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Supplement of

Simulating oxygen isotope ratios in tree ring cellulose using a dynamic global vegetation model

Sonja G. Keel et al.

Correspondence to: Sonja G. Keel (sonja.keel@agroscope.admin.ch)

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Table S1: Information of forest sites including coordinates, the dominant tree species, and the years against which we compared our model simulations.

Nr	°E	°N	Site	Code	Country	Dominant Species	Altitude [m]	Years	Reference
1	23.08	60.00	Bromarv	BRO	Finland	<i>Quercus robur</i>	5	1960-2002	Treydte et al., 2007
2	8.60	46.35	Cavergno	CAV	Switzerland	<i>Quercus petraea</i>	900	1960-2003	Treydte et al., 2007
3	-2.96	37.81	Cazorla	CAZ	Spain	<i>Pinus nigra</i>	1816	1960-2002	Treydte et al., 2007
4	-5.07	32.97	Col Du Zad	COL	Morocco	<i>Cedrus atlantica</i>	2200	1960-2000	Treydte et al., 2007
5	9.78	51.50	Dransfeld	DRA	Germany	<i>Quercus petraea</i>	320	1960-2002	Treydte et al., 2007
6	9.86	46.82	Davos north	DAV	Switzerland	<i>Picea abies</i>	1660	1960-2012	this study
7	2.67	48.38	Fontainebleau	FON	France	<i>Quercus petraea</i>	100	1960-2000	Treydte et al., 2007
8	12.18	62.00	Gutuli	GUT	Norway	<i>Pinus sylvestris</i>	800	1960-2003	Treydte et al., 2007
9	30.98	62.98	Ilomantsi	ILO	Finland	<i>Pinus sylvestris</i>	200	1960-2002	Treydte et al., 2007
10	28.42	68.93	Kessi, Inari	INA	Finland	<i>Pinus sylvestris</i>	150	1960-2002	Treydte et al., 2007
11	74.93	35.9	Karakorum mountains,	KBA	Pakistan	<i>Juniperus excelsa</i>	2900	1960-1998	Treydte et al., 2006

			Bagrot Valley						
12	74.98	36.62	Karakorum mountains, Boibar Valley	KBO	Pakistan	<i>Juniperus turkestanica</i>	3900	1960-1998	Treydte et al. 2006
13	8.37	47.48	Lägern A	LAEA	Switzerland	<i>Fagus sylvatica</i>	710	1960-2012	this study
14	8.36	47.48	Lägern B	LAEB	Switzerland	<i>Fagus sylvatica</i>	740	1960-2012	this study
15	16.20	48.18	Lainzer Tiergarten	LAI	Austria	<i>Quercus petraea</i>	300	1960-2003	Treydte et al., 2007
16	-3.43	55.27	Lochwood	LCH	Scotland	<i>Quercus robur</i>	175	1960-2003	Treydte et al., 2007
17	-5.25	43.07	Pinar de Lillo	LIL	Spain	<i>Pinus sylvestris</i>	1600	1960-2002	Treydte et al., 2007
18	7.80	46.43	Lötschen valley	LOE	Switzerland	<i>Larix decidua</i>	2100	1960-2004	Kress et al., 2010
19	60	68.1	Moreju Siberia Trees T1-T4	MOT	Russia	<i>Picea obovata</i>	40	1960-1996	Holzkämper et al., 2008
20	7.77	46.39	Lötschen Valley N19	N19	Switzerland	<i>Picea abies</i>	1965	1960-2012	this study

