FILE NAME: Station Record AK 301.doc

LAST UPDATED: 8/28/23

**TOOLIK, ALASKA**

### Station Record

**STATION:** AK301, TOOLIK LAKE LTER (301)

|  |  |  |  |
| --- | --- | --- | --- |
| **PROJECT MANAGER:**  Phone:  FAX:  E-mail: | Chien-Lu Ping  University of Alaska Fairbanks  Palmer Research Center  533 E. Fireweed  Palmer, Alaska 99645  907-746-9462  907-746-2677  pfclp@uaa.alaska.edu | Vladimir Romanovsky  University of Alaska Fairbanks  Geophysical Institute  903 Koyukuk Drive  Fairbanks, Alaska 99775  907-474-7459  ffver@uaf.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:** Toolik Lake, Alaska, University of Alaska/NSF Research Camp

GPS (09/16/98): 68° 37’ 23.2” N

149° 36’ 36.4” W

2480 ft elevation

GPS (05/14/99): 68° 37’ 22.7” N

149° 36’ 33.4” W

2500 ft elevation

GPS (04/30/00): 68° 37’ 22.8” N

149° 36’ 34.3” W

2430 ft elevation

GPS (08/15/01): 68° 37’ 22.9” N

149° 36’ 35.2” W

2506 ft elevation

GPS (06/20/02): 68° 37’ 22.8” N

149° 36’ 35.4” W

2543 ft elevation

GPS (08/18/03): 68° 37’ 22.8” N

149° 36’ 35.5” W

2477 ft elevation

GPS (08/14/04): 68° 37’ 22.9” N

149° 36’ 35.6” W

2501 ft elevation

GPS (08/10/05): 68° 37’ 22.8” N

149° 36’ 35.5” W

2491 ft elevation

GPS (08/11/06): 68° 37’ 22.8” N

149° 36’ 35.5” W

2480 ft elevation

GPS (08/09/07): 68° 37’ 22.9” N

149° 36’ 35.4” W

2487 ft elevation

GPS (08/14/10): 68° 37’ 22.9” N

149° 36’ 35.5” W

2488 ft elevation

GPS (08/13/12): 68° 37’ 22.8” N

149° 36’ 35.6” W

2495 ft elevation

**INSTRUMENTATION:**

Summary

| Quantity | Description | Comments |
| --- | --- | --- |
| 1 | Campbell CR10X-2M datalogger SN: X14468. Wiring panel SN: 6120 | Installed 1998 |
| 1 | Campbell AM416 multiplexer SN: 11648 | Installed 1998 |
| 1 | Campbell PS12LA power supply. | Installed 1998 |
| 1 | 7 Ah battery | replaced 2003, replaced 2005 |
| 1 | Campbell MSX-10 Solar panel. | Installed 1998 |
| 1 | Campbell ENC 16/18 enclosure. | Installed 1998 |
| 1 | Campbell Storage module SM4M | Installed 2003 |
| 6 | Vitel (Type A) soil moisture/temperature sensors. | Installed 1998 |
| 1 | MRC probe SN:486 | Supplied by UAF; Installed 1998 |
| 3 | Campbell 107 soil temperature sensors. | Installed 1998 |
| 1 | Campbell 107 air temperature sensor and solar radiation shield. | Installed 1998 |
| 1 | Texas Electronics (Campbell) TE525 precipitation gage. | Installed 1998; connected 5/00 |

| MULTIPLEXER  POSITION | VITEL PROBE  NUMBER | DEPTH  (cm) | COMMENTS |
| --- | --- | --- | --- |
| 1 | 1 | 12 |  |
| 2 | 2 | 9 |  |
| 3 | 3 | 28 |  |
| 4 | 4 | 28 |  |
| 5 | 5 | 39 |  |
| 6 | 6 | 68 |  |

