FILE NAME: Station Record AK 003.doc

LAST UPDATED: 09/23/2022

**ATQASUK, ALASKA**

### Station Record

**STATION:** AK003, ATQASUK (003)

|  |  |  |  |
| --- | --- | --- | --- |
| **PROJECT MANAGER:**  Phone:  FAX:  E-mail: | F. E. Nelson  Department of Geography  University of Delaware  Newark, Delaware 19711  (302) 831-0852  (302) 831-6654  fnelson@udel.edu | C.A. Seybold  USDA NRCS  Federal Bldg., Rm. 152  Lincoln, NE 68508  (402) 437-4132  (402) 437-5336  cathy.seybold@lin.usda.gov |  |

**LOCATION:** About 1½ miles south of Atqasuk airport runway.

GPS (06/27/96): 70° 27’ 08.88” N

157° 24’ 41.87” W

23 m elevation

GPS (08/14/97): 70° 27’ 07.32” N

157° 24’ 39.51” W

8 m elevation

GPS (08/08/98): 70° 27’ 09.0” N

157° 24’ 41.1” W

141 ft elevation

GPS (05/12/99): 70° 27’ 08.5” N

157° 24’ 43.6” W

ft elevation

GPS (04/27/00): 70° 27’ 09.3” N

157° 24’ 41.2” W

150 ft elevation

GPS (08/17/01): 70° 27’ 08.7” N

157° 24’ 42.1” W

73 ft elevation

GPS (08/16/03): 70° 27’ 08.7” N

157° 24’ 42.1” W

90 ft elevation

GPS (08/24/04): 70° 27’ 08.6” N

157° 24’ 42.4” W

62 ft elevation

GPS (08/22/05): 70° 27’ 08.8” N

157° 24’ 42.3” W

67 ft elevation

GPS (08/18/07): 70° 27’ 08.7” N

157° 24’ 42.4” W

73 ft elevation

GPS (08/18/09): 70° 27’ 08.8” N

157° 24’ 42.2” W

54 ft elevation

GPS (08/17/10): 70° 27’ 08.8” N

157° 24’ 42.3” W

64 ft elevation

GPS (08/16/12): 70° 27’ 08.6” N

157° 24’ 42.4” W

68 ft elevation

**INSTRUMENTATION:**

Summary

| Quantity | Description | Comments |
| --- | --- | --- |
| (1) | Campbell CR-10 datalogger SN: 21325. Extended temperature. | Supplied by Fritz Nelson; replaced 2000. |
| (1) | Campbell CR-10X-2M datalogger SN: X18187. Wiring panel SN: 2105 | Installed 2000. Recalled.  Replaced 2001 |
| 1 | Campbell CR-10X-2M-XT datalogger SN: X27355. Wiring panel SN: 2105 | Installed 2001. |
| 1 | Campbell AM416 multiplexer SN: 5973 | Supplied by Fritz Nelson |
| (1) | Campbell SM192 storage module;  Replaced with SM716 XT SN: 4067. | Both supplied by Fritz Nelson; replacement 8/98; removed 4/00. |
| 1 | Campbell Storage module SM4M | Installed 2003. |
| 1 | Campbell BP24 24-amp-hr YUASA battery | Supplied by Fritz Nelson  Replaced 2003; Replaced 2007 |
| 1 | Campbell CH12R charger/regulator. | Supplied by Fritz Nelson |
| (1) | YUASA NP7-12 12V 7AH battery for PS12LA | Left in enclosure 1997.  Removed 2003 |
| 1 | Campbell Solar panel. | Supplied by Fritz Nelson; installed 1997. Replaced 2006 |
| 1 | Campbell ENC 16/18 enclosure. | Supplied by Fritz Nelson |
| 4 | Vitel dielectric constant soil moisture/temperature sensors. | Installed 1996. |
| 1 | Campbell 107 air temperature sensor. | Installed 1997. |
| 1 | Campbell solar radiation shield for 107. | Installed 1997. |
| 1 | MRC soil temperature probe | Supplied by Fritz Nelson. |

| MULTIPLEXER  POSITION | VITEL PROBE  SERIAL # | DEPTH  (cm) | COMMENTS |
| --- | --- | --- | --- |
| 1 | 396 | 15 | Horizontal installation. Just below organic layer. |
| 2 | 385 | 25 | Horizontal installation. |
| 3 | 389 | 40 | Horizontal installation. |
| 4 | 387 | 50 | Vertical installation. |

