Wild apple growth and climate change in southeast Kazakhstan

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Supplementary Materials

Table S1. Statistics of 12 plots sampled to study wild apple growth across the Jungar Alatau and Trans-Ili Alatau in the southern Kazakhstan. Plot locations are shown in Figure 1.

Location	Plot Code	Coordinates[1]	Elevation m, a.s.l.	Slope degree	Aspect[2]	Number Trees	First Year
Jungar Alatau							
Kok-Jota	KOE	N45.25.824, E80.26.988	1439	12	265	13	1940
	KOW	N45.25.882, E80.26.867	1475	12	136	13	1933
	KON	N45.25.925, E80.26.883	1447	15	172	13	1940
Maslov Griva	CHR	N45.31.089, E80.43.492	1254	8	105	14	1918
	BAP	N45.30.416, E80.45.090	1466	18	81	13	1898
Lepsy	POS	N45.31.173, E80.44.028	1380	12	106	12	1922
	TK	N45.24.288, E80.24.474	1290	17	125	14	1913
	TP*	N45.24.480, E80.24.306	1245	12	103	16	1966
Trans-Ili Alatau							
Turgen	KUZ	N43.22.007, E77.40.407	1540	18	80	12	1898
	KUL	N43.21.607, E77.40.653	1546	20	8	12	1915
	KUM	N43.22.078, E77.40.339	1590	17	17	12	1886
Medeo	CH*	N43.10.416, E76.55.474	1490	11	120	11	1948

*Plots with hybrid apple trees. 1-Decimal degrees, 2-ASP magnetic.

Figure S1. Number of tree samples averaged into the composite ring chronologies. Red line is Jungar and black line is Trans-Ili series.

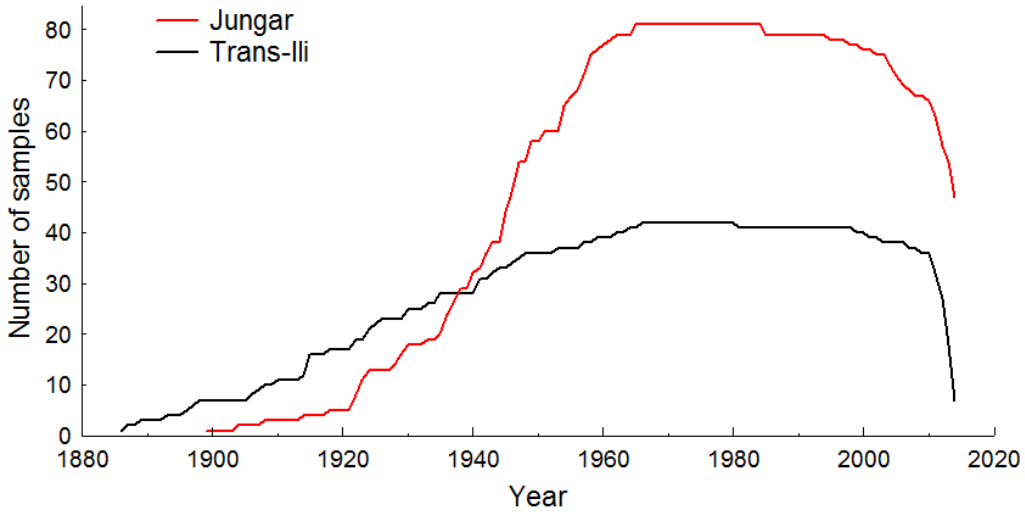
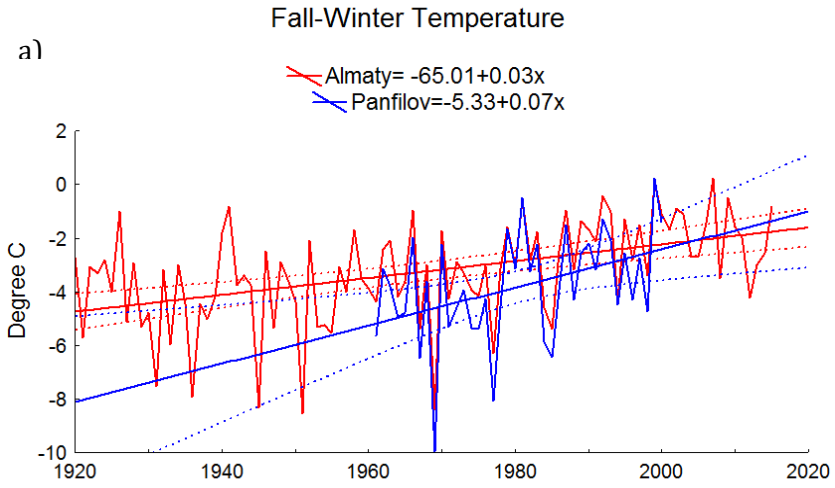
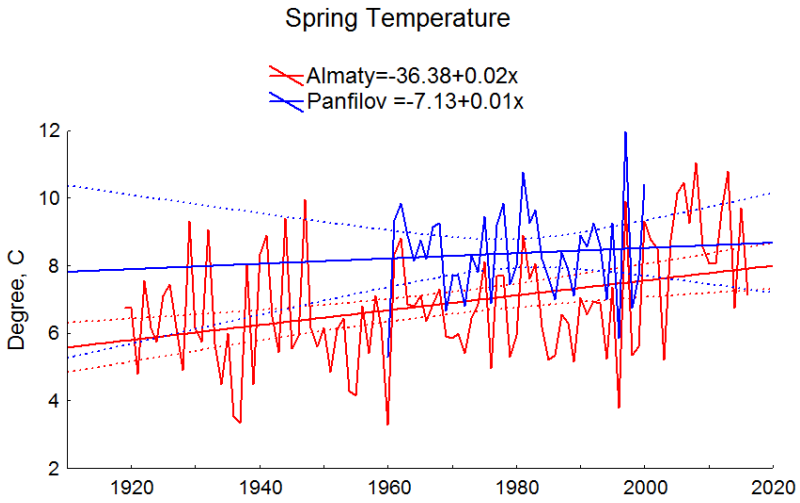


