Table S1. Accuracy metrics relative to NASA POWER maximum temperature with and without bias correction for all 14 locations.

Location	Bias correction scheme		b	R2	RMSE (°C)	NRMSE (%)	MBE (°C)	NMBE (%)	EF
Alentejo	No Bias Correction		0.98	0.95	1.95	8.07	-0.64	-2.66	0.94
	Regional Bias Correction	Calibration Set	1.00	0.95	1.78	7.36	0.02	0.10	0.95
		Validation Set	1.00	0.95	1.78	7.38	0.03	0.14	0.95
		Full Set	1.00	0.95	1.78	7.37	0.03	0.12	0.95
Aljustrel	No Bias Correction		0.96	0.96	1.92	7.82	-1.01	-4.11	0.93
	Regional Bias Correction		0.99	0.96	1.61	6.59	-0.34	-1.37	0.95
	Local Bias Correction	Calibration Set	1.00	0.96	1.57	6.41	0.04	0.15	0.96
		Validation Set	1.00	0.96	1.59	6.52	0.11	0.47	0.95
		Full Set	1.00	0.96	1.58	6.46	0.08	0.31	0.95
Alvalade	No Bias Correction		0.96	0.95	2.15	8.69	-1.27	-5.12	0.91
	Regional Bias Correction		0.98	0.95	1.77	7.14	-0.60	-2.41	0.94
	Local Bias Correction	Calibration Set	1.00	0.95	1.67	6.73	0.06	0.26	0.95
		Validation Set	1.00	0.95	1.63	6.60	0.06	0.24	0.95
		Full Set	1.00	0.95	1.65	6.66	0.06	0.25	0.95
Beja	No Bias Correction		1.00	0.96	1.64	6.83	-0.11	-0.46	0.96
	Regional Bias Correction		1.02	0.96	1.63	6.78	0.54	2.27	0.96
	Local Bias Correction	Calibration Set	1.00	0.96	1.51	6.28	0.01	0.03	0.96
		Validation Set	1.00	0.96	1.50	6.22	0.02	0.08	0.96
		Full Set	1.00	0.96	1.50	6.25	0.01	0.06	0.96
Castro Verde	No Bias Correction		0.97	0.97	1.52	6.28	-0.67	-2.77	0.96
	Regional Bias Correction		0.99	0.97	1.38	5.70	0.00	-0.01	0.97
	Local Bias Correction	Calibration Set	1.00	0.97	1.37	5.66	0.00	0.00	0.97
		Validation Set	1.00	0.97	1.37	5.63	-0.02	-0.07	0.97
		Full Set	1.00	0.97	1.37	5.64	-0.01	-0.04	0.97
Elvas	No Bias Correction		0.95	0.96	2.23	9.08	-1.40	-5.71	0.93
	Regional Bias Correction		0.97	0.96	1.82	7.41	-0.72	-2.93	0.95
	Local Bias Correction	Calibration Set	1.00	0.96	1.68	6.81	0.05	0.22	0.96
		Validation Set	1.00	0.96	1.66	6.79	0.04	0.16	0.96
		Full Set	1.00	0.96	1.67	6.80	0.05	0.19	0.96
Estremoz	No Bias Correction		1.02	0.96	1.81	7.95	0.56	2.43	0.95
	Regional Bias Correction		1.04	0.96	2.08	9.10	1.23	5.39	0.93
	Local Bias Correction	Calibration Set	1.00	0.97	1.47	6.53	-0.03	-0.11	0.97
		Validation Set	1.00	0.97	1.39	6.17	-0.02	-0.08	0.97
		Full Set	0.98	0.96	1.74	7.61	-0.42	-1.85	0.95
Évora	No Bias Correction		0.98	0.96	1.84	7.75	-0.59	-2.50	0.95
	Regional Bias Correction		1.00	0.96	1.66	7.00	0.09	0.39	0.96
	Local Bias Correction	Calibration Set	1.00	0.96	1.62	6.78	0.03	0.12	0.96
		Validation Set	1.00	0.96	1.64	6.88	-0.01	-0.03	0.96
		Full Set	1.00	0.96	1.64	6.91	-0.03	-0.11	0.96

Ferreira do Alentejo	No Bias Correction		0.96	0.96	1.99	8.01	-1.21	-4.89	0.93
	Regional Bias Correction		0.98	0.96	1.59	6.42	-0.55	-2.21	0.95
	Local Bias Correction	Calibration Set	1.00	0.96	1.45	5.82	0.06	0.23	0.96
		Validation Set	1.00	0.96	1.52	6.13	0.01	0.05	0.96
		Full Set	1.00	0.96	1.48	5.98	0.04	0.14	0.96
Moura	No Bias Correction		0.96	0.97	1.99	7.94	-1.23	-4.92	0.94
	Regional Bias Correction		0.98	0.97	1.58	6.33	-0.57	-2.29	0.96
	Local Bias Correction	Calibration Set	1.00	0.97	1.47	5.84	0.06	0.25	0.97
		Validation Set	1.00	0.97	1.46	5.87	0.08	0.32	0.97
		Full Set	1.00	0.97	1.46	5.85	0.07	0.28	0.97
Odemira	No Bias Correction		1.03	0.82	2.67	12.55	0.57	2.68	0.68
	Regional Bias Correction		1.06	0.82	2.80	13.12	1.30	6.12	0.65
	Local Bias Correction	Calibration Set	0.99	0.83	2.04	9.58	-0.11	-0.50	0.82
		Validation Set	0.99	0.82	2.05	9.60	-0.01	-0.06	0.81
		Full Set	0.99	0.82	2.04	9.59	-0.06	-0.28	0.81
Redondo	No Bias Correction		0.97	0.97	1.75	7.24	-0.95	-3.92	0.95
	Regional Bias Correction		0.99	0.97	1.46	6.04	-0.27	-1.11	0.97
	Local Bias Correction	Calibration Set	1.00	0.97	1.44	5.97	0.02	0.10	0.97
		Validation Set	1.00	0.97	1.44	5.94	-0.01	-0.06	0.97
		Full Set	1.00	0.97	1.44	5.95	0.01	0.02	0.97
Serpa	No Bias Correction		0.97	0.95	2.01	7.99	-0.79	-3.14	0.94
	Regional Bias Correction		0.99	0.95	1.80	7.14	-0.16	-0.62	0.95
	Local Bias Correction	Calibration Set	1.00	0.95	1.73	7.00	0.03	0.13	0.95
		Validation Set	0.99	0.95	1.84	7.18	-0.10	-0.39	0.95
		Full Set	1.00	0.95	1.79	7.10	-0.03	-0.14	0.95
Viana do Alentejo	No Bias Correction		1.00	0.97	1.36	5.73	0.14	0.60	0.97
	Regional Bias Correction		1.02	0.97	1.58	6.66	0.80	3.36	0.96
	Local Bias Correction	Calibration Set	1.00	0.97	1.34	5.62	0.00	0.00	0.97
		Validation Set	1.00	0.97	1.38	5.81	0.00	0.01	0.97
		Full Set	1.00	0.97	1.36	5.72	0.00	0.01	0.97
Vidigueira	No Bias Correction		0.97	0.97	1.86	7.44	-1.02	-4.05	0.94
	Regional Bias Correction		0.99	0.97	1.53	6.10	-0.37	-1.46	0.96
	Local Bias Correction	Calibration Set	1.00	0.97	1.45	5.78	0.05	0.18	0.97
		Validation Set	1.00	0.96	1.50	5.97	-0.01	-0.04	0.96
		Full Set	1.00	0.97	1.47	5.88	0.02	0.07	0.97

Table S2. Accuracy metrics relative to NASA POWER minimum temperature with and without bias correction for all 14 locations.

