

# Daily summary, July 19

July 19, 10:45 CDT [July 20]

Dan Rajewski (in Ames)

Summary: Stations 1-4 operational, Russ and Dan cleared the weeds out of the access paths and around the base of each flux tower and wind cube sites. Kris and Jimmy serviced the ISU sites and the wind cubes  
clear/hazy skies hot and muggy, generally SW wind, much less wind speed in the morning and early afternoon (turbines hardly turning 10:30-13:30)

Vdsm: 13.5-13.8 V during day, down to 12.4 V at night,

P: ok, pressure steady around 974 mb overnight through early morning; dropping to ~971 mb by early evening

T.2m: ok, night: stn1 cooler than stn 3 by 1.0 degree from 21:00-22:00 [July 18]  
stn 2 cooler than stn 4 by 1.0 degree from 23:00-0:00  
stn 1 warmer than other sites by 1.0 degree from 0:30 to 3:00  
stn 4 has error (wet sensor?) from 6:15-6:30  
day: stn 2 1.0 degrees warmer than other sites in mid morning and early evening  
stn 2 1.5-2.0 degrees warmer than other sites in late morning-late afternoon  
stn 4 0.5 degrees cooler than stns 1 & 3 from 15:00-19:00

RH.2m: 85-100% nighttime; dropping to 70-80% by afternoon  
night: stn 4 5% RH higher than other sites; stn 4 has error (due to wet sensor?) from 6:00-6:15  
morning/evening stn 4 10% RH higher than stn 2, 5% RH higher than stns 1,3  
afternoon stn 4 ~10-15%RH higher than stns 2, and ~5-7%RH higher than stn 1 & 3 [moisture effects due to mature corn with larger Potential evapotranspiration at Stn 4?]

H2O.2m: ok, nighttime from 28 to 20 g/m<sup>3</sup>, up to 27-29 g/m<sup>3</sup> by mid afternoon  
night: stn 1 about 1.0 g/m<sup>3</sup> drier than other sites from 20:30-22:30 [July 18]  
stn 2 about 1 g/m<sup>3</sup> more moist than stn 3 & 4 from 11:00-0:30  
stn 2 & 3 about 0.5 g/m<sup>3</sup> drier than sites 2 & 4 from 0:30 to 2:30  
stn 4 about 0.5 g/m<sup>3</sup> more moist than other sites from 2:30 to 4:00

Wetness: dew formation from 21:00 (July 18) through 7:00, sensor dry by 9:00

T.10m: ok, range of 24 to 33.5 degrees  
night: stn 1 about 0.5 degrees warmer than other sites from 1:00-2:00  
stn 2 about 0.5 degrees cooler than other sites from 3:30-5:00  
day: stn 1 0.5 degrees warmer than other sites in morning/ late afternoon and 1.0 degree warmer in early to middle afternoon

RH.10m: ok, night: stns within a few%RH of each other  
day: stn 1 about 5%RH less than other sites

H2O.10m: ok, before midnight stn 4 about 0.5 g/m<sup>3</sup> more vapor than other sites  
nighttime: stn 2 0.3-0.5 g/m<sup>3</sup> more moist than other stns  
day: close agreement at all sites

Spd.10m: ok, before midnight stn 2 about 0.5-0.7 m/s higher than other sites  
daytime: stn 4 about 1.0 m/s less than other sites from 10:30 to 14:30; and 0.5 m/s less from 16:30-18:00

Dir.10m: ok, WSW flow before midnight, slightly WNW before changing to E and veering to SSE by sunrise  
SSW to SW morning and early afternoon, hovering to S or SSW rest of the period

T.10m - T.2m: ok, night: most of time a few tenths within each site except for 0.5-0.75 degree cooler at 10 m vs. 2m for stn 1 than for other sites from 1:00-2:30

day: stn1 nearly zero thermal gradient, stn 3 & 4 about 1.0 to 1.5 degree warmer at 2m vs. 10 m, stn 2 about 2.0-3.0 warmer at 2 m vs. 10 m

