Supplementary Material

Tab. S1 - Directly-calculated variables from the ClimateEU software and included into the PCA.

ClimateEU Acronym	Description
MAT	mean annual temperature (°C)
MWMT	mean warmest month temperature (°C)
MCMT	mean coldest month temperature (°C)
TD	temperature difference between MWMT and MCMT, or continentality (°C)
MAP	mean annual precipitation (mm)
MSP	mean summer (May to Sept.) precipitation (mm)
AH:M	annual heat moisture index (MAT+10)/(MAP/1000))
SH:M	summer heat moisture index ((MWMT)/(MSP/1000))

Tab. S2 - Derived climatic indices from the ClimateEU software and included into the PCA.

Acronym	Description
DD<0	degree-days below 0°C, chilling degree-days
DD>5	degree-days above 5°C, growing degree-days
DD<18	degree-days below 18°C, heating degree-days
DD>18	degree-days above 18°C, cooling degree-days
NFFD	the number of frost-free days
FFP	frost-free period
bFFP	the Julian date on which FFP begins
eFFP	the Julian date on which FFP ends
PAS	precipitation as snow between August in previous year and July in current year
EMT	extreme minimum temperature over 30 years
Eref	Hargreaves reference evaporation
CMD	Hargreaves climatic moisture deficit

Tab. S3 - Derived seasonal variables from the ClimateEU software and included into the PCA.

Acronym	Description
TAV_wt	winter (Dec.(prev. yr) - Feb.) mean temperature (°C)
TAV_sp	spring (Mar. - May) mean temperature (°C)
TAV_sm	summer (Jun. - Aug.) mean temperature (°C)
TAV_at	autumn (Sep. - Nov.) mean temperature (°C)
TMAX_wt	winter mean maximum temperature (°C)
TMAX_sp	spring mean maximum temperature (°C)
TMAX_sm	summer mean maximum temperature (°C)
TMAX_at	autumn mean maximum temperature (°C)
TMIN_wt	winter mean minimum temperature (°C)
TMIN_sp	spring mean minimum temperature (°C)
TMIN_sm	summer mean minimum temperature (°C)
TMIN_at	autumn mean minimum temperature (°C)
PPT_wt	winter precipitation (mm)
PPT_sp	spring precipitation (mm)
PPT_sm	summer precipitation (mm)
PPT_at	autumn precipitation (mm)

Tab. S4 - Non-parametric ANOVA on the combination between methods and algorithms.

METHOD:ALGORITHM	TSS	SD	groups
PDM:GLM	0.9092	0.0547	a
PDM:GBM	0.9022	0.0569	a
PDM:RF	0.9018	0.0573	a
PDM:MARS	0.9012	0.0877	a
PDM:ANN	0.8953	0.0603	a
PDM:GAM	0.8765	0.0665	a
PDM:CTA	0.8702	0.0735	a
PDM:FDA	0.8691	0.0682	a
wPDM:RF	0.8086	0.1722	b
wPDM:GAM	0.7389	0.1806	c
wPDM:MARS	0.7385	0.2168	c
wPDM:GBM	0.7379	0.1998	c
wPDM:FDA	0.7353	0.2154	c
FCA:GBM	0.6796	0.0356	d
FCA:ANN	0.6728	0.0411	de
BAA:RF	0.6613	0.0410	def
BAA:ANN	0.6597	0.0405	defg
BAA:GBM	0.6585	0.0319	defgh
FCA:GLM	0.6536	0.0357	defghi
FCA:RF	0.6531	0.0461	defghi
FCA:MARS	0.6452	0.0408	defghij
wPDM:ANN	0.6444	0.2436	defghijk
BAA:MAXENT	0.6429	0.0450	defghijk
wBAA:RF	0.6420	0.0582	defghijk
FCA:MAXENT	0.6416	0.0460	defghijk
BAA:MARS	0.6330	0.0350	defghijkl
FCA:GAM	0.6306	0.0551	efghijklm
BAA:GAM	0.6297	0.0451	efghijklmn
BAA:GLM	0.6214	0.0347	fghijklmn
BAA:CTA	0.6133	0.0552	fhijklmno

METHOD:ALGORITHM	TSS	SD	groups
FCA:FDA	0.6087	0.0581	ghijklmno
wBAA:MAXENT	0.6075	0.0906	hijklmno
BAA:FDA	0.6036	0.0378	ijklmno
wBAA:FDA	0.5951	0.0394	jklmno
FCA:CTA	0.5946	0.0908	klmno
wBAA:GLM	0.5844	0.0428	lmno
wBAA:GBM	0.5775	0.0748	mno
wBAA:ANN	0.5767	0.0436	no
wPDM:GLM	0.5610	0.0692	op
wBAA:MARS	0.5593	0.0625	op
wBAA:GAM	0.5127	0.0418	p
wPDM:CTA	0.4587	0.2691	q
wBAA:CTA	0.3570	0.2333	r
wPDM:MAXENT	0.3537	0.1406	r
PDM:MAXENT	0.3458	0.0686	r