

Supplementary

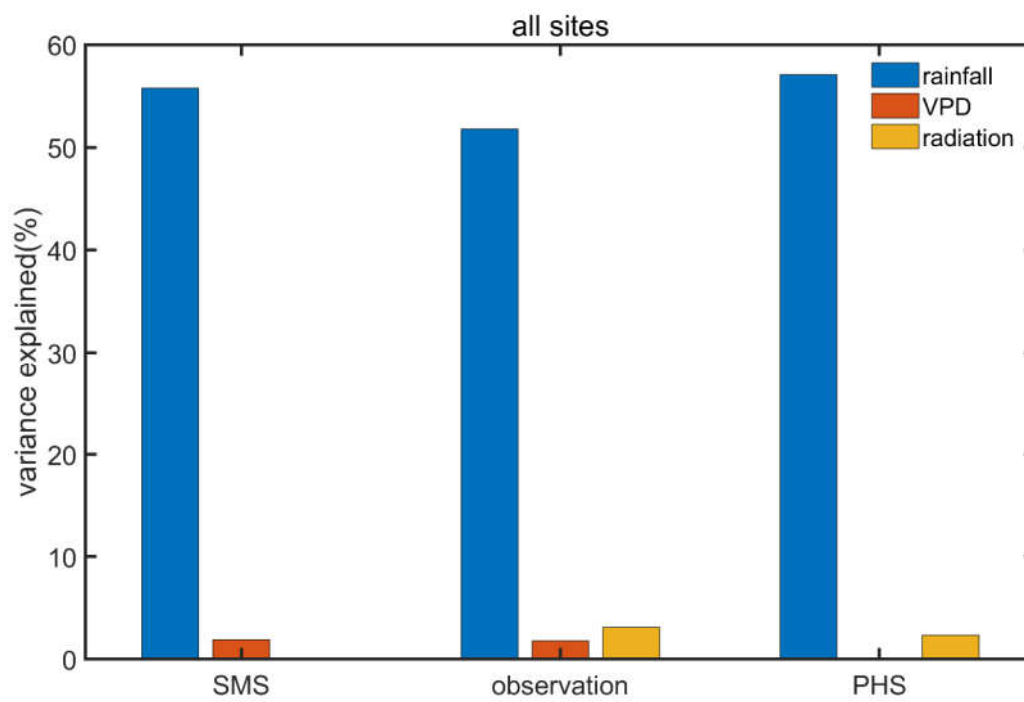


Figure S1. The variance explained of rainfall, VPD and radiation to transpiration, respectively.

Table S1. FLUXNET site descriptions (Lat and Lon represent latitude and longitude, LAI is annual averaged leaf area index obtained from MODIS datasets, T is mean temperature, P is precipitation, Years is the period with observation, Land cover types are defined by USGS classification.)

ID	Site	Lat	Lon	LAI	T(°C)	P(mm/yr)	Years	Land cover type	USGS	Height(m)
1	AT-Neu	47.1	11.3	2.14	6.85	578.3	2007-2012	Grassland	7	3
2	AU-ASM	22.3	133.2	0.36	22.85	312.7	2011-2014	Evergreen Needleleaf Forest	14	13.7
3	AU-Cpr	-34	140.6	0.61	17.65	322.5	2011-2013	Savanna	10	2
4	AU-Cum	33.6	150.7	1.53	18.45	595.9	2013-2014	Evergreen Broadleaf Forest	13	30
5	AU-DaP	14.1	131.3	1.85	25.35	1334.2	2009-2012	Grassland	7	15
6	AU-DaS	14.2	131.4	1.33	26.55	1431.3	2010-2013	Savanna	10	23
7	AU-Gin	-31.4	115.7	0.84	19.65	660.3	2013-2014	Savanna	10	14
8	AU-How	-12.5	131.2	1.43	26.85	1787.4	2010-2014	Savanna	10	23
9	AU-Stp	-17.2	133.4	0.56	25.95	728.5	2010-2014	Grassland	7	5
10	AU-Tum	-35.7	148.2	2.4	10.7	1159	2002-2005	Evergreen Broadleaf Forest	13	70
11	AU-Ync	-35	146.3	0.56	17.75	621.4	2013-2014	Grassland	7	2
12	BE-Lon	50.6	4.7	1	11.95	630.2	2011-2014	Irrigated Cropland and Pasture	3	2
13	BE-Vie	50.3	6	2.44	8.55	750.4	2010-2014	Mixed Forest	15	40
14	CA-NS2	55.9	-98.5	0.99	-2.15	490.2	2002-2004	Evergreen Needleleaf Forest	14	20
15	CA-NS5	55.9	-98.5	1.46	-2.45	190	2003-2004	Evergreen Needleleaf Forest	14	9
16	CA-NS6	55.9	-99	1.15	-1.15	200.7	2002-2004	Mixed Shrubland/Grassland	9	6
17	CA-NS7	56.6	-99.9	0.82	-2.15	234.1	2003-2004	Mixed Shrubland/Grassland	9	6
18	CA-Oas	53.6	-106.2	1.92	1.75	478	2001-2010	Deciduous Broadleaf Forest	11	2

