Lake Lacawac, Bruce R. Hargreaves, Lehigh University (brh0@lehigh.edu, http://www.lehigh.edu/~brh0)
13Apr09: Station moved from dock from 2:30-3:30pm (problems with ice-shift anchors result in wind direction error until corrected on 10Jun09)
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

5280	ft/mile
1609.3	m/mile

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).

	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						
	25.9	31.5	20.3		1.30	5.6	27					32.9	38.5	39.1	39.5	38.9	39.8	39.4	39.6	39.8	39.5	39.2						
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
	-3.4	**-0.3**	**-6.5**	**82.2**	**33.1**	**2.5**	**12.1**	**258.1**	**954.8**	**216413811**	**434**	**0.5**	**3.6**	**4.0**	**4.2**	**3.8**	**4.3**	**4.1**	**4.2**	**4.3**	**4.2**	**4.0**	**2.0**	**-74.8**	**33.1**	**12.5**	**24.3**	**14.7**

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%	2/1/2010	32	-5.4	-2.1	-8.0	62.1	0.0	2.0	7.9	286	966.9	9864329	19	1	4	3.6	3.8	3.6	4.1	3.9	4.0	4.0	4.0	3.7	2.0	-35.4	0.000	12.6	20.8	15.6
ND	100%	2/2/2010	33	-6.1	-3.0	-9.9	82.6	0.0	0.6	3.4	182	967.2	5219960	11	1	4	3.7	3.9	3.7	4.2	4.0	4.1	4.2	4.2	3.8	2.0	-42.7	0.000	12.6	18.2	15.4
ND	100%	2/3/2010	34	-3.6	-1.0	-6.8	89.2	1.0	1.5	6.8	226	963.0	3447987	7	1	4	3.8	4.0	3.7	4.2	4.0	4.1	4.2	4.2	3.8	2.0	-47.8	1.000	12.5	18.4	14.7
ND	100%	2/4/2010	35	-4.3	-1.3	-7.2	66.1	0.0	3.3	12.1	298	970.7	12745938	24	1	4	3.8	4.0	3.7	4.2	4.0	4.1	4.1	4.1	3.8	2.0	-53.8	1.000	12.5	20.3	15.1
ND	100%	2/5/2010	36	-4.9	-1.6	-9.4	80.3	0.0	0.9	4.4	179	967.8	5427213	11	1	4	3.8	4.1	3.8	4.2	4.1	4.2	4.2	4.3	3.9	2.0	-59.3	1.000	12.7	17.1	15.4
ND	100%	2/6/2010	37	-5.9	-3.0	-11.5	64.4	0.0	3.3	8.8	121	954.6	6807969	13	1	4	3.8	4.1	3.7	4.2	4.0	4.1	4.2	4.2	3.9	2.0	-64.7	1.000	12.6	16.9	15.4
ND	100%	2/7/2010	38	-9.5	-4.7	-13.1	79.0	0.0	3.4	9.3	320	958.3	11418549	21	1	4	3.9	4.1	3.8	4.3	4.1	4.2	4.2	4.2	3.9	2.0	-69.6	1.000	12.6	16.9	16.3
ND	100%	2/8/2010	39	-6.3	-1.8	-9.5	75.9	0.0	3.5	10.5	313	960.0	11676105	22	1	4	4.0	4.2	3.8	4.3	4.1	4.2	4.2	4.2	3.9	2.0	-74.1	1.000	12.6	16.6	15.6
ND	100%	2/9/2010	40	-2.6	1.4	-6.1	73.6	0.0	2.0	8.0	224	960.8	9031664	18	1	4	4.1	4.2	3.9	4.4	4.2	4.3	4.4	4.3	4.1	2.0	-78.0	1.000	12.6	17.3	14.5
ND	100%	2/10/2010	41	-2.9	-1.0	-4.1	100.2	0.0	2.9	9.3	188	941.6	2562868	6	1	4	4.1	4.2	3.9	4.4	4.2	4.3	4.4	4.3	4.1	2.0	-75.9	1.000	12.6	16.4	14.4
ND	100%	2/11/2010	42	-4.4	-0.8	-6.7	74.3	3.1	3.9	10.5	323	949.9	12916518	25	1	4	4.1	4.2	3.8	4.4	4.1	4.2	4.4	4.2	4.1	2.0	-71.8	4.100	12.5	17.8	14.9
