Lake Lacawac, Bruce R. Hargreaves, Lehigh University (brh0@lehigh.edu, http://www.lehigh.edu/~brh0) 41°22.5'N 75°17.3'W elevation 428m

24 Marchl 2012: platform moved to lake center, 12-1:00pm 3Nov 2012: platform move to dock by 12N

The water level sensor (referenced to dock) settles for several days after moving platform to lake center and thus underestimates water level during this period.

Dec11: Tw12 appears to be failing (drifting upward); need to check or replace when possible

5280	ft/mile
1609.3	m/mile

Std pressure at sea level =1 atm=760 mm Hg=29.92" Hg=1013.2 mbars

Std pressure at 428m elevation =724 mm Hg, 29.61 in. Hg, (965.2 mbars)

H310 sensor depth & Lake level are based on differential pressure sensor with ca 0.1mm resolution & vertical position referenced to bottom of lake. Sensor PSIG converted to depth using density of water at 4oC (1.43321 psi/m) Lake level is referenced also to lower frame of dock at SE corner (2003-May2005) (Actual water level at dock varies seasonally with density of water column and hourly from precip, runoff, evaporation, seepage & outflow. Outflow also varies with status of beaver dam).

rain sum (in.) Aug-Sep2011=> 11.52

	Tair avg F	Tair max F	Tair min F		Rain-in	WS-mph	WS max mph					Tw 0.1m F	Tw 0.5m F	Tw 1m F	Tw 2m F	Tw 3m F	Tw 4m F	Tw 5m F	Tw 6m F	Tw 8m F	Tw 10m F	Tw 12m F					
	38.2	61.4	23.4		0.80	2.6	21					39.7	39.8	39.7	39.5	39.5	39.6	39.7	39.6	39.5	39.6	39.5					
Month summa avg Tw	Tair avg-C	Tair Hi-C	Tair Min-C	RHair-%	Rain-mm	WS-m/s	WS Max-m/s	WDIR-deg	Barom-mb	Sum Rad W/m2	Sum PAR uM/m2/s	Tw 0.1m	Tw 0.5m	Tw 1m	Tw 2m	Tw 3m	Tw 4m	Tw 5m	Tw 6m	Tw 8m	Tw02.1m	Tw02.6m	H310_z (m)	Lakelevel-mm (4oC)	cumul. rain-mm	Batt min-V	RH% CR10 enc	RH% MUX enc
4.2	3.5	16.3	-4.8	95.0	20.4	1.2	9.5	205.3	967.3	42337494	85	4.3	4.3	4.3	4.2	4.2	4.2	4.3	4.2	4.2	4.2	4.2	2.1	109.9	20.4	12.4	14.7	14.3

month (All)

