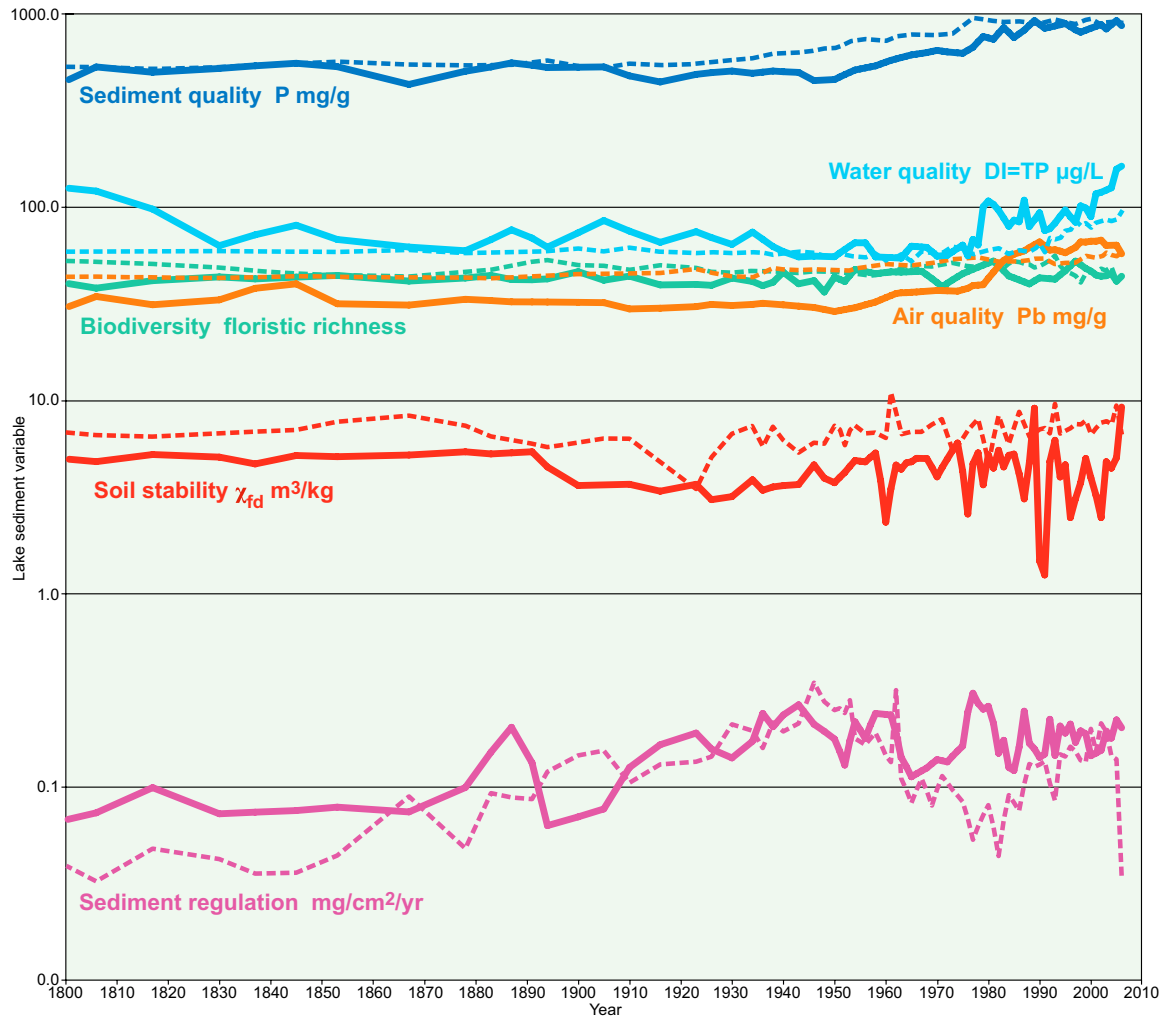


# Supporting Information

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**Fig. S1.** Time series of sediment analytical data 1800–2006 for Chaohu Lake (solid lines) and Taibai Lake (dashed lines), showing pairs of proxies for sediment quality, water quality, sediment regulation, soil stability, air quality, and biodiversity (vertical axis shows values from Table S1 on logarithmic scale).







