

Oklahoma Mesonet/ARS Quality Assurance Report November 2021

Prepared by Trey Bell and Ethan Becker

Published on December 13, 2021

Contact: gamgr@mesonet.org

- Mesonet technicians completed scheduled rotations of 5 rain gauges (RAIN/TIP2), 7 batteries (BATV/BVAS), 3 barometers (PRES), 8 relative humidity sensors (RELH/TSLO), 4 pyranometers (SRAD), 4 PRT thermometers (TAIR/TA9M), 1 thermistor, 5 wind directions (WDIR), 6 wind sentries (WS2M), 4 wind monitor nose cones (WSPD), and 1 current excitation module.
- A datalogger problem at Pauls Valley (PAUL) resulted in missing records from November 26th – November 29th. Specific RF modem deployed at the site determined to be ‘locking up’ the datalogger. This modem was replaced November 30th and has not missed records since.
- A blown fuse at our A146 ARS Micronet site resulted in missing records from November 20th – 22nd. The faulty soil moisture sensor responsible for the blown fuse was replaced on November 23rd and has not missed records since.

Mesonet QA Report for Standard Variables

Variable	Status	Site	Ticket	Remarks
TAIR	Resolved	NRMN	45019	Tech visit confirms damage to aspirated shelter. Photos reveal hailstone induced puncture in plastic on top of sensor enclosure. Please replace. Indeed cracked. Replaced.
RELH	Resolved	NRMN	45020	Tech visit this morning confirms damage to sensor housing. Hailstone induced puncture in top most disc of radiation shield. Please replace radiation shield. Indeed cracked. Replaced.
WSPD				

WDIR	Resolved	NRMN	45022	Please inspect windmonitor body for potential hail damage. If damaged, please replace. Currently no problems seen in data. No damage found.
PRES	Resolved	CAMA	45027	Values sometimes report much higher and more erratically than expected, particularly following rainfall. Suspect problem lies with warped, shrunken barometer tubing. Please replace barometer tubing with prepared sections of tube in FieldReady box. Bring old tube back to lab for examination. Replaced tubing, cleaned brass nipple with wire brush.
	Resolved	NOWA	45028	Values often report much higher than neighbors during morning hours following near zero dewpoint depression before stepping down to normal. Suspect problem lies with warped shrunken barometer tubing. Please replace barometer tubing with prepared sections of tube in FieldReady box. Bring old tube back to lab for examination. Replaced tubing and cleaned brass nipple with wire brush.
	Resolved	WOOD	45025	Values sometimes report much higher and more erratically than expected, particularly following rainfall. Suspect problem lies with warped shrunken barometer tubing. Please replace barometer tubing with prepared sections of tube in FieldReady box. Bring old tube back to lab for examination. Replaced external tubing and cleaned brass nipple with wire brush.
SRAD	Resolved	REDR	45051	Following tower leveling during most recent pass, sensor now unlevel to the west, diurnal curve slightly wider on the right side when plotted. Please ensure sensor is level, independent of the tower. Levelled sensor.
RAIN	Resolved	PORT	45053	Gauge fails to record tips during first few hours of ongoing moderate rainfall according to radar. Suspect gauge may be clogged. Cleaned and

				inspected sensor. A wad of organic matter was found on inner drain screen indicating the probable clog. Drip test performed with satisfactory results.
	Resolved	PORT	45055	Gauge does not record tips during the first few hours of ongoing moderate rainfall, before very rapidly increasing in reported tips, faster than radar would indicate. Suspect gauge is affected by a clog. Cleaned and inspected sensor. A wad of organic matter was found on inner drain screen indicating the probable clog. Drip test performed, results are satisfactory.
	Resolved	MEDF	45009	Secondary rain gauge slowly responds to rain and reports a lower total than primary gauge. Suspect gauge is clogged. Cleaned sensor, performed drip test. Results were normal.
	Current	BUFF	45085	Primary gauge drip tested 3 tips low for two consecutive post-cleaning tests. Please replace gauge.
	Current	WATO	45042	Primary gauge misses events entirely while secondary gauge reports reasonable values. Cables already replaced just over a month ago.
	Current	SEIL	45057	Secondary gauge drip tested 3 tips low for two consecutive post-cleaning tests. Please replace gauge.
TA9M	Resolved	NRMN	45024	Please inspect radiation shield for potential hail damage. If damaged, replace radiation shield. No problems currently seen in data. No cracks found.
WS2M	Resolved	FITT	45029	2m wind sensor initially stepped down for several hours, now barely spins even with WSPD > 7m s. Timing does not readily indicate storm damage as problem started over an hour before storm arrival. Event two days prior just grazed the site, with no notable change in behavior during first event storm passage.

