FILE NAME: StationRecordMtFleming.doc

LAST UPDATED: 3/23/2023

STATION RECORD

## MT. FLEMING

**ANTARCTICA**

**STATION:** MT. FLEMING (ANT008)

|  |  |  |  |
| --- | --- | --- | --- |
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**LOCATION:** Mt. Fleming, Antarctica.

GPS (01/04/02): 77º 32’ 42.7” S

160º 17’ 24.6” E

5,568 ft elevation

GPS (01/15/03): 77º 32’ 42.9” S

160º 17’ 25.2” E

5,600 ft elevation

GPS (01/07/04): 77º 32’ 42.9” S

160º 17’ 25.2” E

5,568 ft elevation

GPS (01/17/05): 77º 32’ 42.7” S

160º 17’ 25.0” E

**INSTRUMENTATION:**

Summary

|  |  |  |
| --- | --- | --- |
| Quantity | Description | Comments |
| 1 | Campbell CR-10X-2M-XT datalogger S/N: X24398. Wiring panel S/N: 10178. | Installed 01/02; Replaced 01/08 |
| 1 | Campbell AM416XT multiplexer S/N: 13626. | Installed 01/02 |
| 1 | Campbell CH100 12V charger/regulator | Installed 01/07, replaced 01/12 |
| 3 | Campbell BP24 24-amp-hr YUASA battery | Installed 2006, 2007, 2008. |
| 1 | Campbell MSX-20R Solar panel. | Installed 01/02 |
| (1) | MetOne wind sensor. | Installed 01/02; removed 01/08 |
| 1 | R.M. Young wind sensor | Installed 01/08 |
| 1 | Licor LI200X solar radiation sensor. | Installed 01/02 |
| 1 | Licor pyranometer solar radiation sensor leveling fixtures. | Installed 01/02 |
| 1 | Pyranometer mounting fixture for cross-arm. | Installed 01/02 |
| 1 | Campbell ENC 16/18 enclosure. | Installed 01/02 |
| 1 | Campbell CM10 3-m tripod with guy-wire support. | Installed 01/02 |
| 9 | Vitel dielectric constant soil moisture/temperature sensors. | Installed 01/02 |
| 12 | Campbell 107 soil temperature sensors | Installed 01/02 |
| 1 | Campbell 107 air temperature sensor. | Installed 01/02 |
| 1 | Campbell solar radiation shields for HMP35/45C air temperature/relative humidity sensors. | Installed 01/02 |
| 1 | Campbell SM4M storage module S/N: 3466 (Mt. Fleming (A)); alternate S/N: 3465 (Mt. Fleming (B)) | Installed 01/03 |
| 1 | Vaisala HMP45C temp/relative humidity sensor | Installed 2005. |
| 1 | Solar radiation shield for 107 air temperature sensor | Installed 2005. |

**HISTORY:**  January 4-6, 2002: Station initiated. Three stacks of Vitel Hydra probes were installed, two stacks of three probes in a polygon and one stack of three probes in the adjacent trough. The Vitel probes were attached to a Campbell Scientific CR10X-2M-XT datalogger. Two stacks of Campbell 107 temperature sensors were installed, nine in the polygon and three in the trough. These were attached to the datalogger. Above ground sensors are one Campbell 107 air temperature sensor, one MetOne wind speed and direction sensor, and one Licor pyranometer. The air temperature sensor was mounted in a HMP35/45C solar radiation shield on the tripod because the HMP35C sensor had non-standard wiring and we had no wiring diagram for it. The air temperature sensor was mounted two meters above the ground surface. The wind sensor and solar radiation sensor were mounted on the tripod cross-arm three meters above the soil surface. The datalogger, a Campbell AM416XT multiplexer, and two Campbell BP24 power supply, were located inside of a Campbell ENC16/18 enclosure. The enclosure was mounted on the tripod. Power is supplied by a Campbell (SolarX) MSX20R solar panel, mounted on the tripod. The solar panel faces true north and is perpendicular to the surface of the earth. Datalogger was set to New Zealand Standard Time. Midnight is 0000. The datalogger program, *Ant8*, was downloaded to the datalogger. Measurements are made at 20-minute intervals and averaged and recorded every hour. Measurements of solar radiation and wind are made at 10-second intervals and averaged and recorded every hour.

