

Table. S1 Information about the 53 tree-ring chronologies in the Loess Plateau.

Order	Longitude (°)	Latitude (°)	Precipitation (mm)	Temperature (°C)	Elevation (m)	Tree species	refs cites
1	109.83	34.30			2600	<i>Abies chensiensis</i>	Cai <i>et al.</i> , 2014
2	108.03	33.88	1018.1	6.4	2540	<i>Abies fargesii</i>	Dang <i>et al.</i> , 2007
3	108.03	33.88	1047.5	5.2	2350	<i>Abies fargesii</i>	Dang <i>et al.</i> , 2007
4	108.03	33.88	1083.2	3.7	2360	<i>Abies fargesii</i>	Dang <i>et al.</i> , 2007
5	108.03	33.88	1016.8	6.5	2480	<i>Abies fargesii</i>	Dang <i>et al.</i> , 2007
6	108.03	33.88	1032.6	5.9	2760	<i>Abies fargesii</i>	Dang <i>et al.</i> , 2007
7	108.03	33.88	1070.5	4.3	2670	<i>Abies fargesii</i>	Dang <i>et al.</i> , 2007
8	109.28	40.41	256.0	7.1	1474	<i>Juniperus rigida</i>	Dang <i>et al.</i> , 2007
9	107.80	34.00	850.0	1.9	3216	<i>Larix chinensis</i>	Qi <i>et al.</i> , 2020
10	107.80	33.98			3200	<i>Larix chinensis</i>	Su <i>et al.</i> , 2018
11	107.80	33.98			3300	<i>Larix chinensis</i>	Su <i>et al.</i> , 2018
12	107.77	33.93			3270	<i>Larix chinensis</i>	Sun <i>et al.</i> , 2010
13	107.81	34.00			3200	<i>Larix chinensis</i>	Zhu, 2019
14	107.78	33.93			3200	<i>Larix chinensis</i>	Zhu, 2019
15	111.45	37.83	463.8	9.7	2200	<i>Larix principisrupprechtii</i>	Cai <i>et al.</i> , 2013a
16	111.92	38.75			2621	<i>Larix principis-rupprechtii</i>	Li <i>et al.</i> , 2016
17	111.90	38.73			2339	<i>Larix principis-rupprechtii</i>	Li <i>et al.</i> , 2016
18	109.51	40.40	306.5	7.1	1450	<i>Platycladus orientalis</i>	Sun <i>et al.</i> , 2021
19	101.57	37.49	318.0		2750	<i>Picea crassifolia</i>	Liu <i>et al.</i> , 2021
20	101.57	37.48	318.0		3000	<i>Picea crassifolia</i>	Liu <i>et al.</i> , 2021
21	101.91	37.70	167.0	8.0	2750	<i>Picea crassifolia</i>	Deng <i>et al.</i> , 2013
22	111.45	37.83	463.8	9.7	2200	<i>Picea meyeri</i>	Cai <i>et al.</i> , 2013b