ND	100%	2/12/2010	43	-5.7	-2.3	-11.5	75.5	0.1	2.6	9.3	303	955.8	11353689	22	0	4	4.1	4.2	3.9	4.4	4.2	4.3	4.4	4.2	4.1	2.0	-75.7	4.200	12.7	17.0	15.4
ND	100%	2/13/2010	44	-7.1	-4.7	-11.5	81.1	0.0	2.8	10.2	299	949.5	7916396	16	0	4	4.1	4.2	3.9	4.4	4.2	4.3	4.4	4.3	4.0	2.0	-79.3	4.200	12.6	15.7	15.8
ND	100%	2/14/2010	45	-3.3	-0.4	-6.0	76.3	0.0	3.6	11.0	303	948.2	7041361	14	0	4	4.1	4.2	3.8	4.3	4.1	4.2	4.3	4.2	4.0	2.0	-83.1	4.200	12.6	16.3	14.8
ND	100%	2/15/2010	46	-2.7	2.2	-6.6	77.5	0.2	1.5	7.6	238	952.2	13630936	26	0	4	4.1	4.2	3.9	4.4	4.2	4.3	4.4	4.1	4.1	2.0	-86.4	4.400	12.6	18.2	14.6
ND	100%	2/16/2010	47	-3.4	-2.1	-5.3	92.3	0.0	2.1	10.5	256	946.1	3774709	8	0	4	4.0	4.2	3.9	4.4	4.2	4.3	4.4	4.2	4.1	2.0	-88.0	4.400	12.6	15.6	14.4
ND	100%	2/17/2010	48	-3.8	-1.9	-5.3	85.5	0.1	2.7	8.5	303	947.2	5416003	11	0	4	4.0	4.2	3.8	4.4	4.2	4.3	4.4	4.1	4.1	2.0	-89.9	4.500	12.6	17.4	14.6
ND	100%	2/18/2010	49	-1.7	1.1	-3.5	82.9	0.0	3.7	10.5	314	949.3	4577827	10	0	4	4.0	4.2	3.8	4.4	4.1	4.2	4.3	4.2	4.0	2.0	-92.3	4.500	12.6	17.7	14.4
ND	100%	2/19/2010	50	-0.3	1.8	-2.3	77.6	0.1	4.1	10.7	312	955.2	4924069	10	0	3	4.0	4.2	3.7	4.3	4.0	4.1	4.2	4.2	4.0	2.0	-95.3	4.600	12.6	17.7	14.2
ND	100%	2/20/2010	51	-0.1	3.0	-2.0	79.6	0.0	3.0	8.7	312	961.4	6717812	14	0	3	4.0	4.2	3.8	4.4	4.2	4.3	4.4	4.1	4.1	2.0	-98.3	4.600	12.6	17.5	14.1
ND	100%	2/21/2010	52	-0.1	4.1	-3.6	63.8	0.0	3.2	10.4	313	960.7	15952448	31	0	3	4.0	4.2	3.8	4.4	4.2	4.3	4.4	4.1	4.1	2.0	-100.9	4.600	12.6	18.5	14.3
ND	100%	2/22/2010	53	-2.1	4.0	-10.0	78.4	0.0	1.1	6.4	141	959.6	8007066	17	0	3	4.0	4.3	3.9	4.5	4.2	4.4	4.4	4.1	4.1	2.0	-103.2	4.600	12.7	16.2	14.8
ND	100%	2/23/2010	54	-0.5	0.3	-1.0	99.3	3.2	2.0	5.6	89	956.4	3342726	8	0	3	4.0	4.4	3.9	4.4	4.2	4.3	4.4	4.0	4.1	2.0	-99.5	7.800	12.6	16.2	13.9
ND	100%	2/24/2010	55	0.2	1.4	-1.0	100.2	11.2	1.6	4.8	257	955.0	4124384	11	0	3	4.0	4.4	3.9	4.4	4.2	4.3	4.4	4.1	4.0	2.0	-84.2	19.000	12.6	32.5	14.0
ND	100%	2/25/2010	56	-2.7	-0.6	-6.3	100.8	0.3	2.8	11.3	312	945.3	3375780	8	1	3	4.0	4.3	3.9	4.3	4.1	4.2	4.3	4.1	4.0	2.0	-78.1	19.300	12.5	64.6	13.9
ND	100%	2/26/2010	57	-4.0	0.4	-7.3	94.4	3.1	2.9	9.9	276	936.8	7703438	16	1	3	3.9	4.3	3.8	4.3	4.1	4.2	4.3	4.0	4.0	2.0	-53.1	22.400	12.5	61.0	14.0
ND	100%	2/27/2010	58	-1.4	2.3	-3.6	93.8	6.0	1.5	5.6	273	945.3	9112505	19	1	3	4.0	4.4	4.0	4.5	4.2	4.3	4.4	4.1	4.0	2.0	-54.8	28.400	12.6	62.5	13.9
ND	100%	2/28/2010	59	-0.7	2.3	-2.4	94.3	4.7	1.5	7.5	266	949.5	8323562	17	1	3	4.0	4.4	3.9	4.4	4.2	4.3	4.3	4.0	4.0	2.0	-59.1	33.100	12.7	60.3	13.9
	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: **2.9%**