H2O.10m - H2O.2m: ok, stns 2 & 3 have earlier nighttime stabilization of moisture gradient vs. stn 1 & 4  
day: stn 4 largest negative moisture gradient (4.0 g/m<sup>3</sup> larger H2O at 2 m vs. 10 m), other sites about 2.0 to 3.0 more vapor at 2m vs. 10 m

spd.4.5m: ok, see comments of Spd.10m, similar differences but not identical in intensity and duration to spd.10m, winds only reaches 2.5 m/s max in daytime

dir.4.5m: ok, see comments of dir.10m

w.4.5m: ok, night: (20:00-22:00 [July 18]) stn 1 & 4 have least w<0 ~-0.02 m/s stn 2 & 3 are about -0.05 m/s  
from 3:00-6:30 stn 4 more descent than other sites

tc.4.5m: ok, night: from 1:00-3:00 stn 2 about 0.7 to 1.0 degrees cooler than stn stn 1, about 0.5 degrees cooler than stn 3 & 4

day: stns 3 & 4 about 0.3-0.5 degrees warmer than stn 1 & 2

ldiag: ok,

vh2ov: not ok, stn 2 mostly btwn 10-40 mV  
stn 4 mostly at or above 25 mV, spike voltage during overnight up to 100mV then 250 mV but back down to around 50 mV

kh2o: not ok, stns 2 & 4 are about 1-1.5 g/m<sup>3</sup> lower than stns 1 & 3  
stn 2 & 4 have anomalous spikes/drops during 4:00-6:00 (dew effects?)  
daytime: stn 2 about 1.0-1.5 g/m<sup>3</sup> drier than stn 4; ~2.0 g/m<sup>3</sup> drier than stns 1 & 3

h2o(licor): ok, btwn 18-27 g/m<sup>3</sup> for night to day behavior  
stn 1 about 0.5 to 0.7 g/m<sup>3</sup> more vapor than stn 3 during much of night  
daytime: close agreement btwn stn 1 & 3

lidiag (licor): ok, few samples missing in overnight hours

TKE.4.5m: before 23:00 stn 1 has 0.1-0.15 m<sup>2</sup>/s<sup>2</sup> less TKE than other sites, then a few post-midnight periods where stn 1 TKE is 0.1 units larger than other sites  
and also stn 2 0.1 units larger than other sites; close agreement for daytime

w'w': ok, see comment for TKE.4.5m, also similar nighttime pattern in u'u' and v'v'  
u\* : ok, similar to pattern in TKE.4.5m, also seen in u'w' stress and somewhat in v'w' stress

w'T' : ok, nighttime bump in TKE corresponding to larger negative flux by -0.02 C m/s  
day: stn 3 over all about a 0.02 to 0.04 C m/s greater positive flux than other sites (especially from 12:00-14:00)

w'h2o': ok, no big difference in fluxes during nighttime, spikes at stn 2 related to krypton noise?  
much of daytime: stn 1 & 3 about 0.04 g/m<sup>2</sup>/s greater than stn 4, and 0.12 g/m<sup>2</sup>/s greater than stn 2

h2o'h2o': stns 1 & 3 in close agreement night and day; stn 1 & 3 are about 2.0 (g/m<sup>3</sup>)<sup>2</sup> more than variance at stn 2

kh2o'kh2o': not ok, spikes in nighttime variance at stn 4, several spikes at stn 2  
daytime: stn 2 1.6 g/m<sup>2</sup>/s less than stn 4, stn 4 about 0.02-0.04 g/m<sup>2</sup>/s less than sites 1 & 3

co2: ok,

w'co2': ok, night: slightly more positive flux at Site 3 vs. Site 1 before midnight-1:00  
than about same fluctuations in spikes for both sites rest of the night  
daytime: stns seem to be in close agreement much of the morning and afternoon

co2'co2': ok, very small values but less or about the same nighttime variance at stn 3 vs. stn 1; daytime sites are in close agreement