

Meteorological Post Processing Documentation and Task Lists for 2014/2015

McMurdo Dry Valley Long Term Ecological Research (LTER)

This document compiles the steps taken to post-process raw meteorological data files and notes from station visits. Each numbered output value is identified by column header name, unit of measurement, and post-processing instruction. Station notes document datalogger time adjustments, sensor status, sensor and station maintenance, time of storage module changes, equipment and data problems, and other observations. Files are listed alphabetically by file name that begin with the station ID.

Station Reports

Lake Bonney Met Station (BOYM) 3
Bonney Riegel Met Station (BRMM) **Error! Bookmark not defined.**
Bonney Riegel Sensit Station (BRSM): 5
Bonney Riegel Theta Soil Station (BRTS): not visited 5
Lake Brownworth Met Station (BRHM) 6
Canada Glacier Met Station (CAAM) 8
Explorers Cove Met Station (EXEM) 8
Commonwealth Glacier Met Station (COHM) 9
F6 Met Station (F6MM) 10
F6 Sensit Met Station (F6SM) 11
Mt. Fleming Met Station (FLMM) **Error! Bookmark not defined.**
Lake Fryxell Met Station (FRLM) 13
Friis Hills Met Station (FRSM) 14
Lake Hoare Met Station (HOEM) 15
New Lake Hoare Met Station (HO2M) 16
Howard Glacier Met Station (HODM) 17
Miers Valley Met Station (MISM) 18
Taylor Glacier Met Station (TARM) 19
Lake Vanda Met Station (VAAM) 20
Lake Vida Met Station (VIAM) 21

Appendix

Array I.D. key
Date of Establishment

Prepared by: Maciej Obryk, 2014-15 Season, Portland State University, OR

File description and task list for files:

o1=omit from level 1

ok= no changes to get to level 1

rclow= reverse temperatures to mV and apply clow subroutine to mV values using Steinhart-Hart equation

bad= normally would be included in level 1 but number is suspect or know to be incorrect

flag= reasonable number but needs a note attached concerning its collection

Lowe= see note for relative humidity below

Data Flags

Definition	Flags	Post-processing	Data Manager
Out of Range	R	None	Flag as R, except flag as "U" when IceT20cm exceeds 0 degrees and "V" when IceT1m exceeds 0 degrees
Negative values zeroed out	Z	Converted to zero	Flag as Z
Bad Value - Value below zeroing value	T	Value omitted	Flag as F
Bad Value - Value is equal to -6999 or known to be questionable	B	None	Flag as B
Bad Value - Raw temp value (-53C and 32.79C) which exceeds the bracketed limited for bisection	F	Value omitted	Flag as B
SwRadOut is greater than a % of SwRadIN	S	None	Flag as S
Wdir and WDirStD zeroed out because WSpd = 0	N	Converted to zero	Flag as N
Value missing	M	None	Flag as M

Relative humidity correction note: All of the relative humidity (RH) values were corrected for a systematic error in the measurement created by an instrument manufacturer error. All RH data with air temperatures below freezing were corrected using the vapor pressure over ice (rather than over water which was used initially). The error became quite large for very cold temperatures (the correction could grow to around 30%). The polynomials used for the correction is based on Lowe (1977).

$$\begin{aligned}
 &= [\text{RH3m}] * (6.107799961 + [\text{AirT3m}] * (0.4436518521 + [\text{AirT3m}] * (0.01428945805 + [\text{AirT3m}] * (0.0002650648471 + \\
 &[\text{AirT3m}] * (0.000003031240396 + [\text{AirT3m}] * (0.00000002034080948 + 0.00000000006136820929 * [\text{AirT3m}])))))) / \\
 &(6.109177956 + [\text{AirT3m}] * (0.503469897 + [\text{AirT3m}] * (0.01886013408 + [\text{AirT3m}] * (0.0004176223716 + [\text{AirT3m}] * \\
 &(0.00000582472028 + [\text{AirT3m}] * (0.00000004838803174 + 0.0000000001838826904 * [\text{AirT3m}]))))))
 \end{aligned}$$

Lake Bonney Met Station (BOYM)

Filename: BonneyMet000.dat
 Author of this report: Maciej Obryk
 File Period: 11/21/2013 18:00 to 11/16/2014 11:00
 Sampling Frequency: sonic and prec. every 60 minutes, wind speed every 4 sec, other every 30 sec
 Averaging and Output Interval: every 15 minutes