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)
Grand sum/avg		**-3.40**	**0.52**	**3.63**	**3.97**	**4.19**	**3.83**	**4.33**	**2.3**	**216413811**	**-20100**	**-27.7**	**33.1**	**5.1**	**-29.1**	**0.0**	**-37.1**
																SumTerrevap2=AirVPD,mbar*WS,m/s*sc	
		Data															
2/1/2010	32	-5.36	0.88	3.54	3.62	3.79	3.56	4.08	1.7	9864329	-965	-7.839	0.0	-5.4	-1.4	0.0	-1.2
2/2/2010	33	-6.10	0.73	3.64	3.74	3.94	3.69	4.16	0.5	5219960	-472	-5.906	0.0	-4.0	-0.7	0.0	-1.2
2/3/2010	34	-3.59	0.60	3.64	3.78	3.96	3.68	4.17	1.4	3447987	-459	-5.168	1.0	-4.3	-0.7	0.0	-1.2
2/4/2010	35	-4.27	0.64	3.63	3.76	4.01	3.73	4.23	3.1	12745938	-1296	-6.117	0.0	-3.0	-1.9	0.0	-1.2
2/5/2010	36	-4.94	0.57	3.72	3.80	4.08	3.77	4.21	0.8	5427213	-475	-5.414	0.0	-3.5	-0.7	0.0	-1.2
2/6/2010	37	-5.91	0.58	3.73	3.84	4.06	3.73	4.20	3.1	6807969	-1449	-5.062	0.0	-1.8	-2.1	0.0	-1.2
2/7/2010	38	-9.46	0.58	3.81	3.88	4.14	3.79	4.27	3.2	11418549	-1524	-4.711	0.0	-1.3	-2.2	0.0	-1.2
2/8/2010	39	-6.26	0.66	3.91	3.98	4.17	3.81	4.28	3.3	11676105	-1368	-4.605	0.0	-1.4	-2.0	0.0	-1.2
2/9/2010	40	-2.60	0.60	4.00	4.06	4.19	3.88	4.39	1.8	9031664	-637	-3.656	0.0	-1.5	-0.9	0.0	-1.2
2/10/2010	41	-2.87	0.52	4.00	4.11	4.22	3.88	4.40	2.8	2562868	-438	10.195	0.0	12.1	-0.6	0.0	-1.3
2/11/2010	42	-4.44	0.56	4.01	4.13	4.16	3.83	4.37	3.6	12916518	-1309	-4.113	3.1	-4.1	-1.9	0.0	-1.2
2/12/2010	43	-5.73	0.40	3.98	4.11	4.16	3.86	4.41	2.4	11353689	-1019	-3.480	0.1	-0.9	-1.5	0.0	-1.2
2/13/2010	44	-7.12	0.35	3.87	4.05	4.22	3.88	4.38	2.7	7916396	-1139	-3.761	0.0	-0.9	-1.6	0.0	-1.2
2/14/2010	45	-3.32	0.39	3.92	4.08	4.18	3.83	4.33	3.3	7041361	-1031	-3.902	0.0	-1.2	-1.5	0.0	-1.2
2/15/2010	46	-2.70	0.30	3.86	4.08	4.19	3.90	4.42	1.2	13630936	-464	-2.320	0.2	-0.6	-0.7	0.0	-1.2
2/16/2010	47	-3.38	0.31	3.67	4.05	4.24	3.90	4.42	2.0	3774709	-519	-1.336	0.0	0.6	-0.8	0.0	-1.2
2/17/2010	48	-3.76	0.31	3.56	4.01	4.24	3.85	4.38	2.5	5416003	-702	-2.215	0.1	-0.1	-1.0	0.0	-1.2
2/18/2010	49	-1.68	0.34	3.52	4.03	4.23	3.82	4.36	3.4	4577827	-712	-2.883	0.0	-0.7	-1.0	0.0	-1.2
2/19/2010	50	-0.30	0.40	3.47	3.99	4.18	3.75	4.29	3.8	4924069	-726	-3.480	0.1	-1.3	-1.0	0.0	-1.2
2/20/2010	51	-0.11	0.40	3.38	3.97	4.17	3.85	4.37	2.8	6717812	-478	-2.320	0.0	-0.4	-0.7	0.0	-1.2
2/21/2010	52	-0.14	0.44	3.37	4.01	4.22	3.85	4.38	2.9	15952448	-869	-2.566	0.0	-0.1	-1.3	0.0	-1.2
2/22/2010	53	-2.14	0.41	3.31	3.98	4.33	3.92	4.46	0.9	8007066	-330	-1.441	0.0	0.2	-0.5	0.0	-1.2
2/23/2010	54	-0.55	0.39	3.32	4.00	4.37	3.88	4.39	1.9	3342726	-98	18.175	3.2	16.3	-0.1	0.0	-1.2
2/24/2010	55	0.16	0.50	3.35	3.99	4.39	3.91	4.41	1.5	4124384	-17	0.492	11.2	-9.5	0.0	0.0	-1.2
2/25/2010	56	-2.66	0.53	3.34	4.02	4.34	3.89	4.35	2.6	3375780	-447	25.311	0.3	27.0	-0.6	0.0	-1.3
2/26/2010	57	-3.99	0.84	3.43	3.95	4.28	3.79	4.30	2.7	7703438	-766	6.820	3.1	7.2	-1.1	0.0	-2.4
2/27/2010	58	-1.36	0.65	3.33	4.01	4.39	3.96	4.45	1.4	9112505	-233	-4.640	6.0	-8.0	-0.3	0.0	-2.3
2/28/2010	59	-0.69	0.54	3.28	3.99	4.37	3.94	4.42	1.4	8323562	-155	-1.758	4.7	-4.2	-0.2	0.0	-2.2
#N/A																	
#N/A																	
#N/A																	