January 15, 2003: Downloaded data to a Campbell SM4M storage module S/N: 3465 Mt. Fleming (B). Added a Campbell SM4M storage module S/N: 3466 Mt. Fleming (A). Added desiccant. Downloaded new datalogger program Ant8 v.1.01. Modification of v.1.00. Changed number of Vitel sensors output to 9 from 12. Added max 10-s wind speed and max and min air temperature. Everything seems to be working OK.

January 7, 2004: Retrieved the Campbell SM4M storage module S/N: 3466 (Mt. Fleming (A)) and installed the alternate S/N 3465 (Mt. Fleming (B)). Installed a third Campbell BP24 24-amp-hr YUASA battery. Replaced the desiccant. Checked the Li battery.

January 17, 2005: Retrieved the alternate Campbell SM4M storage module S/N: 3465 (Mt. Fleming (B)) and installed S/N 3466 (Mt. Fleming (A)). Swapped all three batteries. Two of the original ones had frozen and were cracked. Used crimp type butt splices to connect the wiring. Outside wiring was encased in automotive wire sheathing. Put date on all batteries. Swapped desiccant packs. Voltages: SPR-13.72 vdc, station batteries-12.49 vdc, Li battery-3.05 vdc. Station time 9:10 AM, actual time 10:04, NZST. Station was reset back to NZST. Drift spans two years because time was not reset last season. Moved 12 plate shield 180 degrees on tripod mast and inserted an HMP-45. Added a 6 plate shield where 12 plate was previously. Inserted the existing CSI-107 temperature sensor. Wired only the RH portion of the HMP-45 to the data logger. Taped down loose wires. No apparent damage from flying rocks and minimal sand blasting of components. Solar panel is OK. Wiped off the LI200 pyranometer. Took station pictures looking N,E,S,W. Met-One bearings were OK and unit was operating normally. Weather conditions: partly cloudy, -11C, wind 10-15 mph.

January 10, 2006: Added one new battery containment box that is located on the ground. Replaced one 24 amp-hr battery, which was on the ground. Secured box in place with rocks. Downloaded data and program from datalogger. Wired up the air temp of the HMP45C sensor. Uploaded new program (ANT08REV3.dld). The program was corrected to read the HMP45C sensor. PC clock was 2:48 pm and station clock was 2:26 pm; reset station clock. Everything seemed to be working okay. There was no regulator; need to install one for next time. Added three packs of desiccant. Weather conditions: mostly cloudy, -12°C, winds 24 mph. [Note: only partial 2005 data was obtained; missing data between day 116 and 240]

January 18, 2007: Downloaded data and swapped storage modules. Station clock had a date of 2-17-07 and clock was reading 10:45 am. The computer clock was reading 11:21 am. (The raw dataset was corrected to the correct time) Reset clock. Lithium battery was 3.06 volts. Replaced one battery (24Ah). Installed a 12V regulator. Plugged one battery into the “int” socket of regulator. Connected the other two batteries together (in parallel) and plugged them into the “ext” socket of regulator. Added two desiccant packs. Everything seemed to be working okay. For next time may want to replace data logger. Weather conditions: sunny, 20 mph wind, -8°C.

January 18, 2008: Downloaded data and swapped storage modules. Station clock was 35 minutes behind. Battery voltage was 13.65. Swapped out the datalogger with a new one. Reset clock. The new program (MTFLEMREV4.dld) that reads the new R.M. Young wind sensor was downloaded to the new datalogger. Lithium battery was 3.06 volts. Replaced the MetOne wind sensor with an R.M. Young wind sensor. Replaced one battery (24Ah). Replaced battery connections with female connector for easy battery replacement. Everything seemed to be working okay. For next time need to replace or secure the hinge on the enclosure door. Weather conditions: sunny, 25 mph wind, -10°C Temp.

