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Supplement of

Effect of various climate databases on the results of dendroclimatic analysis

Roman Sitko et al.

Correspondence to: Roman Sitko (roman.sitko@tuzvo.sk)

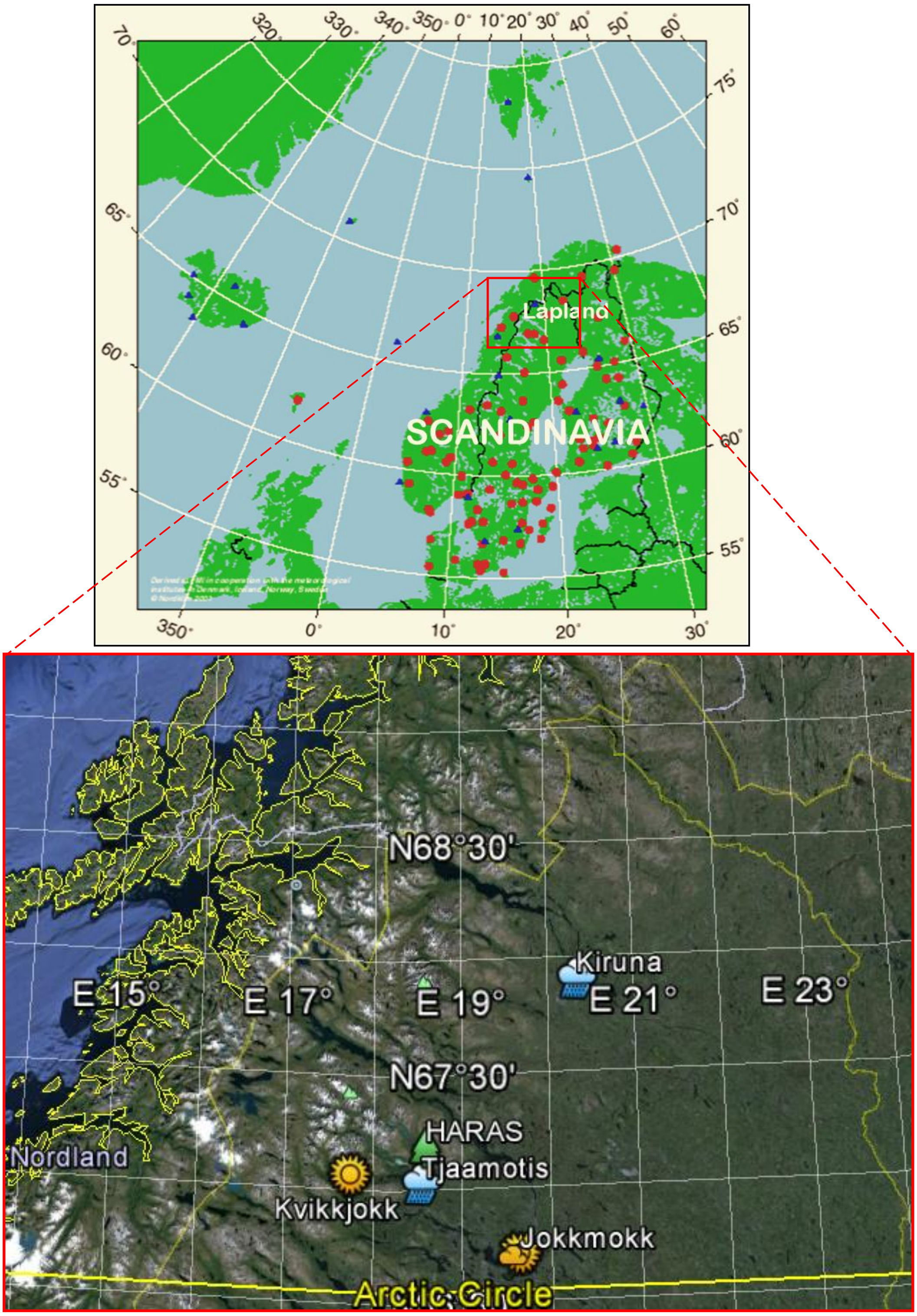


Fig. 1 Location of Hårås plot, Kvikkjokk, Tjåmotis and Kiruna meteorological stations in the Swedish part of Lapland. Meteostation map of the NORDKLIM datadase: stations with data series longer than 90 years ●, shorter than 90 years ▲ (Modified from: Tuomenvirta et al., 2001)

