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STATION RECORD

## BULL PASS, EAST

**ANTARCTICA**

**STATION:** Bull Pass, East (ANT012)

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| --- | --- | --- | --- | --- | --- |
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**LOCATION:** The site is on a ridge east of Bull Pass overlooking the Wright Valley.

GPS (1/17/12): 77° 30’ 07.9” S 77.50219444 S

162° 03’ 53.1” E 162.06475000 E

2729 ft elevation (832 m)

**INSTRUMENTATION:**

Summary

|  |  |  |
| --- | --- | --- |
| Quantity | Description | Comments |
| 1 | Campbell CR1000 datalogger S/N: 11843. Wiring panel S/N: 11543. | Installed 2012. |
| 1 | Campbell AM416 multiplexer S/N: 13080. | Installed 2012. |
| 1 | Campbell NL115 storage flash card module S/N: 5816. | Installed 2012. |
| 4 | Campbell BP24 24-amp-hr YUASA battery | Two installed 2012; one installed 2013; one installed 2016. |
| 1 | Campbell CH100 charger/regulator S/N: 4649. | Installed 2012. |
| 1 | Campbell MSX-20 Solar panel. | Installed 2012. |
| 1 | Campbell ENC 16/18 Enclosure. | Installed 2012. |
| 1 | Campbell CM6 2-m Tower | Installed 2012. |
| 8 | Hydra-probe soil moisture/temperature sensors, analog 2.5 volt. | Installed 2012. |
| 6 | Campbell 107 soil temperature sensors | Installed 2012. |
| 1 | MRC soil temperature probe | Installed 2012. |
| 2 | Campbell CS215 RH and Temp probe | Installed 2012. |
| 1 | Campbell 109 Air Temp Probe w/radiation shield. | Installed 2012. |
| 1 | Licor LI200X pyranometer solar radiation sensor w/leveling fixture and mounting arm | Installed 2012. |
| 1 | RM Young wind sensor | Installed 2012. |
| 1 | Campbell HMP45C Relative Humidity and Radiation Shield | Installed 2012. |
| 1 | Guy Kit | Installed 2012. |
|  |  |  |

**HISTORY:**  January 17, 2012: Station initiated. The station was started late afternoon of the 17th. A soil pit was open using a jack hammer (Hitachi rock breaker) to 120 cm. The Campbell 107s were placed at 2, 10, 25, 35, 50, and 75 cm depths. Hydra-probes were placed in two stacks at 2, 10, 25, and 50 cm depths. The 107s were placed near the MRC probe close to the first stack. Two CS215 soil RH sensors were placed at 2 and 10 cm depths in undisturbed soil away from the pit. The MRC probe was placed so the top was flush with the soil surface. The clock was set to NZ standard time. Checked sensor readings and everything was working okay. Added four desiccant packs to the enclosure (Nema box). Reinforced the solar panel and secured the turn-buckles of the guy wires to the tripod. The battery voltage was 13.9 volts and the lithium battery was 3.34 volts. Everything seemed to be working okay.

January 20, 2012: Downloaded the data to the RECON just before 8:30 am. Checked the data again, everything seemed to be working okay. Add third battery for next time.

December 17, 2012: Swapped flashed cards. Datalogger did not accept the flash card. Checked the program and it was not running. Checked the datalogger status and there were two errors, one under program status that was reset (something about to slow of run time) and the 2nd under status at the top (error indicated if occurs again contact Campbell Scientific, in red), the error was reset. Reloaded the program with the laptop and then everything seemed to be working okay. Guy cables were okay. Installed one new 24 Ahr battery on the ground in a small NEMA box. For next time replace all three batteries and datalogger.

January 6, 2014: Swapped memory cards. Replaced one 24 Ahr battery. Lithium battery was 3.47 volts. Battery voltage was 13.97 volts. Weather conditions: 6 mph winds, -0.7°C Temp.

January 15, 2015: 1200 NZDT. Downloaded datalogger and swapped memory cards. Lithium battery was 3.44 V. Difference between station and PC time was 2 min 30 sec. Snow cover about 10 cm deep. Weather measured on hand-held kestrel 3500; Measurement time1225 NZDT; Wind max 4 Knots, Temp -7 Degrees C, RH: 68 %, Dewpoint -11.4 Degrees C, Wetbulb -7.8 Degrees C, Air pressure 895 hPa.

January 15, 2016: Downloaded datalogger and swapped memory cards. Lithium battery was 3.47 V. Station clock was 2 min ahead; reset clock. MRC probe height was flush with the ground. Replace all three batteries. A fourth battery (24 Ahr) was installed. Pyranometer was levelled. A probe was partly exposed near the MRC probe.