19	CA-Obs	54	-105.1	1.4	0.95	506.4	2002-2010	Evergreen Needleleaf Forest	14	2
20	CA-SF1	54.5	-105.8	1.63	0.45	512.8	2004-2006	Evergreen Needleleaf Forest	14	2
21	CA-SF3	54.1	-106	0.96	0.85	462.2	2004-2005	Mixed Shrubland/Grassland	9	2
22	CG-Tch	-4.3	11.7	0.83	24.35	1615.4	2007-2009	Savanna	10	2
23	CH-Cha	47.2	8.4	2.36	9.35	1137.1	2008-2010	Grassland	7	2
24	CH-Oe1	47.3	7.7	1.28	9.25	1221.4	2002-2008	Grassland	7	2
25	CN-Cha	42.4	128.1	1.81	4.35	474.4	2003-2005	Mixed Forest	15	2
26	CN-Dan	30.5	91.1	0.29	2.15	519.4	2004-2005	Grassland	7	2
27	CN-Din	23.2	112.5	3.56	20.45	1363.3	2003-2005	Evergreen Broadleaf Forest	13	2
28	CN-Du2	42	116.3	0.63	3.25	262.3	2007-2008	Grassland	7	2
29	CN-Ha2	37.6	101.3	0.97	-1.55	526.6	2003-2005	Herbaceous Wetland	17	2
30	CN-HaM	37.4	101.2	0.45	-0.75	550	2002-2003	Grassland	7	2
31	CN-Qia	26.7	115.1	1	18.25	1168.8	2003-2005	Evergreen Needleleaf Forest	14	2
32	CZ-BK1	49.5	18.5	2.39	6.65	831.3	2011-2012	Evergreen Needleleaf Forest	14	36
33	CZ-wet	49	14.8	1.98	8.45	606	2007-2014	Herbaceous Wetland	17	2
34	DE-Geb	51.1	10.9	1.55	9.65	531.5	2001-2014	Irrigated Cropland and Pasture	3	6
35	DE-Gri	51	13.5	2.39	8.55	923.3	2004-2014	Grassland	7	3
36	DE-Hai	51.1	10.5	2.54	8.35	759.7	2000-2009	Deciduous Broadleaf Forest	11	42
37	DE-Kli	50.9	13.5	1.76	7.85	802.9	2006-2014	Irrigated Cropland and Pasture	3	2

38	DE-Lnf	51.3	10.4	2.26	7.85	509	2010-2012	Deciduous Broadleaf Forest	11	2
39	DE-Obe	50.8	13.7	2.25	6.55	1027.8	2010-2014	Evergreen Needleleaf Forest	14	2
40	DE-Tha	51	13.6	2.55	8.95	852.3	2000-2014	Evergreen Needleleaf Forest	14	42
41	DK-Sor	55.5	11.6	1.87	8.45	754.8	2003-2010	Deciduous Broadleaf Forest	11	57
42	ES-Lma	39.9	-5.8	1.19	16.5	370	2004-2006	Savanna	10	13
43	FI-Hyy	61.8	24.3	1.31	4.75	620.1	2006-2009	Evergreen Needleleaf Forest	14	73
44	FI-Sod	67.4	26.6	0.79	0.75	569.7	200-2014	Evergreen Needleleaf Forest	14	48
45	FR-Fon	48.5	2.8	1.86	11.35	681.8	2005-2013	Deciduous Broadleaf Forest	11	35
46	FR-Hes	48.7	7.1	2.41	9.2	793	2001-2006	Deciduous Broadleaf Forest	11	20
47	FR-Gri	48.8	2	1.15	10.95	614.6	2006-2014	Irrigated Cropland and Pasture	3	2
48	FR-LBr	44.7	-0.8	1.97	13.05	962.4	2003-2008	Evergreen Needleleaf Forest	14	38
49	IT-Amp	41.9	13.6	2.13	10.6	945	2003-2006	Grassland	7	2
50	IT-CA1	42.4	12	1.62	15.05	622.1	2012-2013	Deciduous Broadleaf Forest	11	2
51	IT-Cpz	41.7	12.4	4.64	15.95	849.8	2005-2008	Evergreen Broadleaf Forest	13	15
52	IT-Lav	46	11.3	2.15	7.05	1417.3	2008-2009	Evergreen Needleleaf Forest	14	33
53	IT-MBo	46	11	1.71	5.25	986.7	2010-2012	Grassland	7	2
54	IT-Noe	40.6	8.2	1.12	16.75	499.2	2006-2007	Shrubland	8	2