Data

Location	% records	Date	Day of Yr	Tair avg-C	Tair Hi-C	Tair Min-C	RHair-%	Rain-mm	WS-m/s	WS Max m/s	WDIR-deg	Barom-mb	Sum Rad J/m2	Sum PAR Mol/m2	Tw 0.1m	Tw 0.5m	Tw 1m	Tw 2m	TW3m	TW4m	TW5m	TW6m	TW8m	TW H310-C	TW12m	H310 depth-m (4oC)	Lakelevel-mm (4oC)	cumul. rain-mm	Batt min-V	RH% CR10 enc	RH% MUX enc
ND	100%	12/1/2012	336	-0.7	0.5	-1.9	102.5	0.1	1.5	3.9	84	977.4	1331866	3	3.69	3.78	3.77	3.68	3.70	3.69	3.69	3.75	3.66	3.7	3.63	2.1	117.1	0.100	12.4	13.4	14.1
ND	100%	12/2/2012	337	4.5	9.7	0.4	100.4	1.0	0.7	4.5	175	971.0	4561593	9	3.80	3.95	3.94	3.88	3.91	3.86	3.88	3.90	3.90	3.9	3.94	2.1	114.6	1.100	12.4	13.7	13.6
ND	100%	12/3/2012	338	8.3	11.5	4.3	97.3	0.0	1.0	6.5	244	970.2	5957577	12	4.39	4.40	4.37	4.30	4.29	4.28	4.27	4.26	4.24	4.3	4.27	2.1	112.9	1.100	12.4	15.5	13.6
ND	100%	12/4/2012	339	10.4	16.3	5.7	97.5	0.9	0.6	5.9	180	968.8	5974114	12	5.20	4.68	4.47	4.28	4.33	4.32	4.28	4.36	4.34	4.4	4.36	2.1	111.0	2.000	12.5	16.2	13.5
ND	100%	12/5/2012	340	4.8	14.4	-2.1	82.3	2.5	3.3	9.5	308	966.4	3040139	6	4.74	4.75	4.71	4.57	4.53	4.56	4.56	4.44	4.45	4.6	4.47	2.1	110.4	4.500	12.5	15.1	16.8
ND	100%	12/6/2012	341	-1.9	3.8	-4.8	75.8	0.0	1.4	7.4	225	972.1	7876862	15	4.34	4.37	4.31	4.14	4.09	4.14	4.23	4.08	4.10	4.2	4.17	2.1	105.7	4.500	12.4	14.8	14.8
ND	100%	12/7/2012	342	0.0	2.0	-2.6	94.7	5.5	0.3	2.6	178	966.8	1273720	3	3.93	4.25	4.24	4.15	4.14	4.25	4.37	4.28	4.23	4.2	4.20	2.1	103.9	10.000	12.4	13.6	14.3
ND	100%	12/8/2012	343	5.2	10.2	2.0	102.8	4.5	0.3	2.6	170	961.2	3804281	8	4.41	4.34	4.28	4.14	4.15	4.26	4.46	4.29	4.23	4.2	4.26	2.1	109.7	14.500	12.4	14.7	13.9
ND	100%	12/9/2012	344	3.7	8.3	1.6	93.4	1.0	1.8	6.3	160	968.5	2724936	6	4.30	4.33	4.33	4.18	4.16	4.20	4.31	4.17	4.12	4.2	4.15	2.1	108.0	15.500	12.4	14.6	13.9
ND	100%	12/10/2012	345	7.5	11.6	3.2	101.8	3.9	0.8	9.2	188	954.9	1767610	4	4.64	4.45	4.40	4.23	4.23	4.28	4.39	4.27	4.21	4.3	4.22	2.1	108.7	19.400	12.4	15.8	14.2
ND	100%	12/11/2012	346	1.7	4.1	-1.0	93.0	1.0	1.8	7.2	307	960.9	4019763	8	4.36	4.43	4.41	4.27	4.25	4.29	4.38	4.23	4.19	4.3	4.23	2.1	109.6	20.400	12.4	15.0	14.2
ND	25%	12/12/2012	347	-1.9	-0.9	-2.4	98.8	0.0	0.4	1.6	246	969.9	5034	0	3.81	4.33	4.30	4.17	4.17	4.23	4.47	4.30	4.22	4.3	4.24	2.1	107.8	20.400	12.4	14.2	15.0
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														
	0%																														

Lake water & energy budget daily summary from hourly data (negative values: loss from lake; runoff & seepage term is residual after adjusting lake level change for all others)

Ratio of lake watershed to lake area: 2.6176758 Runoff & seepage as % of watershed area precip: -0.1%

Grand sum/avg	3.45	4.29	4.34	4.29	4.16	4.16	4.20	1.0	42337494	-2027	-11.1	20.4	-0.1	-2.8	0.0