23	103.40	35.24			2600	<i>Picea purpurea</i>	Ren <i>et al.</i> , 2014
24	104.24	34.99	511.0	5.1	2350	<i>Picea purpurea</i>	Song <i>et al.</i> , 2021
25	104.24	34.99	510.0	5.94	2350	<i>Picea purpurea</i>	Sun <i>et al.</i> , 2018
26	112.37	39.36			1762	<i>Picea wilsonii</i>	Zhang <i>et al.</i> , 2018
27	104.07	35.78			2350	<i>Picea wilsonii</i>	Chen <i>et al.</i> , 2015
28	110.08	34.47				<i>Pinus armandii</i>	ITRDB
29	110.08	34.47				<i>Pinus armandii</i>	ITRDB
30	112.40	36.90			1450	<i>Pinus tabulaeformis</i>	Cai <i>et al.</i> , 2014
31	106.53	35.52	503.0	8.8	2000	<i>Pinus tabulaeformis</i>	Song <i>et al.</i> , 2011
32	110.07	34.47	900.0	5.9	2082	<i>Pinus tabulaeformis</i>	Liu <i>et al.</i> , 2009
33	111.33	37.77	463.8	9.7	1820	<i>Pinus tabulaeformis</i>	Cai <i>et al.</i> , 2013b
34	102.43	36.41				<i>Pinus tabulaeformis</i>	Wang <i>et al.</i> , 2009a
35	106.27	37.30	240.6	9.2	2400	<i>Pinus tabulaeformis</i>	Wang <i>et al.</i> , 2013
36	111.97	38.70			1800	<i>Pinus tabulaeformis</i>	Fang <i>et al.</i> , 2009
37	112.08	38.83			1900	<i>Pinus tabulaeformis</i>	Li <i>et al.</i> , 2015a
38	102.65	36.83	436.5	2.3	2200	<i>Pinus tabulaeformis</i>	Li <i>et al.</i> , 2012
39	113.45	37.40	520.0	10.0	1440	<i>Pinus tabulaeformis</i>	Cai <i>et al.</i> , 2013a
40	103.80	37.40	306.7	4.9	2500	<i>Pinus tabulaeformis</i>	Gao <i>et al.</i> , 2005
41	106.27	37.30	240.6	9.2	2400	<i>Pinus tabulaeformis</i>	Wang <i>et al.</i> , 2013
42	112.08	38.83			1800	<i>Pinus tabulaeformis</i>	Li <i>et al.</i> , 2015b
43	106.51	35.54	494.6	8.6	1800	<i>Pinus tabulaeformis</i>	Fang <i>et al.</i> , 2012
44	106.16	37.19	271.9	8.9	2300	<i>Pinus tabulaeformis</i>	Wang <i>et al.</i> , 2009b
45	112.08	38.83	420.0	5.0	2400	<i>Pinus tabulaeformis</i>	Li <i>et al.</i> , 2006
46	109.78	35.65	611.8	8.6	1427	<i>Pinus tabulaeformis</i>	Cai <i>et al.</i> , 2005
47	106.27	37.28	240.6	9.2	2600	<i>Pinus tabulaeformis</i>	Wang <i>et al.</i> , 2013

48	106.15	34.45			2080	<i>Pinus tabulaeformis</i>	Chen <i>et al.</i> , 2014
49	110.42	39.29	400.0	7.0	1347	<i>Pinus tabulaeformis</i>	Liang <i>et al.</i> , 2004
50	111.72	38.97			1745	<i>Pinus tabulaeformis</i>	Zhang <i>et al.</i> , 2018
51	106.10	35.58	425.0	6.3	1753	<i>Pinus tabulaeformis</i>	Wang <i>et al.</i> , 2009
52	103.39	35.23			2589	<i>Sabina przewalskii</i>	Fang <i>et al.</i> , 2014
53	102.31	36.59			3100	<i>Sabina przewalskii</i>	Zhang <i>et al.</i> , 2009

All references in the supplementary material are in the text references 62-96.

Table. S2 The comparison of tree ring indices, growth rate and climatic sensitivity during the two warming phases in the Loess Plateau.

Tree growth rate and climatic sensitivity	1910 - 1940	1970 - 2000
	Mean \pm SD	Mean \pm SD
Tree-ring indices	-0.010 \pm 0.984	-0.089 \pm 0.961
Tree growth rate	0.027 \pm 0.020	-0.016 \pm 0.032
Climatic sensitivity-temperature	0.082 \pm 0.206	-0.131 \pm 0.232
Climatic sensitivity-precipitation	-0.021 \pm 0.226	0.073 \pm 0.225
Climatic sensitivity-SPEI	-0.085 \pm 0.224	0.077 \pm 0.240