Location	Bias correction scheme		b	R2	RMSE (°C)	NRMSE (%)	MBE (°C)	NMBE (%)	EF
Alentejo	No Bias Correction		1.08	0.89	2.06	20.74	1.03	10.38	0.84
	Regional Bias Correction	Calibration Set	0.98	0.89	1.73	17.45	-0.05	-0.50	0.89
		Validation Set	0.98	0.89	1.71	17.22	-0.07	-0.67	0.89
		Full Set	0.98	0.89	1.72	17.34	-0.06	-0.58	0.89
Aljustrel	No Bias Correction		1.09	0.91	1.97	19.84	1.26	12.71	0.85
	Regional Bias Correction		0.99	0.91	1.51	15.21	0.16	1.64	0.91
	Local Bias Correction	Calibration Set	0.99	0.91	1.53	15.56	0.01	0.07	0.91
		Validation Set	0.99	0.92	1.50	14.99	-0.06	-0.61	0.91
		Full Set	0.99	0.91	1.52	15.27	-0.03	-0.27	0.91
Alvalade	No Bias Correction		1.06	0.90	1.83	17.74	0.87	8.44	0.87
	Regional Bias Correction		0.96	0.90	1.60	15.52	-0.23	-2.20	0.90
	Local Bias Correction	Calibration Set	0.99	0.90	1.61	15.44	-0.01	-0.08	0.90
		Validation Set	0.99	0.90	1.60	15.61	0.01	0.12	0.90
		Full Set	0.99	0.90	1.60	15.52	0.00	0.02	0.90
Beja	No Bias Correction		1.05	0.93	1.65	15.81	0.40	3.85	0.88
	Regional Bias Correction		0.96	0.93	1.60	15.40	-0.68	-6.54	0.89
	Local Bias Correction	Calibration Set	0.99	0.93	1.27	12.28	-0.05	-0.48	0.93
		Validation Set	1.00	0.93	1.30	12.44	0.02	0.15	0.93
		Full Set	0.99	0.93	1.29	12.36	-0.02	-0.16	0.93
Castro Verde	No Bias Correction		1.10	0.93	1.82	18.34	1.27	12.78	0.86
	Regional Bias Correction		1.00	0.93	1.28	12.93	0.17	1.70	0.93
	Local Bias Correction	Calibration Set	0.99	0.93	1.29	13.02	-0.02	-0.24	0.93
		Validation Set	1.00	0.93	1.29	12.90	0.01	0.11	0.93
		Full Set	0.99	0.93	1.29	12.97	-0.01	-0.06	0.93
Elvas	No Bias Correction		1.06	0.91	1.93	20.33	0.78	8.16	0.88
	Regional Bias Correction		0.97	0.91	1.72	18.12	-0.28	-2.95	0.91
	Local Bias Correction	Calibration Set	0.99	0.91	1.71	17.81	-0.04	-0.44	0.91
		Validation Set	0.98	0.91	1.68	17.85	-0.06	-0.63	0.91
		Full Set	0.98	0.91	1.70	17.83	-0.05	-0.54	0.91
Estremoz	No Bias Correction		1.10	0.91	2.02	21.74	1.05	11.32	0.84
	Regional Bias Correction		1.00	0.91	1.62	17.40	-0.01	-0.06	0.90
	Local Bias Correction	Calibration Set	0.98	0.91	1.48	15.64	-0.12	-1.21	0.91
		Validation Set	0.98	0.91	1.48	15.77	-0.16	-1.68	0.91
		Full Set	0.98	0.91	1.54	16.52	-0.06	-0.66	0.91
Évora	No Bias Correction		1.11	0.89	2.30	25.35	1.31	14.51	0.81
	Regional Bias Correction		1.01	0.89	1.82	20.12	0.25	2.81	0.88
	Local Bias Correction	Calibration Set	0.98	0.89	1.78	19.66	-0.09	-1.00	0.89
		Validation Set	0.98	0.89	1.77	19.79	-0.04	-0.48	0.89
		Full Set	0.98	0.89	1.78	19.65	-0.05	-0.55	0.89
Ferreira do Alentejo	No Bias Correction		1.08	0.89	2.06	20.94	1.15	11.69	0.84
	Regional Bias Correction		0.98	0.89	1.70	17.27	0.06	0.61	0.89
		Calibration Set	0.99	0.90	1.71	17.34	0.02	0.19	0.89

	Local Bias Correction	Validation Set	0.99	0.89	1.73	17.65	0.02	0.24	0.89
		Full Set	0.99	0.89	1.72	17.49	0.02	0.21	0.89
Moura	No Bias Correction		1.15	0.86	3.17	37.05	2.24	26.22	0.72
	Regional Bias Correction		1.05	0.86	2.50	29.20	1.16	13.59	0.83
	Local Bias Correction	Calibration Set	0.98	0.88	2.18	26.43	0.03	0.39	0.87
		Validation Set	0.98	0.85	2.32	26.38	0.00	0.05	0.84
		Full Set	0.98	0.86	2.25	26.35	0.02	0.22	0.86
Odemira	No Bias Correction		1.13	0.85	2.33	20.99	1.64	14.72	0.65
	Regional Bias Correction		1.03	0.85	1.66	14.92	0.46	4.16	0.82
	Local Bias Correction	Calibration Set	0.98	0.85	1.58	14.20	-0.13	-1.13	0.84
		Validation Set	0.98	0.85	1.56	14.03	-0.17	-1.54	0.84
		Full Set	0.98	0.85	1.57	14.12	-0.15	-1.33	0.84
Redondo	No Bias Correction		0.99	0.92	1.57	14.98	-0.15	-1.41	0.91
	Regional Bias Correction		0.90	0.92	1.91	18.26	-1.20	-11.52	0.87
	Local Bias Correction	Calibration Set	0.99	0.92	1.47	14.16	0.01	0.09	0.92
		Validation Set	1.00	0.92	1.47	13.96	0.04	0.37	0.92
		Full Set	1.00	0.92	1.47	14.06	0.02	0.23	0.92
Serpa	No Bias Correction		1.07	0.93	1.68	16.10	0.72	6.87	0.89
	Regional Bias Correction		0.97	0.93	1.48	14.13	-0.38	-3.63	0.92
	Local Bias Correction	Calibration Set	0.99	0.94	1.29	12.46	-0.06	-0.54	0.94
		Validation Set	1.00	0.92	1.46	13.86	0.12	1.13	0.92
		Full Set	0.99	0.93	1.38	13.19	0.03	0.30	0.93
Viana do Alentejo	No Bias Correction		1.10	0.92	1.83	18.30	1.17	11.74	0.85
	Regional Bias Correction		1.00	0.92	1.33	13.31	0.07	0.74	0.92
	Local Bias Correction	Calibration Set	0.99	0.93	1.26	13.01	-0.09	-0.90	0.93
		Validation Set	0.99	0.92	1.34	13.08	-0.07	-0.69	0.92
		Full Set	0.99	0.92	1.30	13.05	-0.08	-0.79	0.92
Vidigueira	No Bias Correction		1.06	0.89	1.98	19.61	0.76	7.54	0.85
	Regional Bias Correction		0.97	0.89	1.78	17.67	-0.32	-3.21	0.88
	Local Bias Correction	Calibration Set	0.98	0.89	1.73	17.79	-0.04	-0.38	0.89
		Validation Set	1.00	0.89	1.75	16.77	0.19	1.82	0.88
		Full Set	0.99	0.89	1.74	17.26	0.08	0.76	0.89