**Table S3. Complete analytical dataset for dated sediment samples from Chaohu and Taibai lake sediment cores**

Year	Chaohu						Taibai					
	P mg/g, sediment quality	DI-TP g/mg, water quality	mg/y, sediment regulation	Xfd m <sup>3</sup> /kg, soil stability	Pb mg/g, air quality	Pollen richness, biodiversity	P mg/g, sediment quality	DI-TP g/mg, water quality	mg/y, sediment regulation	Xfd m <sup>3</sup> /kg, soil stability	Pb mg/g, air quality	Pollen richness, biodiversity
2006	875.2	164.0	0.2	9.3	57.7	44.4	908.6	94.6	0.0	6.7	58.2	44.1
2005	929.7	158.2	0.2	5.1	63.9	41.4	915.4	86.3	0.1	9.4	56.1	41.6
2004	885.6	126.6	0.2	4.5	63.8	49.5	914.0	85.1	0.1	7.6	57.0	45.6
2003	841.6	123.2	0.2	4.8	63.7	47.1	911.7	85.9	0.2	7.9	58.6	44.4
2002	886.7	120.1	0.2	2.5	67.9	48.4	886.9	84.8	0.2	7.7	56.1	44.2
2001	867.7	118.0	0.2	3.2	67.0	46.3	921.6	83.5	0.2	7.2	54.9	44.8
2000	848.7	89.8	0.1	4.0	67.0	46.6	950.0	78.5	0.2	6.7	55.6	46.9
1999	829.1	99.6	0.2	5.0	66.3	45.5	938.4	83.0	0.1	7.9	56.2	48.5
1998	809.4	102.2	0.2	3.8	66.5	40.9	915.9	80.5	0.1	7.5	54.0	50.7
1997	832.5	84.1	0.2	3.1	62.2	44.2	893.4	85.1	0.2	7.6	51.8	52.9
1996	865.3	89.8	0.2	2.5	60.3	45.9	904.3	76.8	0.2	7.2	51.8	50.0
1995	898.1	97.2	0.2	4.7	58.4	47.0	915.1	75.1	0.1	7.0	51.9	47.1
1994	885.1	90.2	0.2	4.0	59.6	50.1	930.2	68.9	0.1	6.8	51.5	44.9
1993	872.1	83.1	0.1	6.3	60.5	56.4	945.3	68.1	0.1	9.6	51.1	42.6
1992	860.3	77.8	0.2	4.8	60.3	53.2	927.5	69.5	0.1	6.8	52.8	42.9
1991	848.5	76.1	0.1	1.3	63.4	51.3	909.7	58.5	0.1	7.2	54.6	43.1
1990	889.1	94.1	0.1	1.5	66.5	49.7	903.4	64.7	0.1	7.1	54.4	43.3
1989	929.7	86.5	0.2	9.2	64.3	49.0	897.2	60.9	0.1	6.7	54.2	41.8
1988	879.5	79.8	0.2	4.8	62.1	50.8	908.7	59.0	0.1	6.5	53.4	40.3
1987	829.2	109.3	0.2	3.1	59.7	51.4	914.5	59.4	0.1	7.6	53.0	41.3
1986	794.1	84.4	0.2	4.2	58.6	52.4	920.3	59.8	0.1	8.7	52.6	42.3
1985	759.0	86.2	0.1	5.3	57.4	52.8	919.0	58.5	0.1	7.4	52.6	43.3
1984	807.3	80.1	0.1	5.2	55.4	51.2	917.7	57.2	0.1	6.0	52.7	44.3
1983	855.5	88.3	0.2	4.5	53.3	48.8	916.4	59.2	0.1	7.2	52.7	47.2
1982	799.8	97.0	0.1	5.5	49.8	50.5	915.1	61.3	0.0	8.3	52.7	50.0
1981	744.1	104.0	0.2	4.5	46.3	51.8	925.9	60.7	0.1	6.4	53.3	52.9
