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					
	72.5	79.7	65.0		0.19	3.6	21					77.8	77.8	77.8	77.3	75.7	65.9	55.4	50.2	44.9	44.3	43.4					
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	Tw10.0m	Tw11.3m	H310_z (m)	Lakelevel-mm (4oC)	cumul. rain-mm	Batt min-V	RH% CR10 enc	RH% MUX enc
	22.5	**26.5**	**18.3**	**81.7**	**4.7**	**1.6**	**9.3**	**215.7**	**963.7**	**209014116**	**437**	**25.4**	**25.4**	**25.4**	**25.2**	**24.3**	**18.9**	**13.0**	**10.1**	**7.2**	**6.8**	**6.3**	**10.0**	**-130.1**	**4.7**	**12.6**	**31.6**	**17.7**

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%	8/1/2010	213	19.3	22.6	16.1	91.7	3.1	1.2	5.5	146	966.7	12352569	26	25	25	25.3	25.2	24.4	18.0	12.7	10.0	7.1	6.8	6.3	10.0	-111.6	3.100	12.6	28.5	14.9
ND	100%	8/2/2010	214	20.7	24.3	17.0	86.1	0.0	1.7	6.3	199	969.7	19094298	40	25	25	25.1	25.0	24.2	18.2	12.8	10.0	7.2	6.8	6.3	10.0	-112.5	3.100	12.6	30.0	17.0
ND	100%	8/3/2010	215	22.6	25.4	19.6	88.4	0.0	2.3	6.5	199	967.9	12455695	26	25	25	24.8	24.8	24.2	18.3	12.8	10.0	7.1	6.8	6.3	10.0	-116.8	3.100	12.6	31.0	17.5
ND	100%	8/4/2010	216	25.4	29.8	21.9	87.3	0.0	1.5	5.8	207	961.8	17794483	38	25	25	24.9	24.8	24.1	18.4	12.8	10.0	7.1	6.8	6.3	10.0	-119.4	3.100	12.6	32.1	19.1
ND	100%	8/5/2010	217	25.1	29.0	21.1	84.8	1.1	2.1	9.3	240	956.1	17336886	37	26	26	25.6	25.1	24.1	18.6	12.9	10.1	7.2	6.8	6.3	10.0	-122.4	4.200	12.6	33.1	19.3
ND	100%	8/6/2010	218	21.0	24.1	14.9	79.1	0.1	2.3	8.8	275	957.9	21577242	45	26	26	25.6	25.5	24.2	18.9	13.0	10.1	7.2	6.8	6.4	10.0	-125.5	4.300	12.6	33.0	17.8
ND	100%	8/7/2010	219	19.2	25.9	13.5	65.4	0.0	1.6	5.9	253	964.0	28033288	58	25	25	25.2	25.0	24.4	19.0	13.0	10.1	7.2	6.8	6.4	10.0	-131.6	4.300	12.6	30.2	15.5
ND	100%	8/8/2010	220	21.7	28.1	15.0	72.0	0.0	1.6	7.2	214	966.0	22118122	46	25	25	25.1	24.9	24.3	19.1	13.1	10.1	7.2	6.9	6.3	10.0	-137.1	4.300	12.6	30.2	16.4
ND	100%	8/9/2010	221	25.3	30.5	19.7	68.6	0.0	1.5	5.8	220	965.7	22738023	48	26	25	25.2	25.0	24.3	19.2	13.2	10.2	7.2	6.9	6.3	9.9	-141.6	4.300	12.6	31.3	17.9
ND	100%	8/10/2010	222	24.1	27.9	20.5	84.4	0.4	1.2	5.8	237	963.9	14989032	31	26	26	25.9	25.3	24.3	19.4	13.2	10.2	7.2	6.9	6.4	9.9	-144.8	4.700	12.6	33.0	19.4
ND	100%	8/11/2010	223	23.8	28.4	19.4	82.3	0.0	1.5	5.7	252	962.6	20524117	43	26	26	26.2	25.6	24.3	19.5	13.3	10.3	7.2	6.9	6.3	9.9	-147.8	4.700	12.6	33.4	19.3
ND	25%	8/12/2010	224	21.8	22.1	21.4	90.5	0.0	0.7	1.9	147	961.9	360	0	26	26	26.3	25.8	24.3	19.5	13.3	10.2	7.3	6.9	6.3	9.9	-150.0	4.700	12.6	33.9	18.4
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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:				**55.8%**																		4.184	joule/calorie (= joule/degree for 1cm3)
