Peter Sinks Temperature Monitoring Project
Utah State Climate Center with support from Campbell Scientific

Station locations:
Sinks   41.91299, -111.51416 at 8164 feet
Rim   41.919142, -111.510208 at 8434 feet

Seasonally deployed ,start year 2009
Time is always Mountain Standard Time (MST)

loggers and peripherals	Sinks Station (manufacturer, model)	Rim Station (manufacturer, model)	
data logger	Campbell Scientific, CR1000	Campbell Scientific, CR10X	
solar panel	Kyocera or BP, 10 watt	Kyocera or BP, 20 watt	
charge controller	Campbell Scientific, CH100	Campbell Scientific, CH101	
sealed AGM batteries	Powersonic, 24 ah	Powersonic, 24 ah	
900 MHz radio modem	Freewave Technologies, FGR-115RC	Freewave Technologies, FGR-115RC	
lightning arrestor	Pasadena Networks, 30DT-90-NBFNF	Pasadena Networks, 30DT-90-NBFNF	
antenna	Laird Technologies YA9-13 13 dBi yagi	Laird Technologies YA9-13 13 dBi yagi	
low loss antenna cable	Times LMR 400	Times LMR 401	
enclosure	Campbell Scientific, non metalic NEMA4	Campbell Scientific, non metalic NEMA5	
sensors - Sinks Station	**method**	**resolution/accuracy**	**manufacturer, model**
shielded air temperature 1m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.1	Measurement Specialties 44033RC
shielded air temperature 1m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.2	Measurement Specialties 44033RC
shielded air temperature 1m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.3	Measurement Specialties 44033RC
shielded air temperature 2.75m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.4	Measurement Specialties 44033RC
shielded air temperature 2.75m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.5	Measurement Specialties 44033RC
shielded air temperature 2.75m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.6	Measurement Specialties 44033RC
shielded air temperature 3.5m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.7	Measurement Specialties 44033RC
shielded air temperature 3.5m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.8	Measurement Specialties 44033RC
shielded air temperature 3.5m elevation	pressed-disk ceramic thermistor	0°C to 70°C °C ± 0.9	Measurement Specialties 44033RC
wind speed/direction 4m elevation	propeller photo chopper/vane potentiometer	±0.6 mph 2.2 mph threshold	R.M. Young 05103
sensors - Rim Station	**method**	**resolution/accuracy**	**manufacturer, model**
shielded air temperature 2.75m elevation	type K thermocouple	± 0.2°C	USU Soil Physics Lab
shielded air temperature 2.75m elevation	type K thermocouple	± 0.2°C	USU Soil Physics Lab
shielded air temperature 2.75m elevation	type K thermocouple	± 0.2°C	USU Soil Physics Lab
shielded air temperature 3.5m elevation	platinum resistance detector (PRT)	(+- 0.2°C at 0°C)	Vaisala, HMP45
relative humidity 3.5m elevation	capacitive polomer chip	(+- 3%)	Vaisala, HMP45
wind speed	3-cup anemometer	(+- 1.5%)	Met One, 014A

* Sinks Station 15 minute output table variable list:

    label timestamp = 'timestamp'
    record = 'observation number'
    mid_F_AVG='average of 3 thermistors at mid elevation (2.75m) and equal to mean of L2S1, L2S2, L2S3'
    L3S1_Max = 'maximum 15 min temperature(F) from thermistor1 at 1m'
    L3S1_TMx = 'time of maximum 15 minute temp from thermistor1 at 1m'
    L3S2_Max = ' maximum 15 min temperature(F) from thermistor2 at 1m'
    L3S2_TMx = 'time of maximum 15 minute temp from thermistor2 at 1m'
    L3S3_Max = 'maximum 15 min temperature(F) from thermistor3 at 1m'
    L3S3_TMx = 'time of maximum 15 minute temp from thermistor3 at 1m'
    L3S1_Min = 'minimum 15 min temperature(F) from thermistor1 at 1m'
    L3S1_TMn = 'time of minimum 15 minute temp from thermistor1 at 1m'
    L3S2_Min = 'minimum 15 min temperature(F) from thermistor2 at 1m'
    L3S2_TMn = 'time of minimum 15 minute temp from thermistor2 at 1m'
    L3S3_Min = 'minimum 15 min temperature(F) from thermistor3 at 1m'
    L3S3_TMn = 'time of minimum 15 minute temp from thermistor3 at 1m'
    L3S1_Avg = 'average 15 min temperature(F) from thermistor1 at 1m'
    L3S2_Avg = 'average 15 min temperature(F) from thermistor2 at 1m'
    L3S3_Avg = 'average 15 min temperature(F) from thermistor3 at 1m'
    L2S1_Max = 'maximum 15 min temperature(F) from thermistor1 at 2.75m'
    L2S1_TMx = 'time of maximum 15 minute temp from thermistor1 at 2.75m'
    L2S2_Max = 'maximum 15 min temperature(F) from thermistor2 at 2.75m'
    L2S2_TMx = 'time of maximum 15 minute temp from thermistor2 at 2.75m'
    L2S3_Max = 'maximum 15 min temperature(F) from thermistor3 at 2.75m'
    L2S3_TMx = 'time of maximum 15 minute temp from thermistor3 at 2.75m'