Table S3. Accuracy metrics relative to NASA POWER solar radiation with and without bias correction for all 14 locations.

Location	Bias correction scheme		b	R2	RMSE (MJ m^{-2} d^{-1})	NRMSE (%)	MBE (MJ m^{-2} d^{-1})	NMBE (%)	EF
Alentejo	No Bias Correction		1.03	0.94	2.14	12.63	0.65	3.83	0.93
	Regional Bias Correction	Calibration Set	0.99	0.94	2.04	12.02	-0.01	-0.05	0.94
		Validation Set	0.99	0.94	2.01	11.88	0.00	-0.03	0.94
		Full Set	0.99	0.94	2.02	11.95	-0.01	-0.04	0.94
Aljustrel	No Bias Correction		1.08	0.94	2.59	15.75	1.62	9.86	0.89
	Regional Bias Correction		1.05	0.94	2.21	13.47	0.96	5.84	0.92
	Local Bias Correction	Calibration Set	0.99	0.93	1.99	12.04	-0.06	-0.34	0.93
		Validation Set	0.99	0.94	1.94	11.87	-0.08	-0.48	0.94
		Full Set	0.99	0.94	1.96	11.95	-0.07	-0.41	0.94
Alvalade	No Bias Correction		1.04	0.91	2.73	16.12	1.12	6.63	0.89
	Regional Bias Correction		1.01	0.91	2.52	14.87	0.46	2.73	0.90
	Local Bias Correction	Calibration Set	0.99	0.91	2.44	14.32	0.01	0.05	0.91
		Validation Set	0.99	0.90	2.55	15.15	-0.02	-0.13	0.90
		Full Set	0.99	0.91	2.50	14.73	-0.01	-0.04	0.90
Beja	No Bias Correction		0.95	0.94	2.20	12.14	-0.84	-4.65	0.93
	Regional Bias Correction		0.92	0.94	2.53	13.94	-1.49	-8.24	0.91
	Local Bias Correction	Calibration Set	0.99	0.94	2.05	11.30	-0.04	-0.20	0.94
		Validation Set	1.00	0.94	2.05	11.31	-0.02	-0.10	0.94
		Full Set	0.99	0.94	2.05	11.31	-0.03	-0.15	0.94
Castro Verde	No Bias Correction		1.01	0.94	1.98	11.27	0.40	2.26	0.94
	Regional Bias Correction		0.98	0.94	1.95	11.14	-0.26	-1.50	0.94
	Local Bias Correction	Calibration Set	1.00	0.94	1.94	10.88	0.01	0.04	0.94
		Validation Set	1.00	0.94	1.96	11.40	0.18	1.05	0.94
		Full Set	1.00	0.94	1.95	11.13	0.09	0.54	0.94
Elvas	No Bias Correction		1.02	0.94	2.00	11.84	0.39	2.31	0.94
	Regional Bias Correction		0.98	0.94	1.96	11.63	-0.26	-1.54	0.94
	Local Bias Correction	Calibration Set	0.99	0.94	1.98	11.68	-0.01	-0.04	0.94
		Validation Set	0.99	0.95	1.91	11.33	-0.08	-0.47	0.94
		Full Set	0.99	0.94	1.95	11.51	-0.04	-0.25	0.94
Estremoz	No Bias Correction		1.03	0.96	1.89	11.34	0.79	4.72	0.95
	Regional Bias Correction		1.00	0.96	1.72	10.32	0.13	0.80	0.96
	Local Bias Correction	Calibration Set	1.00	0.96	1.67	9.84	0.02	0.13	0.96
		Validation Set	1.00	0.96	1.67	10.00	0.02	0.11	0.96
		Full Set	1.01	0.96	1.76	10.55	0.13	0.81	0.95
Évora	No Bias Correction		1.08	0.96	2.14	13.27	1.33	8.26	0.92
	Regional Bias Correction		1.04	0.96	1.77	10.98	0.68	4.20	0.95
	Local Bias Correction	Calibration Set	0.99	0.96	1.52	9.67	-0.09	-0.56	0.96
		Validation Set	0.99	0.96	1.48	9.11	-0.10	-0.59	0.96
		Full Set	0.99	0.96	1.53	9.50	-0.11	-0.68	0.96
Ferreira do Alentejo	No Bias Correction		1.03	0.93	2.18	13.07	0.64	3.80	0.92
	Regional Bias Correction		1.00	0.93	2.06	12.35	-0.02	-0.10	0.93
		Calibration Set	0.99	0.94	1.99	11.90	-0.02	-0.14	0.93