1980	756.4	108.3	0.3	5.3	43.1	51.8	936.7	60.1	0.1	4.5	54.0	51.7
1979	768.8	101.0	0.3	3.7	39.9	50.3	943.9	59.3	0.1	6.3	54.6	50.4
1978	722.5	64.1	0.3	5.4	39.7	49.5	951.1	58.4	0.1	8.1	55.2	49.2
1977	676.2	68.5	0.3	4.7	39.5	49.5	958.3	57.5	0.1	7.6	55.0	48.0
1976	652.9	56.3	0.2	2.6	38.2	49.8	917.3	59.1	0.1	7.0	54.8	46.7
1975	629.6	64.0	0.2	4.3	37.6	50.5	876.2	60.7	0.1	6.4	54.7	45.5
1974	633.1	61.5	0.2	6.0	37.0	51.0	835.1	61.6	0.1	6.0	54.4	43.9
1973	636.5	59.1	0.1	5.5	37.0	51.7	794.0	62.6	0.1	5.5	54.1	42.2
1972	640.0	56.6	0.1	5.0	37.1	51.2	791.4	60.5	0.1	6.8	53.4	40.6
1971	646.1	56.4	0.1	4.5	37.2	50.6	788.7	58.4	0.1	8.0	52.8	39.0
1970	652.1	56.1	0.1	4.0	37.3	50.1	786.0	58.3	0.1	7.8	52.1	40.9
1969	643.6	59.2	0.1	4.5	37.1	49.6	783.3	58.1	0.1	7.6	51.5	42.9
1968	635.0	62.3	0.1	5.0	36.9	49.7	783.5	58.7	0.1	7.2	51.2	44.9
1967	629.3	62.6	0.1	5.0	36.8	49.8	783.7	59.3	0.1	6.9	50.9	46.8
1966	623.5	62.9	0.1	5.0	36.6	50.0	783.8	55.9	0.1	6.9	50.6	46.7
1965	617.8	63.2	0.1	4.8	36.5	50.1	784.0	52.5	0.1	6.9	50.3	46.6
1964	608.1	59.0	0.1	4.8	36.3	50.2	779.1	54.8	0.1	6.8	50.4	46.5
1963	598.4	54.8	0.1	4.4	36.3	48.7	774.3	57.1	0.1	6.7	50.5	46.4
1962	588.7	55.0	0.2	4.7	35.9	47.0	764.5	55.5	0.3	9.1	50.7	46.5
1961	579.0	55.2	0.2	3.5	35.1	45.9	747.7	56.6	0.1	11.0	50.9	46.5
1960	566.6	55.3	0.2	2.4	34.2	45.5	730.8	53.5	0.1	6.4	51.1	46.2
1959	554.2	55.4	0.2	3.9	33.3	45.2	735.8	55.7	0.2	6.6	50.6	45.8
1958	541.8	55.6	0.2	5.4	32.5	44.9	740.7	57.9	0.2	6.8	50.1	45.5
1957	535.3	60.7	0.2	5.1	31.9	44.5	745.6	56.6	0.2	6.8	49.6	46.1
1956	528.8	65.8	0.2	4.8	31.4	44.8	750.5	55.3	0.2	6.8	49.1	46.7
1955	522.3	65.8	0.2	4.9	30.9	45.3	743.6	55.5	0.2	7.1	48.7	47.3
1954	515.8	65.8	0.2	4.9	30.3	45.6	736.6	55.7	0.2	7.5	48.2	47.9
1953	502.0	63.2	0.2	4.6	30.0	45.8	722.6	56.1	0.3	7.0	47.4	44.7
1952	488.2	60.7	0.1	4.3	29.7	45.9	701.8	56.8	0.2	6.0	47.5	41.5
1951	474.4	58.2	0.2	4.0	29.3	46.2	680.9	57.5	0.3	7.1	47.6	42.6
1950	460.6	55.7	0.2	3.8	29.0	46.5	672.0	56.0	0.3	7.4	47.7	43.7
1948	457.7	55.9	0.2	4.0	29.7	46.6	665.6	55.9	0.3	6.0	47.7	36.6
1946	454.8	56.1	0.2	4.7	30.4	46.8	650.1	58.3	0.3	6.1	47.8	41.9

Table S3. Cont.