**HISTORY:** September 16, 1998: Station initiated. Six Vitel sensors were installed at depths of 9, 12, 28 (duplicate sensors), 39, and 68 cm. An MRC probe was installed. The top of the MRC probe is 7 cm above the top of the soil surface. The second thermistor is even with the soil surface. MRC sensor depths are 7 cm agl, 0.6, 8.7, 16.0, 23.6, 31.2, 38.7, 46.3, 61.6, 76.8, and 97.8 cm. Three Campbell 107 temperature sensors were installed at depths of 12, 28, and 65 cm. A Campbell 107 air temperature and solar radiation shield was installed at 1.5 m above the ground surface. The Campbell CR10X-1M datalogger, AM416 multiplexer, and PS12LA power supply are located inside a Campbell ENC16/18 enclosure. The enclosure rests on a wooden box. A 1¼ - in pipe, five feet in length was attached to the box with a pipe flange. The Campbell (SolarX) MSX10 solar panel, the air temperature sensor, and the tipping bucket precipitation gage were mounted on the pipe. Program name is *toolik*. Time is set to Alaska Savings Time. Datalogger reads sensors at 20-minute intervals and averages and records averages hourly. Vladimir Romanovsky pre-wired the datalogger and modified the Smith Lake CR10 program to work here. NOTE: Vitel voltage V4 in CR10 program is multiplied by 0.002. NOTE: V4 output will need to be divided by 2 to give the proper results with the Vitel type A data processing program. The CR10 program reads the Vitel sensors in the order: 12 cm, 9 cm, 28 cm, 28 cm, 39 cm, and 68 cm. The soil temperature sensors are read in the order 12 cm, 28 cm, and 65 cm. Depths are measured from the air/soil surface interface.

May 14, 1999: Serviced site. Downloaded data. Everything looks OK. Added desiccant to enclosure.

April 30, 2000: Connected precipitation gage. Downloaded data to Toolik.dat. Everything appears to be working OK. Sounds like the datalogger reads sensors at 10-minute intervals. Added desiccant to the enclosure.

August 15, 2001: Downloaded data to Toolik.dat. Everything appears to be working OK. The datalogger reads sensors at 10-minute intervals. Looks like the MRC probe is sticking out above the ground surface about 8 inches. Did not add desiccant to the enclosure. Windows version of datalogger program. Tried to level precipitation gage. Wooden platform is not level and may be slowly sinking to one side. Put some soil under one corner, but this probably will not last. Reset datalogger time.

June 20, 2002: Downloaded data to Toolik02.dat. Everything appears to be working OK. Downloaded new datalogger program, *Toolik* v.1.10. Modification of original program written by Vladimir Romanovoski. Modifications are: changed Vitel V4 multiplier to 0.001 from 0.002, added delay between Vitel sensor readings, changed to read and output 6 Vitel sensors instead of 8, changed to read and output 12 MRC sensors instead of 14, eliminated reading redox sensors, replaced wait subroutine with delay command, changed reading of Vitel sensors so output columns do not need to be rearranged. Everything appears to be working OK. No desiccant available to replace old. Stand not level. Need to level for sake of precipitation gage.

August 18, 2003: Downloaded data. Replaced 12V battery. Added two desiccant. MRC probe is 10.5 inches above the soil surface—probably frost heave. Someone wrapped white tape around it. Maybe next year re-install it. Ron talked to Chien Lu and Vladimir about it. Installed storage module SN: 3475. Everything seemed to be working OK.

August 14, 2004: Downloaded data from storage module. Installed module SN:3470. Added two desiccant. MRC probe was 35 cm above the soil surface. Everything seemed to be working OK.

August 16, 2004: Reinstalled MRC probe in same hole. Probe is now 13 cm above the soil surface. Hit rock or stone while drilling. Wrapped tinfoil around exposed end. Downloaded data from storage module. Installed module SN:4183.

August 10, 2005: Downloaded data from datalogger and swapped storage module. Installed module SN:3480. Added two desiccant. MRC probe was 19 cm above the soil surface. Internal battery was 3.1 V. MRC resister was 9.98 ohms, Replaced the 7-Ah battery. Raingage was clean. Everything seemed to be working OK.

August 11, 2006: Downloaded data from datalogger and swapped storage module. Station clock was 6 min 44 sec behind; reset clock. Added two desiccant packs. MRC probe was 21 cm above the soil surface to middle of MRC cable insertion point. Internal battery was 3.309 V. Raingage was clean. Everything seemed to be working OK.