Location	Method	Set							
	Local Bias Correction	Validation Set	1.00	0.93	2.06	12.31	0.01	0.04	0.93
		Full Set	0.99	0.93	2.02	12.10	-0.01	-0.05	0.93
Moura	No Bias Correction		1.05	0.94	2.20	13.37	0.87	5.28	0.92
	Regional Bias Correction		1.01	0.94	1.99	12.14	0.22	1.32	0.93
	Local Bias Correction	Calibration Set	0.99	0.94	1.89	11.55	-0.05	-0.32	0.94
		Validation Set	1.00	0.94	1.89	11.45	0.00	0.02	0.94
		Full Set	0.99	0.94	1.89	11.49	-0.02	-0.15	0.94
Odemira	No Bias Correction		1.00	0.94	2.00	11.14	0.12	0.66	0.94
	Regional Bias Correction		0.97	0.94	2.06	11.48	-0.54	-3.03	0.93
	Local Bias Correction	Calibration Set	0.99	0.94	1.97	11.15	0.00	0.00	0.94
		Validation Set	0.99	0.94	2.01	11.07	-0.04	-0.25	0.94
		Full Set	0.99	0.94	1.99	11.11	-0.02	-0.13	0.94
Redondo	No Bias Correction		1.04	0.97	1.67	10.12	0.73	4.43	0.95
	Regional Bias Correction		1.01	0.97	1.48	8.92	0.08	0.49	0.96
	Local Bias Correction	Calibration Set	1.00	0.97	1.40	8.49	-0.03	-0.19	0.97
		Validation Set	1.00	0.97	1.45	8.74	-0.02	-0.09	0.97
		Full Set	1.00	0.97	1.43	8.62	-0.02	-0.14	0.97
Serpa	No Bias Correction		1.05	0.95	2.07	12.31	1.12	6.68	0.93
	Regional Bias Correction		1.01	0.95	1.80	10.70	0.46	2.76	0.95
	Local Bias Correction	Calibration Set	1.00	0.96	1.64	9.80	0.03	0.18	0.96
		Validation Set	1.01	0.95	1.89	11.19	0.30	1.76	0.94
		Full Set	1.01	0.95	1.77	10.53	0.16	0.97	0.95
Viana do Alentejo	No Bias Correction		1.03	0.93	2.29	13.60	0.69	4.10	0.91
	Regional Bias Correction		1.00	0.93	2.17	12.86	0.04	0.22	0.92
	Local Bias Correction	Calibration Set	0.99	0.93	2.12	12.52	-0.02	-0.11	0.93
		Validation Set	0.99	0.92	2.18	12.97	0.07	0.40	0.92
		Full Set	0.99	0.93	2.15	12.75	0.03	0.15	0.92
Vidigueira	No Bias Correction		1.00	0.97	1.51	8.75	0.11	0.64	0.97
	Regional Bias Correction		0.97	0.97	1.61	9.30	-0.54	-3.14	0.96
	Local Bias Correction	Calibration Set	1.00	0.97	1.48	8.55	0.00	0.01	0.97
		Validation Set	1.00	0.97	1.55	8.98	0.09	0.50	0.97
		Full Set	1.00	0.97	1.52	8.77	0.04	0.25	0.97

Table S4. Accuracy metrics relative to NASA POWER relative humidity with and without bias correction for all 14 locations.

Location	Bias correction scheme		b	R2	RMSE (%)	NRMSE (%)	MBE (%)	NMBE (%)	EF
Alentejo	No Bias Correction		0.93	0.83	9.27	13.05	-5.12	-7.21	0.66
	Regional Bias Correction	Calibration Set	1.01	0.83	6.67	9.38	0.79	1.11	0.82
		Validation Set	1.01	0.83	6.66	9.37	0.77	1.08	0.82
		Full Set	1.01	0.83	6.66	9.38	0.78	1.09	0.82
Aljustrel	No Bias Correction		0.94	0.83	8.96	12.38	-5.02	-6.94	0.63
	Regional Bias Correction		1.01	0.83	6.26	8.66	0.67	0.92	0.82
	Local Bias Correction	Calibration Set	1.01	0.83	6.16	8.50	0.89	1.23	0.82
		Validation Set	1.01	0.83	6.24	8.64	0.96	1.33	0.83
		Full Set	1.01	0.83	6.20	8.57	0.92	1.28	0.82
Alvalade	No Bias Correction		0.93	0.85	9.58	13.10	-5.76	-7.89	0.48
	Regional Bias Correction		1.00	0.85	5.91	8.09	-0.07	-0.10	0.80
	Local Bias Correction	Calibration Set	1.02	0.85	5.51	7.55	1.52	2.08	0.83
		Validation Set	1.02	0.85	5.38	7.35	1.51	2.06	0.83
		Full Set	1.02	0.85	5.44	7.45	1.51	2.07	0.83
Beja	No Bias Correction		0.93	0.85	9.58	13.64	-5.59	-7.96	0.63
	Regional Bias Correction		1.00	0.85	6.44	9.17	0.52	0.74	0.83
	Local Bias Correction	Calibration Set	1.01	0.86	6.21	8.81	0.99	1.40	0.85
		Validation Set	1.01	0.84	6.57	9.41	1.12	1.61	0.82
		Full Set	1.01	0.85	6.40	9.11	1.05	1.50	0.84
Castro Verde	No Bias Correction		0.93	0.83	9.01	12.46	-5.23	-7.24	0.69
	Regional Bias Correction		1.00	0.83	6.71	9.29	0.50	0.70	0.83
	Local Bias Correction	Calibration Set	1.00	0.82	6.91	9.57	0.46	0.63	0.81
		Validation Set	1.00	0.83	6.80	9.41	0.40	0.55	0.82
		Full Set	1.00	0.83	6.86	9.49	0.43	0.59	0.82
Elvas	No Bias Correction		0.95	0.88	8.30	12.23	-3.77	-5.56	0.79
	Regional Bias Correction		1.03	0.88	6.73	9.92	2.41	3.55	0.86
	Local Bias Correction	Calibration Set	1.00	0.88	6.45	9.54	0.49	0.73	0.87
		Validation Set	1.00	0.88	6.31	9.25	0.42	0.62	0.88
		Full Set	1.00	0.88	6.38	9.40	0.46	0.67	0.87
Estremoz	No Bias Correction		0.93	0.80	10.13	14.34	-5.43	-7.68	0.64
	Regional Bias Correction		1.00	0.80	7.61	10.77	0.58	0.83	0.80
	Local Bias Correction	Calibration Set	1.00	0.79	8.21	11.74	0.47	0.67	0.78
		Validation Set	1.00	0.79	8.13	11.54	0.12	0.17	0.78
		Full Set	1.00	0.80	7.85	11.12	0.09	0.13	0.78
Évora	No Bias Correction		0.93	0.87	9.75	13.70	-5.95	-8.36	0.56
	Regional Bias Correction		1.00	0.87	5.96	8.38	0.06	0.09	0.83
	Local Bias Correction	Calibration Set	1.02	0.86	5.69	8.02	1.41	1.99	0.85
		Validation Set	1.02	0.87	5.53	7.72	1.39	1.94	0.86
		Full Set	1.01	0.87	5.60	7.86	1.31	1.84	0.85
Ferreira do Alentejo	No Bias Correction		0.93	0.86	8.78	12.12	-5.63	-7.77	0.62
	Regional Bias Correction		1.00	0.86	5.50	7.60	0.14	0.20	0.85
		Calibration Set	1.01	0.86	5.50	7.58	1.04	1.44	0.85