January 21, 2009: Downloaded data and swapped storage modules. Station clock was 6 minutes ahead. Battery voltage was 13.9. Lithium battery was 3.10 volts. Replaced one battery (24Ah). Everything seemed to be working okay. For next time secure the hinge on the enclosure door. Weather conditions: mostly sunny, 27 mph winds, -14.8°C Temp. For next time add a vital at the surface (replace one of the 30cm depths) and maybe a 107. Also, check V7—look for a vital at the surface (there was a vital exposed at the surface, just part of the white casing).

January 19, 2010: Downloaded data and swapped storage modules. Station clock was 12 minutes ahead; reset clock. Lithium battery was 3.08 volts. Replaced one 24 Ahr battery. Everything seemed to be working okay. Could not see a vital at the surface, there was some snow on the ground. (For next time replace battery connections with female connectors to easily connect to the battery inside the enclosure). Weather conditions: sunny, 10-15 mph winds, -9°C Temp.

January 21, 2011: Downloaded data and swapped storage modules. Station clock was 19 minutes behind, reset clock. Lithium battery was 3.01 volts. Replaced one 24 Ahr battery. Everything seemed to be working okay. Added two desiccant packs. Installed a hydra-probe at the 2-cm depth (in polygon); replacing the #9 hydra-probe on the multiplexer. (For next time raise air temp sensor to 2 m). Weather conditions: sunny, 15 mph winds, -12°C Temp.

January 20, 2012: Downloaded data and swapped storage modules. Station clock was 27 minutes behind, reset clock. Lithium battery was 3.09 volts. Replaced one 24 Ahr battery. Everything seemed to be working okay. Added two desiccant packs. Replaced the regulator. (For next time raise air temp sensor to 2 m and replace bearings in wind sensor). Weather conditions: sunny, 24 mph winds, -14°C Temp.

December 17, 2012: Swapped storage modules. Station clock was 5 minutes behind, reset clock. Lithium battery was 3.04 volts. Replaced one 24 Ahr battery. Everything seemed to be working okay. The battery connector-clip broke while plugging in the new battery, check it next time. (For next time raise air temp sensor to 2 m and replace bearings in wind sensor; the enclosure door hinge needs to be re-riveted at the top). Weather conditions: sunny, 25 mph winds, -15°C Temp.

January 6, 2014: Swapped storage modules. Replaced one 24 Ahr battery. Lithium battery was 3.042 volts. Battery voltage was 13.87 volts. The enclosure door hinge needs to be re-riveted at the top. Weather conditions: 25 mph winds, -5.5°C Temp.

January 18, 2015: 1415 NZDT. Downloaded datalogger and swapped storage modules. Lithium battery was 3.04 V. Difference between station and PC time was 11 min; reset clock. Enclosure rivets broken. Site was covered in snow drift. RM young wind direction visual approx. 220 deg. Weather measured on hand-held kestrel 3500; Measurement time1313 NZDT; Wind 12 Knots, Temp -13 Degrees C, RH: 60 %, Dewpoint -20 Degrees C, Wetbulb -15 Degrees C, Air pressure 794 hPa.

January 14, 2016: Downloaded datalogger and swapped storage modules. Lithium battery was 3.04 V. Replaced oldest battery. In 2015 enclosure door rivets were damaged, this damage was repaired. There was a hydra-probe prong protruding above sediment surface. Surface 107 probes at surface are where electrical tapes to rocks, replaced tape with cable ties. Recommend burial of cable.

January 3, 2017: Downloaded datalogger and swapped storage modules.

January 20, 2018: Downloaded datalogger and swapped storage modules. Replaced oldest battery.

January 12, 2019: Downloaded datalogger and swapped storage modules.

December 27, 2019: Downloaded datalogger and swapped storage modules.

December 2, 2021: Swapped storage modules. Swapped battery. Reset clock (NZST); was off about 30 minutes. Temperature was -20 C and 40 mph wind speeds.

