Meteorological Post Processing Documentation and Task Lists for 2016/2017

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.

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Appendix

Array I.D. key

Date of Establishment

Prepared by: Krista Myers, 2016-17 Field Season, Louisiana State University

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	Т	Value omitted	Flag as F
Bad Value - Value is equal to -6999 or known to be questionable	В	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).

 $= [RH3m]*(6.107799961 + [AirT3m]*(0.4436518521 + [AirT3m]*(0.01428945805 + [AirT3m]*(0.0002650648471 + [AirT3m]*(0.000003031240396 + [AirT3m]*(0.00000002034080948 + 0.000000000006136820929 * [AirT3m]))))))) \\ (6.109177956 + [AirT3m]*(0.503469897 + [AirT3m]*(0.01886013408 + [AirT3m]*(0.0004176223716 + [AirT3m]*(0.00000582472028 + [AirT3m]*(0.0000004838803174 + 0.0000000001838826904 * [AirT3m])))))) \\$

Lake Bonney Met Station (BOYM)

Filename: BOYM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 11/18/2015 19:00 to 11/20/2016 05:15

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: BOYM_201112_v1

1	array I.D.	01
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 air temp. @ 1 meters (C)	rclow
8	mean solar flux; incoming (up-facing) (W/m2) Licor pyranometer; old SN: PY51356, new SN: PY27937	Ok
	mean solar flux; outgoing (down-facing) (W/m2)	
9	Licor pyranometer; SN: PY18656	Ok
10	mean horizontal wind speed (m/s)	Ok
11	resultant mean wind speed (m/s)	01
12	resultant mean wind direction (degrees from north)	Ok
13	standard deviation of wind direction (degrees)	ok
14	maximum wind speed (m/s) SN: WM57319	Ok
15	minimum wind speed (m/s)	Ok
16	mean P.A.R. (micromols/s/m2) Licor quantum; old SN: Q28265, new SN: Q29764	Q28265 divide by 200, multiply by 243.83 Q29764 divide by 200, multiply by 239.95
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) Eppley SN: 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
	mean down-facing pyrgeometer, rad. comp. (W/m2)	
25	Eppley SN: 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	01

- Station visited on 11/17/2016 by K. Myers and L. Winslow. All input values looked good.
- Power cycled station at 18:33; power unplugged at 18:40

- Replaced relative humidity sensor @ 3 m (old SN: U2730014, new SN: Y3250058)
- Replaced quantum sensor (old SN: Q28265, new SN: Q29764)
- Replaced upward facing Licor pyranometer (old SN: PY51356, new SN: PY27937)
- Replaced Campbell CR10X (new SN: X23868)
- Replaced Campbell SM4M storage module (P8: BOYM_201112_V1.dld)
- Downloaded data from StarDot camera

Bonney Riegel Met Station (BRMM)

Bonney Riegel Met Station was completely disassembled and removed on 11/26/2016 by K. Myers, J. Lawrence, and J. Darling.

Bonney Riegel Sensit Station (BRSM): not visited, no data available

Bonney Riegel Sensit Station was completely disassembled and removed on 11/26/2016 by K. Myers, J. Lawrence, and J. Darling.

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

Lake Brownworth Met Station (BRHM)

Filename: BRHM 2016 17 PROCESSED Updated 180222

Author of this report: Krista Myers, James McClure

File Period: 11/12/2015 13:45 to 12/10/2016 13:00

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
	mean solar flux; incoming (up-facing) (W/m²)	
7	Licor pyranometer; SN: PY25306	ok
	mean solar flux; outgoing (down-facing) (W/m²)	
8	Licor pyranometer; SN: PY28370	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	01
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
	mean P.A.R. (micromols/s/m²) –	multiply by 1.100817 (Q30806);
15	Licor quantum; old SN: Q30806, new SN: Q17248	multiply by 1.595018 (Q17248)
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) - C2867	measured depth * -100
20	sample of battery voltage	01