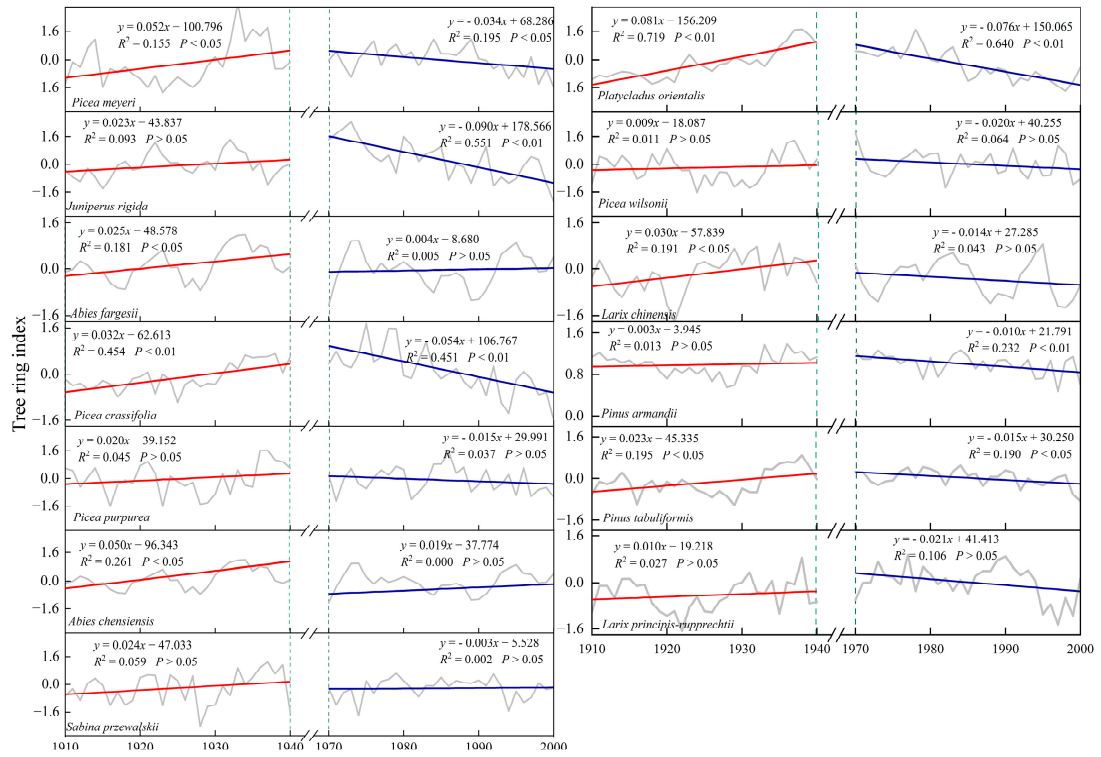


Figure S1. Trends in growth rates of different tree species in two warming phases.