Program Name

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	Ok
5	mean air temp. @ 3 meters (C)	rclow
6	corrected mean R.H. @ 3 meters (%)	Low correction
7	mean air temp. @ 1 meters (C)	rclow
8	mean solar flux going down (W/m2) – PY56364	Ok
9	mean solar flux going up (W/m2) – PY18633	Ok
10	mean horizontal wind speed (m/s)	Ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	Ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s)	Ok
15	minimum wind speed (m/s)	Ok
16	mean P.A.R. (micromols/s/m2) – Q28265	divide by 200, multiply by 292.51
17	mean soil temperature @ 0 cm in soil (C)	rclow
18	mean soil temperature @ 5 cm in soil (C)	rclow
19	mean soil temperature @ 10 cm in soil (C)	rclow
20	sample depth from sensor to surface (cm)	Measured depth * -100
21	mean up-facing pyrgeometer, rad. comp. (W/m2) - 30831F3	divide by 250; multiply by 277.01
22	mean up-facing pyrgeometer hemisphere temp	Eppley
23	mean up-facing pyrgeometer thermopile (W/m2)	Eppley
24	mean up-facing pyrgeometer case temp	Eppley
25	mean down-facing pyrgeometer, rad. comp. (W/m2) - 32059F3	divide by 250; multiply by 227.79
26	mean down-facing pyrgeometer hemisphere temp	Eppley
27	mean down-facing pyrgeometer thermopile (W/m2)	Eppley
28	mean down-facing pyrgeometer case temp	Eppley
29	sample precipitation (mm)	ok
30	sample of battery voltage	o1

Notes:

1. Station visit on 11/16/14 11:05 by Obryk and Alsip. All input values look good except for missing ultrasonic distance ranger. Replaced air temperature, RH, wind monitor (ser# WM57319), quantum (Licor), up-facing pyranometer (Licor ser# PY18633), storage module, and CR10x. Wind monitor is aligned north. Power off between 11:05 to 12:55.

Bonney Riegel Met Station (BRMM)

Filename: BonneyReigelMet000.dat
 Author of this report: Maciej Obryk
 File Period: 11/23/2012 17:00 to 11/16/2014 20:00
 Sampling Frequency: Wind every 4 secs, Sonic every 60 minutes, everything else 30 secs
 Averaging and Output Interval: every 15 minutes
 Program Name BRM1011v3

1	array I.D.	o1
2	Year_RTM L	ok
3	Day	ok
4	Time	ok
5	AirT30c_AVG L	rclow
6	SwRadIn_AVG L	ok
7	WSpd1m_S_WVT L	ok
8	WSpd1m_U_WVT L	o1
9	WDir1m_DU_WVT L	ok
10	WDir1m_SDU_WVT L	ok
11	WSpdMax1m L	ok
12	WSpdMin1m L	ok
13	WSpd3m_S_WVT L	ok
14	WSpd3m_U_WVT L	o1
15	WDir3m_DU_WVT L	ok
16	WDir3m_SDU_WVT L	ok
17	WSpdMax3m L	ok
18	WSpdMin1m L	ok
19	SoilT20cm_AVG L	rclow
20	Depth L	Measured depth * -100
21	Battery L	o1

Notes:

- 1) Station visit on Nov 30, 2014 11:44 by Maciej. CR10X clock forward 33 min. Adjusted Nov 30, 2014 11:47. Input values look good. Wind monitor black boxes pointing north. Ultrasonic height is 117 cm. Replaced wind monitor at 1m (ser# WM15249), wind monitor at 3m (ser# WM38186), CR10X. Storage module swapped on 16 Nov 2014 by John Priscu and Ben Alsip.
- 2) Post-processing: No missing data

Bonney Riegel Sensit Station (BRSM):

Filename: BonneyReigelSensit000.dat
Author of this report: Maciej Obryk
File Period: 11/23/2012 17:46 to 11/16/2014 19:46
Sampling Frequency:
Averaging and Output Interval:
Program Name

Notes:

- 1) Storage module swapped on 16 Nov 2014 by John Priscu and Ben Alsip. Station not serviced.
- 2) Post-processing: No missing data.

Bonney Riegel Theta Soil Station (BRTS): not visited, no data available

Lake Brownworth Met Station (BRHM)

Filename: BRHM_201415.dat
 Author of this report: Maciej Obryk
 File Period: 11/18/2013 12:00 to 11/10/2014 18:00
 Sampling Frequency: sonic every 60 minutes, wind speed every 4 sec, other every 30 sec
 Averaging and Output Interval: every 15 minutes
 Program Name BRHM_201112_v1