21	20.38	50.12	Niopolomice, Gibiel	NIE1	Poland	<i>Pinus sylvestris</i>	190 ?	1960-2003	Treydte et al., 2007
22	20.38	50.12	Niopolomice, Gibiel	NIE2	Poland	<i>Quercus robur</i>	190	1960-2003	Treydte et al., 2007
23	23.97	54.88	Panemunės Silas	PAN	Lithuania	<i>Pinus sylvestris</i>	45	1960-2002	Treydte et al., 2007
24	1.70	42.24	Pedraforca	PED	Spain	<i>Pinus uncinata</i>	2100	1960-2003	Treydte et al., 2007
25	16.06	47.95	Poellau	POE	Austria	<i>Pinus nigra</i>	500	1960-2002	Treydte et al., 2007
26	-1.70	48.25	Rennes	REN	France	<i>Quercus robur</i>	100	1960-1999	Treydte et al., 2007
27	16.20	39.93	Serra Crispo	SER	Italy	<i>Pinus leucodermis</i>	1900	1960-2003	Treydte et al., 2007
28	22.93	54.10	Suwalki	SUW	Poland	<i>Pinus sylvestris</i>	160	1960-2003	Treydte et al., 2007
29	8.77	46.50	Vigera	VIG	Switzerland	<i>Pinus sylvestris</i>	1400	1960-2003	Treydte et al., 2007
30	-0.59	51.41	Windsor	WIN	UK	<i>Pinus sylvestris</i>	10	1960-2003	Treydte et al., 2007
31	-0.59	51.98	Woburn	WOB	UK	<i>Quercus robur</i>	50	1960-2003	Treydte et al., 2007

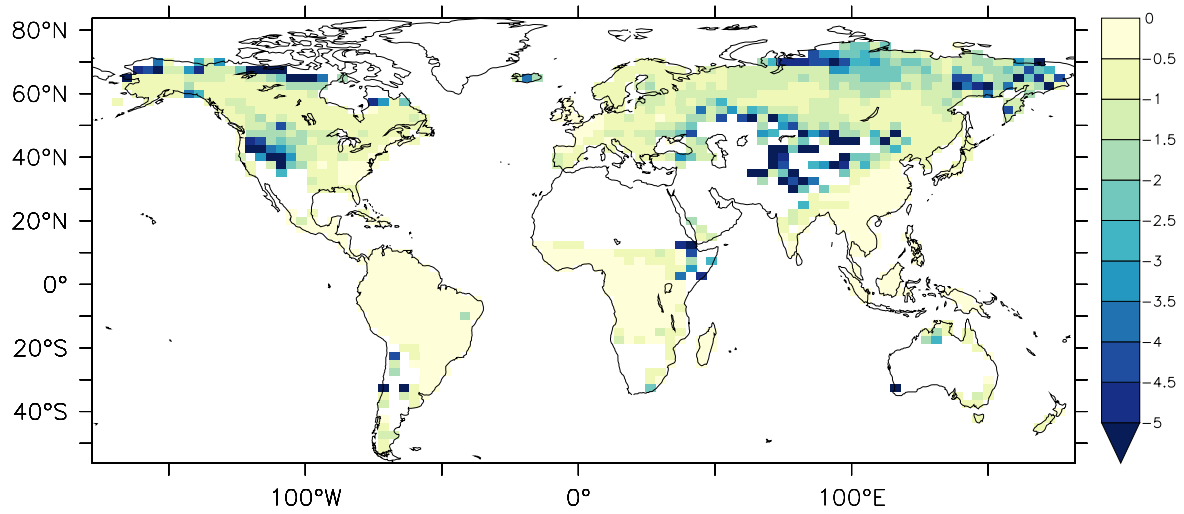


Fig. S1: Reduction of leaf water ^{18}O -enrichment due to Péclet effect (‰) averaged over all tree functional types and over the years 1960-2012. The effect was calculated as:

$$\frac{\Delta^{18}\text{O}_e(1-e^{-\rho})}{\rho} - \Delta^{18}\text{O}_e[\text{‰}] \quad (\text{S1}),$$

and was weighted by NPP to be consistent with the calculation of cellulose $\delta^{18}\text{O}$.