- Station visited on 12/10/2016 by K. Myers, J. Lawrence, and L. Winslow. All input values looked good.
- Power off at 1310
- Replaced relative humidity sensor @ 3 m (new SN: U2340002)
- Replaced quantum sensor (old SN: Q30806, new SN: Q17248), quantum sensor not totally level (was like that when we arrived). Will need new mount next year.
- Replaced Campbell CR10X (new SN: 19225)
- Replaced Campbell SM4M storage module (old SN: 5253, new SN: 6904, P8: BRHM_201112_V1.dld)
- 2 batteries observed, marked 2012 and 2013.
- Filled gap from visit 11/12/15 13:45 —> 1/1/16 0:00 (filled in with telemetry + reprocessed)
- Data downloaded from telemetry SM4M storage module download wasn't working. Gap in data from 4/13/2016 08:15 to 5/7/2016 23:00. (Could not locate data from telemetry or SM4M files)
- Data gap from 7/30/16 8:15 —> 8/1/16 8:30 (Could not locate data from telemetry or SM4M files)

Canada Glacier (CAAM)

Filename: CAAM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 11/7/2015 00:00 to 10/28/2016 11:30

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.	01
2	Year	ok
3	Day	ok
4	Time	ok
5	mean air temp. @ 3m (C)	rclow
6	corrected mean relative humidity (%)	Lowe correction
7	Aspirated mean air temp @ 3m (C)	rclow
8	mean solar flux; incoming (up-facing) (W/m²)	ok
	Licor pyranometer; SN: PY20222	
9	mean solar flux; outgoing (down-facing) (W/m²)	ok
	Licor pyranometer; SN: PY20565	
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	01
17	mV_tpile_AVG	01
18	Ice surface temp (C)	ok
19	sample battery voltage	o1

- Station visited on 10/28/2016 by K. Myers, J. Lawrence, L. Winslow, and T. Bellagamba. All input values looked good.
- Power off between 11:34 11:55
- Replaced relative humidity sensor at 3 m (old SN: U2520038, new SN: V1140044)
- Station lowered by ~30 cm and levelled.
- Downward facing pyranometer ~60 cm from ice after station was lowered.

Commonwealth Glacier Met Station (COHM)

Filename: COHM_2016_17_PROCESSED_Updated_180312

Author of this report: Krista Myers, James McClure

File Period: 11/7/2015 15:45 to 10/28/2016 07:00

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 v2

Prog	ram Name: COHM_201314_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 R.H. @ 3 meters (%)	lowe correction
7	mean air temp. @ 1 meters (C)	rclow
8	mean solar flux; incoming (up-facing) (W/m²) Eppley pyranometer; SN: 29776F3	divide by 100; multiply by 120.34
9	mean solar flux; outgoing (down-facing) (W/m²) Eppley pyranometer; SN: 29763F3	divide by 100; multiply by 120.05
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/m²) - 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/m²)	eppley
19	mean incoming IR case temp. (pins E-D)(mv)	eppley
20	mean outgoing IR pyrgeometer output (pins A-B)(W/m²) – 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/m2)	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
otos.		

- Station visited on 10/28/2016 by K. Myers, J. Lawrence, L. Winslow, and T. Bellagamba. All input values looked good.
- Power off between 12:49 13:48
- Accidentally replaced downward facing Eppley pyrgeometer with Eppley pyranometer (old SN: 29763F3, new SN: 30884F3). Need to replace next season. Data reported as "outgoing IR" is really outgoing shortwave radiation.
- Replaced Campbell CR10X (old SN: X36154, new SN: X13999)
- Replaced Campbell SM4M storage module with same program (P8: COHM_201314_V2.dld)
- Station lowered by ~27 cm and levelled.

- Southern leg of tripod pole in glacier may need replacement or remove top pole
- Data missing 12/3/15 13:45 + 14:00 (Could not locate data from telemetry or SM4M files)
- Data downloaded from telemetry SM4M storage module download wasn't working. Gap in data from 4/13/2016 10:30 to 5/19/2016 09:45. (Could not locate data from telemetry or SM4M files)
- On 8/16/16 7:15 (day 229) Julian day starts logging 1 day behind (post process side I changed Date column and Year. Date column equations = (C#+1) (Dates now match at end)
- Data missing day visited 10/28/16 7:00 —> 12:45 (Could not locate data from telemetry or SM4M files)

Explorers Cove Met Station (EXEM)

