Lake Lacawac, Bruce R. Hargreaves, Lehigh University (brh0@lehigh.edu, http://www.lehigh.edu/~brh0)
Station moved to dock on 9Nov08, between 11:38 and 12:30pm EDT
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						
	28.2	37.5	19.4		1.63	4.5	36					32.1	37.6	38.2	38.6	39.1	39.1	39.0	38.9	38.7	38.6	39.1						
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	Tw02.0m	Tw02.5m	H310_z (m)	Lakelevel-mm (4oC)	cumul. rain-mm	Batt min-V	RH% CR10 enc	RH% MUX enc
	-2.1	**3.1**	**-7.0**	**75.4**	**41.4**	**2.0**	**16.0**	**254.9**	**963.2**	**277198030**	**539**	**0.1**	**3.1**	**3.4**	**3.7**	**3.9**	**3.9**	**3.9**	**3.8**	**3.7**	**3.7**	**3.9**	**2.0**	**3.2**	**41.4**	**12.6**	**14.0**	**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
LC	100%	2/1/2009	32	-0.2	7.8	-7.8	68.1	13.1	1.1	11.2	248	957.9	11599259	23	0	2	2.8	3.2	3.6	3.6	3.4	3.4	3.2	3.1	3.5	2.0	-2.8	13.100	12.7	13.8	14.5
LC	100%	2/2/2009	33	-0.5	4.3	-3.3	91.6	1.4	0.9	5.6	245	961.1	3997945	9	0	2	2.8	3.3	3.6	3.6	3.5	3.4	3.3	3.2	3.5	2.0	-4.8	14.500	12.7	13.4	14.3
LC	100%	2/3/2009	34	-3.7	-2.2	-8.6	96.5	0.0	1.4	6.5	109	956.2	1991738	4	0	2	2.8	3.3	3.6	3.6	3.5	3.4	3.2	3.1	3.5	2.0	-4.7	14.500	12.6	13.8	14.2
LC	100%	2/4/2009	35	-10.1	-6.6	-14.4	73.5	0.0	2.5	7.9	318	961.8	13183963	24	0	2	2.8	3.2	3.6	3.5	3.4	3.4	3.2	3.1	3.5	2.0	-6.2	14.500	12.6	15.4	14.7
LC	100%	2/5/2009	36	-13.9	-10.2	-17.5	79.4	0.0	2.5	9.6	310	970.1	10038670	18	0	2	2.8	3.3	3.6	3.5	3.4	3.4	3.2	3.2	3.4	2.0	-8.6	14.500	12.7	16.3	15.5
LC	100%	2/6/2009	37	-8.7	-0.1	-17.0	69.2	0.0	0.8	5.2	252	972.1	9455574	18	0	2	2.8	3.3	3.6	3.6	3.5	3.4	3.3	3.2	3.5	2.0	-11.0	14.500	12.6	15.2	15.1
LC	100%	2/7/2009	38	-0.6	10.2	-12.4	78.4	0.7	0.9	7.0	214	968.3	8233287	17	0	2	2.7	3.3	3.6	3.6	3.5	3.4	3.2	3.2	3.5	2.0	-13.2	15.200	12.6	14.3	15.4
LC	100%	2/8/2009	39	5.5	10.3	-0.4	75.1	0.3	3.4	11.4	295	964.2	6836876	14	0	2	2.8	3.2	3.5	3.5	3.4	3.4	3.1	3.2	3.5	2.0	-12.2	15.500	12.7	13.3	15.4
LC	100%	2/9/2009	40	-0.7	4.2	-4.2	71.5	0.0	1.7	7.2	280	973.5	13228906	26	0	2	2.8	3.3	3.6	3.6	3.6	3.5	3.3	3.2	3.6	2.0	-12.1	15.500	12.7	13.7	14.7
