

## PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION



**Initial**

**coordinators:** Liang Sun & Yunjun Yao

**Collaborators**

**needing**

**access to**

**data:** \_\_\_\_\_

**Affiliations:** Beijing Normal University, Beijing, China

### DATASET PROPOSED

We request access to the LaThuile data set

### TITLE OF PAPER AND OUTLINE

**TITLE: Comparison of multiple ET methods over different land cover types**

**Description:**

Land evapotranspiration (ET), a common component in the water and energy cycles, is a complicated process that involves interactions of soil, vegetation and atmosphere. Accurate estimates of ET are critical for better understanding climate and hydrological interactions. Currently, there are numerous methods for simulating ET at the regional and global scales. Large differences of estimated ET among numerous models have been reported due to the lack of reference observations. The Global intercomparison of various ET products has been analyzed (Mueller et al. 2011; Jimenez et al. 2011). However, there are rare studies focusing on the validation and comparison of the ET models based on ground measurement. The research sites of FLUXNET which are operating across the global terrestrial ecosystems offer a unique opportunity to undertake this task.

The objective of this work is to compare various ET models based on a standard dataset. We selected about 10 ET models for comparison, such as one source energy budget model (SEBS, Su, 2002), two source energy budget models (TSEB series and parallel models, Norman et al, 1995;), Penman-Monteith series approaches including PM-Mu, PM-Yuan and PM-Sun (Mu et al, 2007; Mu et al,2011;Yuan et al, 2007; Sun and Liang, 2012), SW model (Shuttleworth and Wallace, 1985), Priestly-Taylor method (Fisher et al, 2008) and empirical method (Wang et al, 2010). ET is evaluated using climate data both from ground measurements and MERRA (Modern Era Retrospective-Analysis for Research and Applications) as input. Remote sensing data including LST, LAI and NDVI products from MODIS are used.

Estimated ET is validated against Fluxnet measurements for each station individually. The stations are grouped by IGBP vegetation type, forest, shrub, savannah, grassland and croplands.

PROPOSED SITES TO BE INVOLVED

ID	Name	Lat	Lon	IGBP	Year
AT-Neu	Neustift/Stubai Valley	47.12	11.32	GRA	2002-2006
CA-Ca1	British Columbia- Campbell River - Mature Forest Site	49.87	-125.33	ENF	2000-2005
CA-Ca3	British Columbia- Campbell River - Young Plantation Site	49.53	-124.90	ENF	2001-2005
CA-Let	Lethbridge	49.71	-112.94	GRA	2000-2005
CA-Ocu	Quebec Boreal Cutover Site	49.27	-74.04	ENF	2001-2006
CA-Qfo	Quebec Mature Boreal Forest Site	49.69	-74.34	ENF	2003-2006
CA-TP1	Ontario- Turkey Point Seedling White Pine	42.66	-80.56	ENF	2004-2005
CA-TP2	Ontario- Turkey Point Young White Pine	42.77	-80.46	ENF	2003-2005
CA-TP4	Ontario- Turkey Point Mature White Pine	42.71	-80.36	ENF	2003-2005
FR-Fon	Fontainebleau	48.48	2.78	DBF	2005-2006
FR-Hes	Hesse Forest- Sarrebourg	48.67	7.06	DBF	2000-2006
FR-LBr	Le Bray (after 6/28/1998)	44.72	-0.77	ENF	2000-2006
IT-BCi	Borgo Cioffi	40.52	14.96	CRO	2004-2006
IT-Col	Collelongo- Selva Piana	41.85	13.59	DBF	2000-2006
IT-Cpz	Castelporziano	41.71	12.38	EBF	2000-2006
IT-Lav	Lavarone (after 3/2002)	45.96	11.28	ENF	2000-2006
IT-Non	Nonantola	44.69	11.09	DBF	2001-2003,2006
IT-PT1	Zerbolo-Parco Ticino-Canarazzo	45.20	9.06	DBF	2002-2004
IT-Ro1	Roccarespampani 1	42.41	11.93	DBF	2000-2006
JP-Tom	Tomakomai National Forest	42.74	141.51	MF	2001-2003
US-ARM	OK - ARM Southern Great Plains site- Lamont	36.61	-97.49	CRO	2003-2006
US-Aud	AZ - Audubon Research Ranch	31.59	-110.51	GRA	2002-2006
US-Bar	NH - Bartlett Experimental Forest	44.06	-71.29	DBF	2004-2005
US-Bkg	SD - Brookings	44.35	-96.84	GRA	2004-2006
US-Blo	CA - Blodgett Forest	38.90	-120.63	ENF	2000-2006
US-Bo1	IL - Bondville	40.01	-88.29	CRO	2000-2007
US-Bo2	IL - Bondville (companion site)	40.01	-88.29	CRO	2004-2006
US-CaV	WV - Canaan Valley	39.06	-79.42	GRA	2004-2005
US-Dk1	NC - Duke Forest-open field	35.97	-79.09	GRA	2001-2005
US-Dk2	NC - Duke Forest-hardwoods	35.97	-79.10	DBF	2003-2005
US-Dk3	NC - Duke Forest - loblolly pine	35.98	-79.09	ENF	2001-2005
US-Fmf	AZ - Flagstaff - Managed Forest	35.14	-111.73	ENF	2005-2006
US-FPe	MT - Fort Peck	48.31	-105.10	GRA	2000-2006