Filename: EXEM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 11/12/2015 00:00 to 12/10/2016 14:45

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

1106	an Name.	
1	array I.D.	01
2	year	ok
3	day	ok
4	time	ok
5	mean air temp. @ 3 meters (C)	rclow
6	mean RH @ 3 meters	lowe correction
	mean solar flux; incoming (up-facing) (W/m²)	
7	Licor pyranometer; SN: PY23275	ok
	mean solar flux; outgoing (down-facing) (W/m²)	
8	Licor pyranometer; SN: PY28167	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	01
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
	mean P.A.R. (mmols/s/m²)	
15	Licor quantum; old SN: Q33906, new SN: Q30804	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

- Station visited on 12/10/2016 by K. Myers, J. Lawrence, and J. Darling. All input values looked good.
- Power off between 14:50 15:09
- Replaced quantum sensor (new SN: Q30804)
- Replaced Campbell CR10X (new SN: X23866)
- Replaced Campbell SM4M storage module with same program (new SN: 6909, P8: EXE_1112_V1.dld)
- Screws on pyranometer and quantum sensor are stripped bring new screws and replace next year. Wasn't able to take out pyranometer because of this. Need to replace entire mount + upward facing pyranometer.
- 2 batteries observed, both from 2012

F6 Met Station (F6MM)

F6 Met Station was completely disassembled and removed on 11/9/2016 by J. Lawrence and L. Winslow.

F6 Sensit Met Station (F6SM)

F6 Sensit Met Station was completely disassembled and removed on 11/9/2016 by J. Lawrence and L. Winslow.

Mt. Fleming Met Station (FLMM)

Filename: FLMM_2016_17_PROCESSED_UPDATED_180223

Author of this report: Krista Myers, James McClure

File Period: 12/2/2015 13:15 to 12/9/2016 14:00
Sampling Frequency: wind every 4 sec; others: every 30 sec

Averaging and Output Interval: every 15 min

Program Name: FLMM_201213_V1.dld

1	array I.D.	o1
2	Year	ok
3	Day	ok
4	Time	ok
5	AirT2m (C)	ok
6	RH1.3m (%)	Lowe correction
7	wspd_U_WVT (m/s)	ok
8	wspd_U_WVT (m/s)	01
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	01

- Station visited on 12/9/2016 by K. Myers, J. Lawrence, and J. Darling. All input values looked good.
- Power off between 14:09 14:20
- Replaced anemometer (RM Young, new SN WM31296)
- Did not replaced Campbell SM4M storage module because new SM4M had different program (currently has P8: FLMM_201213_V1.dld replaced by T. Nylen 2014)
- Batteries are in very old rock boxes, should be replaced next year.
- Filled gap from visit 12/2/15 15:05 —> 1/1/16 0:00 (filled in with telemetry + reprocessed)
- Data gap from 12/15/15 8:45 -> 12/15/15 10:45 (Could not locate data from telemetry or SM4M files)
- Data deleted on 4/14/2016 16:45 because values unreliable (flagged as B). Station not recording data from 4/14/2016 17:00 4/26/2016 03:45. (filled in with telemetry + reprocessed)

Lake Fryxell Met Station (FRLM)

Filename FRLM_2016_17_PROCESSED.csv

Author of this report: Krista Myers

File Period: 12/12/2015 00:15 to 5/24/2016 04:30

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

riog	TAIL TAILE.	
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
	mean solar flux; incoming (up-facing) (W/m²)	
7	Licor pyranometer; SN: PY45665	ok
	mean solar flux; outgoing (down-facing) (W/m²)	
8	Licor pyranometer; SN: PY40423	ok
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	01
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
	mean P.A.R. (micromols/s/m²)	
15	Licor quantum; SN: Q30794	divide by 200, multiply by 229.63
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

- Station was found on its side in early November 2016. Main pole of tripod was snapped at joint. Main pole was replaced, and station was rectified.
- No data between May 24, 2015 and November 4, 2016
- Station visited on 11/4/2016 by L. Winslow. Time adjusted to match GPS time.
- Power off between 16:47 17:12
- Replaced Campbell CR10X (old SN: X23872, new SN: X23287)
- Height of ultra sonic measured manually as 57 cm.

