Lake Lacawac, Bruce R. Hargreaves, Lehigh University (brh0@lehigh.edu, http://www.lehigh.edu/~brh0)
4Apr2010: Station moved from dock from 12:-2:30pm (new NE anchor installed)
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.
Adjusted Tw sensors 13Nov07 based on comparison of depths and vs PUV & YSI sonde profiles (note that Tw at 11.3m matches PUV Tw at 12.5, probably within sediment boundary layer)
Tw12 adjusted to match others on bottom after moved to dock

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).

						5280	ft/mile																				
						1609.3	m/mile																				
	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					
	51.6	62.3	40.5		3.36	4.9	31					54.7	54.6	54.4	52.0	48.9	46.1	44.0	43.4	42.6	42.9	42.3					
Month summary	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
	10.9	**16.9**	**4.7**	**64.9**	**85.3**	**2.2**	**14.1**	**233.2**	**961.2**	**564264752**	**1164**	**12.6**	**12.6**	**12.4**	**11.1**	**9.4**	**7.9**	**6.7**	**6.4**	**5.9**	**6.1**	**5.7**	**9.1**	**74.0**	**85.3**	**12.6**	**58.0**	**15.0**

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%	4/1/2010	91	11.6	23.2	1.7	71.2	0.0	0.5	5.2	171	966.2	23302139	47	8	7	6.4	6.2	6.2	6.2	6.1	6.2	6.0	6.3	6.0	2.1	91.8	0.000	12.6	84.7	15.1
ND	100%	4/2/2010	92	15.2	23.1	6.3	65.6	0.0	0.6	4.4	186	968.3	22303523	46	9	8	7.5	6.6	6.4	6.5	6.4	6.5	6.3	6.7	6.3	2.1	85.6	0.000	12.7	76.5	12.4
ND	100%	4/3/2010	93	16.4	22.4	9.7	59.2	0.0	0.9	5.2	226	966.4	20047001	41	11	11	9.4	7.2	6.7	6.8	6.7	6.8	6.7	7.2	6.6	2.1	79.5	0.000	12.7	64.6	11.6
ND	100%	4/4/2010	94	14.2	18.7	8.8	57.5	0.0	1.7	7.6	279	968.3	21683844	45	12	12	12.3	8.6	7.3	7.3	7.2	7.3	7.2	8.1	7.7	5.1	74.3	0.000	12.7	58.6	12.9
ND	100%	4/5/2010	95	14.6	23.9	4.5	60.9	0.0	1.9	10.4	231	965.7	17678466	37	13	13	12.6	7.9	6.4	6.2	5.9	6.0	5.8	5.9		10.1	71.0	0.000	12.9	56.1	12.3
ND	100%	4/6/2010	96	17.5	26.1	8.6	69.9	1.8	1.5	9.0	229	959.7	15281804	32	14	14	13.5	8.5	6.6	6.2	5.9	6.0	5.7	5.9		10.1	69.8	1.800	12.9	56.3	12.1
ND	100%	4/7/2010	97	22.0	28.1	13.5	48.0	0.0	2.2	12.4	236	955.2	21086947	44	15	15	14.8	9.2	6.7	6.3	6.0	6.0	5.7	5.9		10.1	67.2	1.800	12.9	56.5	11.7
ND	100%	4/8/2010	98	18.7	26.5	11.7	72.4	4.1	2.1	13.5	195	953.0	23088052	48	16	16	16.0	9.9	6.9	6.4	6.0	6.0	5.7	5.9	5.8	10.1	63.4	5.900	12.9	57.0	12.1
ND	100%	4/9/2010	99	7.6	14.0	2.0	76.8	7.6	3.6	10.9	294	955.3	11538405	24	16	16	15.9	10.6	7.1	6.5	6.0	6.0	5.7	5.9	5.6	10.1	70.9	13.500	12.9	58.4	13.0
