

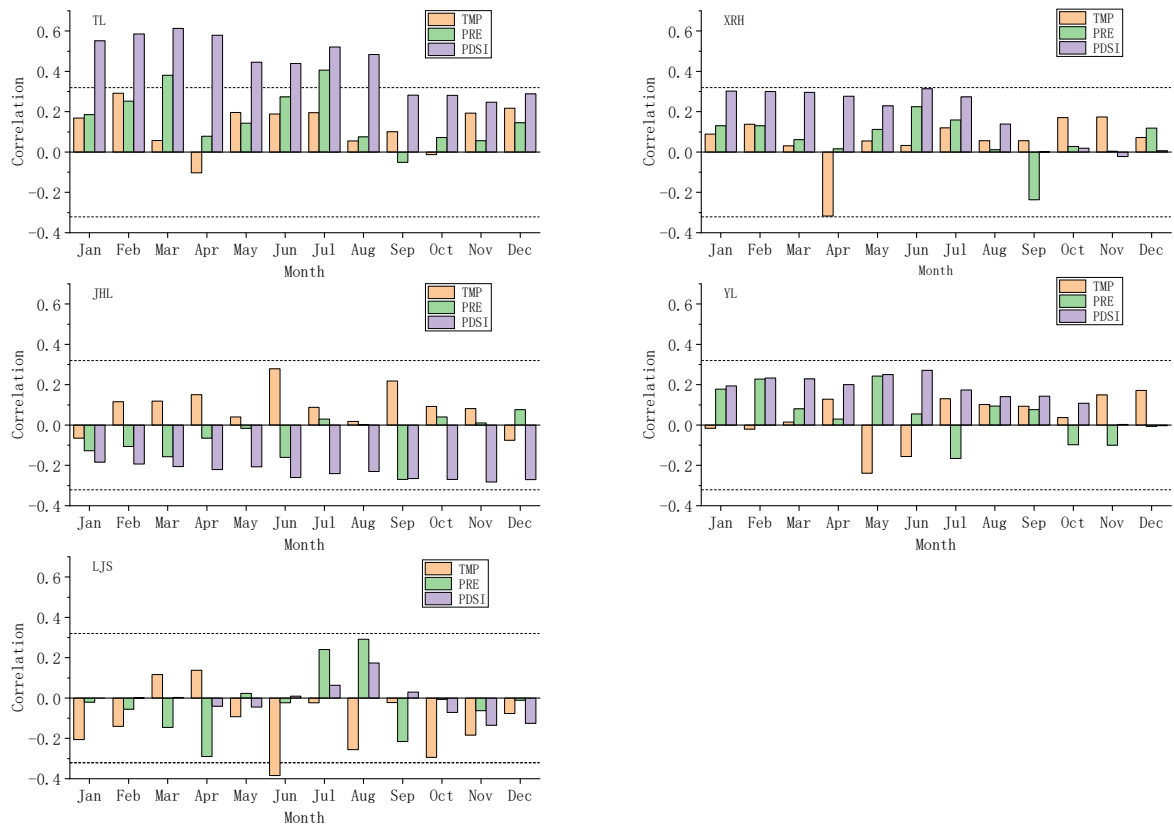


Fig.S1 Correlation response function analysis (1951-2012) using RW chronologies with CRU TS4.05 mean temperatures, precipitation and PDSI