Figure S2. Trends in variability of temperature and moisture at the studied locations of Jungar Alatau and Trans-Ili Alatau. Plotted instrumental data show a) Fall-winter temperature (Nov-Feb) and b) Spring temperature (Mar-May) observed at the Panfilov station (Blue line) in Jungar and the Almaty weather station (Red line) in Trans-Ili c) Winter PDSI and d) Spring PDSI series from grid 44N-80E (Jungar) and grid 43N-77E (Trans-Ili) measuring the variations of soil moisture. Red and blue lines show variables for the full interval. Grey line shows the early period of observations and black line – the late period (see related Seascorr calculation results in Table 2). Solid straight line shows linear regression fit with 95% confidence intervals (dash line).

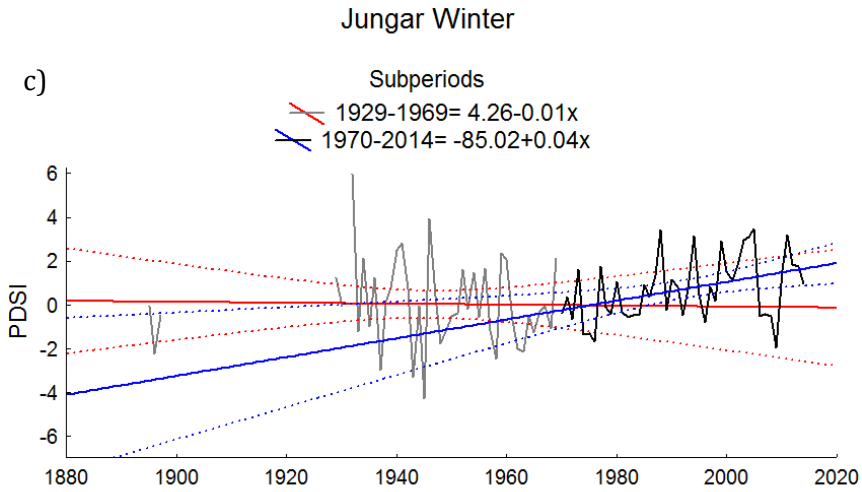
a)

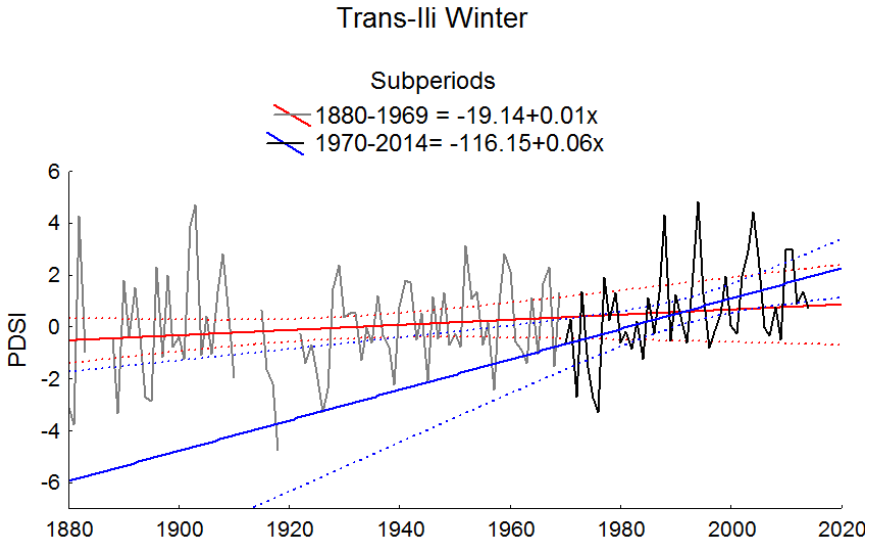

Fall-Winter Temperature
Almaty= -65.01+0.03x
Panfilov=-5.33+0.07x
Degree C
2
0
-2
-4
-6
-8
-10
1920
1940
1960
1980
2000
2020

b)