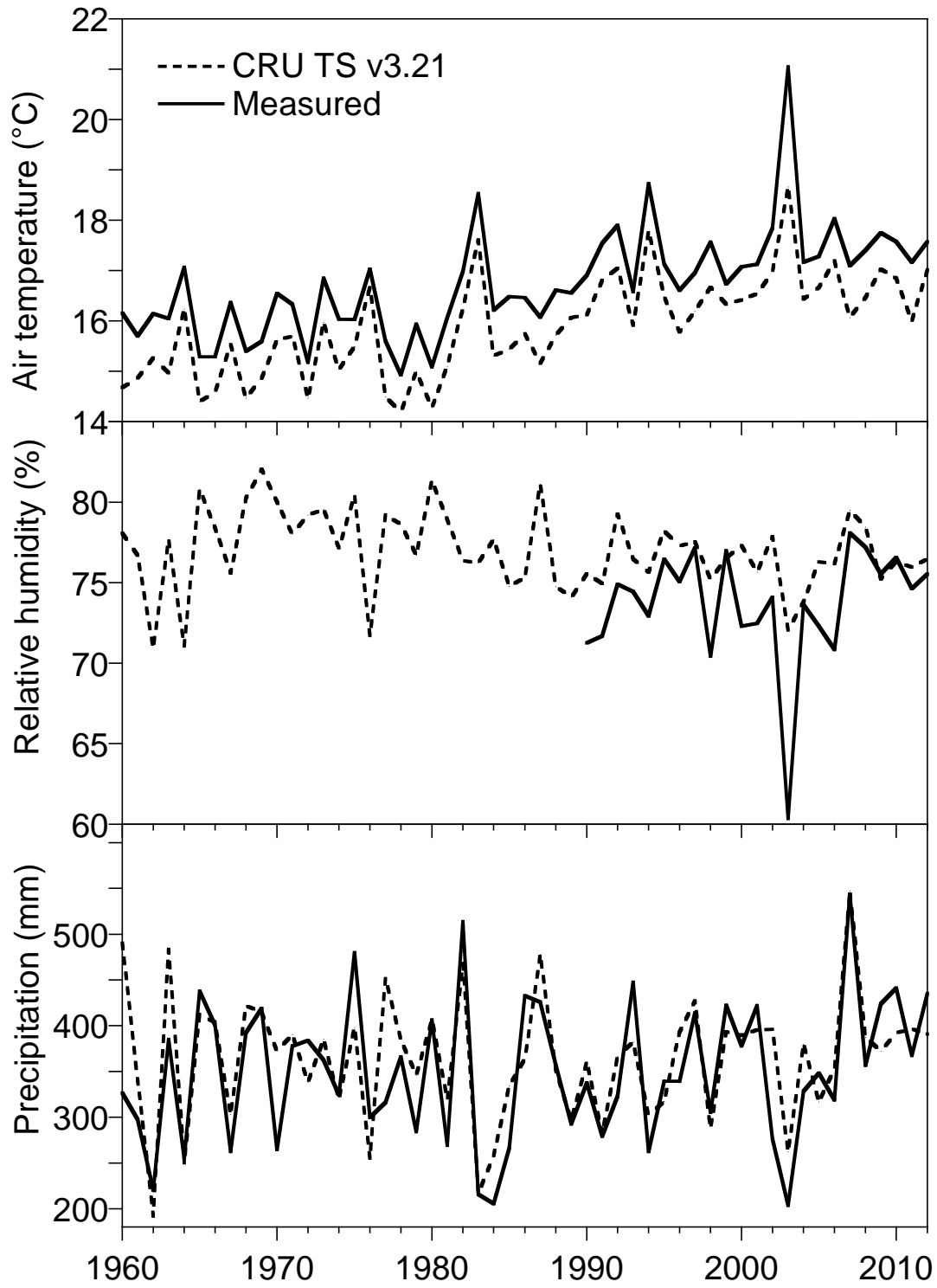


Fig. S2: Comparison of grid cell average data from the CRU climatology (CRU TS v3.21) and measurements from a nearby meteorological station for the sites LAEA/LAEB (Lägern).