	Local Bias Correction	Validation Set	1.01	0.86	5.48	7.58	1.16	1.60	0.85
		Full Set	1.01	0.86	5.49	7.58	1.10	1.52	0.85
Moura	No Bias Correction		0.92	0.88	9.52	13.78	-6.23	-9.02	0.71
	Regional Bias Correction		1.00	0.88	6.13	8.86	0.14	0.21	0.88
	Local Bias Correction	Calibration Set	1.01	0.88	6.26	9.03	0.86	1.25	0.88
		Validation Set	1.01	0.88	6.21	9.01	0.92	1.34	0.88
		Full Set	1.01	0.88	6.23	9.01	0.89	1.28	0.88
Odemira	No Bias Correction		0.94	0.40	11.18	14.57	-4.56	-5.95	-0.08
	Regional Bias Correction		1.00	0.40	9.24	12.04	0.38	0.49	0.26
	Local Bias Correction	Calibration Set	1.00	0.42	9.19	12.01	0.60	0.79	0.29
		Validation Set	0.99	0.38	9.41	12.23	-0.01	-0.01	0.22
		Full Set	1.00	0.40	9.30	12.12	0.30	0.38	0.25
Redondo	No Bias Correction		0.96	0.86	7.81	11.41	-2.93	-4.28	0.79
	Regional Bias Correction		1.04	0.86	7.01	10.25	3.04	4.45	0.83
	Local Bias Correction	Calibration Set	1.00	0.86	6.34	9.28	0.41	0.61	0.86
		Validation Set	1.01	0.86	6.47	9.45	0.84	1.23	0.85
		Full Set	1.00	0.86	6.41	9.37	0.63	0.92	0.86
Serpa	No Bias Correction		0.93	0.84	9.77	14.08	-5.39	-7.77	0.61
	Regional Bias Correction		1.01	0.84	6.67	9.61	0.81	1.17	0.82
	Local Bias Correction	Calibration Set	1.01	0.84	6.45	9.28	1.10	1.58	0.83
		Validation Set	1.01	0.84	6.48	9.36	1.25	1.81	0.83
		Full Set	1.01	0.84	6.47	9.32	1.18	1.70	0.83
Viana do Alentejo	No Bias Correction		0.92	0.88	8.48	11.74	-6.03	-8.35	0.72
	Regional Bias Correction		0.99	0.88	5.55	7.69	-0.17	-0.24	0.88
	Local Bias Correction	Calibration Set	1.00	0.88	5.64	7.79	0.42	0.59	0.88
		Validation Set	1.00	0.88	5.64	7.83	0.44	0.60	0.88
		Full Set	1.00	0.88	5.63	7.79	0.39	0.54	0.88
Vidigueira	No Bias Correction		0.94	0.87	8.54	12.38	-4.82	-6.99	0.75
	Regional Bias Correction		1.01	0.87	6.37	9.24	1.35	1.96	0.86
	Local Bias Correction	Calibration Set	1.00	0.87	6.20	9.01	0.55	0.80	0.87
		Validation Set	1.00	0.86	6.51	9.42	0.66	0.96	0.85
		Full Set	1.00	0.87	6.36	9.22	0.60	0.88	0.86

Table S5. Accuracy metrics relative to NASA POWER wind speed with and without bias correction for all 14 locations.

Location	Bias correction scheme		b	R2	RMSE (m s⁻¹)	NRMSE (%)	MBE (m s⁻¹)	NMBE (%)	EF
Alentejo	No Bias Correction		1.33	0.56	1.15	60.61	0.87	45.63	-0.35
	Regional Bias Correction	Calibration Set	0.90	0.56	0.71	37.18	-0.10	-5.36	0.49
		Validation Set	0.90	0.56	0.71	37.43	-0.10	-5.38	0.49
		Full Set	0.90	0.56	0.71	37.31	-0.10	-5.37	0.49
Aljustrel	No Bias Correction		1.43	0.73	1.15	60.06	0.98	51.43	-0.62
	Regional Bias Correction		0.99	0.73	0.52	27.28	0.00	-0.08	0.67
	Local Bias Correction	Calibration Set	0.88	0.73	0.53	27.53	-0.22	-11.49	0.65
		Validation Set	0.87	0.73	0.54	28.13	-0.24	-12.36	0.65
		Full Set	0.87	0.73	0.53	27.86	-0.23	-11.91	0.65
Alvalade	No Bias Correction		1.34	0.71	1.03	49.90	0.83	40.09	-0.24
	Regional Bias Correction		0.92	0.71	0.57	27.54	-0.16	-7.59	0.62
	Local Bias Correction	Calibration Set	0.91	0.71	0.53	25.92	-0.16	-7.61	0.66
		Validation Set	0.90	0.70	0.55	26.78	-0.17	-8.08	0.65
		Full Set	0.91	0.71	0.54	26.35	-0.16	-7.85	0.65
Beja	No Bias Correction		1.29	0.79	0.79	39.01	0.61	29.72	-0.11
	Regional Bias Correction		0.86	0.79	0.55	27.22	-0.35	-17.13	0.46
	Local Bias Correction	Calibration Set	0.91	0.78	0.40	19.70	-0.17	-8.28	0.72
		Validation Set	0.91	0.80	0.40	19.48	-0.18	-8.89	0.72
		Full Set	0.91	0.79	0.40	19.59	-0.17	-8.58	0.72
Castro Verde	No Bias Correction		1.04	0.75	0.62	23.08	0.19	7.00	0.71
	Regional Bias Correction		0.71	0.75	0.98	36.35	-0.79	-29.42	0.27
	Local Bias Correction	Calibration Set	0.98	0.75	0.60	22.08	0.00	0.13	0.73
		Validation Set	0.99	0.75	0.60	22.33	0.02	0.73	0.73
		Full Set	0.98	0.75	0.60	22.20	0.01	0.42	0.73
Elvas	No Bias Correction		1.30	0.54	1.03	56.72	0.74	40.53	-0.36
	Regional Bias Correction		0.86	0.54	0.69	38.04	-0.21	-11.34	0.39
	Local Bias Correction	Calibration Set	0.90	0.55	0.65	35.58	-0.12	-6.77	0.47
		Validation Set	0.89	0.53	0.66	36.21	-0.13	-6.90	0.45
		Full Set	0.89	0.54	0.65	35.90	-0.12	-6.83	0.46
Estremoz	No Bias Correction		1.53	0.52	1.33	86.74	1.11	72.66	-1.49
	Regional Bias Correction		1.03	0.52	0.68	44.26	0.16	10.29	0.35
	Local Bias Correction	Calibration Set	0.72	0.70	0.57	39.01	-0.43	-29.58	0.24
		Validation Set	0.80	0.58	0.50	40.50	-0.20	-16.50	0.47
		Full Set	0.64	0.51	0.77	50.46	-0.50	-32.68	0.16
Évora	No Bias Correction		1.17	0.62	0.92	45.38	0.61	29.73	0.30
	Regional Bias Correction		0.79	0.62	0.76	37.46	-0.35	-17.12	0.52
	Local Bias Correction	Calibration Set	0.97	0.62	0.73	35.78	0.04	2.05	0.57
		Validation Set	0.98	0.62	0.72	35.40	0.06	2.87	0.57
		Full Set	0.97	0.62	0.72	35.33	0.04	2.03	0.57
Ferreira do Alentejo	No Bias Correction		1.67	0.68	1.37	87.02	1.22	77.45	-2.34
	Regional Bias Correction		1.14	0.68	0.59	37.50	0.24	15.59	0.38
		Calibration Set	0.78	0.68	0.57	36.07	-0.36	-22.60	0.42