LC	100%	2/10/2009	41	3.8	8.7	-1.0	78.5	0.0	0.6	5.1	222	968.7	5980920	13	0	2	3.0	3.4	3.7	3.7	3.6	3.6	3.4	3.3	3.7	2.0	-12.8	15.500	12.7	13.0	14.1
LC	100%	2/11/2009	42	9.4	16.9	3.6	89.0	0.5	0.7	4.6	243	958.4	9289948	20	0	3	3.0	3.4	3.8	3.8	3.7	3.6	3.5	3.4	3.7	2.0	-10.8	16.000	12.7	14.0	14.2
LC	100%	2/12/2009	43	4.8	10.0	1.8	85.7	8.6	4.0	16.0	272	944.6	3145485	7	0	3	3.1	3.3	3.6	3.6	3.5	3.6	3.3	3.4	3.7	2.1	6.6	24.600	12.7	13.3	15.7
LC	100%	2/13/2009	44	-0.7	1.7	-4.7	66.8	0.0	4.5	11.5	322	958.5	14469293	28	0	3	3.2	3.4	3.7	3.7	3.6	3.7	3.5	3.5	3.8	2.1	18.7	24.600	12.6	13.9	14.8
LC	100%	2/14/2009	45	-3.7	-0.5	-6.9	68.3	0.0	2.1	6.1	310	960.4	8136224	16	0	3	3.4	3.7	4.0	4.0	4.0	3.9	3.8	3.8	4.0	2.1	20.3	24.600	12.7	13.9	15.0
LC	100%	2/15/2009	46	-3.5	0.4	-6.3	68.2	0.0	2.6	7.9	323	964.3	13915297	26	0	4	3.6	3.8	4.0	4.1	4.0	4.0	3.8	3.9	4.1	2.1	19.3	24.600	12.7	14.0	15.1
LC	100%	2/16/2009	47	-4.9	-0.9	-8.6	74.2	0.0	2.3	7.8	268	967.3	14085352	26	0	4	3.7	3.8	4.1	4.1	4.0	4.1	3.9	3.9	4.2	2.1	16.9	24.600	12.6	14.3	15.6
LC	100%	2/17/2009	48	-5.0	1.5	-10.2	71.2	0.0	1.2	6.3	233	968.9	15390936	29	0	4	3.9	3.9	4.2	4.2	4.2	4.2	4.1	4.0	4.3	2.1	14.4	24.600	12.6	14.5	15.6
LC	100%	2/18/2009	49	-2.6	0.0	-7.4	84.1	0.0	1.0	6.8	150	955.9	2575487	6	0	4	4.0	4.0	4.2	4.2	4.1	4.1	4.1	4.1	4.2	2.1	13.8	24.600	12.6	13.8	15.1
LC	100%	2/19/2009	50	-0.5	3.8	-8.8	90.1	6.6	2.3	10.1	270	944.5	6250835	13	0	4	4.0	4.0	4.2	4.2	4.1	4.1	4.0	4.1	4.2	2.1	18.0	31.200	12.6	13.5	14.4
LC	100%	2/20/2009	51	-7.3	-3.8	-10.2	63.2	0.0	3.9	12.9	293	953.6	11271194	21	0	4	4.0	4.0	4.2	4.2	4.1	4.1	4.0	4.1	4.2	2.1	16.2	31.200	12.6	14.6	15.7
LC	100%	2/21/2009	52	-3.4	2.3	-7.4	63.7	0.0	2.2	8.2	273	966.5	15806834	30	0	4	4.0	3.9	4.2	4.2	4.2	4.1	4.0	4.1	4.3	2.1	12.0	31.200	12.6	14.1	15.1
LC	100%	2/22/2009	53	-1.5	0.9	-6.0	77.0	0.9	2.3	11.3	286	961.0	4911673	10	0	4	4.0	4.0	4.2	4.3	4.2	4.2	4.1	4.1	4.3	2.1	9.8	32.100	12.7	13.4	14.6
LC	100%	2/23/2009	54	-6.8	-4.1	-9.0	68.4	0.0	4.5	12.5	313	964.8	9676645	19	0	4	4.0	4.0	4.2	4.2	4.1	4.1	4.1	4.2	4.3	2.1	7.1	32.100	12.6	14.4	15.6