Grand sum/avg	**22.50**	**25.44**	**25.44**	**25.44**	**25.16**	**24.27**	**18.85**	**1.4**	**209014116**	**-24631**	**-39.0**	**4.7**	**10.1**	**-36.5**	**-4.3**	**-13.4**											
															SumTerrevap2=AirVPD,mbar*WS,m/s*s												
Nominal diffuse %R from water=7%		#N/A	#N/A	11%									21	20.7	0.8											#N/A	-6.1

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)
8/1/2010	213	19.28	25.19	25.25	25.33	25.23	24.38	18.04	1.0	12352569	-2058	0.457	3.1	1.5	-3.0	-0.1	-1.2
8/2/2010	214	20.75	24.95	25.01	25.08	24.97	24.22	18.17	1.5	19094298	-2359	-4.078	0.0	0.9	-3.5	-0.3	-1.2
8/3/2010	215	22.62	24.65	24.73	24.81	24.80	24.22	18.30	2.1	12455695	-1727	-3.726	0.0	0.3	-2.6	-0.3	-1.2
8/4/2010	216	25.42	25.19	25.12	24.92	24.79	24.12	18.44	1.3	17794483	-316	-2.193	0.0	-0.2	-0.5	-0.3	-1.2
8/5/2010	217	25.14	25.67	25.70	25.65	25.06	24.13	18.62	1.9	17336886	-1497	-2.729	1.1	0.0	-2.2	-0.4	-1.2
8/6/2010	218	21.04	25.50	25.51	25.60	25.50	24.23	18.86	2.1	21577242	-4054	-5.554	0.1	2.2	-6.0	-0.6	-1.2
8/7/2010	219	19.17	25.28	25.23	25.17	24.96	24.44	19.03	1.3	28033288	-4027	-5.765	0.0	1.9	-6.0	-0.5	-1.2
8/8/2010	220	21.68	25.03	25.02	25.08	24.93	24.34	19.12	1.4	22118122	-2860	-4.781	0.0	1.2	-4.2	-0.6	-1.2
8/9/2010	221	25.26	25.63	25.47	25.22	25.04	24.28	19.23	1.3	22738023	-2109	-4.324	0.0	0.6	-3.1	-0.6	-1.2
8/10/2010	222	24.06	25.97	25.92	25.92	25.27	24.28	19.38	1.0	14989032	-1396	-2.285	0.4	0.8	-2.1	-0.3	-1.2
8/11/2010	223	23.84	26.08	26.09	26.17	25.56	24.27	19.51	1.4	20524117	-1939	-3.551	0.0	0.9	-2.9	-0.4	-1.2
8/12/2010	224	21.78	26.12	26.19	26.31	25.83	24.30	19.54	0.6	360	-290	-0.422	0.0	0.0	-0.4	0.0	-0.2
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				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)	
11488	-1852	9636	16.1%	0.46	20.50	20.42	(0.08)	(0.54)	-0.07	(0.47)	
17758	-2123	15634	12.0%	0.71	20.42	20.42	(0.00)	(0.71)	-0.08	(0.62)	
11584	-1554	10030	13.4%	0.46	20.42	20.28	(0.14)	(0.60)	-0.06	(0.54)	
16549	-284	16265	1.7%	0.66	20.28	20.47	0.19	(0.46)	-0.01	(0.45)	
16123	-1348	14776	8.4%	0.64	20.47	20.74	0.27	(0.38)	-0.05	(0.32)	
20067	-3649	16418	18.2%	0.80	20.74	20.73	(0.01)	(0.80)	-0.15	(0.66)	
26071	-3624	22447	13.9%	1.04	20.73	20.65	(0.08)	(1.12)	-0.14	(0.98)	
20570	-2574	17996	12.5%	0.82	20.65	20.68	0.02	(0.80)	-0.10	(0.69)	
21146	-1898	19249	9.0%	0.84	20.68	20.87	0.20	(0.64)	-0.08	(0.57)	
13940	-1257	12683	9.0%	0.56	20.87	21.01	0.14	(0.41)	-0.05	(0.36)	
19087	-1745	17342	9.1%	0.76	21.01	21.26	0.25	(0.51)	-0.07	(0.44)	
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