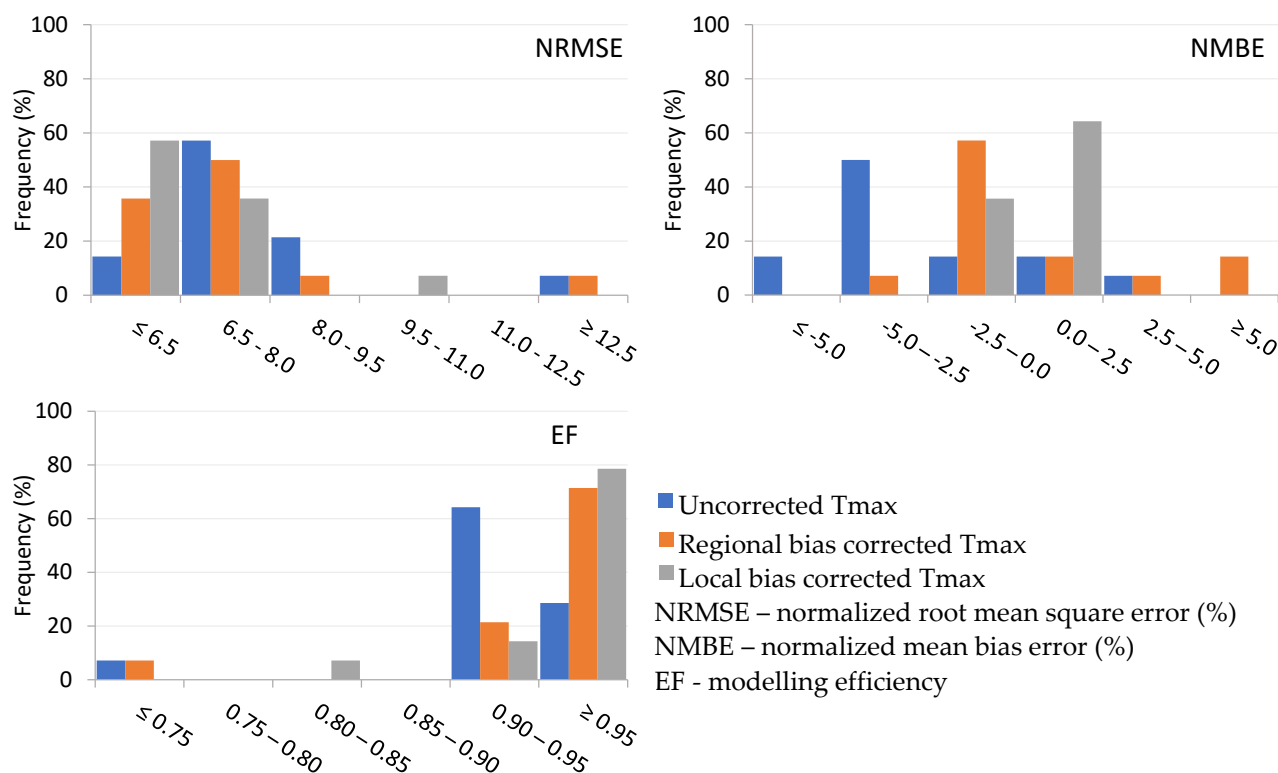| Location	Method	Set							
	Local Bias Correction	Validation Set	0.78	0.67	0.57	36.44	-0.35	-22.64	0.42
		Full Set	0.78	0.67	0.57	36.26	-0.36	-22.62	0.42
Moura	No Bias Correction		1.79	0.67	1.39	105.62	1.24	94.54	-3.03
	Regional Bias Correction		1.20	0.67	0.61	46.28	0.30	22.75	0.23
	Local Bias Correction	Calibration Set	0.73	0.60	0.56	43.05	-0.34	-26.27	0.33
		Validation Set	0.73	0.61	0.57	43.09	-0.35	-26.53	0.33
		Full Set	0.73	0.61	0.57	43.09	-0.35	-26.44	0.33
Odemira	No Bias Correction		1.63	0.67	1.63	80.31	1.44	70.66	-2.32
	Regional Bias Correction		1.17	0.67	0.77	37.83	0.38	18.87	0.26
	Local Bias Correction	Calibration Set	0.78	0.67	0.71	35.26	-0.47	-23.13	0.36
		Validation Set	0.77	0.68	0.72	35.05	-0.48	-23.71	0.37
		Full Set	0.77	0.67	0.71	35.16	-0.48	-23.42	0.36
Redondo	No Bias Correction		0.96	0.66	0.77	30.19	0.12	4.54	0.65
	Regional Bias Correction		0.65	0.66	1.14	44.94	-0.84	-33.15	0.23
	Local Bias Correction	Calibration Set	0.97	0.67	0.78	30.85	0.02	0.97	0.63
		Validation Set	0.97	0.66	0.80	31.61	0.06	2.26	0.63
		Full Set	0.97	0.66	0.79	31.24	0.04	1.62	0.63
Serpa	No Bias Correction		1.73	0.64	1.43	101.75	1.26	90.29	-2.49
	Regional Bias Correction		1.17	0.64	0.65	46.37	0.31	21.97	0.28
	Local Bias Correction	Calibration Set	0.78	0.67	0.57	36.71	-0.34	-21.99	0.44
		Validation Set	0.89	0.63	0.48	38.23	-0.09	-7.08	0.57
		Full Set	0.83	0.63	0.53	37.53	-0.21	-15.31	0.53
Viana do Alentejo	No Bias Correction		1.24	0.76	0.78	35.39	0.58	26.02	0.18
	Regional Bias Correction		0.84	0.76	0.61	27.55	-0.40	-17.92	0.50
	Local Bias Correction	Calibration Set	0.94	0.76	0.45	20.08	-0.11	-5.09	0.72
		Validation Set	0.95	0.77	0.44	20.22	-0.10	-4.51	0.74
		Full Set	0.94	0.76	0.45	20.15	-0.11	-4.80	0.73
Vidigueira	No Bias Correction		1.52	0.66	1.20	73.86	1.03	63.38	-1.17
	Regional Bias Correction		1.02	0.66	0.55	33.76	0.07	4.38	0.55
	Local Bias Correction	Calibration Set	0.85	0.67	0.55	33.90	-0.23	-14.57	0.56
		Validation Set	0.84	0.65	0.56	34.20	-0.25	-15.51	0.52
		Full Set	0.84	0.66	0.55	34.06	-0.24	-15.05	0.54