**HISTORY:**  June 27, 1996: Our involvement began. Fritz Nelson had an MRC probe and datalogger at this site (established 1995?). The multiplexer was in place and connected to the datalogger, but no instruments were connected to it. We added four Vitel sensors to this station. Lowest Vitel sensor #387 installed at bottom of 47-cm hole. Vertical installation, not quite flush with face of hole on one side, packed some loose soil in the gap. Center of sensor reading at 50 cm. Installed Vitel sensor #389 horizontally on North side of hole at 40 cm. This sensor crept out after installation and froze about 0.1 or 0.2 inches away from face of hole. Packed loose soil into this space. Installed Vitel sensor #385 horizontally on North side of hole at 25 cm. Installed Vitel sensor #396 just below organic layer at 15 cm. Modified datalogger program being used to read the MRC probe: *mrcartic*. Measurements are made at 20-minute intervals and averaged and recorded every two hours. Sensor cables were buried just below the soil surface. Datalogger was set to Alaska Savings Time. The enclosure was placed in a plastic garbage sack and wrapped with a plastic coated tarp, secured with duct tape. The wrapped enclosure was placed on two boards to raise it off the ground.

June 17, 1997: Mounted Campbell 107 air temperature sensor and solar radiation shield on mast near datalogger. Did not connect air temperature sensor to datalogger because its lead was too short. Will replace it later with a sensor with a longer lead. Fritz replaced the battery in August 1996 and reloaded the datalogger program. He used the original version which only read the MRC probe and did not read the Vitel sensors. Therefore no Vitel data since August 1996. Downloaded data to ATQ97001.dat, ATQ97002.dat, and ATQ97003.dat. Downloaded an updated version of the datalogger program that reads the Vitel sensors and also air temperature. The program is named *atqasuk*. Installed thermocouple and CR10TCR for enclosure temperature. Left a small screwdriver, electrical tape, and an additional 12V battery in the enclosure.

August 14, 1997: Installed Campbell 107 air temperature sensor in the solar radiation shield on the mast, six feet above the ground. Installed a Campbell (SolarX) MSX10 solar panel. Downloaded data to Asuk9701.dat, Asuk9702.dat., ….

August 16, 1997: An examination of the data indicated that the MRC probe was not functioning; therefore, the site was visited to troubleshoot. The white MRC probe wire was not connected. It had never been soldered to the resistor circuit and had worked loose. Reconnected the wire to the resistor and soldered it.

August 8, 1998: Downloaded data to ATQ98001.dat and ATQ98002.dat. Added desiccant to enclosure. Datalogger program, *atqasuk*, was modified to output site ID of 003. Also, set storage area to area 1. Data go back only to day 89, 1998. Need to change SM192 for SM716.

August 1998: Fritz Nelson replaced SM192 with SM716.

May 12, 1999: Serviced site. Had to dig through snow to enclosure and solar panel; only top of blue tarp showing above the snow. Downloaded data to AK003001.dat. Added desiccant to enclosure. Everything looks OK. Downloaded modified *atqasuk* program to eliminate Vitel sensor delay, eliminate the “extra” MRC probe, and to change reading interval to 15 minutes. Averages every 15 minutes. Want to get better resolution during the spring thaw. Will change back this fall to previous reading interval.

April 27, 2000: Serviced site. Station completely buried in snow. Solar panel has at least a foot of snow covering it. Battery voltage is 12.7. Downloaded data to Atqasuk.dat. Connected the ground (shield) wire for MRC probe because it was completely out of the port. Replaced CR10 datalogger with CR10X-2M. Removed SM716 storage module. Everything seems to be working OK. Downloaded *atqasuk* v.2.00 to the datalogger. The program reads at 20-minute intervals and averages hourly. Also, added desiccant to enclosure.

August 17, 2001: Serviced site. Solar panel partially covered by tarp. Replaced recalled datalogger with CR10X-2M-XT. Downloaded *atqasuk* v.2.00 to the datalogger. Everything seems to be working OK. Did not add desiccant to enclosure. Tied tarp with nylon cord. Downloaded data from recalled datalogger.

June 25, 2002: Serviced site. Air T sensor was out of shield and on ground. Returned sensor to shield. Downloaded data. Downloaded *atqasuk* v.2.10 to the datalogger. Everything seems to be working OK. Did not add desiccant to enclosure. Tied tarp with nylon cord.

