

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  
 18 May 2013, 4:30-6:43pm EDT; platform moved to lake center 3 Nov 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

H310 sensor depth & Lake level are based on differential pressure sensor with ca 0.1mm resolution & vertical position referenced to bottom of lake.  
 Sensor PS30 converted to depth using density of water at 40C (1.43321 psf/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).

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)																													
Tair avg F	Tair max F	Tair min F	Rain-in	WS-mpd	WS max mph																										
						WS-min	WS Max	WDIR-deg	Barom-mb	Sum Rad W/m2	Sum PAR	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									
						WS-min	WS Max	WDIR-deg	Barom-mb	Sum Rad W/m2	Sum PAR	Tw 0.1m	Tw 0.5m	Tw 1m	Tw 2m	Tw 3m	Tw 4m	Tw 5m	Tw 6m	Tw 8m	Tw 10m	Tw 12m	H310_z (m)	Lakelevel-mm (40C)	cumul. rain-mm	Batt min-V	RH% CR10 enc	RH% MUX enc			
month	avg Tw	Tair avg-C	Tair Min-C	RHair-%	Rain-mm	WS-min	WS Max	WDIR-deg	Barom-mb	Sum Rad W/m2	Sum PAR	Tw 0.1m	Tw 0.5m	Tw 1m	Tw 2m	Tw 3m	Tw 4m	Tw 5m	Tw 6m	Tw 8m	Tw 10m	Tw 12m	H310_z (m)	Lakelevel-mm (40C)	cumul. rain-mm	Batt min-V	RH% CR10 enc	RH% MUX enc			
month	(All)	14.5	15.0	32.1	2.9	75.3	33.2	1.8	10.1	246.4	965.8	50745550.2	1036	20.8	20.7	20.6	20.1	19.7	18.9	15.3	10.7	6.9	6.2	6.9	11.2	-49.5	33.2	12.6	40.7	43.4	