Figure S1. Frequency (%) distribution of the accuracy metrics measuring the performance of NASA POWER maximum temperature (Tmax) without bias correction compared with adopting a regional bias correction and a local bias correction.
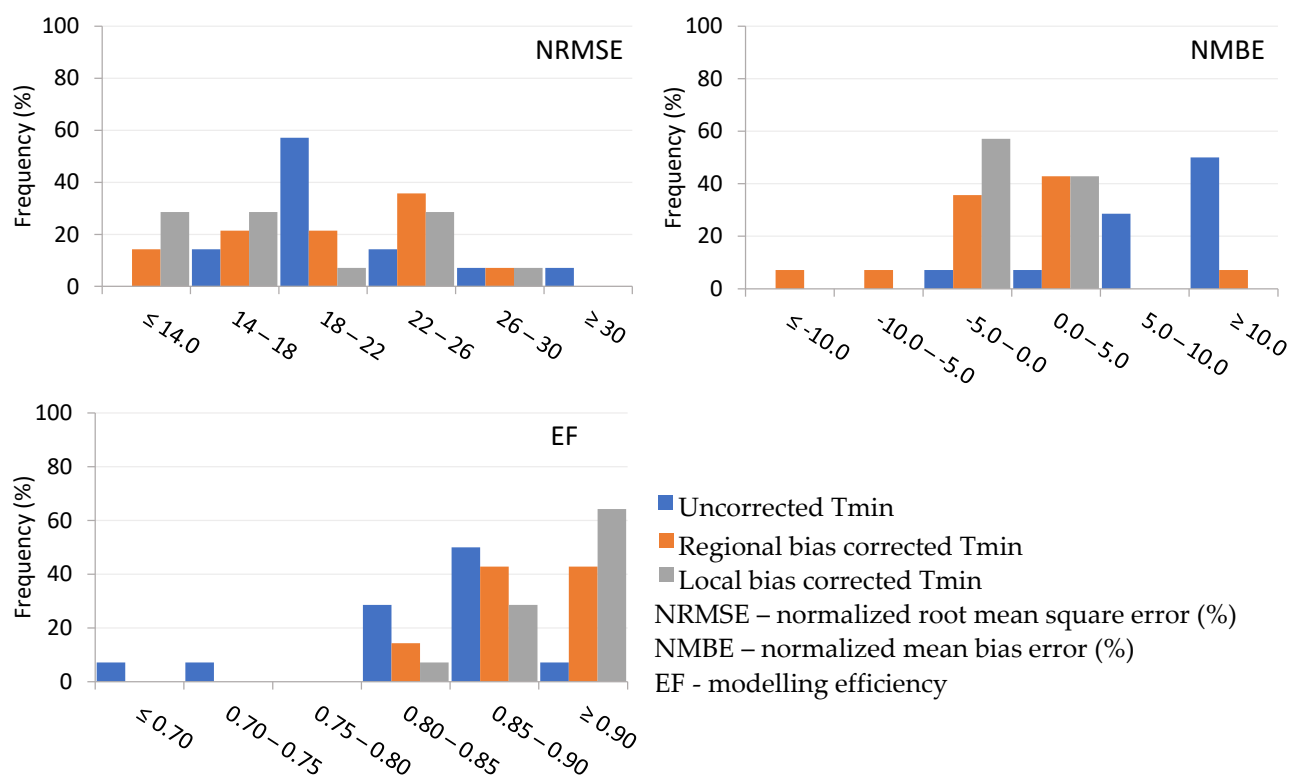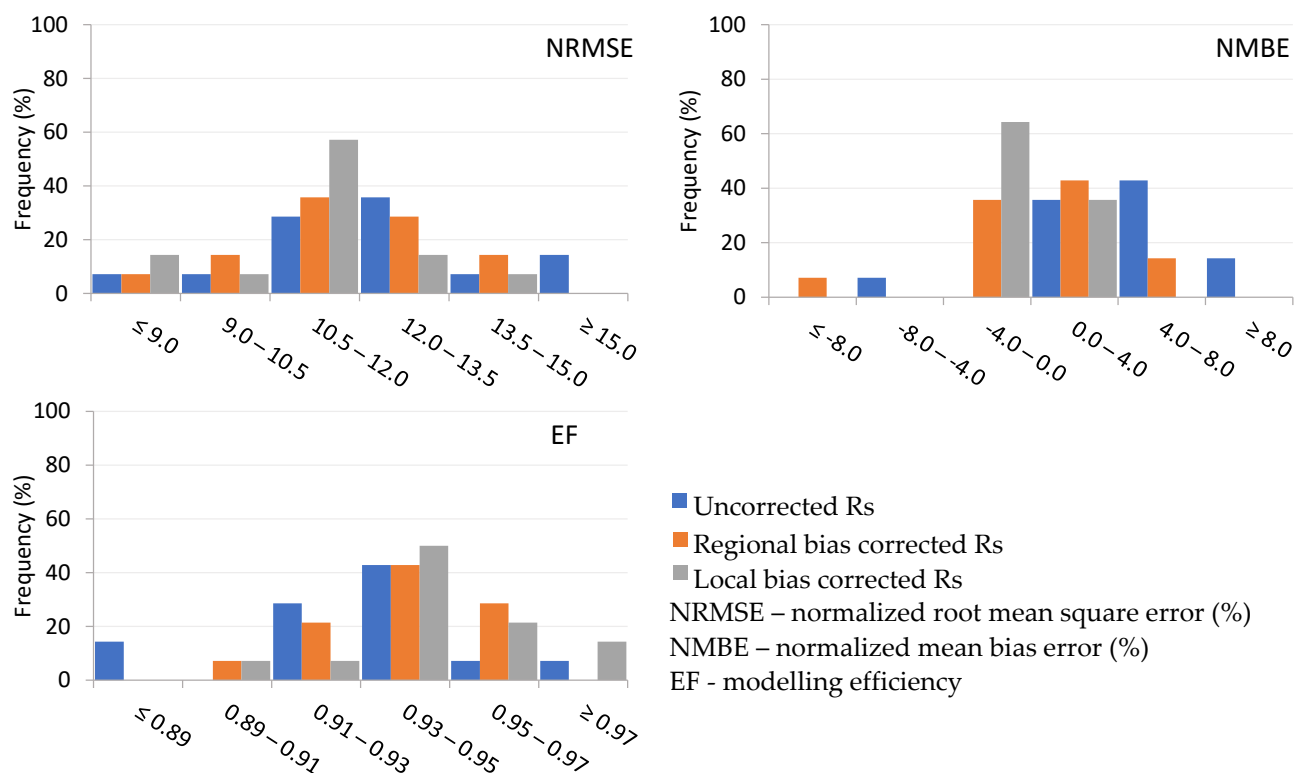

Figure S2. Frequency (%) distribution of the accuracy metrics measuring the performance of NASA POWER minimum temperature (Tmin) without bias correction compared with adopting a regional bias correction and a local bias correction.