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	corrected mean R.H. @ 3 meters (%)	lowe correction
7	mean solar flux coming down (W/m ²)	ok
8	mean solar flux going up (W/m ²)	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m ²) – old Q32567, new Q30806	multiply by 1.3960
16	mean soil temperature @ 0 cm in soil (C)	rclow
17	mean soil temperature @ 5 cm in soil (C)	rclow
18	mean soil temperature @ 10 cm in soil (C)	rclow
19	sample depth from sensor to surface (cm) – new C2867	measured depth * -100
20	sample of battery voltage	o1

Notes:

1. Station visit on 11/10/14 at 17:36 by Maciej and Ben. Checked input values and wind alignment, all values look good, except the ultrasonic ranger is still not working.
2. Station maintenance: replaced quantum, CR10x, and installed new sonic. Power off at 1745, power on at 1817.
3. Post processing: No missing data. Sonic did not operate, flagged all data as bad. Time adjusted (forward) by 15min on 11/18/2013 12:30.

Canada Glacier (CAAM)

Filename: Canada000.dat
 Author of this report: Maciej Obryk
 File Period: 11/11/13 15:15 to 11/11/14 10:45
 Sampling Frequency: wind speed every 4 sec; all other every 30 sec
 Averaging and Output Interval: every 15 minutes
 Program Name CAAM_201112_v1

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3m (C)	rclow
6	corrected mean relative humidity (%)	Low correction
7	Aspirated mean air temp @ 3m (C)	rclow
8	mean solar flux coming down (W/m ²) – PY23277	ok
9	mean solar flux going up (W/m ²) - PY18395	ok
10	mean horizontal wind speed (m/s)	ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s)	ok
15	minimum wind speed (m/s)	ok
16	mV_therm_average	o1
17	mV_tpile_AVG	o1
18	Ice surface temp (C)	ok
19	sample battery voltage	o1

Notes:

1. Station visit on Nov 11, 2014 10:40 by Maciej, Ben, and Thomas. Input values and wind alignment looked good. Station legs adjusted by 8 cm.
2. Station maintenance on Nov 11, 2014: replaced wind monitor (WM15361), CR10x. Power off at 1046, on at 1130.
3. Post processing notes: No missing data. No sonic. Winter battery low was 10v, this battery will need to be replaced next season. RH needs replacement next season (values above 100% were flagged).

Explorers Cove Met Station (EXEM)

Filename: EXE_201415.dat0
Author of this report: Maciej Obryk
File Period: 1/31/14 10:45 to 11/10/14 16:00
Sampling Frequency: prec every 60 minutes, wind every 4 secs.; others: every 30 secs.
Averaging and Output Interval: every 15 minutes
Program Name: EXE1112v1.dld

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	lowe correction
7	mean solar flux coming up (W/m ²)	ok
8	mean solar flux going down (W/m ²)	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (mmols/s/m ²): Q33906	divide by 200, multiply by 289.95
16	mean soil temperature @ 0 cm (C)	rclow
17	mean soil temperature @ 5 cm (C)	rclow
18	mean soil temperature @ 10 cm (C)	rclow
19	sample precipitation (mm)	ok
20	sample battery voltage	ok

Notes:

1. Station visited on 11/10/14 at 16:11 by Maciej and Ben.
2. Station maintenance on 11/10/14: Power off at 16:14, on at 16:48. Replaced RH sensor head, CR10x. No sonic. Add precipitation fluid next season.
3. Post processing: no missing data. RH above 100% during winter (flagged).

Commonwealth Glacier Met Station (COHM)

Filename: Commonwealth000.dat, Commonwealth001.dat, Commonwealth002.dat
 Author of this report: Maciej Obryk
 File Period: 11/14/2013 15:45 to 11/11/2014 13:00
 Sampling Frequency: sonic every 60 minutes, wind every 4 secs.; other every 30 secs.
 Averaging and Output Interval: every 15 minutes
 Program Name: COHM_201314_v1

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean air temp. @ 1 meters (C)	rclow
8	mean solar flux coming down (W/m ²) - 33733F3	divide by 100; multiply by 119.62
9	mean solar flux going up (W/m ²) - 31435F3	divide by 100; multiply by 128.04
10	mean horizontal wind speed (m/s)	Ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	Ok
14	maximum wind speed (m/s)	Ok
15	minimum wind speed (m/s)	Ok
16	mean incoming IR pyrgeometer output (pins A-B) (W/m ²) - 32348F3	divide by 250; multiply by 262.47
17	mean incoming IR hemisphere temp. (pins A-C) (mv)	eppley
18	mean incoming IR thermopile output (pins F-G)(W/m ²)	eppley
19	mean incoming IR case temp. (pins E-D)(mv)	eppley
20	mean outgoing IR pyrgeometer output (pins A-B)(W/m ²) - 29786F3	divide by 250; multiply by 276.24
21	mean outgoing IR hemisphere temp. (pins F-G) (mv)	eppley
22	mean outgoing IR thermopile (pins A-C) (W/m ²)	eppley
23	mean outgoing IR case temp. (pins E-D) (mv)	eppley
24	ice temperature @ 50cm (original depth, mV*0.01)	Offline
25	ice temperature @ 100cm (original depth, mV*0.01)	Offline
26	IRT thermistor (mV)	o1
27	IRT raw ice surface temp mV	o1
28	Surface Temperature (C)	Ok
29	sample depth from sensor to surface (m)	measured depth* -100
30	sample of battery voltage	ok