August 16, 2003: Serviced site. Air temp was tapped into the radiation shield. Downloaded data. Added desiccant to enclosure. Replaced power supply (12 Ah for 24 Ah). Tarp needs to be replaced. Added storage module. Everything seems to be working OK.

August 24, 2004: Replaced air temp radiation shield. Solar panel was covered by the blue plastic. Downloaded data from storage module. Added storage module SN:3464. Added two desiccant packs to enclosure. Tarp needs to be replaced. Everything seems to be working OK.

August 22, 2005: Blue tarp was unfolded and blowing in the wind. Downloaded data from datalogger and swapped storage modules. Added storage module SN:3474. Internal battery was 3.1 volts. Station clock was 4 min behind. Retrieved program from datalogger. Put solar panel on T-post, one foot above ground. Added four desiccant packs to enclosure. Cut away half of the tarp. Everything seems to be working OK. There is electrical tape and screw driver in enclosure under desiccant. Next time, replace solar panel and battery. The storage module that was removed from the enclosure was dead, no data was obtained.

August 25, 2006: Arrived at station at about 12:30 PM. Removed blue tarp: cut a section out of it to put back around enclosure. Cleaned the site of garbage. Replaced the solar panel. Station clock was 7 min and 30 sec behind; reset clock. Downloaded data from datalogger onto Palm. Swapped storage modules. Retrieved program from logger (atqus06.dld). Downloaded new program (atqusuk3.dld); new program removes the zero’s and adds internal battery voltage. Internal battery was 3.2 volts. MRC probe out of the ground 8 cm (measured from ground surface to middle of cable insertion point of MRC). Everything seems to be working OK. Added two desiccants packs. Replace battery for next time.

August 18, 2007: Station clock was the same as the computer clock. Downloaded data from datalogger onto Palm. Swapped storage modules. Lithium battery was 3.2 volts. MRC probe was out of the ground 11 cm (measured from ground surface to middle of cable insertion point of MRC). Replaced 24 Ahr battery. Everything seems to be working OK. Added four desiccants packs.

August 20, 2008: Arrived at station about 3:00 PM. Station clock was two min behind. Lithium battery was reading 3.2 volts. Battery was reading 14.0 volts. The air temp cable was chewed in two at the base of the tripod; a section was missing. Replace the air temp sensor. Buries the cable. Downloaded data from datalogger onto Palm. Swapped storage modules. MRC probe was out of the ground 11 cm (measured from ground surface to middle of cable insertion point of MRC). Everything seems to be working OK. Added two desiccant packs.

August 18, 2009: Downloaded data from logger and swapped storage modules. Station clock was 3.5 min behind—reset clock. Lithium battery was reading 3.24 volts. MRC probe was 11 cm out of the ground (measured from ground surface to middle of cable insertion point of MRC). Everything seems to be working OK. Added two desiccant packs. Air temp was 5.9°C and windy.

August 17, 2010: Downloaded data from logger (with RECON) and swapped storage modules. Station clock was 1 min behind. Lithium battery was reading 3.28 volts; battery was 12.16 volts. MRC probe was 11.5 cm out of the ground (measured from ground surface to middle of cable insertion point of MRC). Everything seems to be working OK. Regulator light was not on—it should have been charging. Replaced the regulator—red light indicated it was charging. Also, tilted solar panel up somewhat. Added one desiccant packs. Air temp was 8.6°C and windy with some light rain at times.

August 16, 2012: Station was down. Battery voltage was reading 3.78 volts and solar panel on cloudy day was reading 0.622. The solar panel was bad. Next time bring solar panel and battery. MRC was 16 cm out of ground. Took the datalogger and storage module.

August 21, 2014: Station was down. Solar panel (10W) was replaced. A red light appeared when new solar panel was hooked up. The portal was sealed with putting after insertion of the cable. The solar panel was leaned against the metal stake, looping the large bracket (the stand) over the stake so that the panel wouldn’t fall into a horizontal position. A CR10X-2M datalogger was installed (tin can part) at 11:25 AM. The datalogger had the program installed on it and time set (done in Lincoln). A new storage module was installed. A 12-Ahr battery was installed. The top of the MRC probe was 18.0 cm out of the ground. Enclosure box was closed at 12:15 PM.

