

Table S1. The statistical parameters of the applied data.

	Station 1				Station 2				Station 3			
	Whole Data	Training	Validation	Testing	Whole Data	Training	Validation	Testing	Whole Data	Training	Validation	Testing
Temperature												
Mean	-3.90	-4.37	-3.90	-2.94	-2.02	-2.56	-1.90	-1.07	3.39	2.90	3.47	4.30
Min.	-29.5	-29.5	-21.1	-19.0	-19.5	-19.5	-17.3	-14.6	-11.6	-11.6	-11.6	-7.96
Max	10.3	9.11	8.49	10.3	11.6	10.4	9.98	11.6	15.6	14.1	13.9	15.6
Skewness	-0.16	-0.21	-0.12	-0.05	-0.14	-0.15	-0.17	-0.06	-0.16	-0.18	-0.22	-0.06
Std. dev.	8.76	8.91	8.76	8.35	8.15	8.19	8.22	7.92	7.18	7.20	7.22	7.02
Extraterrestrial radiation												
Mean	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.6	30.6	30.6	30.6
Min.	17.3	17.3	17.3	17.3	17.4	17.4	17.4	17.4	18.1	18.1	18.1	18.1
Max	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.4	41.4	41.4	41.4
Skewness	-0.13	-0.13	-0.13	-0.13	-0.14	-0.14	-0.14	-0.14	-0.15	-0.15	-0.15	-0.15
Std. dev.	8.62	8.62	8.62	8.62	8.60	8.60	8.60	8.60	8.33	8.33	8.33	8.33
Evaporation												
Mean	2.38	2.34	2.42	2.40	2.28	2.27	2.28	2.29	2.43	2.40	2.40	2.50
Min.	0.33	0.33	0.52	0.63	0.57	0.57	0.61	0.73	0.65	0.71	0.65	0.78
Max	4.93	4.36	4.93	4.73	4.58	4.58	4.30	4.40	4.64	4.60	4.35	4.64
Skewness	0.08	0.03	0.18	0.07	0.07	0.09	0.03	0.05	0.01	0.01	0.02	0.01
Std. dev.	1.10	1.11	1.16	1.03	1.07	1.08	1.07	1.02	1.07	1.07	1.10	1.06

Table S2. Validation and test statistics of the models for monthly ET0 prediction – Station 1 (56004).

Model Inputs	Validation Period			Test Period		
	RMSE	MAE	R ²	RMSE	MAE	R ²
LSSVM-GSA						
T _t	0.422	0.310	0.872	0.420	0.320	0.856
T _t , T _{t-1}	0.260	0.190	0.944	0.252	0.186	0.949
T _t , T _{t-1} , T _{t-2}	0.246	0.184	0.958	0.246	0.182	0.953
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.265	0.193	0.950	0.248	0.188	0.951
Ra _t	0.338	0.244	0.921	0.285	0.227	0.932
Ra _t , Ra _{t-1}	0.340	0.249	0.920	0.282	0.223	0.934
Ra _t , Ra _{t-1} , Ra _{t-2}	0.341	0.246	0.920	0.279	0.220	0.934
Ra _t , Ra _{t-1} , Ra _{t-2} , Ra _{t-3}	0.341	0.246	0.920	0.277	0.219	0.935
DENFIS						
T _t	0.427	0.315	0.866	0.424	0.327	0.851
T _t , T _{t-1}	0.264	0.195	0.949	0.255	0.188	0.947
T _t , T _{t-1} , T _{t-2}	0.256	0.194	0.952	0.258	0.194	0.950
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.271	0.198	0.947	0.249	0.190	0.950
Ra _t	0.373	0.289	0.903	0.308	0.243	0.919
Ra _t , Ra _{t-1}	0.346	0.252	0.919	0.290	0.230	0.932
Ra _t , Ra _{t-1} , Ra _{t-2}	0.344	0.249	0.918	0.285	0.223	0.934
Ra _t , Ra _{t-1} , Ra _{t-2} , Ra _{t-3}	0.342	0.248	0.919	0.281	0.221	0.934
M5RT						
T _t	0.451	0.310	0.849	0.445	0.335	0.832
T _t , T _{t-1}	0.319	0.226	0.925	0.330	0.244	0.915
T _t , T _{t-1} , T _{t-2}	0.322	0.221	0.923	0.305	0.232	0.928
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.343	0.246	0.913	0.315	0.234	0.916
Ra _t	0.378	0.307	0.899	0.352	0.293	0.917
Ra _t , Ra _{t-1}	0.350	0.266	0.917	0.323	0.267	0.932
Ra _t , Ra _{t-1} , Ra _{t-2}	0.351	0.264	0.916	0.328	0.269	0.931

Table S3. Validation and test statistics of the models for monthly ET0 prediction – Station 2 (56021).