PAR & PYR Integration period=15min instead of 60min after 11am on 9/11/2013

Location	% records	Date	Day of Yr	Tair avg-C	Tair Hi-C	Tair Min-C	RHair-%	Rain-mm	WS-min	WS Max	WDIR-deg	Barom-mb	Sum Rad J/m2	Sum PAR	Tw 0.1m	Tw 0.5m	Tw 1m	Tw 2m	Tw 3m	Tw 4m	Tw 5m	Tw 6m	Tw 8m	Tw H310-C	Tw 12m	H310 depth-mm (40C)	Lakelevel-cumul. rain-mm (40C)	Batt min-V	RH% CR10 enc	RH% MUX enc	
ND	100%	9/1/2013	244	22.7	25.6	19.8	86.8	0.0	0.9	4.0	177	959.5	10429679	22.0	25.23	25.04	24.94	24.12	22.60	19.74	14.38	10.07	6.70	6.0	6.02	11.2	-10.4	0.000	12.6	53.4	42.3
ND	100%	9/2/2013	245	22.5	25.1	20.3	82.0	0.1	1.2	6.9	207	957.7	12366523	26.0	25.25	25.02	24.95	24.27	22.62	19.74	14.44	10.10	6.73	6.0	6.02	11.2	-12.4	0.100	12.6	54.0	41.9
ND	100%	9/3/2013	246	19.4	21.4	16.9	76.5	1.7	2.2	8.1	244	959.9	19011064	39.9	24.84	24.80	24.82	24.55	22.72	19.75	14.50	10.10	6.74	6.1	6.00	11.2	-14.3	1.800	12.6	55.0	42.6
ND	100%	9/4/2013	247	18.4	23.4	14.3	69.0	2.3	8.9	28.9	289	963.7	23145154	47.4	24.15	24.15	24.15	23.87	22.97	19.85	14.52	10.14	6.74	6.1	5.99	11.2	-19.8	6.74	12.6	57.8	40.6
ND	100%	9/5/2013	248	16.8	18.6	12.7	63.9	0.0	2.5	8.4	309	965.5	20257185	41.2	23.61	23.60	23.63	23.47	23.21	19.96	14.54	10.17	6.75	6.1	5.98	11.2	-25.4	18.00	12.6	53.9	41.4
ND	100%	9/6/2013	249	12.2	18.1	6.5	65.0	0.0	1.4	5.8	256	971.0	23716408	47.6	22.86	22.81	22.75	22.52	22.30	20.32	14.59	10.19	6.74	6.1	5.99	11.2	-31.6	1.800	12.6	53.7	39.1
ND	100%	9/7/2013	250	15.3	22.4	7.7	64.3	0.0	1.2	5.2	263	965.9	17750973	36.6	22.46	22.40	22.32	22.01	21.83	20.35	14.64	10.22	6.77	6.1	6.02	11.2	-36.2	1.800	12.6	51.8	37.0
ND	100%	9/8/2013	251	17.0	19.9	12.3	68.7	0.1	2.6	9.2	296	962.4	13487340	28.0	21.97	21.96	22.09	21.81	21.69	20.54	14.66	10.26	6.77	6.1	6.01	11.2	-39.9	1.900	12.6	53.8	41.2
ND	100%	9/9/2013	252	13.9	20.4	5.8	72.9	0.0	1.8	6.0	222	969.8	20072358	40.6	21.44	21.41	21.45	21.10	20.92	20.69	14.72	10.28	6.79	6.1	6.01	11.2	-44.8	1.900	12.6	53.2	38.5
ND	100%	9/10/2013	253	22.8	28.8	18.0	78.5	0.7	2.2	8.5	220	968.7	14640952	30.8	21.79	21.62	21.58	21.07	20.86	20.44	14.79	10.29	6.77	6.1	6.05	11.2	-47.4	6.00	12.6	53.1	41.8
ND	100%	9/11/2013	254	25.6	32.1	19.7	74.8	4.0	2.0	7.6	217	967.6	16277200	34.2	23.87	23.41	22.57	21.39	20.98	20.39	14.95	10.35	6.79	6.1	6.08	11.2	-48.8	6.600	12.6	45.0	45.0
ND	100%	9/12/2013	255	20.6	25.4	17.8	89.6	5.0	1.5	8.7	243	960.7	9773601	20.6	23.69	23.59	23.04	21.55	21.01	20.29	14.95	10.46	6.87	6.1	6.11	11.2	-46.3	11.600	12.6	39.3	48.9
ND	100%	9/13/2013	256	15.1	17.9	10.6	83.5	0.4	2.8	10.0	307	957.2	11049404	22.9	22.58	22.56	22.56	21.88	21.09	20.17	15.21	10.47	6.88	6.2	6.14	11.2	-44.0	12.000	12.6	40.3	53.4
ND	100%	9/14/2013	257	9.7	11.3	5.9	79.2	0.0	2.7	7.8	313	965.1	7806001	15.9	20.77	20.78	20.80	20.66	20.59	20.27	15.27	10.48	6.86	6.2	6.08	11.2	-49.0	12.000	12.7	38.2	47.6
ND	100%	9/15/2013	258	11.5	19.0	4.0	73.8	0.1	1.3	5.0	259	968.6	18687843	37.6	20.05	20.00	19.86	19.55	19.38	19.38	15.51	10.48	6.88	6.2	6.09	11.2	-53.0	12.100	12.6	35.7	43.8
ND	100%	9/16/2013	259	13.3	16.5	7.6	77.4	1.5	2.3	8.3	296	968.4	12313754	25.2	19.72	19.70	19.70	19.50	19.36	19.20	15.73	10.51	6.87	6.2	6.09	11.2	-54.8	13.600	12.6	36.7	46.2
ND	100%	9/17/2013	260	9.0	16.4	3.0	71.5	0.0	1.4	5.8	196	968.6	22172145	44.4	20.25	19.20	19.13	18.82	18.66	18.68	16.07	10.56	6.87	6.2	6.10	11.2	-58.4	13.600	12.6	35.3	45.1
ND	100%	9/18/2013	261	11.3	19.4	2.9	69.8	0.1	1.2	5.4	238	973.2	21533099	43.8	19.21	18.98	18.85	18.56	18.37	18.33	16.23	10.57	6.92	6.2	6.12	11.2	-61.6	13.700	12.6	33.2	42.7
ND	100%	9/19/2013	262	14.4	22.9	6.6	69.2	0.0	1.1	4.4	235	969.2	21193765	43.3	19.47	19.03	18.76	18.44	18.29	18.26	16.30	10.60	6.91	6.2	6.13	11.1	-64.7	13.700	12.6	33.8	42.6
ND	100%	9/20/2013	263	16.2	23.0	9.0	75.2	0.0	1.2	6.4	219	966.4	20743396	42.3	19.68	19.45	19.19	18.61	18.34	18.26	16.16	10.66	6.92	6.2	6.14	11.1	-67.1	13.700	12.6	35.0	43.3
ND	100%	9/21/2013	264	16.2	20.5	13.2	80.5	18.8	2.2	8.8	215	959.3	15737970	31.9	19.64	19.53	19.57	18.90	18.49	18.28	16.16	10.72	6.94	6.2	6.15	11.1	-67.6	32.500	12.6	36.9	45.5
ND	100%	9/22/2013	265	11.7	13.5	8.8	76.1	0.5	2.8	8.7	302	968.2	11892870	33.9	19.92	19.94	19.98	18.90	18.63	18.41	16.22	10.88	6.95	6.2	6.20	11.2	-62.1	33.000	12.6	39.0	59.7
ND	100%	9/23/2013	266	9.0	12.0	6.3	70.0	0.0	3.4	10.1	327	965.3	16946402	33.9	19.77	19.77	19.77	18.73	17.78	17.88	16.71	10.96	6.98	6.2	6.17	11.2	-57.2	33.000	12.6	37.9	50.9
ND	100%	9/24/2013	267	10.1	17.7	3.3	73.7	0.0	2.2	7.5	299	965.1	20384484	41.0	17.48	17.46	17.45	17.28	17.13	17.11	16.77	11.09	6.98	6.2	6.18	11.2	-61.3	33.000	12.6	35.7	47.3
ND	100%	9/25/2013	268	11.3	19.0	4.2	75.0	0.0	1.4	5.0	251	963.3	18840626	37.5	17.59	17.53	17.44	16.96	16.85	16.89	16.54	11.22	7.01	6.2	6.19	11.1	-64.3	33.000	12.6	35.3	46.2
ND	100%	9/26/2013	269	12.2	18.8	5.3	81.0	0.1	1.0	6.3	198	965.9	14317828	29.5	17.57	17.54	17.31	16.95	16.77	16.76	16.46	11.44	7.01	6.2	6.20	11.1	-66.5	33.100	12.6	35.8	46.2
ND	100%	9/27/2013	270	12.4	18.5	6.7	80.6	0.0	1.3	5.4	169	971.4	19010999	38.8	17.97	17.85	17.51	17.05	16.84	16.79	16.35	11.64	7.02	6.3	6.24	11.1	-68.3	33.100	12.6	38.1	46.9
ND	100%	9/28/2013	271	13.9	19.3	9.9	73.3	0.0	1.1	5.9	974.2	963.9	19633860	39.9	18.30	18.18	17.99	17.26	16.97	16.85	16.28	11.71	7.02	6.3	6.24	11.1	-70.5	33.100	12.6	30.6	37.0
ND	100%	9/29/2013	272	12.7	19.6	5.8	79.1	0.1	0.9	4.6	200	970.0	16415769	30.0	18.33	18.29	18.12	17.94	17.08	16.90	16.90	11.77	7.04	6.3	6.19	11.1	-72.7	33.200	12.6	31.5	43.4
ND	100%	9/30/2013	273	12.7	20.6	5.6	77.7	0.0	0.9	4.8	257	966.3	17399249	36.9	18.39	18.13	17.81	17.50	17.18	16.94	16.19	11.85	7.06	6.3	6.20	11.1	-74.8	33.200	12.6	11.7	12.5