Tab. 1 Properties of climatic databases and labels of evaluated data sets

	Database properties Name*, Location / Distance / Grid, References	Label of the data sets			
		Temperature (1902 – 2001)		Precipitation (1910 – 1997)	
		Month	Season	Month	Season
Observed	**, Tjaamotis (66°55' N 18°32' E) / 18 km, ***	-	-	P18	$P18_{agr}$
	, Kvikkjokk (66°57' N 17°44' E) / 40 km, *	T40	$T40_{agr}$	P40	-
	, Jokkmokk (66°37' N 19°38' E) / 70 km, *	T70	-	P70	-
	, Kiruna (67°49' N 20°20' E) / 110 km, *	-	-	P110	$P110_{agr}$
Modelled	CRU TS 3.23, 0.5°, Harris et al. (2014)	T_CRU	T_CRU_{agr}	P_CRU	P_CRU_{agr}
	GISS 250 T2m/SST anom, 1°, Hansen et al. (2010)	GISS	-	-	-
	Luterbacher et al. Temperature, 0.5°, Luterbacher et al. (2004)	-	LT	-	-
	GPCC V7 0.5, 0.5°, Schneider et al. (2015)	-	-	GPCC	-
	Pauling et al. Precipitation, 0.5°, Pauling et al. (2006)	-	-	-	PP

* Names of modelled databases related to Climexp.KNMI (2014), ** NORDKLIM, *** Tuomenvirta et al. (2014)