Notes:

1. Station visit on 11/11/2014 at 13:05 by Maciej, Ben, and Thomas. Datalogger time and date are correct. Input values look. Wind in alignment. Height was not reset.
2. Station maintenance: Swapped CR10x. Power off at 13:10, on at 13:15.
3. Post processing: No missing data. Some RH values are above 100% (flagged). Replace sensor next season 2015/16.

F6 Met Station (F6MM)

Filename: F6_201415.dat
 Author of this report: Maciej Obryk
 File Period: 11/23/13 11:30 to 11/9/14 13:45
 Sampling Frequency: sonic every 60 min, wind every 4 sec; others: every 30 sec
 Averaging and Output Interval: every 15 min
 Program Name: FSM1112v2.dld

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	AirT@1m	rclow
6	AirT@30cm – average	rclow
7	AirT@30cm – sample	o1
8	SwRadIn. @ 82 cm (W/m ²) – PY25307	ok
9	mean horizontal wind speed (m/s) @ 1m	ok
10	resultant mean wind speed (m/s) @ 1m	o1
11	resultant mean wind direction (degrees from north) @ 1m	ok
12	standard deviation of wind direction (degrees) @ 1m	ok
13	maximum wind speed (m/s) @ 1m	ok
14	minimum wind speed (m/s) @ 1m	ok
15	mean horizontal wind speed (m/s) @ 3m	ok
16	resultant mean wind speed (m/s) @ 3m	o1
17	resultant mean wind direction (degrees from north) @ 3m	ok
18	standard deviation of wind direction (degrees) @ 3m	ok
19	maximum wind speed (m/s) @ 3m	ok
20	minimum wind speed (m/s) @ 3m	ok
21	mean soil temperature @ 20 cm in soil	rclow
22	Sonic Ranger Depth (cm)	Measured depth * -100
23	sample of battery voltage	o1

Notes:

1. Station visited on 11/10/2014 at 1405 by Maciek and Ben. CR10X time was 26min behind. Input values look good. Wind sensors are properly aligned. Snow has accumulated at site, covering entire area.
2. Station maintenance: power off at 14:15. Replaced wind monitor at 1m (ser# WM80554) and 3m (ser# WM15188), CR10x, and sonic (ser# C1946). Tighten met station down.
3. Post processing notes: Low voltage (~9V) during winter causing intermittent data recording mid-winter. Battery needs replacement.

F6 Sensit Met Station (F6SM)

Filename: F6sensit000.dat, F6sensit001.dat
Author of this report: Maciej Obryk
File Period:
Sampling Frequency: 60 seconds
Averaging and Output Interval: every 15 min
Program Name: F6S1112V1.dld

1	array I.D.	o1
2	Year	Ok
3	Day	Ok
4	Time	Ok
5	PC_1	Sensor failed
6	PC_2	Sensor failed
7	sample of battery voltage	Ok

Notes:

1. Station visited on 1/6/2015 by Maciek. CR10X time corrected from 20:15 to 16:32. SM4M replaced at 16:40.
2. Post processing notes: Failed sensors (only a few events). Recalibrate/replace next season. All data considered bad.

Mt. Fleming Met Station (FLMM)

Filename: FLMM_201415_002.DAT
Author of this report: Maciej Obryk
File Period: 12/4/2013 15:30 to 11/20/2014 10:30
Sampling Frequency: wind every 4 sec; others: every 30 sec
Averaging and Output Interval: every 15 min
Program Name: flmm_201112_v1.dld

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	AirT2m (C)	ok
6	RH1.3m (%)	Low correction
7	wspd_U_WVT (m/s)	ok
8	wspd_U_WVT (m/s)	o1
9	WDir DU (degrees)	ok
10	WDir Std Dev	ok
11	WSpd Max (m/s)	ok
12	WSpd Max (m/s)	ok
13	Pressure (mbar)	ok
14	Voltage	o1

Notes:

1. Station visit on 11/20/2014 by Thomas Nylén (storage module swapped). Station visited by Maciej and Kyle on 12/5/14 23:05 for service. Input values look good. Wind sensors are properly aligned.
2. Station maintenance: Power off 23:15, on 23:45. Wind monitor replaced (ser# WM80546), RH sensor head replaced (ser#Y2850072).
3. Post-processing: No missing data. Some RH values are above 100% (sensor head replaced upon visit). Winter battery power looks good.