Year	Chaohu						Taibai					
	P mg/g, sediment quality	DI-TP g/mg, water quality	mg/y, sediment regulation	Xfd m <sup>3</sup> /kg, soil stability	Pb mg/g, air quality	Pollen richness, biodiversity	P mg/g, sediment quality	DI-TP g/mg, water quality	mg/y, sediment regulation	Xfd m <sup>3</sup> /kg, soil stability	Pb mg/g, air quality	Pollen richness, biodiversity
1943	501.4	55.6	0.3	3.7	30.9	46.0	632.9	59.1	0.2	5.4	47.6	40.3
1940	505.5	59.2	0.2	3.6	31.4	46.3	629.2	58.0	0.2	6.3	47.9	46.4
1938	509.7	62.9	0.2	3.6	31.7	47.0	624.6	57.0	0.2	7.3	48.6	41.1
1936	502.9	68.6	0.2	3.4	32.0	47.1	611.1	58.4	0.2	5.9	46.1	39.5
1934	496.2	74.7	0.2	3.9	31.6	47.1	592.3	58.7	0.2	7.4	43.6	41.5
1930	509.6	64.5	0.1	3.2	31.1	46.2	577.8	58.3	0.2	6.7	44.1	43.2
1926	500.0	70.0	0.2	3.1	31.6	46.8	567.8	58.8	0.1	5.1	46.0	39.6
1923	489.7	75.1	0.2	3.7	30.7	48.7	556.6	58.1	0.1	3.5	48.0	40.0
1916	447.3	66.1	0.2	3.4	30.2	50.3	548.2	59.0	0.1	4.9	46.0	39.8
1910	481.1	75.6	0.1	3.7	29.9	47.8	555.6	61.7	0.1	6.4	45.7	44.2
1905	535.3	85.8	0.1	3.7	32.2	49.9	531.9	59.3	0.2	6.3	45.3	42.1
1900	533.3	74.1	0.1	3.6	32.3	50.6	542.4	61.0	0.1	6.1	45.2	46.6
1894	531.3	62.4	0.1	4.5	32.5	53.4	577.1	59.7	0.1	5.7	44.5	42.8
1891	546.5	69.6	0.1	5.4	32.5	52.5	563.1	59.4	0.1	6.0	44.1	42.3
1887	561.7	76.8	0.2	5.4	32.5	50.1	549.2	59.2	0.1	6.3	43.6	42.4
1883	535.0	68.3	0.2	5.3	33.0	47.6	547.8	58.6	0.1	6.6	43.0	44.6
1878	508.3	59.8	0.1	5.4	33.5	46.5	546.4	58.1	0.0	7.4	43.4	43.2
1867	434.5	62.5	0.1	5.2	31.3	44.1	550.8	60.0	0.1	8.3	43.6	41.7
1853	536.8	68.4	0.1	5.1	31.8	44.7	570.3	59.0	0.0	7.7	43.8	44.6
1845	559.1	81.1	0.1	5.2	40.3	45.6	559.0	59.1	0.0	7.0	44.2	43.7
1837	542.3	72.3	0.1	4.7	38.2	47.1	547.7	59.3	0.0	6.9	43.6	42.8
1830	525.5	63.6	0.1	5.1	33.3	48.9	533.1	59.4	0.0	6.8	43.1	43.8
1817	502.2	98.3	0.1	5.3	31.4	51.1	523.4	59.5	0.0	6.5	43.6	41.9
1806	535.1	121.8	0.1	4.8	34.7	52.4	537.7	59.5	0.0	6.7	43.9	38.3
1794	382.5	131.4	0.1	5.2	26.5	53.9	534.0	59.5	0.0	7.1	43.6	42.6

P, phosphorus; DI-TP, diatom-inferred total phosphorus; Xfd, frequency-dependent magnetic susceptibility; Pb, lead.