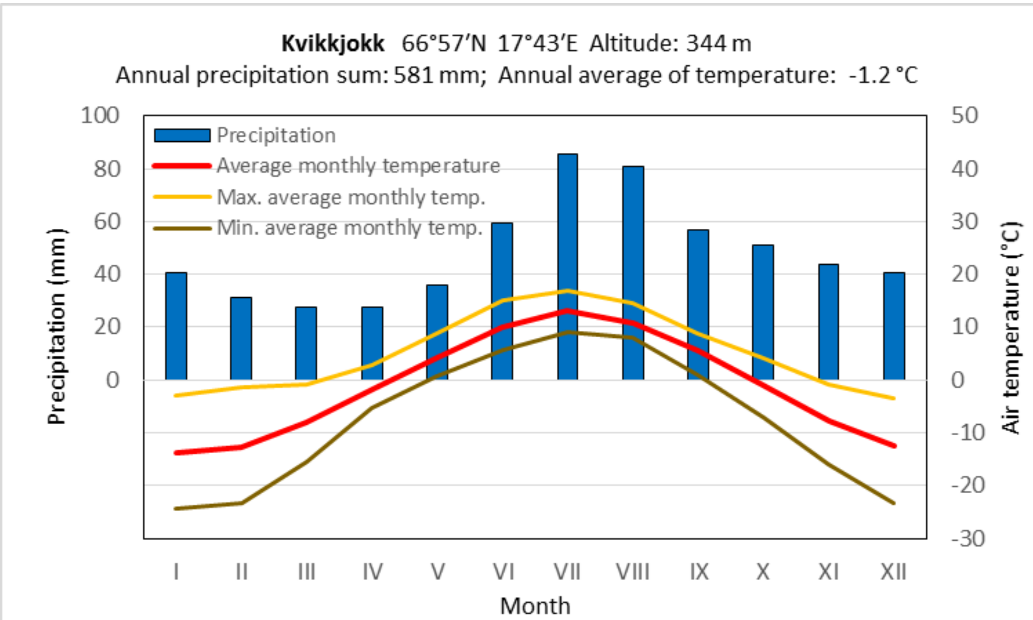


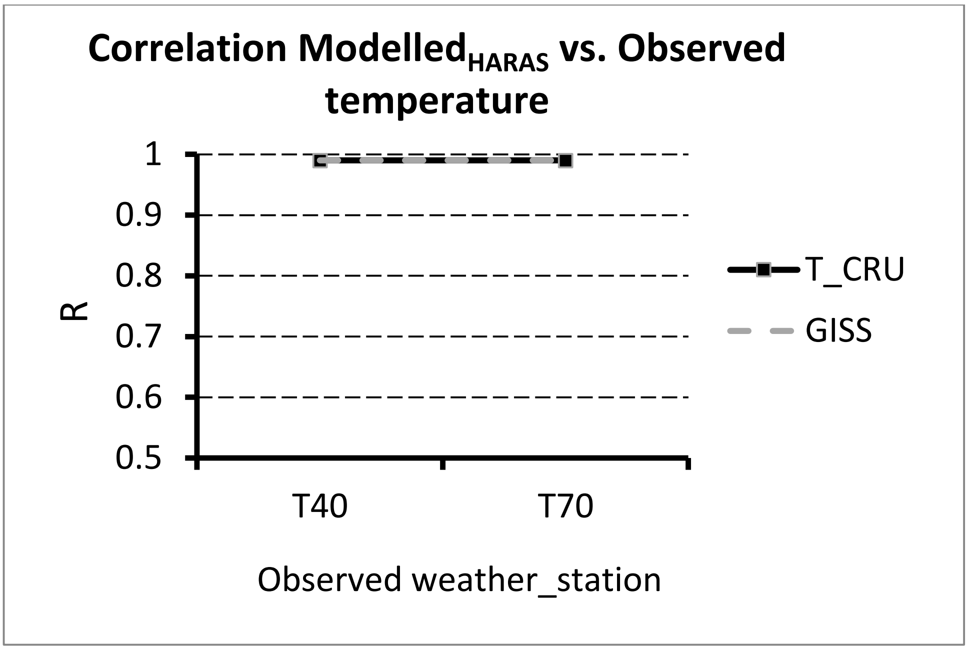
Fig. 2 Walter climate diagram for the station Kvikkjokk (time period 1890 –2001)

Tab. 2 Statistical evaluation of the differences between the observed and modelled data of monthly and seasonal temperatures (** significant value at α=1 %). T40 data set is used as a reference data.

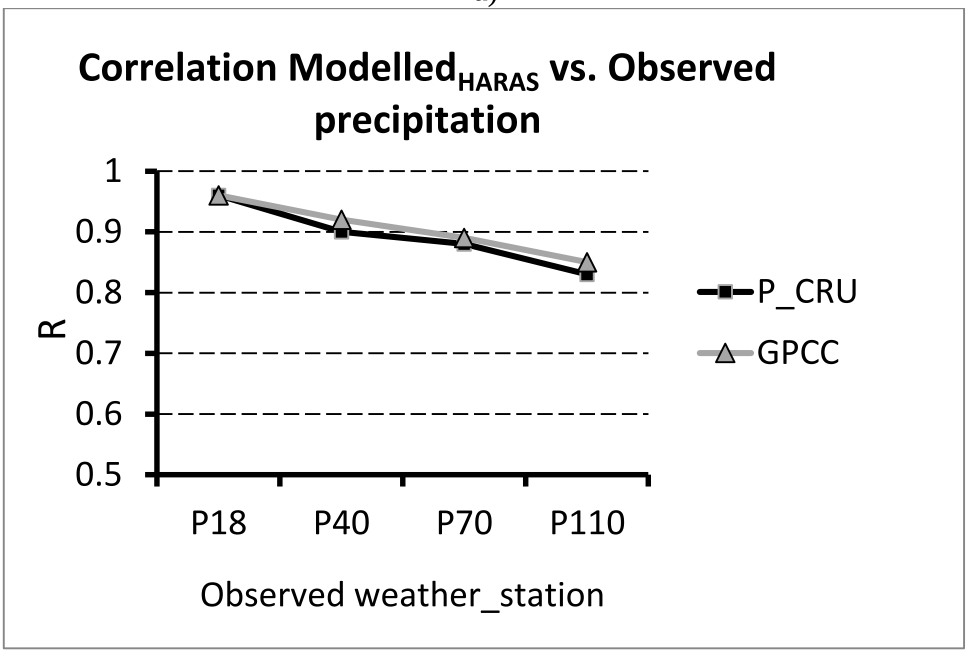
	Temperature			
	T_CRU	**GISS**	**T_CRUagr**	**LT**
Mean error [°C]	-1.43**	-0.15**	-1.43**	-1.39**
Standard error [°C]	±0.69	±1.56	±1.17	±1.19
Root mean square error [°C]	±1.59	±1.57	±1.85	±1.83

