.331
	2000-2010	0.004	6	0.04	2.892	2.98	1.55	-0.09	-0.166
Ningxia	2010-2020	0.002	0.77	0.01	0.850	107.48	6.42	0.02	0.318
	2000-2020	0.007	3.285	0.05	1.974	110.46	5.92	-0.07	-0.116
	2000-2010	-0.01	-14.58	0.31	22.410	70.46	36.7	0.17	0.314
Xinjiang	2010-2020	0.03	7.08	-0.11	-9.347	216.59	12.93	-1.13	-17.959
	2000-2020	0.01	-3.75	0.2	7.896	287.05	15.37	-0.94	-1.554
	2000-2010	0.0001	0.14	0.0001	0.007			-0.02	-0.037
Hongkong	2010-2020	0.00008	0.02	0.0007	0.059			0.001	0.016
	2000-2020	0.0001	0.08	0.0008	0.032			-0.02	-0.033
	2000-2010	0.000009	0.001	0.000004	0.000			-0.001	-0.002
Macao	2010-2020	0.000003	0.001	0.000004	0.000			0.001	0.016
	2000-2020	0.000001	0.001	0.000008	0.000			0.001	0.002

	2000-2010	0.004	5.68	0.02	1.446			-0.37	-0.682
Taiwan	2010-2020	0.002	0.69	0.008	0.680			-0.86	-13.668
	2000-2020	0.007	3.185	0.03	1.184			-1.25	-2.066