December 12, 2022: Swapped storage modules. Swapped battery. Reset clock to UTC (9:27am to 21:22).

| MULTIPLEXER  POSITION | STACK | PROBE | DEPTH  (cm) | COMMENTS |
| --- | --- | --- | --- | --- |
| 1 | 1 | Vitel # 1 | 7.5 | Polygon |
| 2 | 1 | Vitel # 2 | 15 | Polygon |
| 3 | 1 | Vitel # 3 | 30 | Polygon |
| 4 | 2 | Vitel # 4 | 7.5 | Polygon |
| 5 | 2 | Vitel # 5 | 15 | Polygon |
| 6 | 2 | Vitel # 6 | 30 | Polygon |
| 7 | 3 | Vitel # 7 | 7.5 | Trough |
| 8 | 3 | Vitel # 8 | 15 | Trough |
| 9 | 3 | Vitel # 9 | 30 | Trough |
| 10 |  |  |  | Empty |
| 11 |  |  |  | Empty |
| 12 |  |  |  | Empty |
| 13H1 | 1 | Campbell 107 # 1 | 2 | Polygon |
| 13L1 | 1 | Campbell 107 # 2 | 7.5 | Polygon |
| 13H2 | 1 | Campbell 107 # 3 | 15 | Polygon |
| 13L2 | 1 | Campbell 107 # 4 | 22.5 | Polygon |
| 14H1 | 1 | Campbell 107 # 5 | 30 | Polygon |
| 14L1 | 1 | Campbell 107 # 6 | 37.5 | Polygon |
| 14H2 | 1 | Campbell 107 # 7 | 45 | Polygon |
| 14L2 | 1 | Campbell 107 # 8 | 60 | Polygon |
| 15H1 | 1 | Campbell 107 # 9 | 75 | Polygon |
| 15L1 | 2 | Campbell 107 # 10 | 7.5 | Trough |
| 15H2 | 2 | Campbell 107 # 11 | 15 | Trough |
| 15L2 | 2 | Campbell 107 # 12 | 30 | Trough |
| 16H1 |  | Campbell 107 Air Temperature |  | 2 m above soil surface |

**DATA:**

DATALOGGER OUTPUT:

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10 | 008 |
| 2 | Year | N/A | N/A | Campbell CR10 |  |
| 3 | Day | N/A | N/A | Campbell CR10 |  |
| 4 | Time | N/A | N/A | Campbell CR10 | NZ standard time |
| 5 | Battery | Volts | Enclosure | Campbell CR10 |  |
| 6 | Int Temp | ºC | Datalogger | Campbell CR10 |  |
| 7 | Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Ave hourly. |
| 8 | Max Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Max hourly. |
| 9 | Min Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Min hourly. |
| 10 | RH | % | Air 1.6 m | Vaisala HMP45C |  |
| 11 | Solar Rad | W/m2 | Air 3 m | LiCor LI200X |  |
| 12 | Wind Speed | mph | Air 3 m | Met One | Hourly average |
| 13 | Wind Dir | azimuth | Air 3 m | Met One | True North |
| 14 | Wind Speed | mph | Air 3 m | Met One; Replaced with R.M. Young 01/08 | Max 10-s avg. |
| 15 | 1V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 16 | 1V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 17 | 1V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 18 | 1V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 19 | 2V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 20 | 2V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 21 | 2V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 22 | 2V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 23 | 3V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 24 | 3V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 25 | 3V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 26 | 3V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 27 | 4V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 29 | 4V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 29 | 4V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 30 | 4V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 31 | 5V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 32 | 5V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 33 | 5V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 34 | 5V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 35 | 6V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 36 | 6V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 37 | 6V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 38 | 6V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 39 | 7V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 40 | 7V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 41 | 7V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 42 | 7V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 43 | 8V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 44 | 8V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 45 | 8V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 46 | 8V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 47 | 9V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 48 | 9V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 49 | 9V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 50 | 9V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 51 | Soil Temp | ºC | Soil 2 cm | Campbell 107 Temperature |  |
| 52 | Soil Temp | ºC | Soil 7.5 cm | Campbell 107 Temperature |  |
| 53 | Soil Temp | ºC | Soil 15 cm | Campbell 107 Temperature |  |
| 54 | Soil Temp | ºC | Soil 22.5 cm | Campbell 107 Temperature |  |
| 55 | Soil Temp | ºC | Soil 30 cm | Campbell 107 Temperature |  |
| 56 | Soil Temp | ºC | Soil 37.5 cm | Campbell 107 Temperature |  |
| 57 | Soil Temp | ºC | Soil 45 cm | Campbell 107 Temperature |  |
| 58 | Soil Temp | ºC | Soil 60 cm | Campbell 107 Temperature |  |
| 59 | Soil Temp | ºC | Soil 75 cm | Campbell 107 Temperature |  |
| 60 | Soil Temp | ºC | Soil 7.5 cm | Campbell 107 Temperature |  |
| 61 | Soil Temp | ºC | Soil 15 cm | Campbell 107 Temperature |  |
| 62 | Soil Temp | ºC | Soil 30 cm | Campbell 107 Temperature |  |
| 63 | Air Temp | ºC | Air 2 m | Campbell 107 Temperature |  |