Lake Fryxell Met Station (FRLM)

Filename LF_201415.dat
 Author of this report: Maciej Obryk
 File Period: 11/24/2013 10:15 to 11/10/2014 12:00
 Sampling Frequency: sonic every 60 min, wind every 4 sec; others: every 30 sec
 Averaging and Output Interval: every 15 min
 Program Name: FRL_201112_v2

1	array I.D.	o1
2	Year	Ok
3	Day	Ok
4	Time	Ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	lowe correction
7	mean solar flux coming down (W/m ²) - PY41099	ok
8	mean solar flux going up (W/m ²) - PY23276	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m ²) – old Q99253; new Q30794	divide by 200, multiply by 248.59
16	mean soil temperature @ 0 cm in soil (C)	rclow
17	mean soil temperature @ 5 cm in soil (C)	rclow
18	mean soil temperature @ 10 cm in soil (C)	rclow
19	sample depth from sensor to surface (m)	measurement * -100
20	sample of battery voltage	o1

Notes:

1. Station visited on 11/10/2014 at 12:02. CR10X time matches GPS time. Inputs look good. Wind sensor is in alignment.
2. Station maintenance on: Datalogger power off between 12:09, on 13:07. Replaced RH head at 12:20, wind sensor (ser# WM31281), quantum (ser# Q30794). Adjusted pyranometer level.
3. Post processing notes: No missing data. Some RH values above 100% (sensor head replaced). Several sonic values are too high (Replace the sensor next season).

Friis Hills Met Station (FRSM)

Filename: FrissHills001.dat
Author of this report: Maciej Obryk
File Period: 11/21/2013 11:30 to 12/5/14 22:00
Sampling Frequency: wind every 4 sec; others: every 30 sec
Averaging and Output Interval: every 15 min
Program Name: FRSM_201112_v1

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	Mean air temp. @ 2.5 m (C)	ok
6	Mean RH @ 2.5m (%)	ok
7	NetRad (W m ⁻²)	ok
8	NetRad (W m ⁻²) Correction	ok
9	mean horizontal wind speed (m/s)	ok
10	WSpd_U_WVT L	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	Wind Speed Max (m/s)	ok
14	Wind Speed Min (m/s)	ok
15	Pressure (mbar)	ok

Notes:

1. Station visit on 12/5/2014 at 22:00 by Maciej Obryk and Kyle Cronin. Input values look good. Wind sensor is in alignment. Power off 22:12, storage module swapped, power on 22:22.
2. Post-processing: No missing data. Replace RH sensor head next season (a few values are out of range)

Lake Hoare Met Station (HOEM)

Filename: LH_old_2014.DAT, LH_old_2014_002.DAT
 Author of this report: Maciej Obryk
 File Period: 11/12/2013 10:15 to 11/7/2014 18:45
 Sampling Frequency: sonic every 60 min, wind every 4 sec; prec every 1 minute, others, every 30 sec
 Averaging and Output Interval: every 15 minutes
 Program Name: HOEM_201112_V3

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	Low correction
7	mean air temp @ 1 meter (C)	rclow
8	mean solar flux coming down (W/m ²) – PY20561	ok
9	mean solar flux going up (W/m ²) – PY20523	ok
10	mean horizontal wind speed (m/s)	ok
11	resultant mean wind speed (m/s)	o1
12	resultant mean wind direction (degrees from north)	ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s)	ok
15	minimum wind speed (m/s)	ok
16	mean P.A.R. (mmols/s/m ²) Q17248	divide by 200, multiply by 317.70
17	mean soil temperature @ 0 cm	rclow
18	mean soil temperature @ 5 cm	rclow
19	mean soil temperature @ 10 cm	rclow
20	sample station barometric pressure (mbar)	ok
21	mean temperature difference 1&3 m (C)	multiply -1
22	distance to surface (m)	measurement * -100
23	Prec Accum Real-Time, Not Real-Time – Total	o1
24	Prec Accum. Not Real-Time – Total	o1
25	Prec Accum. Total Non Real-Time	o1
26	Prec Bucket Real-Time – Average	o1
27	Prec Sample Bucket Non Real-Time	Measurement – Previous Measurement
28	Prec Status	o1
29	sample of battery voltage	ok

Notes:

1. Station visit on 11/5/14 and 11/7/14 by Maciej Obryk. All channel inputs look good.
2. Station decommissioned on 11/7/14 by Maciej Obryk. New Station located on a higher ground 200 m north.
3. Post-processing: No missing data. RH values out of range were flagged.