Friis Hills Met Station (FRSM)

Filename: FRSM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 12/1/15 19:15 to 12/9/2016 11:45
Sampling Frequency: wind every 4 sec; others: every 30 sec

Averaging and Output Interval: every 15 min

Program Name: FRSM 201314 V1.dld

i i ogi	an Name. 11311_201314_V1.did	
1	array I.D.	01
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	01
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

- Station visited on 12/9/2016 by K. Myers, J. Lawrence, and J. Darling. All input values looked good.
- Power off between 11:45 12:10
- Attempted to replaced wind monitor (RM Young), however new anemometer was not working. Original anemometer was reinstalled.
- Replaced Campbell SM4M storage module (old SN: 6052, new SN: 4425) with same program (P8: FRSM_201314_V1.dld)
- Batteries are in very old rock boxes, should be replaced next year.

New Lake Hoare Met Station (HO2M)

Filename: HO2M_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 11/10/2015 7:45 to 10/27/2016

Sampling Frequency: wind every 4 sec.; others: every 30 sec.

Averaging and Output Interval: every 15 minutes

Program Name HOEM_201112_V2.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
	mean solar flux; incoming (up-facing) (W/m2)	
6	Licor pyranometer; SN: PY20562	ok
	mean solar flux; outgoing (down-facing) (W/m2)	
7	Licor pyranometer; SN: PY28371	ok
8	mean horizontal wind speed (m/s)	ok
9	resultant mean wind speed (m/s)	01
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
	mean P.A.R. (micromols/s/m2)	
14	Licor quantum; old SN: Q29765, new SN: Q29766	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

- Station visited on 10/27/2016 by K. Myers, J. Lawrence, and L. Winslow. All input values looked good.
- Power off between 15:25 17:50 (multiple power cycles during this time)
- Replaced quantum sensor (Licor, old SN: Q29765, new SN: Q29766)
- Replaced Campbell SM4M storage module (P8: HOEM_201112_V2.dld, new SN: 1464)
- Manual measurement of ultrasonic 98 cm above ground.

Howard Glacier Met Station (HODM)

Filename: HODM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 11/6/2015 13:30 to 10/28/2016 14:45

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_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; incoming (up-facing) (W/m²)	divide by 100; multiply by 121.51
	Eppley pyranometer; SN: 33733F3	
8	mean solar flux; outgoing (down-facing) (W/m²)	divide by 100; multiply by 121.21
	Eppley pyranometer; SN: 29777F3	
9	mean horizontal wind speed (m/s)	ok
10	resultant mean wind speed (m/s)	01
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	01

- Station visited on 10/28/2016 by K. Myers, J. Lawrence, L. Winslow, and T. Bellagamba. All input values looked good.
- Power off between 14:34 15:26
- Replaced relative humidity sensor @ 1 m (old SN: U2340010, new SN: V1140043)
- Replaced relative humidity sensor @ 3 m (old SN: U2730016, new SN: Y2850072)
- Replaced wind monitor (RM Young, old SN: WM47856, new SN: WM85183)
- Replaced Campbell CR10X (old SN: X40361, new SN: X23165)
- Replaced Campbell SM4M storage module (old SN: 5255, new SN: 6902) with same program (P8: HODM_201314_V1.dld)
- Station lowered by 35 cm and levelled.

Miers Valley Met Station (MISM)

Filename: MISM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 2/7/2016 9:15 to 12/13/2016 13:45

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

Prog	alli Nallie Iviisivi_zotttiz_vi.diu	
1	array I.D.	01
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; incoming (up-facing) (W/m²) Licor pyranometer; old SN: PY28169, new SN: PY40424	ok
8	mean solar flux going up; outgoing (down-facing) (W/m²) Licor pyranometer; old SN: PY23250, new SN: PY45668	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/m²) Licor quantum; SN: Q23204	Divide by 200, multiply by 237.88
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

- Station visited on 12/13/2016 by K. Myers and J. Lawrence. All input values looked good.
- Power off between 13:58 14:17
- Replaced upward facing Licor pyranometer (new SN: PY40424)
- Replaced downward facing Licor pyranometer (new SN: PY45668)
- Replaced Campbell SM4M storage module (old SN: 5989, new SN: 1466) with same program (P8: MISM_201112_V1.dld)
- Replaced relative humidity sensor @ 3 m (new SN: U2020021)
- Took GPS of met station (78° 6.068, 163° 47.259)