ND	100%	4/10/2010	100	6.4	13.5	1.2	52.9	0.0	3.8	10.1	272	967.4	23601193	48	13	13	12.9	12.3	7.6	6.6	6.0	6.1	5.8	5.9	5.6	10.1	64.2	13.500	12.9	55.7	12.5
ND	100%	4/11/2010	101	12.8	16.8	7.2	42.2	0.0	2.5	9.3	263	969.9	19041403	39	13	13	12.7	12.7	8.1	6.7	6.1	6.1	5.8	5.9	5.5	10.1	59.4	13.500	12.9	54.6	11.7
ND	100%	4/12/2010	102	8.5	13.4	2.3	49.9	0.0	2.6	9.2	298	974.1	24985892	51	13	13	12.8	12.8	8.7	6.8	6.1	6.1	5.8	5.9	5.5	10.1	55.6	13.500	12.9	55.0	12.2
ND	100%	4/13/2010	103	7.5	11.0	4.1	59.5	0.0	1.1	4.8	189	977.9	12794033	27	13	13	12.8	12.7	9.4	6.8	6.1	6.1	5.8	5.9	5.5	10.1	52.0	13.500	12.9	55.0	12.3
ND	100%	4/14/2010	104	8.3	15.5	0.7	59.3	0.0	1.7	7.3	235	978.9	26138927	53	13	13	13.0	12.5	9.6	6.9	6.2	6.1	5.8	5.9	5.5	10.1	49.4	13.500	12.9	54.6	12.2
ND	100%	4/15/2010	105	11.5	17.9	5.4	56.4	0.0	1.4	7.1	252	972.1	18373894	38	13	13	13.3	12.7	10.0	7.0	6.2	6.1	5.8	5.9	5.5	10.1	46.4	13.500	12.9	53.9	11.8
ND	100%	4/16/2010	106	10.9	17.8	4.9	79.1	21.4	2.2	8.9	124	960.1	18614862	39	14	14	13.9	13.1	10.2	7.2	6.3	6.2	5.8	5.9	5.5	10.1	48.2	34.900	12.9	55.6	14.9
ND	100%	4/17/2010	107	6.4	10.4	3.5	81.8	4.1	2.7	9.5	270	955.6	6095334	13	13	14	13.6	13.5	10.2	7.3	6.3	6.2	5.8	5.9	5.5	10.1	70.6	39.000	12.8	57.5	18.5
ND	100%	4/18/2010	108	4.4	8.8	0.7	81.4	0.3	2.8	10.8	284	959.8	10759806	23	12	12	12.1	12.1	11.0	7.6	6.4	6.2	5.8	5.9	5.5	10.1	69.4	39.300	12.8	56.6	13.4
ND	100%	4/19/2010	109	8.3	12.9	3.5	65.1	0.0	3.4	11.9	300	962.6	21594674	44	11	11	11.5	11.5	11.3	8.1	6.5	6.2	5.8	5.9	5.5	10.1	66.6	39.300	12.9	55.4	12.6
ND	100%	4/20/2010	110	9.4	16.9	1.4	67.0	0.0	1.3	6.6	265	962.2	22150460	45	12	12	11.9	11.4	11.2	8.8	6.6	6.3	5.8	5.9	5.5	10.1	63.8	39.300	12.9	55.9	12.5
ND	100%	4/21/2010	111	11.5	17.7	3.7	65.5	0.0	1.6	6.9	207	956.6	17433244	35	13	13	12.5	11.7	11.1	8.9	6.6	6.3	5.8	5.9	5.5	10.1	61.8	39.300	12.9	55.1	12.2
ND	100%	4/22/2010	112	11.3	16.6	6.0	67.8	0.1	2.3	8.3	260	954.8	21572799	44	13	13	13.0	12.2	11.2	9.0	6.7	6.4	5.8	5.9	5.5	10.1	59.9	39.400	12.9	56.2	12.1
ND	100%	4/23/2010	113	8.4	14.4	1.3	54.8	0.0	3.1	10.4	303	960.2	27187325	55	13	13	13.0	13.0	11.5	9.1	6.8	6.4	5.8	5.9	5.5	10.1	57.3	39.400	12.8	55.7	12.3
ND	100%	4/24/2010	114	10.2	18.6	0.4	50.9	2.6	1.5	7.9	191	964.5	24619442	49	14	13	13.1	12.8	11.9	9.3	7.0	6.4	5.8	5.9	5.5	10.1	54.1	42.000	12.8	54.6	12.4
ND	100%	4/25/2010	115	7.4	8.3	6.2	98.6	28.7	1.8	5.5	93	951.0	4201536	10	13	13	13.4	13.1	11.9	9.4	7.0	6.4	5.8	5.9	5.5	10.1	74.1	70.700	12.8	56.5	30.9