LC	100%	2/24/2009	55	-7.7	-2.9	-11.0	70.2	0.0	3.5	9.4	316	972.1	16660372	31	0	4	4.1	4.1	4.3	4.3	4.2	4.2	4.1	4.2	4.4	2.1	3.7	32.100	12.6	14.7	15.8
LC	100%	2/25/2009	56	-3.5	5.7	-12.3	62.3	0.0	0.6	4.0	212	974.5	16724408	32	0	4	4.1	4.1	4.4	4.4	4.4	4.3	4.2	4.1	4.5	2.0	0.9	32.100	12.6	14.6	15.6
LC	100%	2/26/2009	57	3.2	10.6	-1.3	68.0	1.0	0.7	4.8	235	971.3	10032658	20	0	4	4.1	4.1	4.4	4.5	4.4	4.3	4.2	4.2	4.5	2.0	-0.5	33.100	12.6	13.1	14.3
LC	100%	2/27/2009	58	7.1	10.6	2.5	87.6	8.3	1.3	7.8	254	961.8	5086744	11	0	4	4.1	4.1	4.3	4.4	4.3	4.3	4.1	4.2	4.4	2.1	2.2	41.400	12.7	13.1	15.3
LC	0%	2/28/2009	59	-3.1	7.6	-7.1	71.0	0.0	1.0	10.6	70	968.4	15221507	29	0	4	4.2	4.1	4.4	4.4	4.3	4.3	4.2	4.2	4.5	2.1	9.3	41.400	12.6	14.0	15.4
	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: **3.88** Runoff & seepage as % of watershed area precip: **8.0%**

1.000 <=SCALE ADJ (1.0=no adjustment)
4.184 joule/calorie (= joule/degree for 1cm3)
Note: first adju

Grand sum/avg	**-2.10**	**0.08**	**3.12**	**3.45**	**3.67**	**3.93**	**3.94**	**1.8**	**277198030**	**-15568**	**10.1**	**41.4**	**6.9**	**-22.5**	**0.0**	**-15.9**	**9.9**	**#N/A**	**#N/A**		**24%**	**#N/A**	**1.5**	**4**	**3.7**	**0.9**	**#N/A**	**#N/A**
															SumTerrevap2=AirVPD,mbar*WS,m/s*sc													0.00000
																							4.184	<=CONVERT HEAT TO DEGREES				0
																		0.9	80.0%	<=%R that optimizes Tair-Tsurf			6000000	cm3/m2 (for 0-4m integrated depth)				0

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	Sum Out flow (lake mm)	sum in+out (mm)	Sum H evap (KJ/m^2)	solar heat absorbed - evap loss (kJ/m^2)	% of absorbed solar heat lost via evap	evap loss (degC 0-6m)	solar heat - evap loss (degC 0-6m)	starting Tw (0-6m)	ending Tw (0-6m)	actual Tw chg, 0-6m	non-evap heat exchange to balance solar heat gain (oC, 0-	residual lake exchange (non-evap xchg minus
2/1/2009	32	-0.18	-0.09	2.04	2.81	3.23	3.57	3.56	0.9	11599259	-274	-2.601	13.1	-14.3	-0.4	0.0	-1.2	-2.720	-246	2073	10.6%	-0.01	0.1	3.2	3.2	0.01	(0.07)	0.07