SumTerrevap2=AirVPD,mbar*WS,m/s*s

Data

DATE	DayOfYr	AvgTair C	AvgTw 0.1m	AvgTw0.5m	Avg Tw1m	Avg Tw2m	Avg Tw3m	Avg Tw4m	AvgWS CSI m/s	SumRad J/m2	SumH Evap (*0.9=KJ/m2)	Sum Lk_lvl chg (mm)	SumRain mm	Sum Runoff & seepage, mm	SumLake evap (mm)	Sum Terrevap2
12/1/2012	336	-0.75	3.69	3.78	3.77	3.68	3.70	3.69	1.4	1331866	-403	-2.918	0.1	0.6	-0.5	0.0
12/2/2012	337	4.46	3.80	3.95	3.94	3.88	3.91	3.86	0.5	4561593	49	-1.476	1.0	0.4	0.1	0.0
12/3/2012	338	8.26	4.39	4.40	4.37	4.30	4.29	4.28	0.9	5957577	293	-2.601	0.0	-0.2	0.4	0.0
12/4/2012	339	10.36	5.20	4.68	4.47	4.28	4.33	4.32	0.4	5974114	332	-1.547	0.9	-0.3	0.5	0.0
12/5/2012	340	4.84	4.74	4.75	4.71	4.57	4.53	4.56	3.0	3040139	-652	-2.144	2.5	-1.2	-0.9	0.0
12/6/2012	341	-1.86	4.34	4.37	4.31	4.14	4.09	4.14	1.3	7876862	-912	-4.183	0.0	-0.7	-1.2	0.0
12/7/2012	342	0.00	3.93	4.25	4.24	4.15	4.14	4.25	0.2	1273720	-259	2.496	5.5	-0.4	-0.4	0.0
12/8/2012	343	5.17	4.41	4.34	4.28	4.14	4.15	4.26	0.3	3804281	17	3.129	4.5	1.1	0.0	0.0
12/9/2012	344	3.66	4.30	4.33	4.33	4.18	4.16	4.20	1.7	2724936	-181	-1.476	1.0	0.2	-0.2	0.0
12/10/2012	345	7.50	4.64	4.45	4.40	4.23	4.23	4.28	0.7	1767610	178	2.250	3.9	0.6	0.2	0.0
12/11/2012	346	1.75	4.36	4.43	4.41	4.27	4.25	4.29	1.7	4019763	-402	-1.933	1.0	0.1	-0.5	0.0
12/12/2012	347	-1.97	3.73	4.32	4.29	4.16	4.16	4.22	0.4	5034	-87	-0.738	0.0	-0.3	-0.1	0.0
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																
#N/A																

											1.000	<=SCALE ADJ (1.0=no adjustment)
											4.184	joule/calorie (= joule/degree for 1cm3)
Nominal diffuse %R from water=7%	#N/A	#N/A	7%			4	4.2	0.6		#N/A	-0.9	
				4.184	<=CONVERT HEAT TO DEGREES					4.184	slope	
7%	0.9			6000000	cm3/m2 (for 0-4m integrated depth)					6000000	intercept	
											r2	
Solar Heat input (absorbed from solar rad), KJ/m2)	Sum H evap (KJ/m^2)	solar heat absorbed - evap loss (kJ/m^2)	% of absorbed solar heat lost via evap	Solar Heat input (absorbed from solar rad), Tw 0-6m)	starting Tw (0-6m)	ending Tw (0-6m)	actual dTw, 0-6m	RESID1: NON-SOLAR FLUX (Heat flux to offset absorbed solar to match dTw)	evap loss (degC 0-6m)	RESID2: NON-SOLAR FLUX to offset absorbed solar to match dTw LESS EVAP (degC 0-6m)		
1239	-362	876	29.3%	0.05	3.71	3.72	0.02	(0.03)	-0.01	(0.02)		
4242	44	4286	-1.0%	0.17	3.72	4.08	0.36	0.19	0.00	0.19		
5541	264	5804	-4.8%	0.22	4.08	4.38	0.30	0.08	0.01	0.07		
5556	299	5855	-5.4%	0.22	4.38	4.36	(0.03)	(0.25)	0.01	(0.26)		
2827	-587	2241	20.7%	0.11	4.36	4.23	(0.13)	(0.24)	-0.02	(0.21)		
7325	-821	6504	11.2%	0.29	4.23	4.33	0.10	(0.19)	-0.03	(0.16)		
1185	-233	951	19.7%	0.05	4.33	4.26	(0.07)	(0.12)	-0.01	(0.11)		
3538	15	3553	-0.4%	0.14	4.26	4.26	0.00	(0.14)	0.00	(0.14)		
2534	-162	2372	6.4%	0.10	4.26	4.23	(0.03)	(0.13)	-0.01	(0.12)		
1644	160	1804	-9.7%	0.07	4.23	4.35	0.12	0.06	0.01	0.05		
3738	-362	3376	9.7%	0.15	4.35	4.26	(0.09)	(0.24)	-0.01	(0.22)		
5	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			
	#N/A	#N/A		#N/A				#N/A	#N/A			