Taylor Glacier Met Station (TARM)

Filename: TARM_2016_17_PROCESSED

Author of this report: Krista Myers

File Period: 12/1/2015 19:30 to 12/9/2016 10:15

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.	01	
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	
	mean solar flux; incoming (pointing up) (W/m²) –		
9	Eppley pyranometer 31437F3	divide by 100; multiply by 125.47	
	mean solar flux; outgoing (pointing down) (W/m²) –		
10	Eppley pyranometer 31435F3	divide by 100; multiply by 130.38	
11	mean horizontal wind speed (m/s)	ok	
12	resultant mean wind speed (m/s)	01	
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	

- Station visited on 12/9/2016 by K. Myers, J. Lawrence, and J. Darling. All input values looked good.
- Power off between 10:25 11:00
- Station lowered by ~30 cm and levelled.
- Replaced Campbell SM4M storage module (new SN: 1468) with same program (P8: TARM_201112_V1.dld)
- Replaced Campbell CR10X (old SN: X36197, new SN: X28585)
- Replaced ultra sonic internal transducer. Initial height of sonic was 91 cm. New height after station was lowered was 62 cm.
- (2) batteries observed, last changed 2011 & 2012

Lake Vanda Met Station (VAAM)

Filename: VAAM 2016 17 PROCESSED Updated 180226

Author of this report: Krista Myers, James McClure

File Period: 12/1/2015 14:30 to 12/8/2016 14:15

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

1108	vaaiii_zo1112_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
	mean solar flux; incoming (up-facing) (W/m²)	
6	Licor pyranometer; SN: PY27929	ok
	mean solar flux going up (W/m²)	
7	Licor pyranometer; SN: PY28348	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
	mean P.A.R. (micromols/s/m²)	
14	Licor quantum; SN: Q20275	divide by 200, multiply by 255.4983
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

- Station visited on 12/8/2016 by K. Myers, J. Lawrence, J. Darling, and T. Nylen. All input values looked good.
- Power off between 14:25 16:26
- Station was moved from near Kiwi huts to southern side of the Onyx due to encroaching lake levels. Old location was on peninsula and would be underwater in a few years.
- Replaced relative humidity sensor @ 254 cm above ground
- Replaced sonic internal transducer
- Sensor heights at new location: temp 244 cm; upward facing pyranometer 250 cm; wind 284 cm
- Manual measurement of ultra sonic 60.5 cm
- Solar panel is falling apart will need to replace next year
- New met station location: -77.52567, 161.69129
- Telemetry used for this time period because SM4M was not collected in the field. Some data gaps. Will need to reprocess when SM4M data is downloaded in 2017/18 season.
- Filled gap from visit 12/1/15 14:25 -> 1/1/16 0:00 (filled in with telemetry + reprocessed)
- Updated PAR correction # for Quantum SN: Q20275 installed 12/1/15
- Data gap 1/15/2016 2:15 —> 2/5/2016 22:45 (Could not locate data from telemetry or SM4M files)
- Data gap 4/13/2016 8:00 —> 5/8/2016 22:45 (Could not locate data from telemetry and No SM4M file available)

•	Data gap 7/30/2016 8:00 —> 8/1/2016 8:15 (Could not locate data from telemetry and No SM4M file available)

Lake Vida Met Station (VIAM)

Filename: VIAM 2016 17 PROCESSED Updated 180312

Author of this report: Krista Myers, James McClure

File Period: 12/2/2015 17:45 to 12/10/2016 12:15

Sampling Frequency: wind every 4 secs.; ultrasonic every 1 hr; others every 30 secs.

