Chequamegon Ecosystem-Atmosphere Study (ChEAS) Ameriflux Core Site cluster

Ke Xu
University of Wisconsin Madison
US-PFa (Park Falls WLEF very tall tower - fluxes at 30,122,396 m sampling a mix of upland/wetland)

US-WCr (Willow Creek mature hardwood)

US-Syv (Sylvania old-growth mixed forest)

US-Los (Lost Creek shrub fen wetland)
Instrument

- 10 Hz eddy covariance data
- Licor 6262 (WCr and PFa), Licor 7200 (Syv), Licor 7700/7500 (Los), CSAT (all sites except PFa) and ATI (PFa) for sonics
Research goals

- understand the role ecosystem heterogeneity in scaling water and carbon fluxes from plot to site to region.
- The sites have been running since the late 1990s and have been used in hundreds of publications.
Team

• Ankur R. Desai (PI)
• Jonathan Thom (lead tech)
• Dan Baumann (USGS field tech)
• a number of collaborators at DOE LLNL, Penn State, U Minnesota, NASA GFSC, CalTech, Boston U, and UW.
• Sylvania is being jointly managed with Gil Bohrer and Peter Curtis (Ohio State)
Ankur is really working hard:
Disturbance

• General region was "cut-over" in the early 20th century except for Sylvania, which hasn't been cut since European settlement.

• Willow Creek site was recently a part of a larger US Forest Service thinning operation that is actively going. A portion of the canopy was removed in winter 2013-2014, and more in 2014-2015.
Data Processing

• Campbell Scientific dataloggers and PC laptops or computers at each site to store data.
• DSL Internet or Cellular 3g internet and raw data are sent every 30 minutes to our Linux server at UW.
• IDL.
• For the tall tower site, we are processing and outputting to the web daily hourly fluxes. Other sites, we are running monthly.
• Annual gap-filled fluxes for 2013 were made available a few weeks ago for Willow Creek and WLEF.
• All are data, both raw and processed are made available on our local website immediately.
Challenges

• Maintaining and serving a steady flow of biometric, ecophysiological, and component flux measurements
• regularly update the BADM.
• How to deal with formats for data like auto-chambers.
• Also, having a machine readable BADM that can be used in model-data assimilation and parameterization.
• Providing 10 Hz data in a format that is easily usable to the larger community.
• Remembering to send new data files to Ameriflux - should automate this
Challenges

• Time stamps are different.
• H2O: LI-6262, CH4: Picarro

Time stamp1: 1 2 3 4 5 6 7 8 9 10..................
Time stamp2: 1 2 3 4 5 6 7 8 9 10..................

Time stamp1: 1 2 3 4 5 6 7 8 9 10..................
Time stamp2: 1 2 3 4 5 6 7 8 9 10..................

Correct time stamp to standard time every minute and keep data loggers and multiple systems time synced
What we want from AMP

• Diagnostics and quality control of our data (both with the roving intercomparison but also with reports from submitted data).

• Troubleshooting and hot swap for instrument failure. Ingest, serving, and visualization of flux, met, and BADM data.

• Short answer - you've already done job #1 - a continued base of funding to continue tower operations.