

Daily summary, July 20

July 20, 18:40 CDT

Dan Rajewski (in Ames)

Summary: Stations 1-4 operational, no ISFS staff on site
clear/hazy skies hot and muggy, generally SW wind, breezy in the morning and afternoon
all stations were powered down and restarted from 13:15-14:00

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

P: ok, pressure generally dropping 2mb from 970 mb the evening of July 19 to

T.2m: ok, night: stns 1 and 4 cooler than stns 3 by 0.5-0.7 degree from 21:30-22:30 [July 18]
stn 1 cooler by 1.0 degrees than other sites from 23:00-1:00
rest of night stns within 0.3 degrees

day: stn 2 about 0.5-1.0 degree warmer than sites 1 & 3 from 11:00-18:00
stn 2 about 1.0-1.5 degree warmer than stn 4 for same period

RH.2m: 85-100% nighttime; dropping to 65-80% by afternoon

night: stn 4 5% RH higher than other sites;

few hours after sunrise: stn 4 few%RH higher than other sites

afternoon stn 4 ~10-15%RH higher than stns 2, and ~7-10%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 19.5 g/m³, up to 26 g/m³ by mid afternoon

night: stn 1 about 1.0 g/m³ drier than stn 4 most of the night, from 23:00 (July 19) to 0:30 about 1.7 g/m³ drier

stns 2 & 3 about 0.5 g/m³ drier than stn 4

day: similar pattern as during night with stn 4 most moist and stns 1-3 about 1.0 g/m³ drier

Wetness: dew formation from 22:30 (July 19) through 2:30, wetness slightly decreases until 6:00 with a small rise before 7:00 before going dry by 7:30

T.10m: ok, range of 24 to 33.5 degrees

night: stn 2 about 0.5 degrees warmer than other sites from 22:00-0:00

stns 1 & 2 about 0.5 degrees cooler than other sites from 0:00-1:30

day: stn 1 0.5 degrees warmer than other sites late morning through afternoon

RH.10m: ok, night: stns within a few%RH of each other

daytime: close agreement at all sites (well-mixed windy condition)

H2O.10m: ok, most of night: stn 4 about 0.5 g/m³ less than stn 2 (other sites in between)

day: stn 4 about 0.3-0.5 g/m³ less than other sites

Spd.10m: ok, before midnight stn 2 about 0.5-0.7 m/s higher than other sites

stn 1 about 0.7 m/s less than other sites for short period before sunrise

daytime: no big differences btwn stns

Dir.10m: ok, wind backing from SW to SSE before midnight then mostly SSW until sunrise, rest of the day SW flow

T.10m - T.2m: ok, night: about the same positive thermal gradient at all sites (slightly warmer at 10 m at stn 1 & 4 before 1:00)

day: stn3 nearly zero thermal gradient, stn 1 & 4 about 0.5 degree cooler at 2m vs. 10 m, stn 2 about 1.0 warmer at 2 m vs. 10 m

H2O.10m - H2O.2m: ok, stns 2 & 3 have little nighttime moisture gradient, slightly positive at stn 1 from 23:00 (July 19)-1:00

stn 4 is about 1.0 g/m³ greater at 2 m vs. 10 m than at the other sites

day: stn 4 largest negative moisture gradient (+4.0 g/m³ larger H2O at 2 m vs. 10 m), other sites about 2.0 g/m³ more vapor at 2m vs. 10 m

spd.4.5m: ok, see comments of Spd.10m,

dir.4.5m: ok, see comments of dir.10m, more SE wind at stn 1 than at 10 m from 23:00-1:00

w.4.5m: ok, less downward motion during night when wind is from an angle away from 180 degrees

from 2:00-5:00 w slightly positive at stns 1 & 4, w~0.1 m/s at stns 2 & 3

much of morning and afternoon stns 1 & 4 have w~0 or slightly positive (0.02 m/s) and stns 2 & 3 have w<0 (-0.12 m/s)

tc.4.5m: ok, night: stns 1 & 2 about 0.5 degrees cooler than other sites from 0:00-1:30

day: stns 3 & 4 about 0.3-0.5 degrees warmer than stn 1 & 2 for peak of late afternoon

ldiag: ok,

vh2ov: not ok, stn 2 mostly btwn 30-80 mV

stn 4 mostly btwn 30-60 mV

kh2o: not ok, stn 2 about 1-1.5 g/m³ lower than stns 1 & 3

stn 4 within 0.5 g/m³ of 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: close agreement btwn stn 1 & 3, about 0.5 g/m³ greater than at stn 4 during late afternoon

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

TKE.4.5m: before midnight stn 2 has 0.15-0.20 m²/s² more TKE than other sites, then a few post-midnight periods where stn 1 TKE is 0.1 units smaller than at 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 v'w' stress

w'T' : ok, nighttime bump in TKE corresponding to larger negative flux at stn 2 by -0.01 C m/s
day: stn 3 about a 0.02 C m/s greater positive flux than other sites (especially from 10:00-16:00)

w'h2o': ok, small difference in fluxes during nighttime,
much of daytime: stn 1 & 3 about 0.04 g/m²/s greater than stn 4, and 0.12 g/m²/s greater than stn 2

h2o'h2o': stns 1 & 3 in close agreement night and day; stn 1 & 3 are about 2.0 (g/m³)² more than variance at stn 2

kh2o'kh2o': not ok, elevated variance at stn 4 all night
daytime: stn 2 0.8 (g/m³)² less than stn 4, stn 4 about 0.2 (g/m³)² less than stns 1 & 3

co2: ok,

w'co2': ok, night: mostly in agreement a few periods with more positive flux at site 3 and also brief period around 1:00 with site 1 > site 3

daytime: stns seem to be in close agreement much of the morning and afternoon, slightly more negative flux at stn 3

co2'co2': ok, nighttime "ramp" event at both sites around 23:00-1:00 (stn 1 > stn 3) but similar flux rest of the night and early morning
daytime: sites are in close agreement