Averaging and Output Interval: every 15 minutes
Program Name VIA1213v1.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
	mean solar flux; incoming (up-facing) (W/m²)	
7	Licor pyranometer; SN: PY20523	ok
	mean solar flux; outgoing (down-facing) (W/m²)	
8	Licor pyranometer; SN: PY56364	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
	mean P.A.R. (micromols/s/m²)	divide by 200, multiply by 182.48 (Q20526)
15	Licor quantum; old SN: Q20526, new SN: Q30805	divide by 200, multiply by 136.80 (Q30805)
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

- Station visited on 12/10/2016 by K. Myers, J. Lawrence, and J. Darling. All input values looked good.
- Power off between 12:18 12:33
- Replaced quantum sensor (Licor, old SN: Q20526, new SN: Q30805)
- Replaced relative humidity @ 3m (Vaisala, old SN: Y2820008, new SN: U2730015)
- Replaced Campbell SM4M storage module (new SN: 6917) with same program (P8: VIA201213V1.dld)
- Manual measurement of ultra sonic 58 cm
- Filled data gap from visit 12/2/15 17:40 —> 1/1/16 0:00 (filled in with telemetry + reprocessed)
- Additional gap in data from 3/17/2016 20:00 to 5/8/2016 01:00 due to failure in telemetry system (filled in with telemetry + reprocessed)