August 25, 2015: Box was opened at 1055 ADT. New tarp is needed. Box is dry, light in on. Tundra area immediately surrounding logger box is extremely wet this year—much more so than Fritz remembers. It’s possible that some thaw subsidence is occurring. Storage module removed at 1105 ADT. Storage module #6062 installed at 1110 ADT. Logger box closed at 1115 ADT. There is a Campbell screwdriver left in the logger box. MRC probe height is 23 cm.

August 20, 2016: Someone opened the logger box and did not latch it again. The inside was clean and dry, but the storage module was disconnected from the logger. I did not leave it that way in 2015 and have no idea who opened the box or why. I opened the box at 1105 ADT on August 20, 2016. The red light on the regulator was on. When I connected the storage module to the logger, the green "write" light came on briefly. The red status light on the storage module also came on for a second or two. I removed storage module #6062 at 1150 ADT and replaced it with storage module #3468. The red light on the storage module came on briefly, so I know it was communicating with the logger. The green light also came on briefly. I had a very poor Sharpie, and so wrote only "ATQ IN 2016" on SM3468. The average of three measurements to the top of the probe from the ground surface is 23 cm. I left a Campbell screwdriver inside the box, and rewrapped it with the old blue tarp at the site. The ground surrounding the box is very wet, with some standing water. None has gotten into the box, and flooding didn't appear immanent.

August 21, 2017: Swapped storage modules.

August 22, 2018: Swapped storage modules. MRC probe height above ground was 22 cm.

August 23, 2019: Swapped storage modules. MRC probe height above ground was 22 cm.

August 21, 2022: Swapped storage modules. MRC probe height above ground was 24 cm. The datalogger went down on 5/30/2020. The inside of the NEMA box was wet and metal parts were rusting. Station was in bad shape. The station will no longer be continued. The end.

**DATA:**

DATALOGGER OUTPUT:

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10 | 003 |
| 2 | Year | N/A | N/A | Campbell CR10 |  |
| 3 | Day | N/A | N/A | Campbell CR10 |  |
| 4 | Time | N/A | N/A | Campbell CR10 | AK savings time |
| 5 | 1V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 6 | 2V1 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 7 | 3V1 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 8 | 4V1 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 9 | 1V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 10 | 2V2 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 11 | 3V2 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 12 | 4V2 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 13 | 1V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 14 | 2V3 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 15 | 3V3 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 16 | 4V3 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 17 | 1V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 18 | 2V4 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 19 | 3V4 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 20 | 4V4 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 21 | 0 |  |  |  |  |
| 22 | 0 |  |  |  |  |
| 23 | 0 |  |  |  |  |
| 24 | 0 |  |  |  |  |
| 25 | 0 |  |  |  |  |
| 26 | 0 |  |  |  |  |
| 27 | 0 |  |  |  |  |
| 29 | 0 |  |  |  |  |
| 29 | Soil Temp | °C | Vegetation | MRC Temperature Probe |  |
| 30 | Soil Temp | °C | Soil Surface | MRC Temperature Probe |  |
| 31 | Soil Temp | °C | Soil 5 cm | MRC Temperature Probe |  |
| 32 | Soil Temp | °C | Soil 10 cm | MRC Temperature Probe |  |
| 33 | Soil Temp | °C | Soil 15 cm | MRC Temperature Probe |  |
| 34 | Soil Temp | °C | Soil 20 cm | MRC Temperature Probe |  |
| 35 | Soil Temp | °C | Soil 25 cm | MRC Temperature Probe |  |
| 36 | Soil Temp | °C | Soil 30 cm | MRC Temperature Probe |  |
| 37 | Soil Temp | °C | Soil 35 cm | MRC Temperature Probe |  |
| 38 | Soil Temp | °C | Soil 45 cm | MRC Temperature Probe |  |
| 39 | Soil Temp | °C | Soil 70 cm | MRC Temperature Probe |  |
| 40 | Soil Temp | °C | Soil 95 cm | MRC Temperature Probe |  |
| 41 | Soil Temp | °C | Soil 120 cm | MRC Temperature Probe |  |
| 42 | Soil Temp | °C |  | MRC Temperature Probe | Reference |
| 43 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 44 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 45 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 46 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 47 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 48 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 49 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 50 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 51 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 52 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 53 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 54 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 55 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 56 | Soil Temp | °C |  | MRC Temperature Probe | No Instrument; eliminated 5/99 |
| 67 | Battery | Volts | Enclosure | Campbell CR10 |  |
| 68 | Int Temp | °C | Datalogger | Campbell CR10 |  |
| 59 | Ref Temp | °C | Enclosure | Campbell CR10TCR |  |
| 60 | Enc Temp | °C | Enclosure | Thermocouple |  |
| 61 | Air Temp | °C |  | Campbell 107 |  |