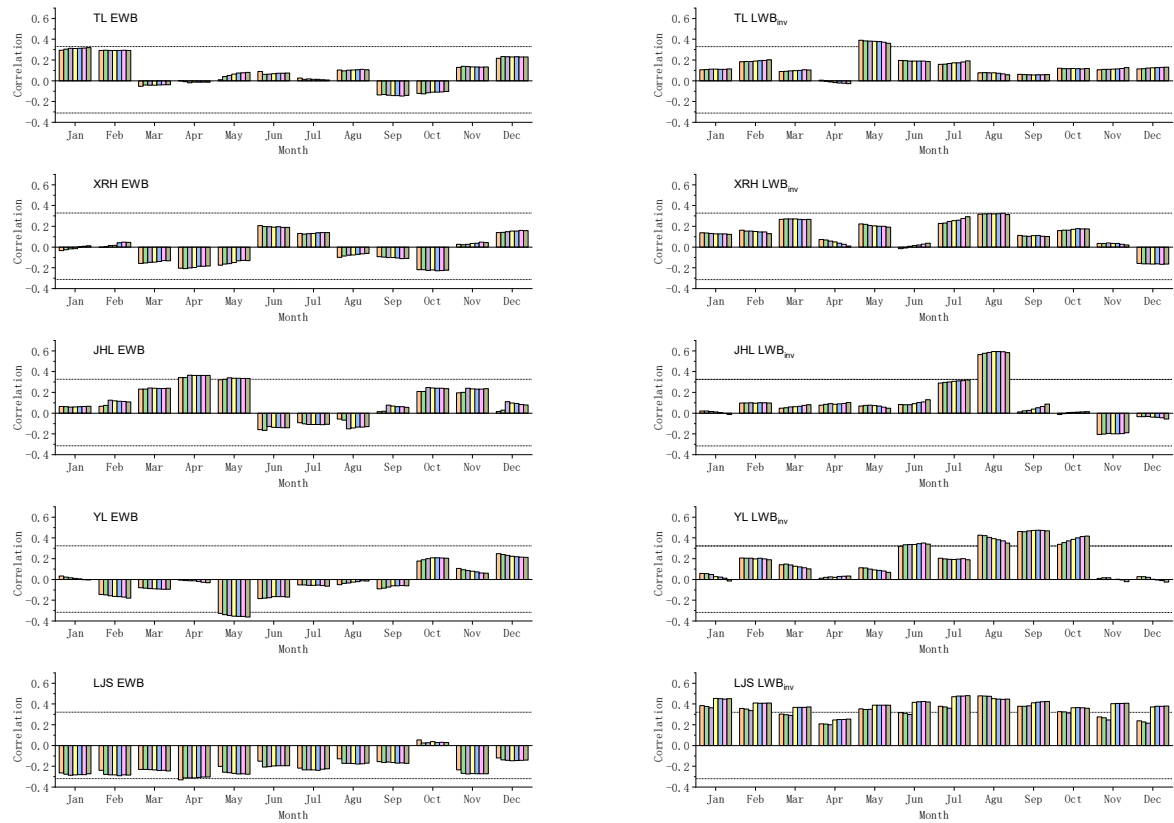


Fig.S2 Correlation response function analysis (1951-2012) using monthly TMP with EWB

and LWB_{inv} . The different bars denote the different percentile extraction levels: 50-50, 60-40, 70-30, 80-20, 85-15, 90-10, 95-5