DATALOGGER OUTPUT: After 01/18/08

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10X | 008 |
| 2 | Year | N/A | N/A | Campbell CR10X |  |
| 3 | Day | N/A | N/A | Campbell CR10X |  |
| 4 | Time | N/A | N/A | Campbell CR10X | NZ standard time |
| 5 | Battery | Volts | Enclosure | Campbell CR10X |  |
| 6 | Lith Batt | Volts | Datalogger | Campbell CR10X |  |
| 7 | Int Temp | ºC | Datalogger | Campbell CR10X |  |
| 8 | Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Ave hourly. |
| 9 | Max Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Max hourly. |
| 10 | Min Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Min hourly. |
| 11 | RH | % | Air 1.6 m | Vaisala HMP45C |  |
| 12 | Solar Rad | W/m2 | Air 3 m | LiCor LI200X |  |
| 13 | Wind Speed | mph | Air 3 m | Met One; Replaced with R.M. Young 01/08 | Hourly average |
| 14 | Wind Dir | azimuth | Air 3 m | Met One; Replaced with R.M. Young 01/08 | True North |
| 15 | Wind Speed | mph | Air 3 m | Met One; Replaced with R.M. Young 01/08 | Max 10-s avg. |
| 16 | 1V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 17 | 1V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 18 | 1V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 19 | 1V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 20 | 2V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 21 | 2V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 22 | 2V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 23 | 2V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 24 | 3V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 25 | 3V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 26 | 3V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 27 | 3V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 29 | 4V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 29 | 4V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 30 | 4V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 31 | 4V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 32 | 5V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 33 | 5V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 34 | 5V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 35 | 5V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 36 | 6V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 37 | 6V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 38 | 6V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 39 | 6V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 40 | 7V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 41 | 7V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 42 | 7V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 43 | 7V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 44 | 8V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 45 | 8V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 46 | 8V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 47 | 8V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 48 | 9V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 49 | 9V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 50 | 9V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 51 | 9V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 52 | Soil Temp | ºC | Soil 2 cm | Campbell 107 Temperature |  |
| 53 | Soil Temp | ºC | Soil 7.5 cm | Campbell 107 Temperature |  |
| 54 | Soil Temp | ºC | Soil 15 cm | Campbell 107 Temperature |  |
| 55 | Soil Temp | ºC | Soil 22.5 cm | Campbell 107 Temperature |  |
| 56 | Soil Temp | ºC | Soil 30 cm | Campbell 107 Temperature |  |
| 57 | Soil Temp | ºC | Soil 37.5 cm | Campbell 107 Temperature |  |
| 58 | Soil Temp | ºC | Soil 45 cm | Campbell 107 Temperature |  |
| 59 | Soil Temp | ºC | Soil 60 cm | Campbell 107 Temperature |  |
| 60 | Soil Temp | ºC | Soil 75 cm | Campbell 107 Temperature |  |
| 61 | Soil Temp | ºC | Soil 7.5 cm | Campbell 107 Temperature |  |
| 62 | Soil Temp | ºC | Soil 15 cm | Campbell 107 Temperature |  |
| 63 | Soil Temp | ºC | Soil 30 cm | Campbell 107 Temperature |  |
| 64 | Air Temp | ºC | Air 2 m | Campbell 107 Temperature |  |