Figure S3. Frequency (%) distribution of the accuracy metrics measuring the performance of NASA POWER solar radiation (Rs) without bias correction compared with adopting a regional bias correction and a local bias correction.
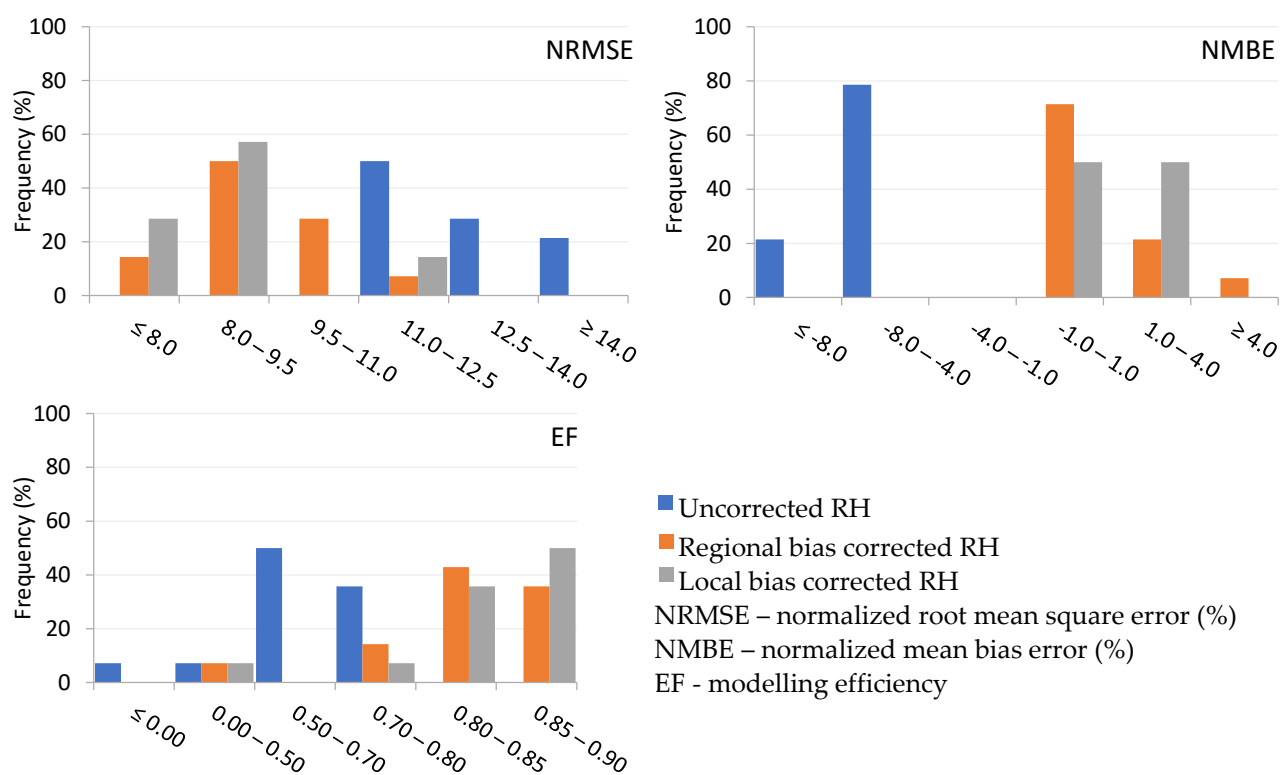

Figure S4. Frequency (%) distribution of the accuracy metrics measuring the performance of NASA POWER relative humidity (RH) without bias correction compared with adopting a regional bias correction and a local bias correction.
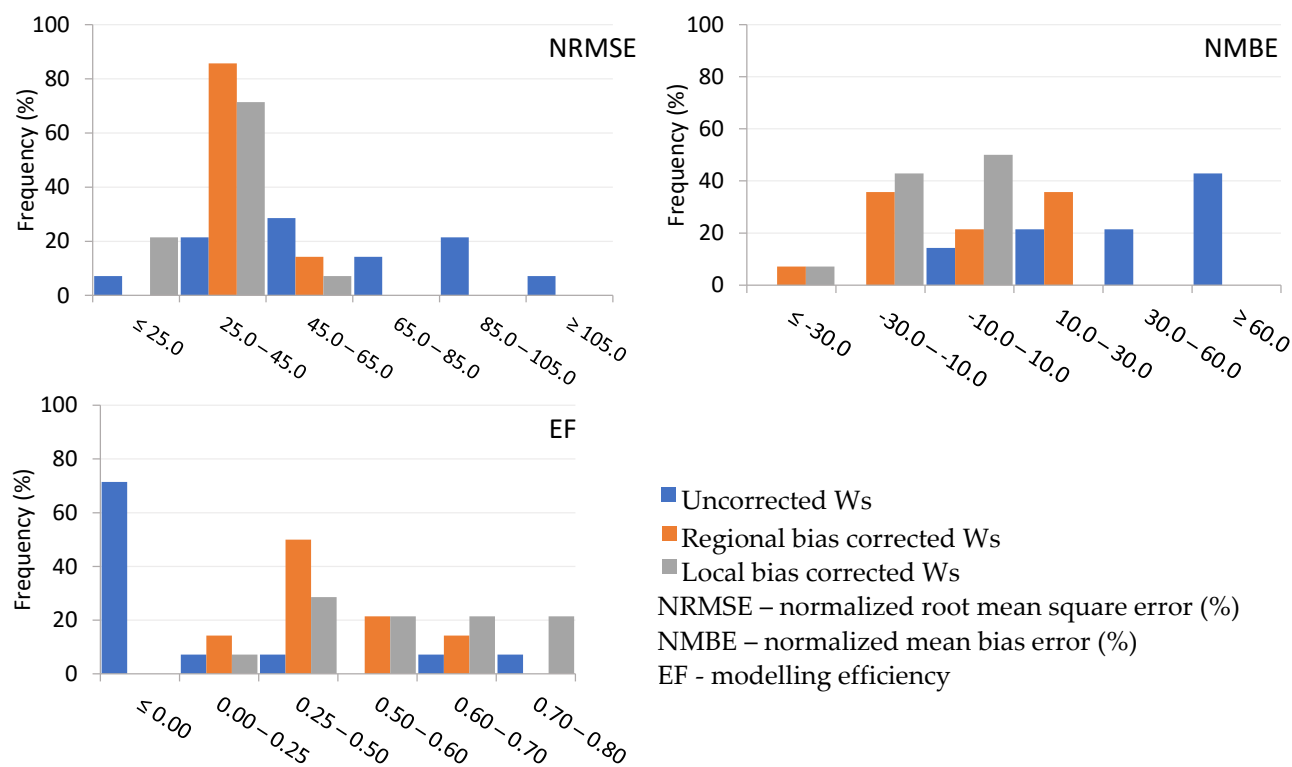
Figure S5. Frequency (%) distribution of the accuracy metrics measuring the performance of NASA POWER wind speed (Ws) without bias correction compared with adopting a regional bias correction and a local bias correction.