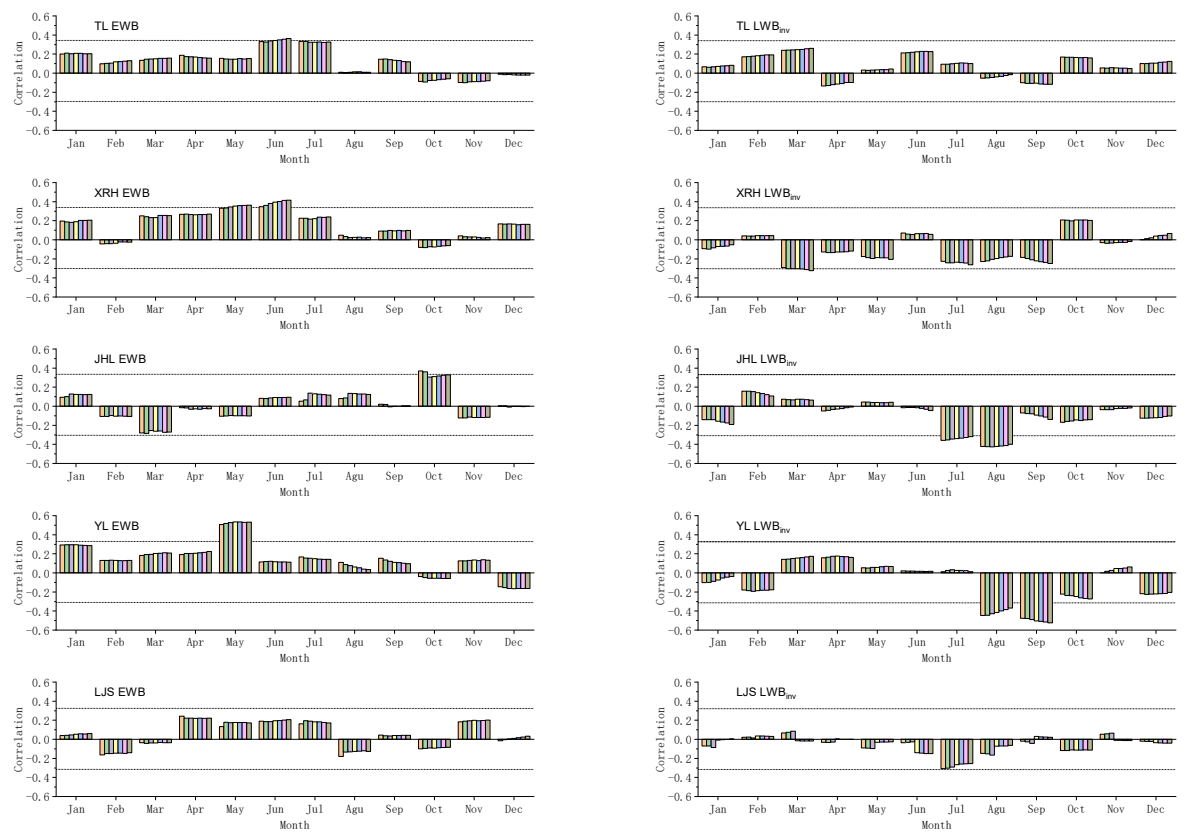


Fig.S3 as Fig.S2, but correlations for PRE with EWB and LWB_{inv}

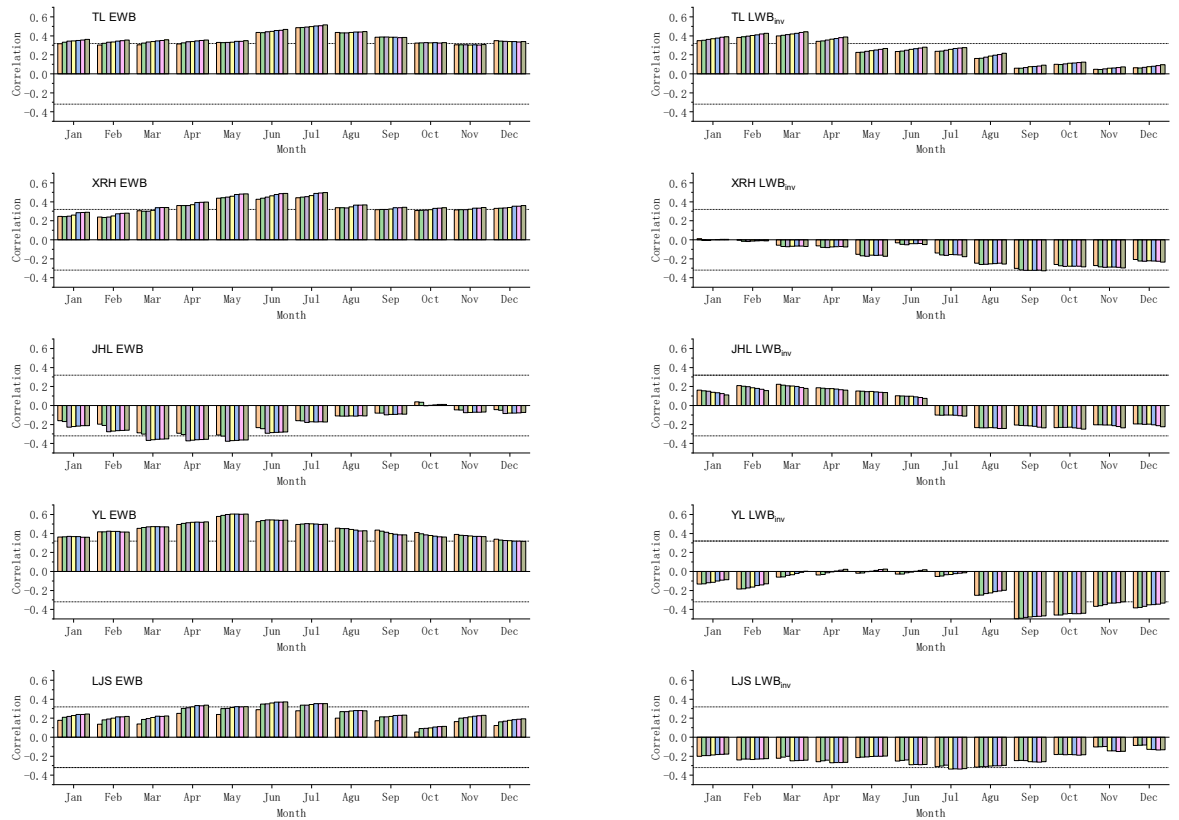


Fig.S4 as Fig.S2, but correlations for scPDSI with EWB and LWB_{inv}

Table S1 CV, AC1, and Rbar for each standard chronology

Site	Extraction	Parameter	CV	AC1	Rbar
TL	RW	RW	0.537	0.644	0.512
XRH	RW	RW	0.431	0.699	0.430
JHL	RW	RW	0.637	0.682	0.369
YL	RW	RW	0.475	0.608	0.247
LJS	RW	RW	0.578	0.815	0.234
TL	F50:50	EWB	0.056	0.688	0.269
TL	F60:40	EWB	0.055	0.688	0.257
TL	F70:30	EWB	0.054	0.692	0.257
TL	F80:20	EWB	0.053	0.695	0.258
TL	F85:15	EWB	0.053	0.697	0.259
TL	F90:10	EWB	0.052	0.699	0.260
TL	F95:5	EWB	0.052	0.700	0.261
XRH	F50:50	EWB	0.076	0.682	0.140
XRH	F60:40	EWB	0.075	0.683	0.140
XRH	F70:30	EWB	0.074	0.684	0.141
XRH	F80:20	EWB	0.073	0.685	0.141
XRH	F85:15	EWB	0.073	0.688	0.148
XRH	F90:10	EWB	0.072	0.689	0.148
XRH	F95:5	EWB	0.071	0.689	0.149
JHL	F50:50	EWB	0.055	0.723	0.214
JHL	F60:40	EWB	0.056	0.724	0.215
JHL	F70:30	EWB	0.062	0.730	0.236

JHL	F80:20	EWB	0.061	0.732	0.236
JHL	F85:15	EWB	0.060	0.732	0.236
JHL	F90:10	EWB	0.060	0.728	0.227
JHL	F95:5	EWB	0.059	0.729	0.226
YL	F50:50	EWB	0.065	0.444	0.197
YL	F60:40	EWB	0.065	0.448	0.192
YL	F70:30	EWB	0.064	0.453	0.188
YL	F80:20	EWB	0.063	0.457	0.185
YL	F85:15	EWB	0.063	0.459	0.184
YL	F90:10	EWB	0.063	0.461	0.182
YL	F95:5	EWB	0.063	0.462	0.181
LJS	F50:50	EWB	0.085	0.771	0.228
LJS	F60:40	EWB	0.084	0.772	0.235
LJS	F70:30	EWB	0.083	0.772	0.235
LJS	F80:20	EWB	0.082	0.772	0.236