L2S1_Min = 'minimum 15 min temperature(F) from thermistor1 at 2.75m'
L2S1_TMn = 'time of minimum 15 minute temp from thermistor1 at 2.75m'
L2S2_Min = 'minimum 15 min temperature(F) from thermistor2 at 2.75m'
L2S2_TMn = 'time of minimum 15 minute temp from thermistor2 at 2.75m'
L2S3_Min = 'minimum 15 min temperature(F) from thermistor3 at 2.75m'
L2S3_TMn = 'time of minimum 15 minute temp from thermistor3 at 2.75m'
L2S1_Avg = 'average 15 min temperature(F) from thermistor1 at 2.75m'
L2S2_Avg = 'average 15 min temperature(F) from thermistor2 at 2.75m'
L2S3_Avg = 'average 15 min temperature(F) from thermistor3 at 2.75m'
L1S1_Max = 'maximum 15 min temperature(F) from thermistor1 at 3.5m'
L1S1_TMx = 'time of maximum 15 minute temp from thermistor1 at 3.5m'
L1S2_Max = 'maximum 15 min temperature(F) from thermistor2 at 3.5m'
L1S2_TMx = 'time of maximum 15 minute temp from thermistor2 at 3.5m'
L1S3_Max = 'maximum 15 min temperature(F) from thermistor3 at 3.5m'
L1S3_TMx = 'time of maximum 15 minute temp from thermistor3 at 3.5m'
L1S1_Min = 'minimum 15 min temperature(F) from thermistor1 at 3.5m'
L1S1_TMn = 'time of minimum 15 minute temp from thermistor1 at 3.5m'
L1S2_Min = 'minimum 15 min temperature(F) from thermistor2 at 3.5m'
L1S2_TMn = 'time of minimum 15 minute temp from thermistor2 at 3.5m'
L1S3_Min = 'minimum 15 min temperature(F) from thermistor3 at 3.5m'
L1S3_TMn = 'time of minimum 15 minute temp from thermistor3 at 3.5m'
L1S1_Avg = 'average 15 min temperature(F) from thermistor1 at 3.5m'
L1S2_Avg = 'average 15 min temperature(F) from thermistor2 at 3.5m'
L1S3_Avg = 'average 15 min temperature(F) from thermistor3 at 3.5m'
TempMin = 'minimum daily temperature(F) from all thermistors'
HrTempMin = 'hour of daily minimum'
MinuteTempMin = 'minute of daily minimum'
SecTempMin = 'second of daily minimum'
StdDevTemp_Avg = '15 min standard deviation of all 9 thermistors'
WS_mph_Max = 'maximum 15 mimute wind speed (mph)'
WS_ms_TMx = 'time of maximum wind speed'
WS_mph_Avg = 'average 15 minute wind speed (mph)'
WindDir_Avg = 'average 15 minute wind direction'
WindDir_SD = '15 minute wind direction standard deviation'
WSMax = 'maximum daily wind speed (mph)'
HrWSMax = 'hour of daily max windspeed'
MinuteWSMax = 'minute of daily max windspeed'
SecWSMax = 'second of daily max windspeed'

* Rim Station 15 minute output table variable list:
temp1_F_AVG = 'rim 15 minute thermocouple1 temperature (F)'
temp2_F_AVG = 'rim 15 minute thermocouple2 temperature (F)'
temp3_F_AVG = ' = 'rim 15 minute thermocouple3 temperature (F)'
TC_F_AVG = '15 min average (TC1-TC3) rim temperature (F)'
rimwindS_mph_AVG = 'rim wind speed (mph)'
hmptemp_F_AVG = 'rim temperature (F)'
rh_frc = 'rim relative humidity (%)'
e_sat_AVG = 'rim average saturation vapor pressure (kPa)'
vp_AVG = 'rim average vapor pressure (kPa)'
refT_F_AVG = 'rim average reference temperature (F)'
batt_volt = 'rim battery voltage'
Ptemp_F = 'rim logger panel temperature (F)';