DATALOGGER OUTPUT: After 01/21/11

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Station ID | N/A | N/A | Campbell CR10X | 008 |
| 2 | Year | N/A | N/A | Campbell CR10X |  |
| 3 | Day | N/A | N/A | Campbell CR10X |  |
| 4 | Time | N/A | N/A | Campbell CR10X | NZ standard time |
| 5 | Battery | Volts | Enclosure | Campbell CR10X |  |
| 6 | Lith Batt | Volts | Datalogger | Campbell CR10X |  |
| 7 | Int Temp | ºC | Datalogger | Campbell CR10X |  |
| 8 | Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Ave hourly. |
| 9 | Max Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Max hourly. |
| 10 | Min Air Temp | ºC | Air 1.6 m | Vaisala HMP45C | Min hourly. |
| 11 | RH | % | Air 1.6 m | Vaisala HMP45C |  |
| 12 | Solar Rad | W/m2 | Air 3 m | LiCor LI200X |  |
| 13 | Wind Speed | mph | Air 3 m | Met One; Replaced with R.M. Young 01/08 | Hourly average |
| 14 | Wind Dir | azimuth | Air 3 m | Met One; Replaced with R.M. Young 01/08 | True North |
| 15 | Wind Speed | mph | Air 3 m | Met One; Replaced with R.M. Young 01/08 | Max 10-s avg. |
| 16 | 1V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 17 | 1V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 18 | 1V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 19 | 1V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 20 | 2V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 21 | 2V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 22 | 2V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 23 | 2V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 24 | 3V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 25 | 3V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 26 | 3V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 27 | 3V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 29 | 4V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 29 | 4V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 30 | 4V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 31 | 4V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 32 | 5V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 33 | 5V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 34 | 5V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 35 | 5V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 36 | 6V1 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 37 | 6V2 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 38 | 6V3 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 39 | 6V4 | Volts | Soil 30 cm | Vitel Soil Moisture/Temp |  |
| 40 | 7V1 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 41 | 7V2 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 42 | 7V3 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 43 | 7V4 | Volts | Soil 7.5 cm | Vitel Soil Moisture/Temp |  |
| 44 | 8V1 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 45 | 8V2 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 46 | 8V3 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 47 | 8V4 | Volts | Soil 15 cm | Vitel Soil Moisture/Temp |  |
| 48 | 9V1 | Volts | Soil 2 cm | Vitel Soil Moisture/Temp | Installed 1/21/11 |
| 49 | 9V2 | Volts | Soil 2 cm | Vitel Soil Moisture/Temp | Installed 1/21/11 |
| 50 | 9V3 | Volts | Soil 2 cm | Vitel Soil Moisture/Temp | Installed 1/21/11 |
| 51 | 9V4 | Volts | Soil 2 cm | Vitel Soil Moisture/Temp | Installed 1/21/11 |
| 52 | Soil Temp | ºC | Soil 2 cm | Campbell 107 Temperature |  |
| 53 | Soil Temp | ºC | Soil 7.5 cm | Campbell 107 Temperature |  |
| 54 | Soil Temp | ºC | Soil 15 cm | Campbell 107 Temperature |  |
| 55 | Soil Temp | ºC | Soil 22.5 cm | Campbell 107 Temperature |  |
| 56 | Soil Temp | ºC | Soil 30 cm | Campbell 107 Temperature |  |
| 57 | Soil Temp | ºC | Soil 37.5 cm | Campbell 107 Temperature |  |
| 58 | Soil Temp | ºC | Soil 45 cm | Campbell 107 Temperature |  |
| 59 | Soil Temp | ºC | Soil 60 cm | Campbell 107 Temperature |  |
| 60 | Soil Temp | ºC | Soil 75 cm | Campbell 107 Temperature |  |
| 61 | Soil Temp | ºC | Soil 7.5 cm | Campbell 107 Temperature |  |
| 62 | Soil Temp | ºC | Soil 15 cm | Campbell 107 Temperature |  |
| 63 | Soil Temp | ºC | Soil 30 cm | Campbell 107 Temperature |  |
| 64 | Air Temp | ºC | Air 2 m | Campbell 107 Temperature |  |

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 1 (sand) is used here for the Type A probes. Note that with this program negative values of soil water are converted to zero.