				NO ACTION TAKEN - Problem resolved automatically
	Resolved	NRMN	45021	Tech visit confirms damage to WS2M sensor. Anemometer cup likely cracked by hailstone. Please replace sensor. Indeed cracked cup found. Replaced.
TB10	Resolved	HOBA	44870	Continuity 10cm bare sensor reporting -7999 or otherwise errant, negative values. Please replace sensor. Replaced. Original sensor was previously decapitated.
TS05				
TS10				
TS25				
TS60				
TR05	Current	FREE	45086	5cm sod sensor stopped heating. Starting and final temperatures are the same.
TRB10				
TRS10	Resolved	BREC	44969	After prolonged period of noisy data, 10cm sod final temperature now same as starting temp or reports random bad value. Replaced sensor.
	Resolved	HOLL	44860	Sensor heating less than expected, causing bad soil moisture data. Problem does not trace to any current excitation module replacement. Please replace sensor. Replaced.
TR25				

TR60	Resolved	WASH	44868	Both soil temperature and moisture values reporting -7999. Please replace sensor. Replaced. Previous sensor damaged during recovery. Unable to conduct post field test.

ARS QA Report for Standard Variables

Variable	Status	Site	Ticket	Remarks
RAIN				
VW05				
VW25	Resolved	A131	44871	Voltages 1-3 reporting values near zero, resulting in errant soil moisture values. Please replace. Replaced.
VW45				
V05T				
V25T				
V45T				

FCARS QA Report for Standard Variables

Variable	Status	Site	Ticket	Remarks
RAIN				
VW05				
VW25				
VW45				
V05T				
V25T				
V45T				

'Current' tickets are the unresolved tickets as of the last day of the month OR those tickets added based on the Monthly QA analysis.

'Resolved' tickets are the sensor problems that were fixed during the entire month.

Variable	Description
TAIR	Air temperature at 1.5 meters
RELH	Relative humidity at 1.5 meters
WDIR	Wind direction at 10 meters
WSPD	Wind speed at 10 meters
PRES	Air pressure
SRAD	Incident solar radiation
RAIN	Rainfall
TA9M	Air temperature at 9 meters
WS2M	Wind speed at 2 meters
TB10	Soil temperature at 10 cm under bare soil
TS05	Soil temperature at 5 cm under native sod
TS10	Soil temperature at 10 cm under native sod
TS25	Soil temperature at 25 cm under native sod
TS60	Soil temperature at 60 cm under native sod
TR05	Soil moisture: Calibrated DeltaT at 5 cm under native sod
TRB10	Soil moisture: Calibrated DeltaT at 10 cm under bare soil
TRS10	Soil moisture: Calibrated DeltaT at 10 cm under native sod
TR25	Soil moisture: Calibrated DeltaT at 25 cm under native sod
TR60	Soil moisture: Calibrated DeltaT at 60 cm under native sod
VW05	Soil moisture: Volumetric water content at 5 cm under native sod
VW25	Soil moisture: Volumetric water content at 25 cm under native sod
VW45	Soil moisture: Volumetric water content at 45 cm under native sod
V05T	Soil temperature at 5 cm under native sod
V25T	Soil temperature at 25 cm under native sod
V45T	Soil temperature at 45 cm under native sod