August 09, 2007: Swapped storage modules. Station clock was the same as the computer. Added two desiccant packs. MRC probe was 27 cm above the soil surface to middle of MRC cable insertion point. Internal battery was 3.3 V. Raingage was clean. Everything seemed to be working OK. Tried to pull out MRC probe in order to re-install it, cut could not get it out of the ground. It was frozen into the permafrost. Covered the portion of the MRC probe that was above ground with white electrical tape.

August 13, 2008: Arrived at station about 2:00 PM. Swapped storage modules. Station clock was 2.5 minutes behind. MRC probe was 32 cm above the soil surface to middle of MRC cable insertion point. Internal battery was 3.33 V. Raingage was clean. Everything seemed to be working OK. Tried to pull out MRC probe in order to re-install it, cut could not get it out of the ground. It was frozen into the permafrost.

August 11, 2009: Downloaded data from data logger and swapped storage modules. Station clock was 4.5 minutes behind—reset clock. MRC probe was 33.5 cm above the soil surface to middle of MRC cable insertion point. Internal battery was 3.34 V. Raingage was clean, but the grate was missing. Everything seemed to be working OK. Pulled out MRC proble and re-installed it—MRC was then 23.5 cm out of the ground. Hit gravel when drilling, could not go any deeper. Added one desiccant pack.

August 14, 2010: Downloaded data from data logger (with RECON) and swapped storage modules. Station clock was 2 minutes behind; reset clock. Lithium battery was 3.35 volts; battery was 13.7 volts. MRC probe was 31.5 cm above the soil surface to middle of MRC cable insertion point. Raingage was clean, but the grate was missing. Everything seemed to be working OK. Air temp was 14.5ºC.

August 13, 2012: Downloaded data from data logger (with RECON) and swapped storage modules. Station clock was 4 minutes behind; reset clock. Lithium battery was 3.35 volts; battery was 13.7 volts. MRC probe was 43.5 cm above the soil surface to middle of MRC cable insertion point (could not push back in). White tapped was added to bare MRC above ground. Raingage was semi-plugged with bird poop; it was cleaned out. The grate was missing. Everything seemed to be working OK. Air temp was 17.3ºC.

August 16, 2014: Swapped storage modules.

August 19, 2015: AEK. Swapped storage modules just before 4:00 pm. MRC – solid; no holes; however 27 cm of it is above ground but not wrapped with white tape. Wrapped the MRC that is above ground with white tape. Min: 27.5, max 30cm, two other sides: 28.5 & 29 cm; no holes.

August 16, 2016: Swapped storage modules.

August 25, 2016: The MRC probe was re-installed by Vladimir Romanovsky and Lily Cohen. The probe had heaved all the way into the active layer so we were able to pull it out and re-drill the hole (thanks to Bill's expert drilling). Since we had a better drill this time, we drilled deeper and the top is at the surface (see attached photo--the white is the tape showing). Therefore depths are now at 2cm, 10.0, 17.3, 25.1, 32.7, 40.2, 55.5, 70.8, 86.0 and 107.0 cm bgs.

August 18, 2017: Swapped storage modules.

August 17, 2018: Swapped storage modules.

August 15, 2019: Swapped storage modules. MRC probe height was 6.0 cm above ground. The probe was vegetated over, water below.

August 19, 2021: Swapped storage modules at 11:04 AST. MRC probe was even with ground. Filled cavity on one side of probe (14 and 18 cm deep) with soil slurry.

August 14, 2022: Swapped storage modules at 1400 AST. The MRC was solidly in the ground and appears to be 2-3 cm below the live moss. There were no gaps on the side of the probe.

August 8, 2023: Swapped storage modules at 1350 AST. The MRC was solidly in the ground. There was a 5-cm gap on NE site of the probe, but within 1-2 cm on other sides.