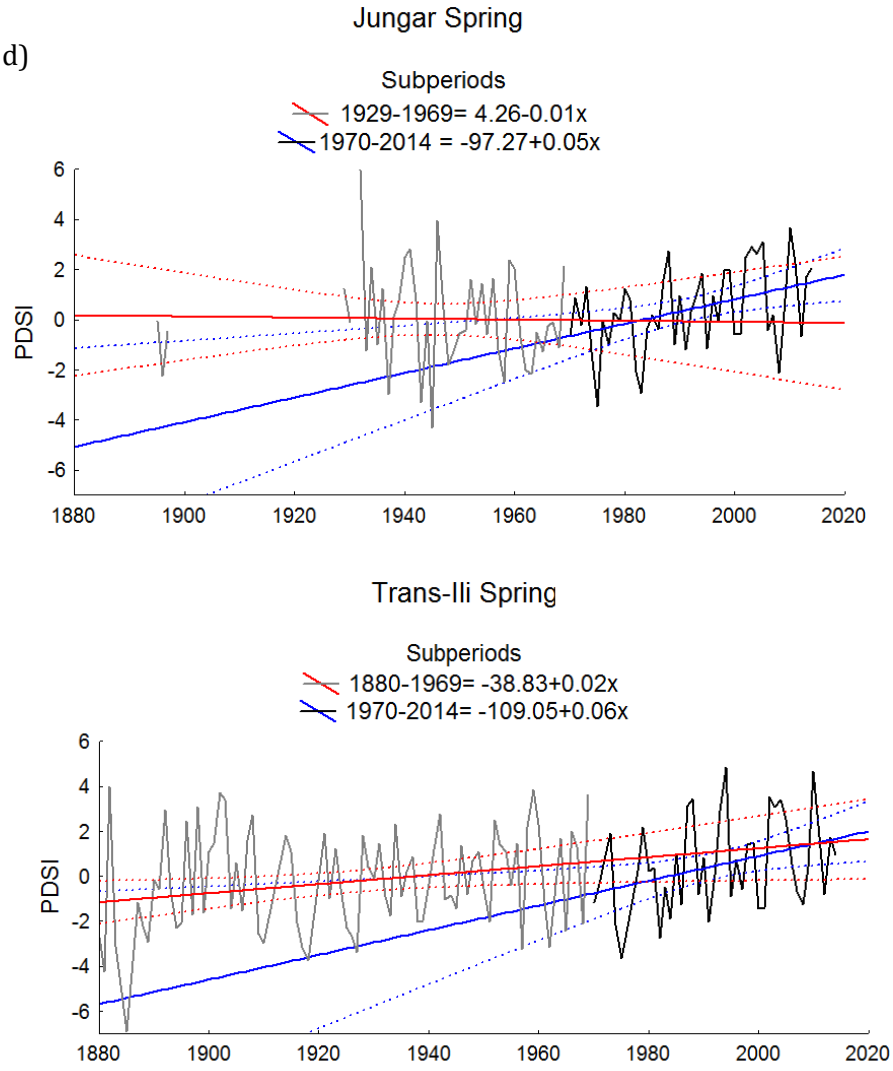

Spring Temperature
Almaty=-36.38+0.02x
Panfilov =-7.13+0.01x
Degree, C
12
10
8
6
4
2
1920
1940
1960
1980
2000
2020

c)


Jungar Winter
Subperiods
1929-1969= 4.26-0.01x
1970-2014= -85.02+0.04x
PDSI
6
4
2
0
-2
-4
-6
1880
1900
1920
1940
1960
1980
2000
2020


Trans-Ili Winter
Subperiods
1880-1969 = -19.14+0.01x
1970-2014= -116.15+0.06x
PDSI
6
4
2
0
-2
-4
-6
1880
1900
1920
1940
1960
1980
2000
2020

d)


Jungar Spring
Subperiods
1929-1969= 4.26-0.01x
1970-2014 = -97.27+0.05x
PDSI
6
4
2
0
-2
-4
-6
1880
1900
1920
1940
1960
1980
2000
2020
Trans-Ili Spring
Subperiods
1880-1969= -38.83+0.02x
1970-2014= -109.05+0.06x
PDSI
6
4
2
0
-2
-4
-6
1880
1900
1920
1940
1960
1980
2000
2020