New Lake Hoare Met Station (HO2M)

Filename: HOEM002.dat
 Author of this report: Maciej Obryk
 File Period: 11/9/2014 14:30 to 12/31/2014 13:30
 Sampling Frequency: wind every 4 sec.; others: every 30 sec.
 Averaging and Output Interval: every 15 minutes
 Program Name HOEM2_v1.dld

1	array I.D.	o1
2	Day	ok
3	Time	ok
4	mean air temp. @ 3 meters (C)	rclow
5	corrected mean R.H. @ 3 meters (%)	lowe correction
6	mean solar flux going down (W/m2) –old: PY28371 , new: PY23277	ok
7	mean solar flux going up (W/m2) – old: PY20562 , new: PY28170	ok
8	mean horizontal wind speed (m/s)	ok
9	resultant mean wind speed (m/s)	o1
10	resultant mean wind direction (degrees from north)	ok
11	standard deviation of wind direction (degrees)	ok
12	maximum wind speed (m/s)	ok
13	minimum wind speed (m/s)	ok
14	mean P.A.R. (micromols/s/m2) – old: Q23199 ; new: Q29765	bad
15	mean soil temperature @ 0 cm in soil (C)	rclow
16	mean soil temperature @ 5 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	sample of battery voltage	o1

Notes:

1. New station placed in service on Dec 27, 2012 at 20:30 by Thomas Nylan.
2. Station visit on 11/9/14 at 13:17 by Maciej Obryk. Date and time correct and all input values look good. Could not access data on the storage module (module was sent to Campbell Sci for data retrieval). Swapped storage module on 11/9/14 and revisited the station on 12/31/14 at 12:20 by Maciej Obryk.
3. Station maintenance: replaced quantum on 11/9/14, installed air temperature at 1m, sonic, precipitation gauge, second solar panel, and telemetry (unidirectional antenna) on 1/2/15. New program as of 11/2/15 is HOEM_201112_V3
4. Post-processing: No data missing. Needs new unique array ID.

Howard Glacier Met Station (HODM)

Filename: Howard000.dat
 Author of this report: Maciej Obryk
 File Period: 11/15/2013 16:00 to 11/11/2014 13:45
 Sampling Frequency: sonic every 60 min, wind every 4 sec; others: every 30 sec
 Averaging and Output Interval: every 15 minutes
 Program Name: HODM_201314_01.dld

1	array I.D.	o1
2	Year	ok
3	Day	Ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean solar flux coming down (W/m^2) - 30884F3	divide by 100; multiply by 120.77
8	mean solar flux going up (W/m^2) - 32057F3	divide by 100; multiply by 114.29
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	ice temperature @ 50cm (original depth, mV*0.01)	Offline; removed from data file 11/15/13
16	ice temperature @ 100cm (original depth, mV*0.01)	Offline; removed from data file 11/15/13
17	mean air temp @ 1 meter m (C)	rclow
18	mean rh @ 1 meter (%)	lowe correction
19	sample depth from sensor to surface (cm)	measured depth * -100
20	sample of battery voltage	o1

Notes:

1. Station visited station on 11/11/2014 by Maciej Obryk, Thomas Nysten, and Ben Alsip. Datalogger time, input values, and wind alignment look good.
2. Station maintenance on 11/11/2014. Station lowered by 14.5 cm. Replaced CR10x, sonic, SM4M, RH at 1 and 3m, and wind monitor (ser#WM47856). Sonic distance at 93.3 cm.
3. Post-processing: No missing data. RH values out of range were flagged (sensor head changed).

Miers Valley Met Station (MISM)

Filename: Miers000.dat, Miers001.dat
 Author of this report: Maciej Obryk
 File Period:
 Sampling Frequency: wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.
 Averaging and Output Interval: every 15 minutes
 Program Name MISM_201112_v1.dld

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean solar flux coming down (W/m ²) – old:PY28370; new:PY28169	ok
8	mean solar flux going up (W/m ²) – old: PY18656; new PY23250	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m ²) – old: Q9916, new:Q30803	Old: divide by 200, multiply by 306.60 New: divide by 200, multiply by 224.04
16	mean soil temperature @ 0 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	pressure (mbars)	ok
19	distance to surface (m)	ok
20	sample of battery voltage	o1

Notes:

1. Station visit on 11/17/2014 at 14:00 by Maciej Obryk and Kyle Cronin. Datalogger date and time are correct. Input values and wind alignment looks good. No ultrasonic at site, but station is still programed for measurement.
2. Station maintenance on 11/17/2014. Bring an extension arm for Sonic installation next season.
3. Post-processing: No missing data. No sonic ranger, all data flagged as missing. RH values out of range were flagged (replace RH head next season).