**DATA:**

DATALOGGER OUTPUT prior to 06/20/02 2100:

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10 | 103. Changed to 301 August 2001. |
| 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 | Enc Temp | °C | Enclosure | Thermocouple |  |
| 8 | Air Temp | °C | Air | Campbell 107 |  |
| 9 | Soil Temp | °C | Soil 12 cm | Campbell 107 |  |
| 10 | Soil Temp | °C | Soil 28 cm | Campbell 107 |  |
| 11 | Soil Temp | °C | Soil 65 cm | Campbell 107 |  |
| 12 | Precip | in | Air | TE525 Tipping Bucket | Connected 4/00. |
| 13 | 1V1 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 14 | 2V1 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 15 | 3V1 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 16 | 4V1 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 17 | 5V1 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 18 | 6V1 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 19 | 7V1 |  |  | Vitel Soil Moisture/Temp | No sensor |
| 20 | 8V1 |  |  | Vitel Soil Moisture/Temp | No sensor |
| 21 | 1V2 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 22 | 2V2 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 23 | 3V2 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 24 | 4V2 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 25 | 5V2 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 26 | 6V2 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 27 | 7V2 |  |  | Vitel Soil Moisture/Temp | No sensor |
| 28 | 8V2 |  |  | Vitel Soil Moisture/Temp | No sensor |
| 29 | 1V3 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 30 | 2V3 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 31 | 3V3 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 32 | 4V3 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 33 | 5V3 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 34 | 6V3 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 35 | 7V3 |  |  | Vitel Soil Moisture/Temp | No sensor |
| 36 | 8V3 |  |  | Vitel Soil Moisture/Temp | No sensor |
| 37 | 1V4 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp | Divide by 2 before processing data |
| 38 | 2V4 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp | Divide by 2 before processing data |
| 39 | 3V4 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp | Divide by 2 before processing data |
| 40 | 4V4 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp | Divide by 2 before processing data |
| 41 | 5V4 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp | Divide by 2 before processing data |
| 42 | 6V4 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp | Divide by 2 before processing data |
| 43 | 7V4 | Volts |  | Vitel Soil Moisture/Temp | No sensor |
| 44 | 8V4 | Volts |  | Vitel Soil Moisture/Temp | No sensor |
| 45 | Soil Temp | °C | Air 7 cm\* | MRC Temperature Probe |  |
| 46 | Soil Temp | °C | Soil 0.6 cm\* | MRC Temperature Probe |  |
| 47 | Soil Temp | °C | Soil 8.7 cm\* | MRC Temperature Probe |  |
| 48 | Soil Temp | °C | Soil 16.0 cm\* | MRC Temperature Probe |  |
| 49 | Soil Temp | °C | Soil 23.6 cm\* | MRC Temperature Probe |  |
| 50 | Soil Temp | °C | Soil 31.2 cm\* | MRC Temperature Probe |  |
| 51 | Soil Temp | °C | Soil 38.7 cm\* | MRC Temperature Probe |  |
| 52 | Soil Temp | °C | Soil 46.3 cm\* | MRC Temperature Probe |  |
| 53 | Soil Temp | °C | Soil 61.6 cm\* | MRC Temperature Probe |  |
| 54 | Soil Temp | °C | Soil 76.8 cm\* | MRC Temperature Probe |  |
| 55 | Soil Temp | °C | Soil 97.8 cm\* | MRC Temperature Probe |  |
| 56 | Reference |  |  | MRC Temperature Probe | Reference |
| 57 | Soil Temp | °C |  | MRC Temperature Probe | No sensor |
| 58 | Soil Temp | °C |  | MRC Temperature Probe | No sensor |
|  |  |  |  |  |  |

\* From soil surface.

DATALOGGER OUTPUT after to 06/20/02 2100:

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10 | 301 |
| 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 | Enc Temp | °C | Enclosure | Thermocouple |  |
| 8 | Air Temp | °C | Air | Campbell 107 |  |
| 9 | Soil Temp | °C | Soil 12 cm | Campbell 107 |  |
| 10 | Soil Temp | °C | Soil 28 cm | Campbell 107 |  |
| 11 | Soil Temp | °C | Soil 65 cm | Campbell 107 |  |
| 12 | Precip | in | Air | TE525 Tipping Bucket | Connected 4/00. |
| 13 | 1V1 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 14 | 1V2 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 15 | 1V3 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 16 | 1V4 | Volts | Soil 12 cm\* | Vitel Soil Moisture/Temp |  |
| 17 | 2V1 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 18 | 2V2 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 19 | 2V3 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 20 | 2V4 | Volts | Soil 9 cm\* | Vitel Soil Moisture/Temp |  |
| 21 | 3V1 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 22 | 3V2 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 23 | 3V3 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 24 | 3V4 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 25 | 4V1 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 26 | 4V2 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 27 | 4V3 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 28 | 4V4 | Volts | Soil 28 cm\* | Vitel Soil Moisture/Temp |  |
| 29 | 5V1 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 30 | 5V2 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 31 | 5V3 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 32 | 5V4 | Volts | Soil 39 cm\* | Vitel Soil Moisture/Temp |  |
| 33 | 6V1 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 34 | 6V2 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 35 | 6V3 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 36 | 6V4 | Volts | Soil 68 cm\* | Vitel Soil Moisture/Temp |  |
| 37 | Soil Temp | °C | Air 7 cm\* | MRC Temperature Probe |  |
| 38 | Soil Temp | °C | Soil 0.6 cm\* | MRC Temperature Probe |  |
| 39 | Soil Temp | °C | Soil 8.7 cm\* | MRC Temperature Probe |  |
| 40 | Soil Temp | °C | Soil 16.0 cm\* | MRC Temperature Probe |  |
| 41 | Soil Temp | °C | Soil 23.6 cm\* | MRC Temperature Probe |  |
| 42 | Soil Temp | °C | Soil 31.2 cm\* | MRC Temperature Probe |  |
| 43 | Soil Temp | °C | Soil 38.7 cm\* | MRC Temperature Probe |  |
| 44 | Soil Temp | °C | Soil 46.3 cm\* | MRC Temperature Probe |  |
| 45 | Soil Temp | °C | Soil 61.6 cm\* | MRC Temperature Probe |  |
| 46 | Soil Temp | °C | Soil 76.8 cm\* | MRC Temperature Probe |  |
| 47 | Soil Temp | °C | Soil 97.8 cm\* | MRC Temperature Probe |  |
| 48 | Reference |  |  | MRC Temperature Probe | Reference |

\* From soil surface.

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. for type A probes (2.5 volts).

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 12 pages of processed Vitel sensor data (one page for each sensor) with the following column headings: 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), ENCL TEMP °C (enclosure temperature), SOIL T 12 cm °C, SOIL T 28 cm °C, SOIL T 65 cm °C, PRECIP in, 1V1 (9-cm depth, Vitel stack 2), 1V2 (9-cm depth Vitel, stack 2), 1V3 (9-cm depth Vitel, stack 2), 1V4 (9-cm depth Vitel, stack 2), 2V1 (12-cm depth Vitel, stack 2), 2V2 (12-cm depth Vitel, stack 2), 2V3 (12-cm depth Vitel, stack 2), 2V4 (12-cm depth Vitel, stack 2), 3V1 (28-cm depth, Vitel stack 2), 3V2 (28-cm depth Vitel, stack 2), 3V3 (28-cm depth Vitel, stack 2), 3V4 (28-cm depth Vitel, stack 2), 4V1 (28-cm depth, Vitel stack 1), 4V2 (28-cm depth Vitel, stack 1), 4V3 (28-cm depth Vitel, stack 1), 4V4 (28-cm depth Vitel, stack 1), 5V1 (39-cm depth, Vitel stack 1), 5V2 (39-cm depth Vitel, stack 1), 5V3 (39-cm depth Vitel, stack 1), 5V4 (39-cm depth Vitel, stack 1), 6V1 (68-cm depth, Vitel stack 1), 6V2 (68-cm depth Vitel, stack 1), 6V3 (68-cm depth Vitel, stack 1), 6V4 (68-cm depth Vitel, stack 1), MRC veg °C, MRC 0.6-cm depth °C, MRC 8.7-cm depth °C, MRC 16.0-cm depth °C, MRC 23.6-cm depth °C, MRC 31.2-cm depth °C, MRC 38.7-cm depth °C, MRC 46.3-cm depth °C, MRC 61.6-cm depth °C, MRC 76.8-cm depth °C, MRC 97.8-cm depth °C, MRC ref.

**SOILS:**

CLASSIFICATION:

**LANDSCAPE:**

SLOPE:

ASPECT:

ELEVATION:

**VEGETATION:**

GROUND COVER:

CANOPY COVER:

**COMMENTS:**

**NOTES FOR NEXT STATION VISIT:** Routine maintenance. Re-install MRC probe.