January 3, 2017: Downloaded datalogger and swapped memory cards.

January 6, 2017: Swapped memory cards. Swapped loggers.

January 20, 2018: Swapped memory cards. Updated program, disconnected the two CS125s. Program would compile in CR Basic but not on the datalogger. There was a problem with the way the new dummy variable in place of the CS125 data was declared. Edited the program to record strings of NaN’s. As data is only written ever hour we were unable to test the edit properly. Everything appeared to be working when we left. The oldest battery was replaced.

January 12, 2019: Swapped memory cards. After looking at the 2018 data, adjustments made to the datalogger wiring last time caused all Vitels to not work and a few 107s were disconnected. The CS125’s temperature wires were not all disconnected.

December 27, 2019: Swapped memory cards. After looking at the 2018 data, adjustments made to the datalogger wiring in January 2018 caused all Vitels to not work and a few 107s were disconnected. The CS125’s temperature wires were not all disconnected.

February 5, 2021: Swapped memory cards. After looking at the 2018 data, adjustments made to the datalogger wiring in January 2018 caused all Vitels to not work and a few 107s were disconnected. The CS125’s temperature wires were not all disconnected. During the December 2019 visit to the station, the solar radiometer became disconnected, so there is no data.

December 3, 2021: Swapped memory cards and downloaded data. Swapped battery. Sand in box, so putty was adjusted. Calibration errors showing up in status. Clock ok.

December 12, 2022: Swapped memory cards and downloaded data. Reset clock to UTC. (12:50pm to 1:14am).

| MULTIPLEXER  POSITION | STACK | VITEL PROBE  # | DEPTH  (cm) | COMMENTS |
| --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 2 |  |
| 2 | 1 | 2 | 10 |  |
| 3 | 1 | 3 | 25 |  |
| 4 | 1 | 4 | 50 |  |
| 5 | 2 | 5 | 2 |  |
| 6 | 2 | 6 | 10 |  |
| 7 | 2 | 7 | 25 |  |
| 8 | 2 | 8 | 50 |  |
|  |  |  |  |  |

| MULTIPLEXER  POSITION | STACK | 107 TEMP  PROBE # | DEPTH  (cm) | COMMENTS |
| --- | --- | --- | --- | --- |
| 9H1 | 1 | 1 | 2 |  |
| 9L1 | 1 | 2 | 10 |  |
| 9H2 | 1 | 3 | 25 |  |
| 9L2 | 1 | 4 | 35 |  |
| 10H1 | 1 | 5 | 50 |  |
| 10L2 | 1 | 6 | 75 |  |

| MULTIPLEXER  POSITION | STACK | SENSOR  # | DEPTH  (cm) | COMMENTS |
| --- | --- | --- | --- | --- |
| 14H1 |  | RH1 | 2 | Relative humidity sensor. |
| 14L1 |  | RH2 | 10 | Relative humidity sensor. |
| 15H1 |  | RH3 |  | Not installed |
|  |  |  |  |  |

**DATA:**

DATALOGGER OUTPUT:

| COL | OUTPUT | UNITS | LOCATION | SENSOR | COMMENTS |
| --- | --- | --- | --- | --- | --- |
| 1 | Timestamp | N/A | N/A | Campbell CR1000 | ANT012 |
| 2 | Record # | N/A | N/A | Campbell CR1000 |  |
| 3 | Year | N/A | N/A | Campbell CR1000 |  |
| 4 | Day | N/A | N/A | Campbell CR1000 |  |
| 5 | Time | N/A | N/A | Campbell CR1000 | NZ standard time |
| 6 | Battery | Volts | Enclosure | Campbell CR1000 |  |
| 7 | Lithium Bat | Volts | Datalogger | Campbell CR1000 |  |
| 8 | Int Temp | ºC | Datalogger | Campbell CR1000 |  |
| 9 | Air Temp | ºC | Air 1.6 m | Campbell 109 |  |
| 10 | Air T Max | ºC | Air 1.6 m | Campbell 109 |  |
| 11 | Air T Min | ºC | Air 1.6 m | Campbell 109 |  |
| 12 | Air Temp | ºC | Air 2 m | HMP45C |  |
| 13 | RH | % | Air 2 m | HMP45C |  |
| 14 | Solar Rad | W/m2 | Air 2.2 m | LiCor LI200X |  |
| 15 | Wind Speed | mph | Air 2.2 m | RM Young sensor |  |
| 16 | Wind Dir | azimuth | Air 2.2 m | RM Young sensor |  |
| 17 | Wind Max | mph | Air 2.2 m | RM Young sensor |  |
| 18 | Wind speed | m/s | Air 2.2 m | RM Young sensor |  |
| 19 | Soil Temp | ºC | Soil 2 cm | Campbell CS215 probe | Disconnected 2018 |
| 20 | Soil RH | % | Soil 2 cm | Campbell CS215 probe | Disconnected 2018 |
| 21 | Soil Temp | ºC | Soil 10 cm | Campbell CS215 probe | Disconnected 2018 |
| 22 | Soil RH | % | Soil 10 cm | Campbell CS215 probe | Disconnected 2018 |
| 23 | Soil Temp | ºC |  | Campbell CS215 probe | Not installed |
| 24 | Soil RH | % |  | Campbell CS215 probe | Not installed |
| 25 | Soil Temp | ºC | Soil 2 cm | Campbell 107 |  |
| 26 | Soil Temp | ºC | Soil 10 cm | Campbell 107 |  |
| 27 | Soil Temp | ºC | Soil 25 cm | Campbell 107 |  |
| 29 | Soil Temp | ºC | Soil 35 cm | Campbell 107 |  |
| 29 | Soil Temp | ºC | Soil 50 cm | Campbell 107 |  |
| 30 | Soil Temp | ºC | Soil 75 cm | Campbell 107 |  |
| 31 | Soil Temp | ºC | Soil 0 cm | MRC Temperature Probe |  |
| 32 | Soil Temp | ºC | Soil 5 cm | MRC Temperature Probe |  |
| 33 | Soil Temp | ºC | Soil 10 cm | MRC Temperature Probe |  |
| 34 | Soil Temp | ºC | Soil 15 cm | MRC Temperature Probe |  |
| 35 | Soil Temp | ºC | Soil 20 cm | MRC Temperature Probe |  |
| 36 | Soil Temp | ºC | Soil 25 cm | MRC Temperature Probe |  |
| 37 | Soil Temp | ºC | Soil 30 cm | MRC Temperature Probe |  |
| 38 | Soil Temp | ºC | Soil 40 cm | MRC Temperature Probe |  |
| 39 | Soil Temp | ºC | Soil 50 cm | MRC Temperature Probe |  |
| 40 | Soil Temp | ºC | Soil 60 cm | MRC Temperature Probe |  |
| 41 | Soil Temp | ºC | Soil 70 cm | MRC Temperature Probe |  |
| 42 | Soil Temp | ºC | Soil 80 cm | MRC Temperature Probe |  |
| 43 | Soil Temp | ºC | Soil 95 cm | MRC Temperature Probe |  |
| 44 | Soil Temp | ºC | Soil 120 cm | MRC Temperature Probe |  |
| 45 | Resistance |  |  | MRC Temperature Probe | Reference value |
| 46 | 1V1 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 47 | 1V2 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 48 | 1V3 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 49 | 1V4 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 50 | 2V1 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 51 | 2V2 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 52 | 2V3 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 53 | 2V4 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 54 | 3V1 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 55 | 3V2 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 56 | 3V3 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 57 | 3V4 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 58 | 4V1 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 59 | 4V2 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 60 | 4V3 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 61 | 4V4 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 62 | 5V1 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 63 | 5V2 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 64 | 5V3 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 65 | 5V4 | Volts | Soil 2 cm | Hydra-probe Soil Moisture |  |
| 66 | 6V1 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 67 | 6V2 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 68 | 6V3 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 69 | 6V4 | Volts | Soil 10 cm | Hydra-probe Soil Moisture |  |
| 70 | 7V1 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 71 | 7V2 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 72 | 7V3 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 73 | 7V4 | Volts | Soil 25 cm | Hydra-probe Soil Moisture |  |
| 74 | 8V1 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 75 | 8V2 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 76 | 8V3 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |
| 77 | 8V4 | Volts | Soil 50 cm | Hydra-probe Soil Moisture |  |

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.

DATA STORAGE AND ACCESS:

Contact Cathy Seybold or Deb Harms. Data are in Excel files organized by calendar year. Data can be downloaded from the NSSC website at <http://soils.usda.gov/survey/smst/>.

**SOILS:**

CLASSIFICATION: At the time of sampling: Sandy-skeletal, mixed, hypergelic Typic Anhyorthels (or Haplorthels)

Sampled for characterization at time of station installation.

LAB PEDON NUMBER:

SITE IDENTIFICATION NUMBER: S12ANT001012

**LANDSCAPE:**

SLOPE: 5 %

ASPECT: South (180º)

ELEVATION: 832 m.

**VEGETATION:**

GROUND COVER: None

CANOPY COVER: None

**COMMENTS:** Soil described by Cathy Seybold and Holly Goddard. Soil samples collected for characterization.

**NOTES FOR NEXT STATION VISIT:**