Taylor Glacier Met Station (TARM)

Filename: Taylormet000.dat
 Author of this report: Maciej Obryk
 File Period: 11/13/2013 13:30; to 12/5/2014 20:30
 Sampling Frequency: depth every 60 minutes, wind every 4 secs.; others: every 30 secs.
 Averaging and Output Interval: every 15 minutes
 Program Name TARM_201112_V1

1	array I.D.	o1
2	Year	o1
3	Day	ok
4	Time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean R.H. @ 3 meters (%)	lowe correction
7	mean air temp @ 1m (C)	rclow
8	mean RH at 1m (%)	lowe correction
9	mean solar flux coming down (W/m ²) – 32057F3	divide by 100; multiply by 113.38
10	mean solar flux going up (W/m ²) – 29762F3	divide by 100; multiply by 125.79
11	mean horizontal wind speed (m/s)	ok
12	resultant mean wind speed (m/s)	o1
13	resultant mean wind direction (degrees from north)	ok
14	standard deviation of wind direction (degrees)	ok
15	maximum wind speed (m/s)	ok
16	minimum wind speed (m/s)	ok
17	ice temp	Offline
18	surface temperature internal thermistor output (mV)	o1
19	surface temperature (mV)	o1
20	surface temperature (C)	ok
21	sample depth from sensor to surface (cm)	multiple by -100
22	sample of battery voltage	ok

Notes:

1. Station visit on 12/05/14 at 20:34 by Maciej Obryk and Kyle Cronin. All input values and wind alignment look good. Ultrasonic distance = 78.07 cm to ice surface.
2. Station maintenance on 12/05/14: station lowered by 12cm, fixed ultrasonic, replaced storage module, and tightened the wind gauge.
3. Post processing: No missing data. RH at 1 and 3m values out of range were flagged (replace RH sensor head next season).

Lake Vanda Met Station (VAAM)

Filename: VandaMet001.dat
 Author of this report: Maciej Obryk
 File Period: 11/25/2013 15:00 to 12/12/2014 15:00
 Sampling Frequency: wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.
 Averaging and Output Interval: every 15 minutes
 Program Name vaam_201112_v1

1	array I.D.	o1
2	day	ok
3	time	ok
4	mean air temp. @ 3 meters (C)	rclow
5	mean R.H. @ 3 meters (%)	lowe correction
6	mean solar flux coming down (W/m ²) - PY40424	ok
7	mean solar flux going up (W/m ²) - PY33485	ok
8	mean horizontal wind speed (m/s)	ok
9	resultant mean wind speed (m/s)	o1
10	resultant mean wind direction (degrees from north)	ok
11	standard deviation of wind direction (degrees)	ok
12	maximum wind speed (m/s)	ok
13	minimum wind speed (m/s)	ok
14	mean P.A.R. (micromols/s/m ²) - Q29773	divide by 200, multiply by 256.2893
15	mean soil temperature @ 0 cm in soil (C)	rclow
16	mean soil temperature @ 5 cm in soil (C)	rclow
17	mean soil temperature @ 10 cm in soil (C)	rclow
18	distance to surface (m)	measured depth * -100
19	sample of battery voltage	ok

Notes:

1. Station visit on 12/12/14 by Kyle Cronin and Neil Foley. CR10X date and time correct, input values and wind alignment look good.
2. Station maintenance on 12/12/14: Replaced RH sensor head (s/n# Y3340029), sonic, and storage module. Power off at 15:06, on at 15:23.
3. Post processing: No missing data. RH value out of range were flagged (sensor was replaced). Sonic value of 'zero' were flagged as bad data.

Lake Vida Met Station (VIAM)

Filename: VidaMet000.dat
 Author of this report: Maciej Obryk
 File Period: 11/20/2013 10:30 to 12/12/2014 16:00
 Sampling Frequency: wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.
 Averaging and Output Interval: every 15 minutes
 Program Name: Via1213v1

1	array I.D.	o1
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	Rclow
6	mean R.H. @ 3 meters (%)	Low correction
7	mean solar flux coming down (W/m ²) – PY23271	ok
8	mean solar flux going up (W/m ²) – PY20565; PY18400	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	o1
11	resultant mean wind direction (degrees from north)	ok
12	standard deviation of wind direction (degrees)	ok
13	maximum wind speed (m/s)	ok
14	minimum wind speed (m/s)	ok
15	mean P.A.R. (micromols/s/m ²) - Q30800	divide by 200, multiply by 222.23
16	mean soil temperature @ 0 cm in soil (C)	Rclow
17	mean soil temperature @ 5 cm in soil (C)	Rclow
18	mean soil temperature @ 10 cm in soil (C)	Rclow
19	distance to surface (m)	Measured depth * -100
20	sample of battery voltage	o1

Notes:

1. Station visit on 12/12/2014 at 16:07 by Kyle Cronin and Neil Foley.
2. Maintenance: swapped storage module, quantum (s/n Q20526), and sonic
3. Post Processing: double timestamp on 8/15/2014 10:45; date/time corrected by 15min. Min winter voltage 11.8.