DATALOGGER OUTPUT: after 06/25/02:

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10 | 003 |
| 2 | Year | N/A | N/A | Campbell CR10 |  |
| 3 | Day | N/A | N/A | Campbell CR10 |  |
| 4 | Time | N/A | N/A | Campbell CR10 | AK savings time |
| 5 | Battery | Volts | Enclosure | Campbell CR10 |  |
| 6 | Int Temp | °C | Datalogger | Campbell CR10 |  |
| 7 | Ref Temp | °C | Enclosure | Campbell CR10TCR |  |
| 8 | Enc Temp | °C | Enclosure | Thermocouple |  |
| 9 | Air Temp | °C |  | Campbell 107 |  |
| 10 | 1V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 11 | 2V1 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 12 | 3V1 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 13 | 4V1 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 14 | 1V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 15 | 2V2 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 16 | 3V2 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 17 | 4V2 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 18 | 1V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 19 | 2V3 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 20 | 3V3 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 21 | 4V3 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 22 | 1V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 23 | 2V4 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 24 | 3V4 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 25 | 4V4 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 26 | 0 |  |  |  |  |
| 27 | 0 |  |  |  |  |
| 29 | 0 |  |  |  |  |
| 29 | 0 |  |  |  |  |
| 30 | 0 |  |  |  |  |
| 31 | 0 |  |  |  |  |
| 32 | 0 |  |  |  |  |
| 33 | 0 |  |  |  |  |
| 34 | Soil Temp | °C | Vegetation | MRC Temperature Probe |  |
| 35 | Soil Temp | °C | Soil Surface | MRC Temperature Probe |  |
| 36 | Soil Temp | °C | Soil 5 cm | MRC Temperature Probe |  |
| 37 | Soil Temp | °C | Soil 10 cm | MRC Temperature Probe |  |
| 38 | Soil Temp | °C | Soil 15 cm | MRC Temperature Probe |  |
| 39 | Soil Temp | °C | Soil 20 cm | MRC Temperature Probe |  |
| 40 | Soil Temp | °C | Soil 25 cm | MRC Temperature Probe |  |
| 41 | Soil Temp | °C | Soil 30 cm | MRC Temperature Probe |  |
| 42 | Soil Temp | °C | Soil 35 cm | MRC Temperature Probe |  |
| 43 | Soil Temp | °C | Soil 45 cm | MRC Temperature Probe |  |
| 44 | Soil Temp | °C | Soil 70 cm | MRC Temperature Probe |  |
| 45 | Soil Temp | °C | Soil 95 cm | MRC Temperature Probe |  |
| 46 | Soil Temp | °C | Soil 120 cm | MRC Temperature Probe |  |
| 47 | Soil Temp | °C |  | MRC Temperature Probe | Reference |

DATALOGGER OUTPUT: After 8/25/06

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10X | 003 |
| 2 | Year | N/A | N/A | Campbell CR10X |  |
| 3 | Day | N/A | N/A | Campbell CR10X |  |
| 4 | Time | N/A | N/A | Campbell CR10X | AK savings time |
| 5 | Battery | Volts | Enclosure | Campbell CR10X |  |
| 6 | Lithium Batt | Volts | Datalogger | Campbell CR10X |  |
| 7 | Ref Temp | °C | Enclosure | Campbell CR10TCR |  |
| 8 | Enc Temp | °C | Enclosure | Thermocouple |  |
| 9 | Air Temp | °C |  | Campbell 107 |  |
| 10 | 1V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 11 | 2V1 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 12 | 3V1 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 13 | 4V1 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 14 | 1V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 15 | 2V2 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 16 | 3V2 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 17 | 4V2 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 18 | 1V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 19 | 2V3 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 20 | 3V3 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 21 | 4V3 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 22 | 1V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 23 | 2V4 | Volts | Soil 25 cm | Vitel Soil Moisture/Temp |  |
| 24 | 3V4 | Volts | Soil 40 cm | Vitel Soil Moisture/Temp |  |
| 25 | 4V4 | Volts | Soil 50 cm | Vitel Soil Moisture/Temp |  |
| 26 | Soil Temp | °C | Vegetation | MRC Temperature Probe |  |
| 27 | Soil Temp | °C | Soil Surface | MRC Temperature Probe |  |
| 29 | Soil Temp | °C | Soil 5 cm | MRC Temperature Probe |  |
| 29 | Soil Temp | °C | Soil 10 cm | MRC Temperature Probe |  |
| 30 | Soil Temp | °C | Soil 15 cm | MRC Temperature Probe |  |
| 31 | Soil Temp | °C | Soil 20 cm | MRC Temperature Probe |  |
| 32 | Soil Temp | °C | Soil 25 cm | MRC Temperature Probe |  |
| 33 | Soil Temp | °C | Soil 30 cm | MRC Temperature Probe |  |
| 34 | Soil Temp | °C | Soil 35 cm | MRC Temperature Probe |  |
| 35 | Soil Temp | °C | Soil 45 cm | MRC Temperature Probe |  |
| 36 | Soil Temp | °C | Soil 70 cm | MRC Temperature Probe |  |
| 37 | Soil Temp | °C | Soil 95 cm | MRC Temperature Probe |  |
| 38 | Soil Temp | °C | Soil 120 cm | MRC Temperature Probe |  |
| 39 | Soil Temp | °C |  | MRC Temperature Probe | Reference |