Model Inputs	Validation Period			Test Period		
	RMSE	MAE	R ²	RMSE	MAE	R ²
LSSVM-GSA						
T _t	0.390	0.306	0.871	0.454	0.383	0.855
T _t , T _{t-1}	0.245	0.170	0.952	0.255	0.205	0.942
T _t , T _{t-1} , T _{t-2}	0.235	0.161	0.954	0.230	0.179	0.956
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.241	0.170	0.952	0.234	0.183	0.953
Ra _t	0.304	0.223	0.919	0.267	0.203	0.934
Ra _t , Ra _{t-1}	0.277	0.198	0.933	0.242	0.180	0.945
Ra _t , Ra _{t-1} , Ra _{t-2}	0.275	0.197	0.934	0.237	0.178	0.948
Ra _t , Ra _{t-1} , Ra _{t-2} , Ra _{t-3}	0.276	0.195	0.933	0.236	0.176	0.949
DENFIS						
T _t	0.393	0.297	0.872	0.443	0.352	0.840
T _t , T _{t-1}	0.249	0.171	0.946	0.326	0.263	0.936
T _t , T _{t-1} , T _{t-2}	0.245	0.168	0.949	0.320	0.264	0.943
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.242	0.162	0.951	0.301	0.253	0.945
Ra _t	0.311	0.229	0.920	0.286	0.225	0.933
Ra _t , Ra _{t-1}	0.291	0.212	0.928	0.265	0.204	0.941
Ra _t , Ra _{t-1} , Ra _{t-2}	0.287	0.203	0.931	0.262	0.203	0.943
Ra _t , Ra _{t-1} , Ra _{t-2} , Ra _{t-3}	0.286	0.209	0.932	0.241	0.186	0.947
M5RT						
T _t	0.442	0.332	0.838	0.483	0.373	0.803
T _t , T _{t-1}	0.329	0.233	0.916	0.433	0.315	0.865
T _t , T _{t-1} , T _{t-2}	0.265	0.189	0.940	0.310	0.227	0.921
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.315	0.233	0.920	0.349	0.262	0.907
Ra _t	0.299	0.221	0.912	0.271	0.204	0.924
Ra _t , Ra _{t-1}	0.294	0.215	0.916	0.267	0.199	0.929
Ra _t , Ra _{t-1} , Ra _{t-2}	0.289	0.211	0.929	0.251	0.191	0.942
Ra _t , Ra _{t-1} , Ra _{t-2} , Ra _{t-3}	0.292	0.213	0.925	0.256	0.194	0.940

Table S4. Validation and test statistics of the models for monthly ET0 prediction – Station 3 (56029).

Model Inputs	Validation Period			Test Period		
	RMSE	MAE	R ²	RMSE	MAE	R ²
LSSVM-GSA						
T _t	0.459	0.362	0.833	0.472	0.395	0.811
T _t , T _{t-1}	0.248	0.195	0.957	0.319	0.240	0.944
T _t , T _{t-1} , T _{t-2}	0.209	0.163	0.967	0.233	0.176	0.953
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.202	0.160	0.968	0.230	0.172	0.954
Ra _t	0.234	0.184	0.955	0.262	0.207	0.945
Ra _t , Ra _{t-1}	0.235	0.181	0.956	0.266	0.205	0.945
Ra _t , Ra _{t-1} , Ra _{t-2}	0.230	0.178	0.957	0.264	0.207	0.946
Ra _t , Ra _{t-1} , Ra _{t-2} , Ra _{t-3}	0.230	0.179	0.957	0.262	0.205	0.947
DENFIS						
T _t	0.464	0.357	0.830	0.497	0.412	0.828
T _t , T _{t-1}	0.253	0.192	0.960	0.340	0.275	0.938
T _t , T _{t-1} , T _{t-2}	0.212	0.161	0.966	0.309	0.256	0.950
T _t , T _{t-1} , T _{t-2} , T _{t-3}	0.217	0.160	0.964	0.291	0.239	0.951

Ra_t	0.231	0.178	0.957	0.268	0.209	0.944
Ra_t, Ra_{t-1}	0.235	0.182	0.955	0.272	0.213	0.942
Ra_t, Ra_{t-1}, Ra_{t-2}	0.233	0.180	0.956	0.270	0.212	0.943
$Ra_t, Ra_{t-1}, Ra_{t-2}, Ra_{t-3}$	0.232	0.180	0.956	0.269	0.210	0.943
M5RT						
T_t	0.530	0.375	0.777	0.551	0.416	0.740
T_t, T_{t-1}	0.293	0.222	0.933	0.341	0.254	0.909
T_t, T_{t-1}, T_{t-2}	0.300	0.224	0.929	0.361	0.276	0.900
$T_t, T_{t-1}, T_{t-2}, T_{t-3}$	0.276	0.209	0.938	0.317	0.224	0.910
Ra_t	0.241	0.197	0.952	0.276	0.229	0.933
Ra_t, Ra_{t-1}	0.239	0.195	0.953	0.274	0.219	0.935
Ra_t, Ra_{t-1}, Ra_{t-2}	0.248	0.199	0.951	0.273	0.218	0.937
$Ra_t, Ra_{t-1}, Ra_{t-2}, Ra_{t-3}$	0.232	0.193	0.954	0.272	0.215	0.940