Appendix

Array ID and date of established date

Array ID	ID	Name	Date of Station Establishment
1	HOEM	Lake Hoare	Dec 1, 1993 by Peter Doran, Retired on Nov 7, 2014 by Maciej Obryk
1A	HO2M	Lake Hoare	Dec 27, 2012 by Thomas Nylen
2	FRLM	Lake Fryxell	Jan 6, 1994 by Peter Doran
3	BOYM	Lake Bonney	November 24, 1993 by Peter Doran
4	COHM	Commonwealth Glacier	November 22, 1993 by Peter Doran
5	HODM	Howard Glacier	November 20, 1993 by Peter Doran
6	TARM	Taylor Glacier	November 21, 1994 by Peter Doran
7	VAAM	Lake Vanda	November 24, 1994 by Peter Doran
8	BRHM	Lake Brownworth	November 13, 1996 by Peter Doran and DJ Osborne
9	EXEM	Explorer's Cove	Nov 21, 1997 by Peter Doran, DJ Osborne and K. Sauter
10	CAAM	Canada Glacier (without Eddy Sensors)	Nov 20, 1995 by Karen Lewis; reinstalled Jan 13, 1998
11	VIAM	Lake Vida	November 24, 1995 by Peter Doran
12	????	RETIRED Hoare Submerged	???
13	????	RETIRED Fryxell Submerged	???
14	????	RETIRED Bonney East Submerged	???
15	????	RETIRED Canada Gl. (w/ Eddy Sensors)	???
16	????	RETIRED Bonney West Submerged	???
17	F6MM	F6 Snow Fence, Met, and Sensit	Changed to F6 Met and F6 Sensit by Hassan Basagic
18	BENM	RETIRED Beacon Valley	Jan 27, 2000 by Susan Kaspari, Thomas Nylen and Adrian Green. Retired in Dec 2012.
19	LHPM	RETIRED Lake Hoare Precipitatio	January 26, 2002 by Thomas Nylen (also Upper Howard)
19	UHDM	RETIRED Upper Howard Met	Temporary station Retired in 2004.
19	BLDM	RETIRED Blood Falls	Temporary station 11/14/2004
20	BRMM	Bonney Snow Fence	Changed to Bonney Riegel Met and Sensit by Hassan Basagic
21	FRSM	Friis Hills	Installed by Cuffey et al., ????; absorbed by LTER.
22	FLMM	Mt. Fleming	Installed 10/16/06 by Univ of Wisc AWS
25	GADM	RETIRED Garwood Valley	Installed by Peter Doran; Removed from service in 2011-12
25	MISM	Miers Valley	Installed by Nylen 2011-12
26	GAFM	Garwood Valley Ice Cliff	December 2010 by Thomas Nylen
27	HTDR	Lake Hoare TDR Station	08-09 Season by Hassan Basagic
92	EXSM	RETIRED Explorers Cove Sensity	Installed by Hassan Basagic; Retired Nov 2012
95	F6SM	F6 Snowfence Sensit	Installed by Hassan Basagic
96		Lake Fryxell Sensit	Installed by Hassan Basagic, Data combined with Fryxell station data
97		RETIRED Lake Hoare Sensit	Installed by Hassan Basagic, Retired 12/2010
98		RETIRED Lake Bonney Sensit	Installed by Hassan Basagic in 2005/06, Retired 12/2010
99	BRSM	Bonney Reigel Sensit	Installed by Hassan Basagic
102	BRSS	Bonney Reigel Soil Station	
103	F6SS	F6 Soil station	
104	LHS3	LH Soil station 2	
105	LHS4	LH Soil station 4	
112	BRTS	Bonney Reigel Theta Station	
113	F6TS	F6 Soil station	
114	LHS1	Lake Hoare Soil station 1 Theta	1/28/2003
115	LHS2	Lake Hoare Soil station 3 Soil	1/28/2003
119	HJHM	RETIRED Hjorth Hill Met	Installed by Peter Doran; Removed from service