

Daily summary, July 12

Summary: Stations 1-4 operational, no ISFS staff on-site, but at nearby ISU towers and CU wind cube stations

northerly to ENE nighttime flow, NE to E flow in daytime,

rain showers in mid morning also in early afternoon

weak flow and cooler, little sensible heating

some corn was damaged in the pathways walking to the wind cube (likely from early Monday morning derecho)

damage path orientation of stalks mostly from WNW

corn about 1 week from tasseling at stns 1 & 2, possibly early next week at stn 4

Vdsm: 13.5-13.8 V during day, down to 12.5 at night, lower voltage at stns 1 & 3 during mid afternoon (rain showers were present)

P: ok

T.2m: ok, stn2 about 0.5 degree cooler than stns 1 & 3 from 22:00 (Jul 11) to 1:30 (Jul 12) and from 3:00-5:00

stn 2 is about 0.3-0.7 degree warmer than other sites in daytime

RH.2m: 95-100% nighttime; dropping to 80%-85% by afternoon

night before rain: stns 2 & 4 few% RH higher than stn 1,3

daytime stns 3-4 ~ few% RH higher than stn 2 most of morning/afternoon

stn 2 few %RH lower than stn 1 (from 13:00-14:00)

H2O.2m: ok, 22 g/m³ before midnight night, drop to around 15 g/m³ by 3:00

daytime rise to 18 g/m³

stn 2 about 0.5-0.7 g/m³ drier than other sites from 22:00 Jul 10 - 0:00 and from 3:00-4:00

stn 1 about 0.5 g/m³ drier than other sites from 5:00 to 8:00

daytime stn 1 and 2 are 0.5-0.7 g/m³ drier than other sites (12:30-13:30)

Wetness: dew collected on sensor by 9:00 [Jul 11] until 0:30 [Jul 12], sensor remaining wet until 6:00;

more rainfall at 9:00, 10:30, and 2:00

T.10m: ok, stn 1 0.2 to 0.5 degree warmer than other sites from 23:30 (Jul 11) to 0:30 (Jul 12) also from 1:00-2:00

from 3:00-5:00 stn 2 is 0.3-0.5 degrees cooler than stns 3 & 4, and about 0.7 to 1.0 degree cooler than stn 1

stations in most agreement after rainfall and into the afternoon

RH.10m: ok, before midnight stn 4 few %RH lower than stns 1-3, after midnight stn 1 few %RH lower than stn 3 & 4, about 5-7%RH lower than stn 2

H2O.10m: ok, nighttime most stns within 0.1 to 0.2 g/m³ of each other except for 2:00-5:00 (stn 4 about 0.5 g/m³ drier than stns 2 & 3)

stn 4 about 0.5 g/m³ lower than other sites in daytime (both before/after rain showers), stn 2 most moist

Spd.10m: ok, much of night stn 1 fastest speed vs. stn 2 slowest speed (difference of close to 1.5 m/s at 3:30)

stns 3 & 4 in most agreement stn 2 is 0.5 m/s higher than other sites before midnight, less change after midnight,

daytime: slightly less speed at stn 2 vs. other sites

Dir.10m: ok, N to ENE flow much of night and early morning.

slight period of easterlies from 11:30-13:30 then return to NE flow rest of afternoon (after another shower passage)

T.10m - T.2m: ok, stn 2 is 0.5 degree warmer at 10 m vs. 2m than at stn 2,3 before midnight to 4:30

daytime before/during/after rain showers stn2 0.5 to 1.0 degrees warmer at 2m vs. 10 m than other sites

H2O.10m - H2O.2m: ok, stn 4 drier gradient than sites 1-3 much of the night, slight period 3:00-4:00 when stn 2 is 0.5 g/m³ moist at 10 m vs. 2m than 1 & 3 by 0.5 /m³ drier than stns 1 & 3

daytime stns 3 & 4 are drier (more negative gradient, ~2.0 g/m³, 10m-2m) than other sites (1.5 g/m³)

daytime stns 1 & 2 in close agreement slightly smaller dry gradient than at other sites

spd.4.5m: ok, see comments of Spd.10m, stn2 speed is not above other sites at 3:30 as in spd.10m

dir.4.5m: ok, stn 2 more ENE vs. other sites NE wind at 4.5 m, all sites at 10m with NE wind in this period

w.4.5m: ok, stns 3 & 4 more w>0 (0.02 m/s) for much of the night, stns 1 & 2 more w<0 at night

daytime for NE flow stns 3 & 4 more w>0 than other sites, stns 1 & 2 more w<0 stn 3 & 4

daytime for E flow stns 1 & 2 less w<0 (-0.04m/s) than stns 3 & 4 (0.12 m/s)

tc.4.5m: ok, stn 2 about 0.5 to 0.7 degree cooler than other stns much of night

ldiag: ok, a few samples not taken in portions of overnight or during the rain events

vh2ov: ok, stn 2 below 100 mV during rainfall, returning to above 100 mV within 30 minutes of rain

stn 4 below 100 mV during rainfall, returning to slightly above 100 mV within 30 minutes of a rain event

kh2o: ok, stn 4 and 2 not affected by noise in overnight, spike signal returns during shower/storm activity

h2o(licor): ok, btwn 19-15 g/m³ for night to day behavior

stn 1 close to stn 3 for night period, noise more often at stn 3 during morning/afternoon rain events

liidiag (licor): ok, a few 100s samples missing at stn 1 around 22:00 and also at both site 1 & 3 during the morning and afternoon shower events

TKE.4.5m: ok, stn 1 about $0.1\text{--}0.15\text{ m}^2/\text{s}^2$ larger TKE than other sites several periods in overnight
stn 2 lowest TKE of the group for nighttime
daytime, all sites have comparable values

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

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

night: greater u* at stn 1 vs. other sites, stn 2 lowest, also seen in v'w' stress

w'T' : ok, nighttime: stn 1 more cooling (-0.04 C m/s) than other sites (-0.02 C m/s)

daytime: stn 4 less max heat flux than other sites, stn 2 & 3 have highest daytime peak

w'h2o': ok, most of daytime all sites have similar positive flux max $\sim 0.12\text{ g/m}^2/\text{s}$

h2o'h2o': ok, slightly more variance at stn 3 for a few afternoon periods

kh2o'kh2o': ok, good agreement and low noise except during rain events

co2: ok,

w'co2': ok, no consistent night pattern of flux > 0 at one site more than other; maybe stn 1 $>$ stn 3 but only from 3:30-5:00

daytime stn 3 greater co2 uptake only when turbines are pointed east; for NE wind there is not much change from stns 1 & 3

co2'co2': ok, very small, except during/after rainfall (anomalous readings expected)