ND	100%	4/26/2010	116	8.4	9.4	7.7	99.8	14.0	1.6	4.4	54	941.8	4127207	10	13	13	12.8	12.9	12.0	9.5	7.1	6.5	5.8	5.9	5.5	10.2	99.2	84.700	12.8	56.8	39.4
ND	100%	4/27/2010	117	5.7	7.8	1.0	80.1	0.6	3.5	12.4	270	943.9	16884496	34	12	12	12.4	12.5	12.2	10.0	7.3	6.5	5.8	5.9	5.5	10.2	121.8	85.300	12.8	58.7	29.0
ND	100%	4/28/2010	118	5.7	11.3	1.2	60.2	0.0	4.1	14.1	294	950.3	12903805	27	11	11	11.3	11.4	11.3	11.1	7.7	6.6	5.8	5.9	5.5	10.2	124.9	85.300	12.8	56.6	15.3
ND	100%	4/29/2010	119	10.2	16.5	4.5	42.7	0.0	3.9	14.1	277	957.1	28508173	58	11	11	10.8	10.9	10.7	10.7	9.0	7.0	5.9	5.9	5.5	10.2	124.1	85.300	12.8	55.8	14.1
ND	100%	4/30/2010	120	15.6	24.3	7.7	49.4	0.0	1.6	8.1	244	958.5	26666063	56	12	12	11.9	11.3	10.9	10.7	9.8	7.5	5.9	5.9	5.5	10.2	122.9	85.300	12.8	55.7	14.4
	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)

																														1.000	<=SCALE ADJ (1.0=no adjustment)
Ratio of lake watershed to lake area:	3.88			Runoff & seepage as % of watershed area precip:				48.1%																						4.184	joule/calorie (= joule/degree for 1cm3)
Grand sum/avg	**10.89**	**12.61**	**12.56**	**12.43**	**11.12**	**9.41**	**7.86**	**2.0**	**564264752**	**-54796**	**27.9**	**85.3**	**158.8**	**-80.1**	**0.0**	**-136.9**														**#N/A**	**#N/A**
																SumTerrevap2=AirVPD,mbar*WS,m/s*s	Nominal diffuse %R from water=7%	#N/A	#N/A	36%			9	#N/A	#N/A						

Data

DATE	DayOfYr	AvgTair C	AvgTw 0.1m	AvgTw0.5 m	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	Sum Out flow (lake mm)														
4/1/2010	91	11.61	7.95	6.68	6.36	6.17	6.16	6.21	0.3	23302139	-194	-6.152	0.0	-1.2	-0.3	0.0	-4.9														
4/2/2010	92	15.24	9.20	8.19	7.50	6.64	6.40	6.49	0.3	22303523	-57	-6.785	0.0	-2.7	-0.1	0.0	-4.0														
4/3/2010	93	16.44	11.11	10.55	9.45	7.15	6.67	6.77	0.4	20047001	-242	-5.273	0.0	-1.5	-0.4	0.0	-3.4														
4/4/2010	94	14.19	12.39	12.49	12.34	8.55	7.31	7.34	1.5	21683844	-945	-4.139	0.0	0.3	-1.4	0.0	-3.0														
4/5/2010	95	14.56	12.80	12.83	12.59	7.89	6.40	6.17	1.7	17678466	-1044	-2.891	0.0	1.5	-1.5	0.0	-2.8														
4/6/2010	96	17.51	13.81	13.75	13.48	8.50	6.57	6.24	1.3	15281804	-225	-0.492	1.8	0.8	-0.3	0.0	-2.8														
4/7/2010	97	22.02	15.00	15.04	14.77	9.18	6.72	6.31	1.9	21086947	-1374	-4.465	0.0	0.2	-2.0	0.0	-2.7														
4/8/2010	98	18.66	16.45	16.38	16.05	9.88	6.87	6.38	1.8	23088052	-1197	-0.035	4.1	0.2	-1.8	0.0	-2.5														
4/9/2010	99	7.62	15.82	15.90	15.92	10.62	7.07	6.46	3.3	11538405	-4110	3.621	7.6	4.9	-6.0	0.0	-2.8														