Tab. 3 Statistical evaluation of the differences between the observed and modelled data of monthly and seasonal precipitation totals (** significant value at α=1 %). P18 data set is used as a reference data.

	Precipitation			
	P_CRU	**GPCC**	**P_CRUagr**	**PP**
Mean error [mm]	4.62**	-0.73**	14.1**	15.75**
Standard error [mm]	±5.12	±6.77	±17.05	±31.84
Root mean square error [mm]	±6.90	±6.81	±22.07	±35.52

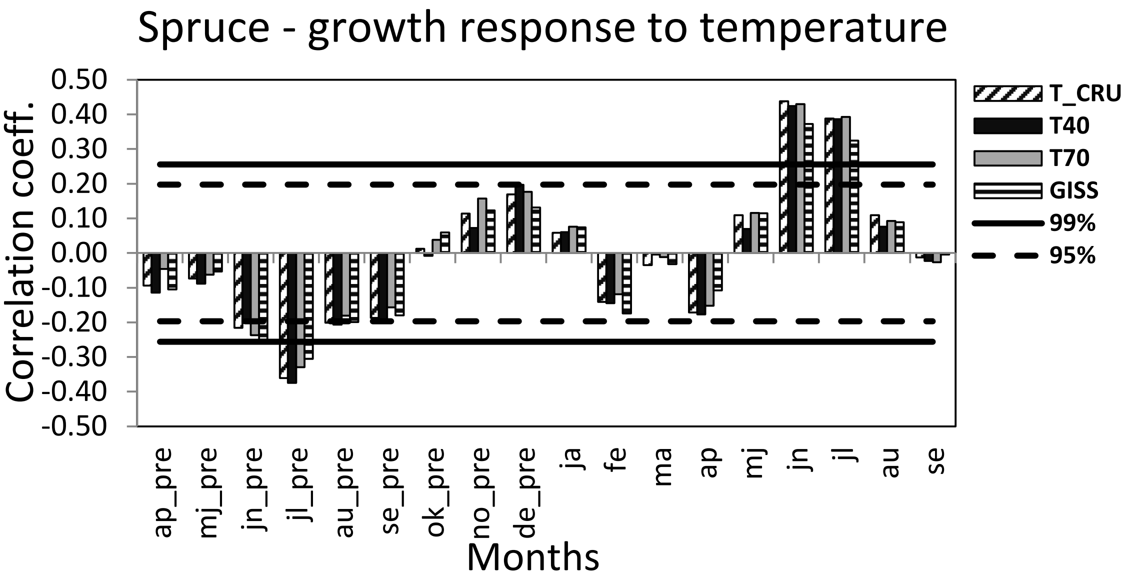


a)