DATA PROCESSING ALGORITHMS:

Vitel Hydra Probe soil moisture, temperature, complex dielectric constant, electrical conductivity, and salinity are determined from the raw data (four voltages), and a calibration option (1, 2, or 3), depending on the soil texture, with a program supplied by Vitel, Inc. Option 2 (silt) used. Consider sand option for this site.

DATA STORAGE AND ACCESS:

Processed data are available on the USDA NRCS NSSC Internet home page at [http://www.wcc.nrcs.usda.gov](http://www.wcc.nrcs.usda.gov/). Data are in Excel files organized by calendar year. Each file consists of a page containing all downloaded data for that year and 4 pages of processed Vitel sensor data (one page for each sensor) with the following column headings: HOUR, TIME, DATE, SENSOR, SOIL (calibration option), ER (real part of the soil dielectric constant), EI (imaginary part of the soil dielectric constant), TEMP (soil temperature °C), ER-COR (temperature corrected ER), EI\_COR (temperature corrected EI), WATER (volume fraction soil water content), SALINITY (soil salinity in g/l NaCl), SOIL\_COND (soil electrical conductivity in S/m or mhos/m), SOIL\_COND\_COR (temperature corrected SOIL\_COND in S/m or mhos/m), WATER\_CON\_COR (temperature corrected soil water electrical conductivity in S/m or mhos/m). The column headings for the annual data are: ID (site), YEAR, DAY OF YEAR, HOUR, TIME, DATE, BATT VOLT (battery voltage), INT TEMP °C (datalogger temperature), REF TEMP °C, TC °C (enclosure temperature), 1V1 15-cm depth (Vitel), 1V2 15-cm depth (Vitel), 1V3 15-cm depth (Vitel), 1V4 15-cm depth (Vitel), 2V1 25-cm depth (Vitel), 2V2 25-cm depth (Vitel), 2V3 25-cm depth (Vitel), 2V4 25-cm depth (Vitel), 3V1 40-cm depth (Vitel), 3V2 40-cm depth (Vitel), 3V3 40-cm depth (Vitel), 3V4 40-cm depth (Vitel), 4V1 50-cm depth (Vitel), 4V2 50-cm depth (Vitel), 4V3 50-cm depth (Vitel), 4V4 50-cm depth (Vitel), MRC1 Veg °C, MRC2 0 cm °C, MRC3 5 cm °C, MRC4 10 cm °C, MRC5 15 cm °C, MRC6 20 cm °C, MRC7 25 cm °C, MRC8 30 cm °C, MRC9 35 cm °C, MRC10 45 cm °C, MRC11 70 cm °C, MRC12 95 cm °C, MRC13 120 cm °C.

**SOILS:** Sandy. Sampled for characterization by John Kimble, summer 1997.

CLASSIFICATION:

**LANDSCAPE:**

SLOPE:

ASPECT:

ELEVATION:

**VEGETATION:**  Moss, grass, and small annual flowers.

GROUND COVER:

CANOPY COVER:

**COMMENTS:**

**NOTES FOR NEXT STATION VISIT:** Routine maintenance. Replace 24 Ah batter.