4/10/2010	100	6.42	12.73	12.81	12.86	12.26	7.56	6.58	3.5	23601193	-4104	-6.996	0.0	1.6	-6.0	0.0	-2.6														
4/11/2010	101	12.78	12.57	12.65	12.68	12.67	8.12	6.71	2.3	19041403	-2192	-3.867	0.0	1.8	-3.2	0.0	-2.4														
4/12/2010	102	8.53	12.66	12.74	12.77	12.80	8.65	6.79	2.4	24985892	-2920	-4.324	0.0	2.3	-4.3	0.0	-2.3														
4/13/2010	103	7.45	12.77	12.79	12.75	12.69	9.42	6.83	1.0	12794033	-1494	-2.180	0.0	2.2	-2.2	0.0	-2.2														
4/14/2010	104	8.29	12.96	13.04	12.99	12.49	9.63	6.90	1.5	26138927	-2113	-3.199	0.0	2.0	-3.1	0.0	-2.1														
4/15/2010	105	11.52	13.31	13.38	13.33	12.74	10.00	7.01	1.3	18373894	-1535	-2.390	0.0	1.9	-2.2	0.0	-2.0														
4/16/2010	106	10.95	13.82	13.90	13.87	13.14	10.22	7.17	1.9	18614862	-1371	19.651	21.4	2.3	-2.0	0.0	-2.1														
4/17/2010	107	6.35	13.40	13.52	13.57	13.46	10.24	7.34	2.6	6095334	-2512	5.238	4.1	7.6	-3.7	0.0	-2.8														
4/18/2010	108	4.39	11.92	12.02	12.07	12.13	11.01	7.57	2.6	10759806	-2329	-2.215	0.3	3.7	-3.4	0.0	-2.8														
4/19/2010	109	8.25	11.34	11.43	11.47	11.52	11.26	8.13	3.2	21594674	-2456	-3.340	0.0	2.9	-3.6	0.0	-2.7														
4/20/2010	110	9.41	11.95	11.96	11.89	11.45	11.16	8.79	1.1	22150460	-1175	-1.863	0.0	2.4	-1.7	0.0	-2.6														
4/21/2010	111	11.50	12.55	12.59	12.46	11.73	11.09	8.88	1.4	17433244	-1220	-2.250	0.0	2.0	-1.8	0.0	-2.5														
4/22/2010	112	11.26	13.06	13.11	13.04	12.24	11.18	8.97	2.1	21572799	-1775	-1.933	0.1	3.0	-2.6	0.0	-2.4														
4/23/2010	113	8.43	12.87	12.95	12.99	13.00	11.48	9.10	2.9	27187325	-3282	-3.551	0.0	3.6	-4.8	0.0	-2.4														
4/24/2010	114	10.20	13.63	13.24	13.10	12.82	11.88	9.28	1.3	24619442	-1996	0.633	2.6	3.2	-2.9	0.0	-2.3														
4/25/2010	115	7.37	13.39	13.46	13.41	13.07	11.94	9.41	1.6	4201536	-1167	32.553	28.7	8.7	-1.7	0.0	-3.1														
4/26/2010	116	8.41	12.68	12.81	12.84	12.92	12.04	9.50	1.5	4127207	-723	27.526	14.0	21.3	-1.1	0.0	-6.8														
4/27/2010	117	5.72	12.25	12.37	12.41	12.48	12.22	9.96	3.3	16884496	-2978	7.980	0.6	26.4	-4.4	0.0	-14.6														
4/28/2010	118	5.65	11.14	11.24	11.29	11.36	11.25	11.09	3.9	12903805	-3558	0.809	0.0	22.3	-5.2	0.0	-16.3														
4/29/2010	119	10.20	10.73	10.82	10.84	10.88	10.74	10.70	3.6	28508173	-3438	-1.793	0.0	19.1	-5.0	0.0	-15.8														
4/30/2010	120	15.63	12.16	12.08	11.88	11.27	10.91	10.70	1.4	26666063	-1068	0.035	0.0	16.2	-1.6	0.0	-15.2														