LJS	F85:15	EWB	0.082	0.772	0.236
LJS	F90:10	EWB	0.081	0.771	0.236
LJS	F95:5	EWB	0.081	0.771	0.237
TL	F50:50	LWB _{inv}	0.083	0.332	0.302
TL	F60:40	LWB _{inv}	0.083	0.333	0.304
TL	F70:30	LWB _{inv}	0.082	0.335	0.306
TL	F80:20	LWB _{inv}	0.081	0.337	0.308
TL	F85:15	LWB _{inv}	0.080	0.339	0.308
TL	F90:10	LWB _{inv}	0.079	0.341	0.308
TL	F95:5	LWB _{inv}	0.078	0.345	0.306
XRH	F50:50	LWB _{inv}	0.075	0.443	0.108
XRH	F60:40	LWB _{inv}	0.074	0.437	0.106
XRH	F70:30	LWB _{inv}	0.074	0.433	0.105
XRH	F80:20	LWB _{inv}	0.073	0.431	0.104
XRH	F85:15	LWB _{inv}	0.073	0.429	0.104
XRH	F90:10	LWB _{inv}	0.072	0.427	0.105
XRH	F95:5	LWB _{inv}	0.071	0.423	0.105
JHL	F50:50	LWB _{inv}	0.058	0.369	0.184
JHL	F60:40	LWB _{inv}	0.058	0.366	0.185
JHL	F70:30	LWB _{inv}	0.057	0.363	0.186
JHL	F80:20	LWB _{inv}	0.057	0.359	0.187
JHL	F85:15	LWB _{inv}	0.056	0.358	0.186
JHL	F90:10	LWB _{inv}	0.056	0.359	0.184
JHL	F95:5	LWB _{inv}	0.054	0.356	0.182
YL	F50:50	LWB _{inv}	0.054	0.265	0.203
YL	F60:40	LWB _{inv}	0.053	0.251	0.207
YL	F70:30	LWB _{inv}	0.053	0.247	0.206
YL	F80:20	LWB _{inv}	0.052	0.243	0.202
YL	F85:15	LWB _{inv}	0.051	0.239	0.199
YL	F90:10	LWB _{inv}	0.050	0.238	0.193
YL	F95:5	LWB _{inv}	0.048	0.236	0.180
LJS	F50:50	LWB _{inv}	0.059	0.492	0.113

LJS	F60:40	LWB _{inv}	0.058	0.488	0.113
LJS	F70:30	LWB _{inv}	0.057	0.486	0.113
LJS	F80:20	LWB _{inv}	0.066	0.583	0.095
LJS	F85:15	LWB _{inv}	0.067	0.586	0.094
LJS	F90:10	LWB _{inv}	0.067	0.588	0.092
LJS	F95:5	LWB _{inv}	0.067	0.589	0.091

Note: Highest values highlighted using shadow.