2/2/2009	33	-0.46	-0.11	2.02	2.80	3.26	3.60	3.59	0.9	3997945	-100	0.246	1.4	-0.5	-0.1	0.0	-0.5	0.246	-90	710	11.2%	0.00	0.0	3.2	3.2	0.01	(0.01)	0.01
2/3/2009	34	-3.67	-0.11	2.00	2.78	3.26	3.60	3.56	1.3	1991738	-284	-0.738	0.0	0.2	-0.4	0.0	-0.5	-0.738	-256	143	64.2%	-0.01	0.0	3.2	3.2	(0.02)	(0.02)	0.02
2/4/2009	35	-10.11	-0.10	1.98	2.78	3.23	3.56	3.52	2.4	13183963	-1253	-3.058	0.0	-0.6	-1.8	0.0	-0.7	-3.058	-1128	1509	42.8%	-0.04	0.1	3.2	3.2	(0.07)	(0.13)	0.13
2/5/2009	36	-13.88	-0.09	1.97	2.77	3.25	3.55	3.48	2.4	10038670	-1396	-1.933	0.0	0.8	-2.0	0.0	-0.7	-1.933	-1256	752	62.6%	-0.05	0.0	3.2	3.2	0.09	0.06	(0.06)
2/6/2009	37	-8.70	-0.11	1.94	2.75	3.29	3.59	3.57	0.7	9455574	-667	-2.531	0.0	-1.0	-1.0	0.0	-0.6	-2.531	-600	1291	31.7%	-0.02	0.1	3.2	3.2	(0.01)	(0.06)	0.06
2/7/2009	38	-0.57	-0.11	1.93	2.74	3.26	3.56	3.55	0.7	8233287	-155	-1.476	0.7	-1.6	-0.2	0.0	-0.4	-1.476	-139	1508	8.4%	-0.01	0.1	3.2	3.2	(0.08)	(0.14)	0.14
2/8/2009	39	5.45	-0.05	2.00	2.76	3.22	3.50	3.47	3.1	6836876	170	2.285	0.3	2.1	0.2	0.0	-0.4	2.285	153	1520	-11.2%	0.01	0.1	3.2	3.2	0.06	(0.00)	0.00
2/9/2009	40	-0.75	-0.05	2.19	2.85	3.31	3.64	3.61	1.5	13228906	-417	-1.160	0.0	-0.3	-0.6	0.0	-0.2	-1.160	-375	2270	14.2%	-0.01	0.1	3.2	3.4	0.14	0.05	(0.05)
2/10/2009	41	3.76	-0.01	2.47	2.95	3.40	3.70	3.67	0.4	5980920	15	-0.211	0.0	-0.1	0.0	0.0	-0.1	-0.211	14	1210	-1.1%	0.00	0.0	3.4	3.4	0.03	(0.01)	0.01
2/11/2009	42	9.45	0.02	2.69	3.03	3.43	3.75	3.75	0.5	9289948	371	6.398	0.5	5.6	0.5	0.0	-0.2	6.398	334	2192	-18.0%	0.01	0.1	3.4	3.4	0.06	(0.03)	0.03
2/12/2009	43	4.84	0.21	2.89	3.11	3.33	3.58	3.58	3.5	3145485	217	23.096	8.6	14.7	0.3	0.0	-0.6	23.096	196	825	-31.1%	0.01	0.0	3.4	3.3	(0.12)	(0.15)	0.15
2/13/2009	44	-0.73	0.42	3.08	3.25	3.44	3.69	3.68	4.2	14469293	-1117	3.269	0.0	5.8	-1.6	0.0	-0.9	3.269	-1005	1889	34.7%	-0.04	0.1	3.3	3.7	0.34	0.26	(0.26)
2/14/2009	45	-3.65	0.16	3.39	3.45	3.69	3.97	3.99	2.0	8136224	-743	0.281	0.0	2.4	-1.1	0.0	-1.1	0.281	-669	958	41.1%	-0.03	0.0	3.7	3.8	0.13	0.10	(0.10)
2/15/2009	46	-3.55	0.25	3.53	3.57	3.76	4.04	4.06	2.5	13915297	-928	-2.004	0.0	0.2	-1.3	0.0	-0.9	-2.004	-836	1948	30.0%	-0.03	0.1	3.8	3.8	0.04	(0.04)	0.04