**Table S4. Socioeconomic data for GDP (Anhui Province, Renmimbi), population (mean of lake-catchment counties), arable land area (mean of lake-catchment counties), and modeled mean annual regional temperature and rainfall (sources: refs. 151–155)**

Year	Gross domestic product: Anhui, RMB $\times 10^8$	Mean population	Arable land (mu)	Mean annual temperature, $T$ °C	Mean annual rainfall, mm/d
2006	6,148.73	4,667,219	3,441,653	16.3	3.64
2005	5,375.84	4,600,008	3,450,638	16.3	3.64
2004	4,759.3	4,546,044	3,454,253	16.3	3.64
2003	3,823.1	4,499,712	3,327,678	16.3	3.63
2002	3,519.72	4,452,971	3,405,314	16.3	3.63
2001	3,246.71	4,414,202	3,496,878	16.2	3.62
2000	2,902.09	4,382,235	3,527,257	16.7	2.83
1999	2,712.34	4,335,610	3,555,400	16.4	4.06
1998	2,542.96	4,305,283	3,572,845	17.1	3.44
1997	2,347.32	4,279,339	3,591,696	16.6	2.77
1996	2,093.3	4,234,291	3,600,616	15.8	4.25
1995	1,810.66	4,196,371	3,607,800	16.4	2.93
1994	1,320.43	4,148,185	3,630,398	16.9	2.72
1993	1,037.14	4,108,590	3,647,708	15.6	4.07
1992	801.16	3,992,072	3,665,321	16.0	2.80
1991	663.6	4,030,854	3,683,007	16.0	5.17
1990	658.02	3,981,574	3,692,406	15.9	3.17
1989	616.25	3,898,650	3,700,076	15.5	4.26
1988	546.94	3,837,051	3,707,206	15.9	3.34
1987	442.35	3,774,678	3,684,575	15.7	4.01
1986	382.76	3,739,080	3,680,693	15.7	3.53
1985	331.24	3,690,763	3,689,662	15.9	4.06
1984	265.74	3,656,222	3,827,241	15.7	3.72
1983	215.68	3,627,205	3,723,706	16.0	4.01
1982	187.02	3,587,977	3,740,530	16.1	3.13
1981	170.51	3,546,375	3,700,885	15.7	3.81
1980	140.88	3,509,082	3,782,602	15.5	4.43
1979	127.31	3,443,268	3,866,462	15.5	3.34
1978	113.96	3,383,684	3,817,259	16.1	2.95
1977	108.01	3,322,976	3,979,530	15.5	4.30
1976	105.77	3,276,238	4,007,834	15.3	3.20
1975	97.01	3,227,452	3,944,996	15.7	3.99
1974	91.44	3,165,123	3,875,150	15.5	3.47
1973	92.18	3,100,620	3,933,748	15.8	3.66
1972	85.88	3,025,268	3,981,319	15.2	3.58
1971	79.99	2,927,524	3,926,281	15.1	3.21
1970	71.79	2,844,869	3,855,327	15.3	3.94
1969	58.09	2,757,096	3,752,249	15.4	3.60
1968	56.09	2,658,055	3,923,243	15.6	2.91
1967	56.88	2,557,064	3,919,254	15.9	2.97
1966	59.82	2,436,149	3,885,978	16.1	2.93
1965	52.75	2,409,735	3,919,522	15.5	3.08
1964	44.97	2,384,779	4,077,038	15.7	3.74
1963	40.81	2,394,296	4,194,893	15.8	3.64
1962	39.47	2,319,538	4,175,577	15.7	3.47
1961	43.65	2,263,666	4,209,034	16.3	3.72
1960	59.76	2,335,700	4,467,981	16.2	3.49
1959	57.97	2,645,932	4,434,017	15.5	3.33
1958	51.31	2,657,543	4,693,872	15.6	3.54
1957	41.37	2,601,733	4,760,084	15.7	3.97
1956	35.27	2,550,547	4,979,452	14.8	3.80
1955	37.15	2,479,520	4,732,867	15.9	3.41
1954	27.76	2,438,169	4,493,172	15.5	3.03
1953	26.99	2,377,928	4,453,268	15.7	3.28
1952	22.88	2,336,177	4,497,722	16.1	3.38
1951	22.52	2,314,447	4,263,230	15.1	2.72
1950	17.32	2,245,101	4,157,830	14.2	4.12