Appendix

Array ID and date of established date

1 HOEM Lake Hoare Dec 1, 1993 by Peter Doran, Retired on Nov 7, 2014 by Maciej Obryk 2 FRLM Lake Fryxell Ian 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 22, 1993 by Peter Doran 6 TARM Taylor Glacier November 22, 1993 by Peter Doran 7 VAAM Lake Vanda November 24, 1994 by Peter Doran, moved to new location due to lake level rise on 12/8/2016 (new 65 = -77.5267, 16.69129) 8 BRHM Lake Brownworth November 33, 1996 by Peter Doran and DJ Osborne 9 EXEM Explorer's Cove Nov 21, 1997 by Peter Doran and DJ Osborne 10 CAAM Canada Glacier (without Eddy November 33, 1996 by Peter Doran and DJ Osborne and K. Sauter 11 VIAM Lake Vida November 24, 1995 by Peter Doran and DJ Osborne and K. Sauter 12 ???? RETIRED Hoare Submerged ???? 13 ???? RETIRED Dorane yeast Submerged ???? 14 ???? RETIRED Bonney West Submerged ???? 15 PETER ED ROMA PETER David Submerged ???? 16 ???? RETIRED Bonney West Submerged ???? 17 FGMM FG Snow Fence, Met, and Sensit Peter Doran Adrian Green. Retired in Dec 2012. 18 BRMM BONNE SNOW Fence Met, and Sensit Peter Doran November 24, 1995 by Peter Doran Peter Doran ???? 19 LIPM RETIRED Upper Howard Met Peter Doran Peter Doran ???? 19 LIPM RETIRED Upper Howard Met Peter Doran ???? 10 LIPM RETIRED Upper Howard Met Peter Doran ???? 11 FSSM Firis Hills Installed Dy Lipm Howard Peter Doran ???? 12 FSSM Firis Hills Installed Dy Lipm Howard November 24, 1995 by Peter Doran ???? 13 PORT RETIRED SNOW Peter Doran Peter Doran ???? 14 Lipm RETIRED Lake Hoare Pecipitatio Percepitatio Peter Doran Peter	Array ID	ID	Name	Date of Station Establishment
2	1	HOEM	Lake Hoare	Dec 1, 1993 by Peter Doran, Retired on Nov 7, 2014 by Maciej Obryk
SOVM	1A	HO2M	Lake Hoare	Dec 27, 2012 by Thomas Nylen
COHM	2	FRLM	Lake Fryxell	Jan 6, 1994 by Peter Doran
HODM	3	BOYM	Lake Bonney	November 24, 1993 by Peter Doran
TARM	4	COHM	Commonwealth Glacier	November 22, 1993 by Peter Doran
November 24, 1994 by Peter Doran, moved to new location due to lake level rise on 12/8/2016 (new GPS = -77.5267, 161.69129) Reference	5	HODM	Howard Glacier	November 20, 1993 by Peter Doran
12/8/2016 (new GPS = -77.52567, 161.69129)	6	TARM	Taylor Glacier	November 21, 1994 by Peter Doran
8BRHMLake BrownworthNovember 13, 1996 by Peter Doran and DJ Osborne9EXEMExplorer's CoveNov 21, 1997 by Peter Doran, DJ Osborne and K. Sauter10CAAMCanada Glacier (without Eddy Sensors)Nov 20, 1995 by Karen Lewis; reinstalled Jan 13, 199811VIAMLake VidaNovember 24, 1995 by Peter Doran12????RETIRED Hoare Submerged???13????RETIRED Hoare Submerged???14????RETIRED Bonney East Submerged???15????RETIRED Bonney Best Submerged???16????RETIRED Bonney West Submerged???17F6MMF6 Snow Fence, Met, and SensitChanged to F6 Met and F6 Sensit by Hassan Basagic18BERMRETIRED Beacon ValleyJan 27, 2000 by Susan Kaspari, Thomas Nylen and Adrian Green. Retired in Dec 2012.19LHPMRETIRED Blood FallsTemporary station Retired in 2004.19LHPMRETIRED Blood FallsTemporary station Retired in 2004.20BRMMBonney Snow FenceChanged to Bonney Riegel Met and Sensit by Hassan Basagic21FRSMFris HillsInstalled by Cuffey et al., 27??? absorbed by LTER.22FLMMMt. FlemingInstalled by Veter 2011.1225GADMRETIRED Sarbores Cove SensityInstalled by Nylen 2011.1226GAFMGarwood Valley Icc CliffDecember 2010 by Thomas Nylen27HTDRLake Hoare TDR StationInstalled by Hassan BasagicRetired 10/201028EX	7	VAAM	Lake Vanda	November 24, 1994 by Peter Doran, moved to new location due to lake level rise on
SEXEM Explorer's Cove Nov 21, 1997 by Peter Doran, DJ Osborne and K. Sauter Nov 20, 1995 by Karen Lewis; reinstalled Jan 13, 1998				12/8/2016 (new GPS = -77.52567, 161.69129)
CAAM Canada Glacier (without Eddy Sensors) 11 VIAM Lake Vida November 24, 1995 by Raren Lewis; reinstalled Jan 13, 1998 12 ???? RETIRED Hoare Submerged ??? 13 ???? RETIRED Fryxell Submerged ??? 14 ???? RETIRED Enanda Gl. (w/ Eddy ??? 15 ???? RETIRED Enanda Gl. (w/ Eddy ??? 16 ???? RETIRED Bonney West Submerged ??? 17 F6MM F6 Snow Fence, Met, and Sensit Passons Passan Basagic Passons Passo	8	BRHM	Lake Brownworth	November 13, 1996 by Peter Doran and DJ Osborne
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MISM Miers Valley Installed by Nylen 2011-12 GAFM Garwood Valley Ice Cliff December 2010 by Thomas Nylen Net The Lake Hoare TDR Station O8-09 Season by Hassan Basagic EXSM RETIRED Explorers Cove Sensity Installed by Hassan Basagic; Retired Nov 2012 F6SM F6 Snowfence Sensit Installed by Hassan Basagic, Data combined with Fryxell station data Installed by Hassan Basagic, Data combined with Fryxell station data Installed by Hassan Basagic, Retired 12/2010 RETIRED Lake Hoare Sensit Installed by Hassan Basagic, Retired 12/2010 RETIRED Lake Bonney Sensit Installed by Hassan Basagic in 2005/06, Retired 12/2010 BRSM Bonney Reigel Sensit Installed by Hassan Basagic, Retired Dec 2016 BRSS Bonney Reigel Soil Station TOS BRSS F6 Soil station LHS3 LH Soil station 2 LHS4 LH Soil station 4 LHS5 Bonney Reigel Theta Station TABANA Banney Reigel Theta Station LHS1 Lake Hoare Soil station 1 Theta Interval 1/28/2003 LHS2 Lake Hoare Soil station 3 Soil 1/28/2003	22	FLMM	Mt. Fleming	Installed 10/16/06 by Univ of Wisc AWS
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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, Retired Dec 2016 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	95	F6SM	F6 Snowfence Sensit	Installed by Hassan Basagic
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·	115	LHS2	Lake Hoare Soil station 3 Soil	
	119	HJHM	RETIRED Hjorth Hill Met	Installed by Peter Doran; Removed from service