

Daily summary, July 18

July 18, 20:50 CDT

Dan Rajewski (in Ames)

Summary: Stations 1-4 operational, Russ and Dan visited the sites from 13:00-15:15 pm (CDT) to check growth stages/ heights of crop (in an upcoming blog post); Hazy skies, hot and muggy conditions with light SSW to SW winds

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

P: ok, pressure steady around 977 mb overnight through early morning; dropping to 974 mb by early evening

T.2m: ok, night: stn1 & 4 about 0.3-0.5 degree cooler than other stn 2
day: stn 2 about 0.5 degrees warmer than stn 1 & 3, 0.7 warmer than stn 4 (stn 2 max near 34 C!)

RH.2m: 95-100% nighttime; dropping to 75-80% by afternoon
night: stn 4 5% RH higher than other sites
daytime stn 4 ~7-10%RH higher than stns 2, and ~5%RH higher than stn 1 & 3 [moisture effects due to mature corn with larger Potential evapotranspiration at Stn 4?]

H2O.2m: ok, nighttime from 27 to 21 g/m³, up to 27-28 g/m³ by mid afternoon
night: stn 1 about 1.0 g/m³ drier than stn 4, 0.7 g/m³ drier than stn 2, 0.5 g/m³ drier than stn 3
day: stn 1 about 1.0-1.5 g/m³ drier than stn 4, 0.5 g/m³ more dry than stns 2 & 3

Wetness: dew formation from 20:30 (July 17) through 7:00, sensor dry by 9:00

T.10m: ok, range of 24.5 to 33 degrees
night: stn 2 about 0.3-0.5 degree warmer than other sites from 1:00-6:30
day: stn 1 has 0.3-0.5 degrees warmer than other sites from 11:30-17:00

RH.10m: ok, before midnight stn 4 few%RH lower other sites; afternoon stn 2 few%RH higher than other sites, stn 1 few%RH lower than stn 2-4 from 4:30-5:30

H2O.10m: ok, nighttime: stn 2 0.3-0.5 g/m³ more moist than other stns
morning and afternoon stn 4 sometimes 0.5-0.7 g/m³ less than stn 2 (Sites 1 & 3 in between stn 2 & 4)

Spd.10m: ok, stn 1 about 1.0-1.2 m/s less than stn 2, and 0.5 m/s less than stn 3 & 4 much of overnight (influence of a turbines from 8:30 (July 17)-8:00?
daytime: close agreement for all sites

Dir.10m: ok, SSW to SW flow before sunrise, WSW to SW flow morning and afternoon (turbines in afternoon mostly from SSW to SW)

T.10m - T.2m: ok, night: most sites in agreement with about 0.7 to 1.0 degrees warmer at 10m vs. 2m
day: stn2 1.0 to 1.5 degree warmer at 2m vs. 10 m than stns 1 & 4, 0.7 degrees warmer at 2m vs. 10 m than at stn 3

H2O.10m - H2O.2m: ok, stn 4 slightly drier gradient (0.7-1.0 g/m³ more moist at 2m v.s 10m) than site 1 & 3, 0.5 more moist at 2m than for stn 2
daytime stn 4 is 1.0-1.5 g/m³ drier at 10m vs. 2m than other other sites (again earlier planted corn drawing out more water?)
stn 2 & 3 about 0.3-0.5 g/m³ drier at 10m vs. 2m than for stn 1

spd.4.5m: ok, see comments of Spd.10m, speed difference about same (1.0 m/s less at stn 1 vs. other sites)

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

w.4.5m: ok, night: stn 1 & 4 have least w<0 ~-0.02 m/s stn 2 & 3 are about -0.06 m/s
morning and afternoon stn 1 & 4 have slightly positive vertical motion, stn 2 about -0.06 m/s and stn 3 -0.12 m/s

tc.4.5m: ok, night: stn 1 about 0.5 degrees cooler than stn 4, other stns in between from 2:00-6:00
day: stns 3 & 4 about 0.3-0.5 degrees warmer than stn 1 & 2

ldiag: ok, a few samples missing right at moment of dew accumulation before midnight

vh2ov: not ok, stn 2 mostly btwn 30-50 mV
stn 4 mostly at or above 20-50 mV, spike voltage during overnight up to 150 mV

kh2o: not ok, stns 2 & 4 are about 1-1.5 g/m³ lower than stns 1 & 3
stn 4 has anomalous drop during 4:00-6:00 (dew/fog effects?)
daytime: stn 2 about 1.5-2.0 g/m³ drier than stn 4; ~2.5-3.0 g/m³ drier than stns 1 & 3

h2o(licor): ok, btwn 20-27 g/m³ for night to day behavior
stn 1 about 0.5 to 0.7 g/m³ more vapor than stn 3 during much of night
daytime: stn 1 about 1.0-1.5 g/m³ more vapor than stn 3 most of morning an daytime

lidiag (licor): ok

TKE.4.5m: most of night stn 1 about 0.2 units less TKE than other sites, few periods with stns 3 & 4 in btwn stn 2 and stn 1 values (0.1 m²/s² less than at stn 2)

mid morning inversion breakup period 9:00-11:00 shows slightly higher TKE at stns 3-4 vs. 1-2

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

w'T' : ok, stn 2 & 4 about -0.02 C m/s more negative flux than stn 1 for overnight
day: stn 3 about 0.02 C m/s more positive flux than other sites (especially stn 2 & 4) from 9:30 to 15:00

w'h2o': ok, no big difference in fluxes during nighttime
much of daytime: stn 1 & 3 about 0.04 g/m²/s greater than stn 4, and 0.1-0.12 g/m²/s greater than stn 2
(full height of corn reached at site 4 over the weekend so transpiration decreased?)

h2o'h2o': stns 1 & 3 in close agreement night and day; stn 1,3-4 are about 0.6-1.0 (g/m³)² more than variance at stn 2

kh2o'kh2o': not ok, spikes in nighttime variance at stn 4,
daytime: stn 2 0.6 g/m²/s less than stn 4, stn 4 close to Sites 1 & 3
stn 2 seems still low reading than at stn 4

co2: ok,

w'co2': ok, night: mostly in agreement
daytime: stn 3 greater co2 uptake than stn 1 most of mid morning through late afternoon

co2'co2': ok, very small values (10⁻⁴ (g/m³)²) but less nighttime variance at stn 3 vs. stn 1; daytime sites are in close agreement