The temperature sensor went out for vitels at 7.5 cm depth (rep 1, rep 2, and rep 3) and at 15 cm (rep 2). The 107 soil temperatures at those respective depths were converted to a voltage and used in place of the bad temperature in the vitels. The four voltages were then processed (run through the hydra-probe program). These are the sensors and years that were corrected:

7.5 cm depth, rep 1, 2003 -2008

7.5 cm depth, rep 2, 2005-2008

7.5 cm depth, rep 3, 2003-2007

15 cm depth, rep 2, 2003-2008

DATA STORAGE AND ACCESS:

Contact Cathy Seybold or Deb Harms. Data can be downloaded from the NSSC website at <http://soils.usda.gov/survey/scan/>. Data are in Excel files organized by calendar year. Each file consists of a page containing all downloaded data for that year and 9 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 ºC), 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 ºC (datalogger temperature), AIR TEMP (ºC), RH (%), SOLAR RADIATION (w m-2), WIND SPEED (mph), WIND DIR (deg from true north), 1V1 (7.5-cm depth, Vitel stack 1), 1V2 (7.5-cm depth, Vitel stack 1), 1V3 (7.5-cm depth, Vitel stack 1), 1V4 (7.5-cm depth, Vitel stack 1), 2V1 (15-cm depth Vitel, stack 1), 2V2 (15-cm depth Vitel, stack 1), 2V3 (15-cm depth Vitel, stack 1), 2V4 (15-cm depth Vitel, stack 1), 3V1 (30-cm depth Vitel, stack 1), 3V2 (30-cm depth Vitel, stack 1), 3V3 (30-cm depth Vitel, stack 1), 3V4 (30-cm depth Vitel, stack 1), 4V1 (7.5-cm depth Vitel, stack 2), 4V2 (7.5-cm depth Vitel, stack 2), 4V3 (7.5-cm depth Vitel, stack 2), 4V4 (7.5-cm depth Vitel, stack 2), 5V1 (15-cm depth, Vitel stack 2), 5V2 (15-cm depth, Vitel stack 2), 5V3 (15-cm depth, Vitel stack 2), 5V4 (15-cm depth, Vitel stack 2), 6V1 (30-cm depth, Vitel stack 2), 6V2 (30-cm depth Vitel, stack 2), 6V3 (30-cm depth Vitel, stack 2), 6V4 (30-cm depth Vitel, stack 2), 7V1 (7.5-cm depth, Vitel stack 1), 7V2 (7.5-cm depth, Vitel stack 1), 7V3 (7.5-cm depth, Vitel stack 1), 7V4 (7.5-cm depth, Vitel stack 1), 8V1 (15-cm depth Vitel, stack 1), 8V2 (15-cm depth Vitel, stack 1), 8V3 (15-cm depth Vitel, stack 1), 8V4 (15-cm depth Vitel, stack 1), 9V1 (30-cm depth Vitel, stack 1), 9V2 (30-cm depth Vitel, stack 1), 9V3 (30-cm depth Vitel, stack 1), 9V4 (30-cm depth Vitel, stack 1), SOIL T (2 cm, stack 1) ºC, SOIL T (7.5 cm, stack 1) ºC, SOIL T (15 cm, stack 1) ºC, SOIL T (22.5 cm, stack 1) ºC, SOIL T (30 cm, stack 1) ºC, SOIL T (37.5 cm, stack 1) ºC, SOIL T (45 cm, stack 1) ºC, SOIL T (60 cm, stack 1) ºC, SOIL T (75 cm, stack 1) ºC, SOIL T (7.5 cm, stack 2) ºC, SOIL T (15 cm, stack 2) ºC, SOIL T (30 cm, stack 2) ºC, AIR T, WIND SPEED (mph).

**SOILS:** Megan Balks described and sampled soil for characterization.

CLASSIFICATION:

**LANDSCAPE:**

SLOPE: %

ASPECT:

ELEVATION: m

**VEGETATION:**

GROUND COVER: None

CANOPY COVER: None

**COMMENTS:** Note: NZ standard time is used here because Scott Base uses NZ time. Actually, NZ and Scott Base use daylight savings time during the summer.

**NOTES FOR NEXT STATION VISIT:**