

Supplement

Table S1. Overview of modelled soil erosion rates (SE) from collected studies compared with our results.

Study area	Other studies			This study		
	Time series	Average SE (t·ha ⁻¹ ·a ⁻¹)	Resolution*	Time series	Average SE (t·ha ⁻¹ ·a ⁻¹)	Resolution
Yangtze River Basin						
Jiangxi Province	2001, 2015	63.75–70.42 (Zhou et al., 2018)	1 km		40.69–77.44 (2001, 2015)	
	2010	353.54 (Chen et al., 2014)	1 km		73.31	
	2000, 2005, 2010, 2015	90.60 (Li et al., 2021)	1 km		73.31	
	Average of 2002–2016	0.92 (Teng et al., 2019)	1 km		48.01	
Hunan Province	2010	558.24 (Chen et al., 2014)	1 km	1992-2019	109.01	300 m
The southern hill region of	2010	421.81 (Chen et al., 2014)	1 km		84.86	
China	2000, 2005, 2010, 2015	108.20 (Li et al., 2021)	1 km			
South of Gansu and northwest	2015	13.39 (Wei et al., 2021a)	1 km		43.65	
of Sichuan	2000, 2005, 2010, 2015	11.53 (Li et al., 2021)	1 km			

Southeast Basin

Fujian Province	2010	298.71 (Chen et al., 2014)	1 km		80.47	
	Average of 2002–2016	5.07 (Teng et al., 2019)	1 km			
	1990, 2000, 2010, 2015	15-30 (Zeng et al., 2017)	30 m (DEM)	1992-2019	60.35	300 m
Zhejiang Province	2010	395.02 (Chen et al., 2014)	1 km		58.01	
	Average of 2002–2016	1.21 (Teng et al., 2019)	1 km		43.39	
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Pearl River Basin						
Guangdong Province	2012	22.94 (Gao et al., 2017)	500 m		116.42	
	Average of 2002–2016	1.88 (Teng et al., 2019)	1 km		112.63	
	2000, 2005, 2010, 2015	115.19 (Li et al., 2021)	1 km	1992-2019	122.88	300 m
Guizhou Province	2002	28.7 (Xu et al., 2008)	25 m		206.66	
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Yellow River Basin						
Loess Plateau	2008	24.05 (Fu et al., 2011)	30 m (DEM)			
	Average of 1991-1995	10.13 (Jin et al., 2021)	30 m		15.56	
	Average of 2011-2015	5.95 (Jin et al., 2021)	30 m			
	2000, 2005, 2010, 2015	8.27 (Li et al., 2021)	1 km	1992-2019		300 m
Gansu Province	-	15.00 (Zhang and McBean, 2016)			12.07	
	Average of 2002–2016	1.72 (Teng et al., 2019)	1 km			
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Shaanxi Province	2006	41.74–43.34 (Cheng et al., 2009)			
	Average of 2002–2016	2.78 (Teng et al., 2019)	1 km		35.31
Continental Basin					
Three-North Shelter Forest Region	2015	2.30 (Ji et al., 2018)			1.78
Tibet Plateau	Average of 1990–2000	40.5 (Xiao et al., 2003)	1 km	1992-2019	300 m
	Average of 2002–2016	2.76 (Teng et al., 2018)	1 km		11.67
	-	0.18–114.98 (Wei et al., 2021b)	-		
Songhua and Liaohe River Basin					
Liaoning Province	Average of 2016–2020	18.73 (Li, 2022)	1 km		18.84
	Average of 2002–2016	0.45 (Teng et al., 2019)	1 km		
Jilin Province	2005	17.70 (Zhao, 2018)	90 m		11.71
	2010	18.25 (Zhao, 2018)	90 m		13.91
	2015	14.33 (Zhao, 2018)	90 m	1992-2019	300 m
	Average of 2002–2016	0.13 (Teng et al., 2019)	1 km		9.13
Black Soil Region	1980, 1990, 2000, 2010,	3.91–4.45 (mean=4.22) (Fang and	90 m (DEM)		6.82
	2017	Fan, 2020)			

China	2001, 2012	6.42 (Borrelli et al., 2017)	25 km		25.78	
	2000, 2005, 2010, 2015	35.98 (Li et al., 2021)	1 km			
	Average of 2002–2016	1.44 (Teng et al., 2019)	1 km	1992–2019	30.40	300 m
	2018	64.88–81.75 (Zhuang et al., 2021)	10 km		34.16	

* The data resolution refers to the resolution of final results of soil erosion estimation. If this information is missed, it will be replaced by the resolution of the DEM data.

Table S2. Overview of collected soil conservation capacity (SC) in different regions and their sources compared with our results.

Study area	Other studies			This study		
	Time	Average SC (t ha ⁻¹ a ⁻¹)	Resolution*	Time	Average SC (t ha ⁻¹ a ⁻¹)	Resolution
China	2009	224.42 (Rao et al., 2013)	90 m		433.45	
Tibet Plateau	Average of 1990–2000	61.9–598.3 (mean value=483.03) (Xiao et al., 2003)	1 km		161.35	
Three Gorges Reservoir region of China	2000–2010	2134.73 (Xiao et al., 2017)	90 m	1992–2019	2132.81	300 m
Hainan Island	2008	247.28 (Rao et al., 2013)	90 m (DEM)		1117.01	

Agro-pastoral ecotone of northern China	2000, 2008	459.03–459.40 (Liu et al., 2021)	90 m (DEM)	177.09
Liaoning Province	Average of 2016–2020	186.15–194.35 (Li, 2022)	1 km	321.43
Xinjiang Province	1996–2012	8.09–8.17 (Ma et al., 2020)	1 km	7.05
Yangtze River Basin	2000, 2015	3082–3164 (Kong et al., 2018)	90 m (DEM)	2515.09

* The data resolution refers to the resolution of final results of soil conservation capacity. If this information is missed, it will be replaced by the resolution of the DEM data.

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