55	IT-PT1	45.2	9.1	1.12	14.05	645.5	2003-2004	Deciduous Broadleaf Forest	11	30
56	IT-Ro1	42.4	11.9	1.59	14.85	811.5	2003-2006	Deciduous Broadleaf Forest	11	20
57	IT-Ro2	42.4	11.9	4.66	14.55	865.5	2005-2006	Deciduous Broadleaf Forest	11	2
58	MY-PSO	3	102.3	4.78	25.35	1863.4	2003-2009	Evergreen Broadleaf Forest	13	2
59	NL-Cal	52	4.9	11.3	9.6	777	2003-2006	Grassland	7	3
60	NL-Loo	52.2	5.7	2.43	10.15	814.5	2000-2014	Evergreen Needleleaf Forest	14	24
61	SD-Dem	13.3	30.5	0.34	27.25	307.8	2005-2009	Savanna	10	2
62	US-AR2	36.6	-99.6	0.5	15.05	429.7	2010-2011	Grassland	7	2.95
63	US-ARM	36.6	-97.5	0.67	15.35	715.8	2003-2007	Irrigated Cropland and Pasture	3	60
64	US-Bkg	44.3	-96.8	0.72	6	586	2005-2006	Grassland	7	4
65	US-Blo	38.9	-120.6	4.63	11.2	1380	2000-2006	Evergreen Needleleaf Forest	14	15
66	US-Bol	40	88.3	0.88	11	991	1997-2006	Dryland Cropland and Pasture	2	10
67	US-Goo	34.3	-89.9	1.25	16.35	1258.1	2004-2006	Grassland	7	2
68	US-Hal	42.5	-72.2	3.53	6.6	1071	1994-2001	Deciduous Broadleaf Forest	11	30
69	US-KS2	28.6	-80.7	1.86	21.55	1022.5	2005-2006	Shrubland	8	2
70	US-Los	46.1	-90	1.06	5.15	764.9	2000-2008	Grassland	7	2
71	US-Me2	44.5	-121.6	2.45	7.95	524.5	2012-2014	Evergreen Needleleaf Forest	14	32
72	US-Me3	44.3	-121.6	0.74	8.15	324	2007-2008	Evergreen Needleleaf Forest	14	2

73	US-Me5	44.4	-121.6	1.35	7.65	402.1	2000-2002	Evergreen Needleleaf Forest	14	2
74	US-Me6	44.3	-121.6	0.92	7.65	480.8	2011-2013	Evergreen Needleleaf Forest	14	2
75	US-NR1	40	-105.5	1.63	2.25	725.8	2000-2014	Evergreen Needleleaf Forest	14	26
76	US-SRG	31.8	-110.8	0.45	18.85	368.7	2009-2014	Grassland	7	2
77	US-SRM	31.8	-110.9	0.41	19.05	333	2004-2014	Savanna	10	6.4
78	US-Syv	46.2	-89.3	1.98	4.35	659.4	2002-2007	Mixed Forest	15	37
79	US-Var	38.4	-121	1.21	15.85	590.5	2005-2014	Grassland	7	2
80	US-Whs	31.7	-110.1	0.28	17.55	284.2	2008-2014	Mixed Shrubland/Grassland	9	2
81	US-Wkg	31.7	-109.9	0.33	17.35	292.5	2005-2014	Grassland	7	6.4