#N/A																															

				4.184	<=CONVERT HEAT TO DEGREES													4.184	slope
70%	0.9			6000000	cm3/m2 (for 0-4m integrated depth)													6000000	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)									
6991	-175	6816	2.5%	0.28	6.08	6.44	0.36	0.08	-0.01	0.08									
6691	-51	6640	0.8%	0.27	6.44	6.98	0.54	0.28	0.00	0.28									
6014	-218	5796	3.6%	0.24	6.98	8.10	1.13	0.89	-0.01	0.89									
6505	-851	5654	13.1%	0.26	8.10	7.66	(0.44)	(0.70)	-0.03	(0.67)									
5304	-939	4364	17.7%	0.21	7.66	8.04	0.38	0.17	-0.04	0.21									
4585	-203	4382	4.4%	0.18	8.04	8.20	0.16	(0.03)	-0.01	(0.02)									
6326	-1237	5089	19.6%	0.25	8.20	8.87	0.68	0.42	-0.05	0.47									
6926	-1077	5849	15.6%	0.28	8.87	9.45	0.58	0.30	-0.04	0.35									
3462	-3699	-237	106.9%	0.14	9.45	9.30	(0.16)	(0.29)	-0.15	(0.15)									
7080	-3694	3387	52.2%	0.28	9.30	9.26	(0.03)	(0.31)	-0.15	(0.17)									
5712	-1973	3740	34.5%	0.23	9.26	9.46	0.20	(0.03)	-0.08	0.05									
7496	-2628	4868	35.1%	0.30	9.46	9.64	0.18	(0.12)	-0.10	(0.02)									
3838	-1345	2494	35.0%	0.15	9.64	9.61	(0.03)	(0.19)	-0.05	(0.13)									
7842	-1902	5940	24.3%	0.31	9.61	9.75	0.14	(0.17)	-0.08	(0.10)									
5512	-1382	4131	25.1%	0.22	9.75	10.03	0.28	0.06	-0.06	0.12									
5584	-1234	4350	22.1%	0.22	10.03	10.22	0.19	(0.03)	-0.05	0.02									
1829	-2261	-433	123.7%	0.07	10.22	9.86	(0.36)	(0.43)	-0.09	(0.34)									
3228	-2096	1132	64.9%	0.13	9.86	9.57	(0.29)	(0.42)	-0.08	(0.34)									
6478	-2211	4268	34.1%	0.26	9.57	9.82	0.25	(0.01)	-0.09	0.08									
6645	-1058	5587	15.9%	0.26	9.82	9.89	0.07	(0.19)	-0.04	(0.15)									
5230	-1098	4132	21.0%	0.21	9.89	10.00	0.12	(0.09)	-0.04	(0.05)									
6472	-1597	4875	24.7%	0.26	10.00	10.43	0.42	0.17	-0.06	0.23									
8156	-2954	5202	36.2%	0.32	10.43	10.58	0.16	(0.17)	-0.12	(0.05)									
7386	-1796	5590	24.3%	0.29	10.58	10.79	0.21	(0.08)	-0.07	(0.01)									
1260	-1051	210	83.3%	0.05	10.79	10.75	(0.04)	(0.09)	-0.04	(0.05)									
1238	-651	587	52.6%	0.05	10.75	10.64	(0.11)	(0.16)	-0.03	(0.13)									
5065	-2680	2385	52.9%	0.20	10.64	10.55	(0.09)	(0.30)	-0.11	(0.19)									
3871	-3203	669	82.7%	0.15	10.55	10.15	(0.40)	(0.56)	-0.13	(0.43)									
8552	-3094	5458	36.2%	0.34	10.15	10.51	0.37	0.02	-0.12	0.15									
8000	-961	7039	12.0%	0.32	10.51	#N/A	#N/A	#N/A	-0.04	#N/A									
	#N/A	#N/A		#N/A				#N/A	#N/A										