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	2.6176798	Runoff & seepage as % of watershed area precip	50%													
Grand sum/avg	14.86	20.72	20.61	20.49	20.04	19.64	18.86	1.6	507455618	-84333	-65.8	33.2	43.0	-116.6	-0.4	0.0

Nominal diffuse NR from water=2%	-75841.7	396091.3	17%
Sum Terrepap2=Air/PD, mbar*WS, m/s^2	4.184	-3.0	-19.6

Data		Sum Terrepap2=Air/PD, mbar*WS, m/s^2																Sum Runoff & seepage, SumLakeLk, Sum Rain										Sum Terrepap2=Air/PD, mbar*WS, m/s^2										Sum Runoff & seepage, SumLakeLk, Sum Rain									
DATE	DOY	AvgTair	AvgTw	AvgTw0.5	Avg Tw1m	Avg Tw2m	Avg Tw3m	Avg Tw4m	AvgWS CSI	SumRad J/m2	SumH Evap ('0.9-KJ/m2)	Sum Lk_Lk	Sum Rain	Sum Runoff	Sum LakeLk	Sum Rain	Sum Terrepap2	Sum Runoff	Sum LakeLk	Sum Rain	Sum Terrepap2	Sum Runoff	Sum LakeLk	Sum Rain	Sum Terrepap2	Sum Runoff	Sum LakeLk	Sum Rain	Sum Terrepap2	Sum Runoff	Sum LakeLk	Sum Rain	Sum Terrepap2														
9/1/2013	244	22.72	22.6	25.04	24.12	22.60	19.74	0.7	10429679	-1123	-1.641	0.0	0.6																																		