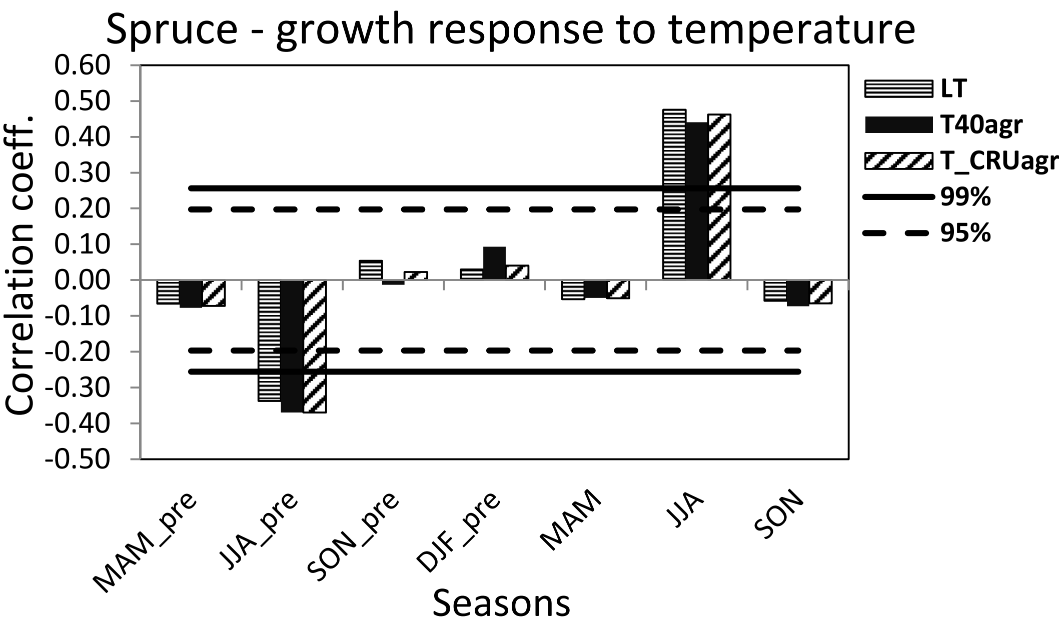


b)

Fig. 3 Change of correlation coefficients between a) modelled monthly temperatures for Haras locality (T_CRU and GISS) and observed monthly temperatures (T40 and T70), b) modelled monthly precipitation for Haras locality (P_CRU and GPCC) and observed monthly precipitation (P18, P40, P70 and P110), related to increasing distance of weather stations from Haras locality.