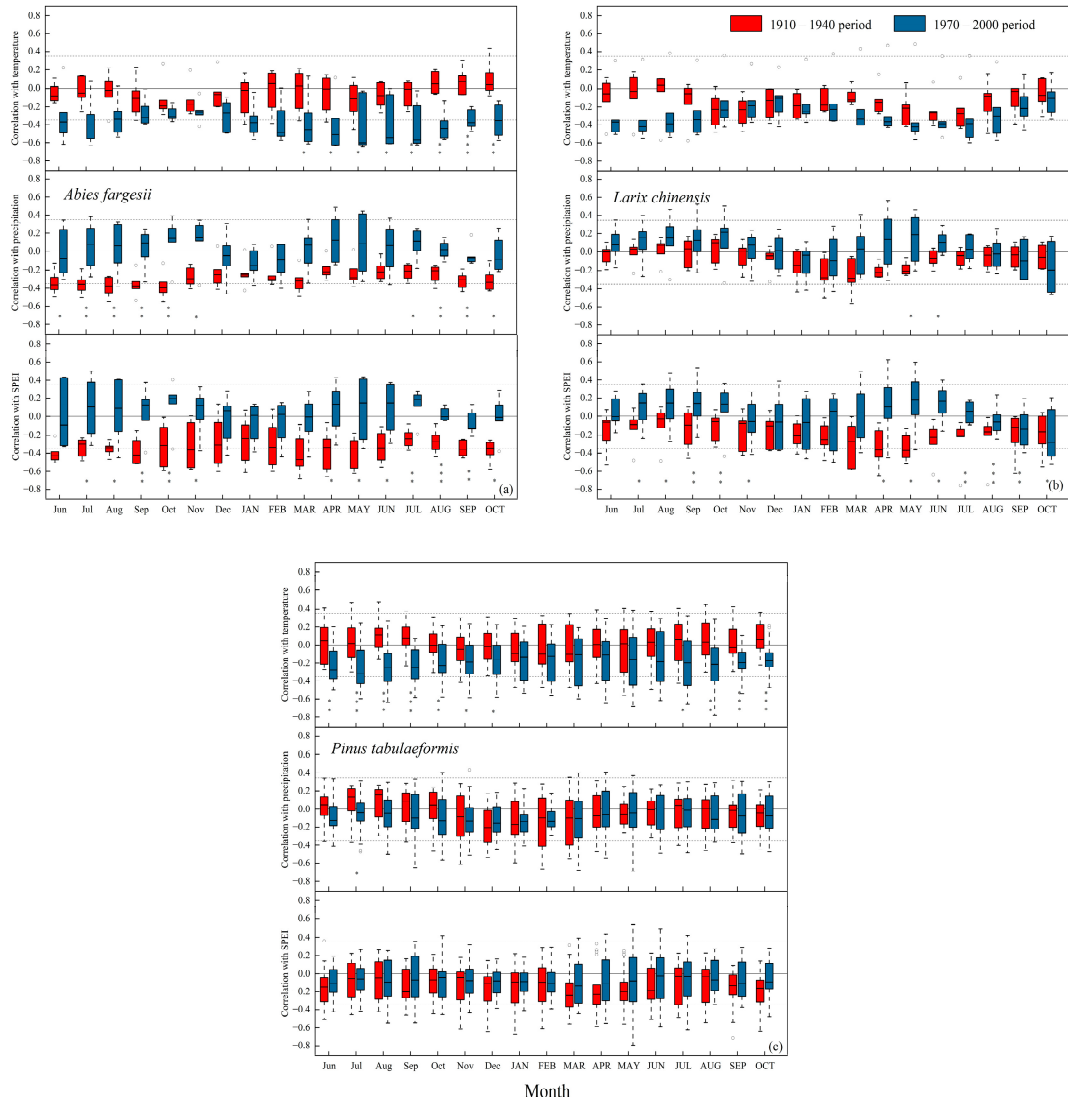


Figure S2. Correlation of tree rings index with temperature and precipitation for different tree species in two warming phases.

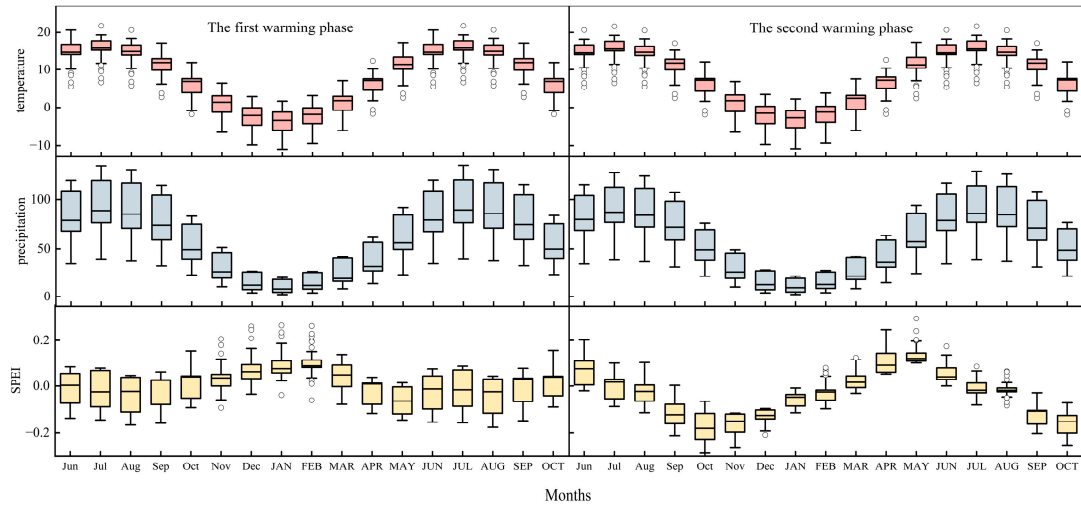


Figure S3. Monthly changes in different climate factors during the two warming phases.