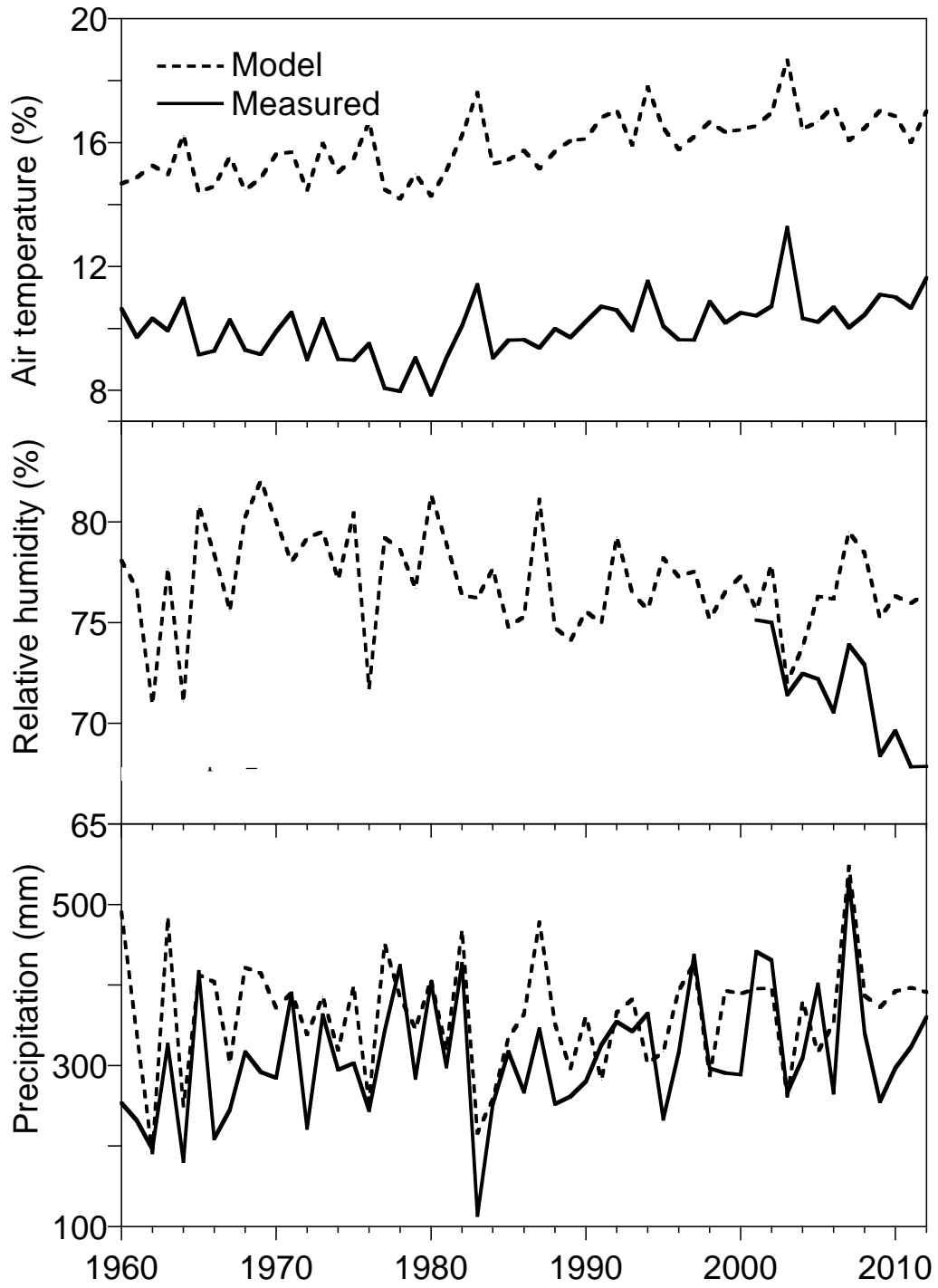


Fig. S3: Comparison of grid cell average data from the CRU climatology (CRU TS v3.21) and measurements from a nearby meteorological station for the sites N19/LOE (Lötschen Valley).

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