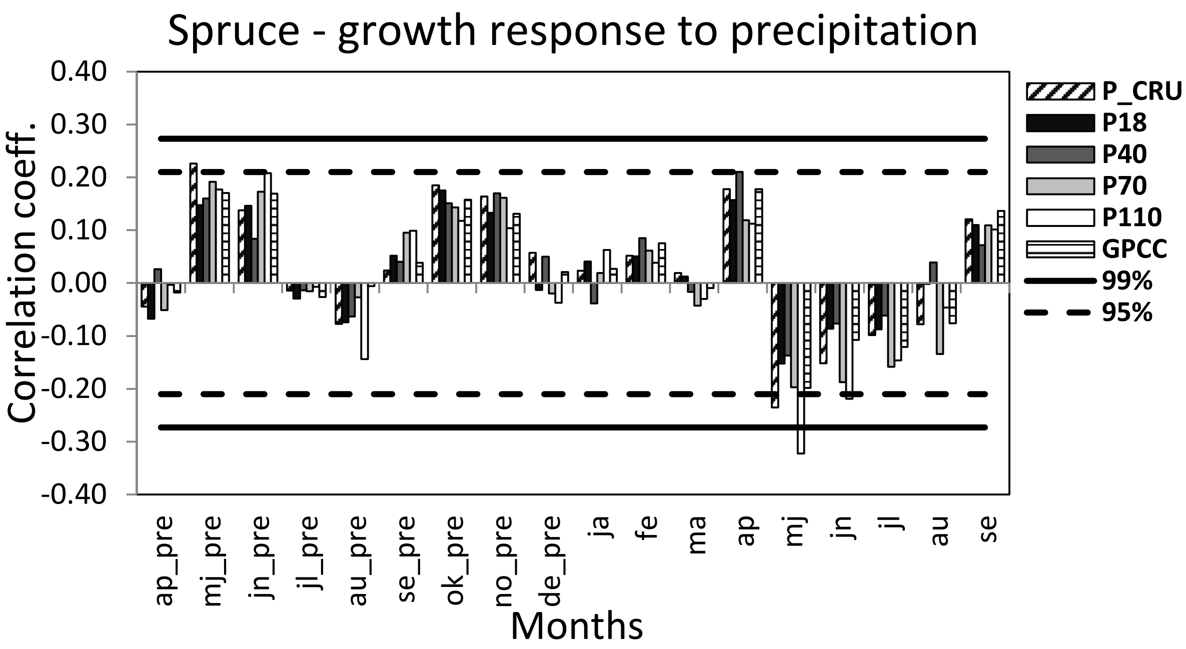


a)

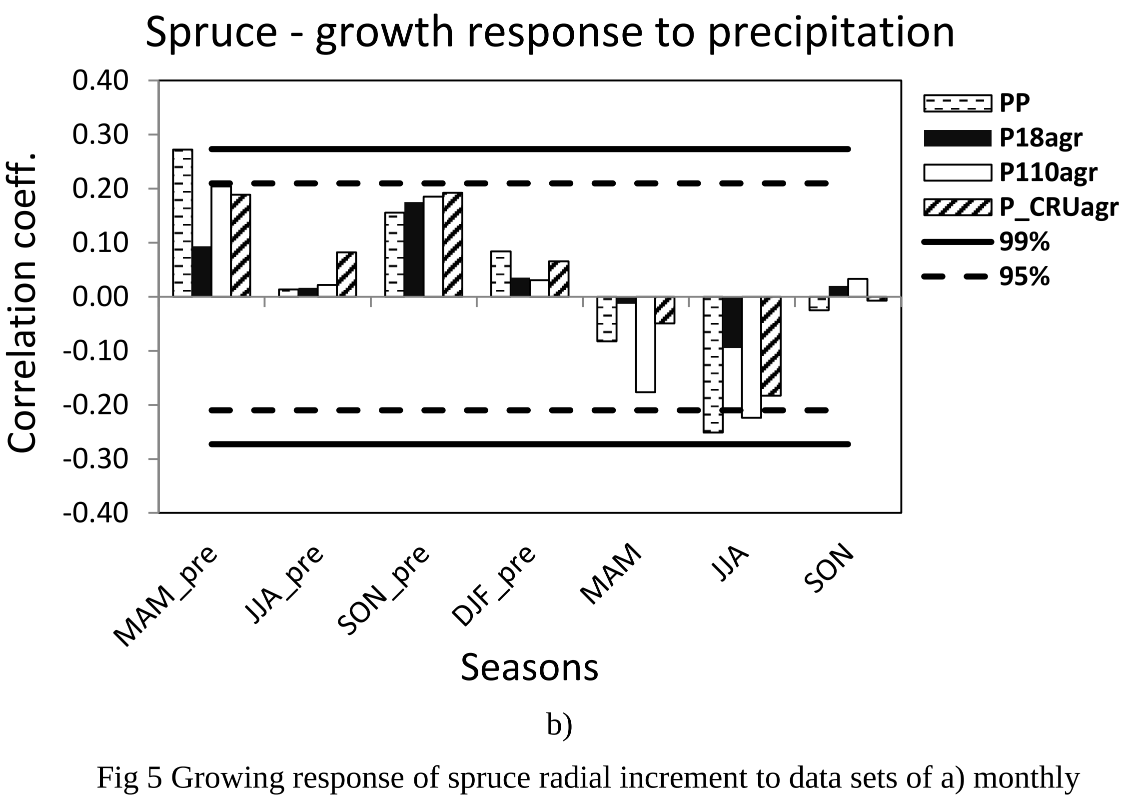


b)

Fig 4 Growing response of spruce radial increment to data sets of a) monthly mean temperature, b) seasonal mean temperature