US-Fuf	AZ - Flagstaff - Unmanaged Forest	35.09	-111.76	ENF	2005-2006
US-Goo	MS - Goodwin Creek	34.25	-89.87	GRA	2002-2006
US-IB1	IL - Fermi National Accelerator Laboratory-Batavia (Agricultural site)	41.86	-88.22	CRO	2005-2007
US-Me1	OR - Metolius - Eyerly burn	44.58	-121.50	ENF	2004-2005
US-Me2	OR - Metolius-intermediate aged ponderosa pine	44.45	-121.56	ENF	2003-2005
US-Me4	OR - Metolius-old aged ponderosa pine	44.50	-121.62	ENF	2000-2000
US-MMS	IN - Morgan Monroe State Forest	39.32	-86.41	DBF	2000-2005
US-MOz	MO - Missouri Ozark Site	38.74	-92.20	DBF	2004-2006
US-NC1	NC - NC_Clearcut	35.81	-76.71	OSH	2005-2006
US-NC2	NC - NC_Loblolly Plantation	35.80	-76.67	ENF	2005-2006
US-Ne1	NE - Mead - irrigated continuous maize site	41.17	-96.48	CRO	2001-2005
US-Ne2	NE - Mead - irrigated maize-soybean rotation site	41.16	-96.47	CRO	2001-2005
US-Ne3	NE - Mead - rainfed maize-soybean rotation site	41.18	-96.44	CRO	2001-2005
US-NR1	CO - Niwot Ridge Forest (LTER NWT1)	40.03	-105.55	ENF	2000-2003
US-PFa	WI - Park Falls/WLEF	45.95	-90.27	MF	2000-2003
US-SRM	AZ - Santa Rita Mesquite	31.82	-110.87	WSA	2004-2006
US-Syv	MI - Sylvania Wilderness Area	46.24	-89.35	MF	2002-2006
US-Ton	CA - Tonzi Ranch	38.43	-120.97	WSA	2001-2006
US-WCr	WI - Willow Creek	45.81	-90.08	DBF	2000-2006
US-Wi1	WI - Intermediate hardwood (IHW)	46.73	-91.23	DBF	2003
US-Wkg	AZ - Walnut Gulch Kendall Grasslands	31.74	-109.94	GRA	2004-2006

## PROPOSED RULES FOR CO-AUTHORSHIP

All data contributors making an intellectual contribution will be included as named coauthors. Data contributors not making an intellectual contribution will be included as group coauthors in the author list, if possible with the journal (i.e., "and the FLUXNET Synthesis Group"). Group coauthors will be identified by name in the acknowledgements.

### CVs of initial coordinator and Collaborator

Liang Sun is doing Postdoc job in College of Global Change and Earth system science, Beijing Normal University. He received his PhD in School of Geography, Beijing Normal University in 2010. His research concerns the use of remote sensing information in the estimation of the soil moisture and ET. He has published several papers in related journal.

Yunjun Yao is an associate researcher at College of Global Change and Earth System Science, Beijing Normal University, China. He received his PhD in Remote Sensing and GIS from Peking University, China in 2010. His research interests include the estimation of evapotranspiration and natural hazards monitoring by remote sensing. In 2008-2010, he worked in the Department of Geography, University of Maryland, College Park, MD, participating in the development of evapotranspiration algorithms to evaluate the water cycle at global scale.