2/16/2009	47	-4.88	0.29	3.67	3.72	3.83	4.06	4.07	2.1	14085352	-883	-2.566	0.0	-0.5	-1.3	0.0	-0.8	-2.566	-794	2023	28.2%	-0.03	0.1	3.8	3.9	0.07	(0.01)	0.01
2/17/2009	48	-5.01	0.23	3.84	3.90	3.93	4.18	4.19	1.1	15390936	-602	-2.390	0.0	-0.8	-0.9	0.0	-0.7	-2.390	-542	2537	17.6%	-0.02	0.1	3.9	4.0	0.10	(0.00)	0.00
2/18/2009	49	-2.62	0.15	3.93	3.98	4.00	4.18	4.17	0.5	2575487	-268	3.515	0.0	4.5	-0.4	0.0	-0.6	3.515	-241	274	46.9%	-0.01	0.0	4.0	4.0	0.02	0.01	(0.01)
2/19/2009	50	-0.55	0.10	3.91	3.96	4.01	4.21	4.20	2.0	6250835	-399	1.125	6.6	-4.2	-0.6	0.0	-0.7	1.125	-359	891	28.7%	-0.01	0.0	4.0	4.0	(0.02)	(0.06)	0.06
2/20/2009	51	-7.26	0.28	3.85	3.96	4.02	4.17	4.20	3.5	11271194	-1698	-4.008	0.0	-0.7	-2.5	0.0	-0.8	-4.008	-1528	726	67.8%	-0.06	0.0	4.0	4.0	(0.05)	(0.08)	0.08
2/21/2009	52	-3.35	0.12	3.93	4.01	3.95	4.20	4.25	1.8	15806834	-802	-3.094	0.0	-1.4	-1.2	0.0	-0.6	-3.094	-722	2439	22.8%	-0.03	0.1	4.0	4.1	0.09	(0.01)	0.01
2/22/2009	53	-1.50	0.07	3.99	4.03	4.03	4.23	4.28	1.9	4911673	-601	-1.687	0.9	-1.2	-0.9	0.0	-0.5	-1.687	-541	441	55.1%	-0.02	0.0	4.1	4.0	(0.01)	(0.02)	0.02
2/23/2009	54	-6.78	0.26	3.92	4.02	4.05	4.17	4.22	4.2	9676645	-1840	-3.761	0.0	-0.6	-2.7	0.0	-0.5	-3.761	-1656	279	85.6%	-0.07	0.0	4.0	4.0	0.00	(0.01)	0.01
2/24/2009	55	-7.70	0.15	3.98	4.06	4.10	4.25	4.30	3.2	16660372	-1513	-3.304	0.0	-0.7	-2.2	0.0	-0.4	-3.304	-1362	1970	40.9%	-0.05	0.1	4.0	4.2	0.11	0.03	(0.03)
2/25/2009	56	-3.48	0.00	4.05	4.09	4.07	4.36	4.42	0.5	16724408	-435	-2.426	0.0	-1.5	-0.6	0.0	-0.3	-2.426	-392	2953	11.7%	-0.02	0.1	4.2	4.1	(0.03)	(0.15)	0.15
2/26/2009	57	3.19	0.00	4.05	4.12	4.13	4.37	4.46	0.5	10032658	-66	-0.562	1.0	-1.2	-0.1	0.0	-0.2	-0.562	-60	1947	3.0%	0.00	0.1	4.1	4.1	0.03	(0.05)	0.05
2/27/2009	58	7.10	0.15	4.05	4.08	4.10	4.32	4.39	0.8	5086744	435	10.652	8.3	2.0	0.6	0.0	-0.3	10.652	391	1409	-38.5%	0.02	0.1	4.1	4.2	0.01	(0.05)	0.05
2/28/2009	59	-3.14	0.25	4.14	4.18	4.13	4.35	4.42	0.9	15221507	-336	-1.301	0.0	-0.4	-0.5	0.0	-0.5	-1.338	#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