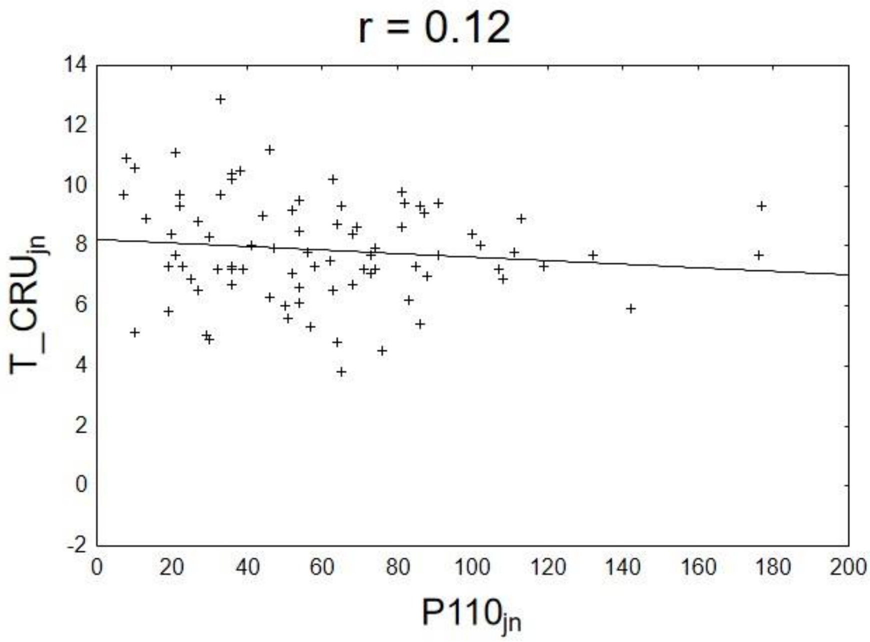


a)

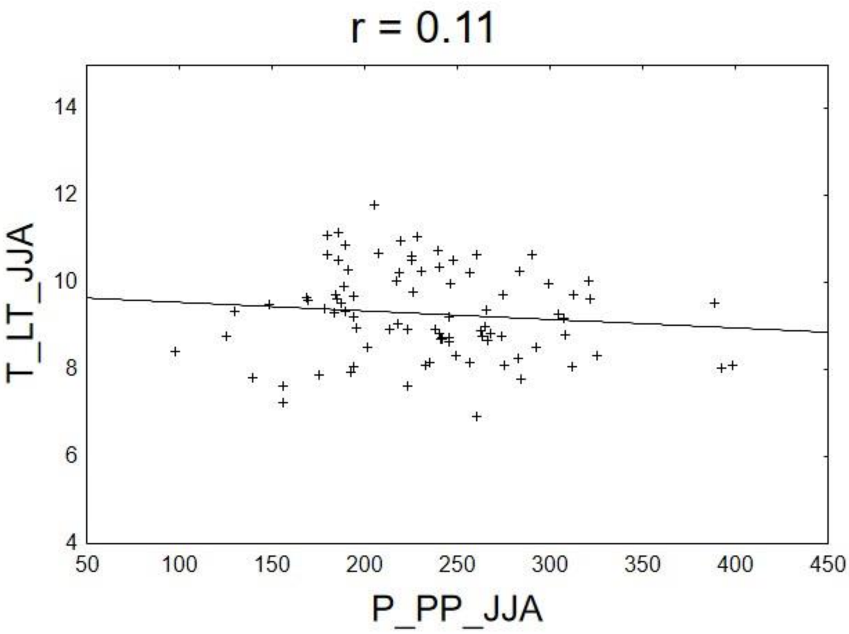


b)

Fig 5 Growing response of spruce radial increment to data sets of a) monthly precipitation totals, b) seasonal precipitation totals



a)



b)

Fig. 6 Correlation between temperature and precipitation common with overlapping a) month (June), b) season (JJA) significant for radial increment formation. Low correlation between the climatic variables in both cases (r=0.12 and r=0.11) confirms that climate regime for growing processes of spruce is not inversely proportional function of precipitation and temperature.