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

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)
Nominal diffuse %R from water=7%	**#N/A**	**#N/A**	**30%**		**4**	**#N/A**	**#N/A**		**#N/A**	**#N/A**
										slope
				4.184	<=CONVERT HEAT TO DEGREES				4.184	intercept
70%	0.9			6000000	cm3/m2 (for 0-4m integrated depth)				6000000	r2
2959	-868	2091	29.3%	0.12	3.73	3.87	0.15	0.03	-0.03	0.07
1566	-425	1141	27.1%	0.06	3.87	3.91	0.03	(0.03)	-0.02	(0.01)
1034	-413	621	40.0%	0.04	3.91	3.93	0.02	(0.02)	-0.02	(0.00)
3824	-1167	2657	30.5%	0.15	3.93	4.00	0.07	(0.08)	-0.05	(0.04)
1628	-427	1201	26.2%	0.06	4.00	3.98	(0.02)	(0.08)	-0.02	(0.07)
2042	-1304	738	63.8%	0.08	3.98	4.00	0.02	(0.06)	-0.05	(0.01)
3426	-1372	2054	40.0%	0.14	4.00	4.06	0.06	(0.07)	-0.05	(0.02)
3503	-1231	2272	35.1%	0.14	4.06	4.05	(0.01)	(0.15)	-0.05	(0.10)
2709	-574	2136	21.2%	0.11	4.05	4.15	0.09	(0.01)	-0.02	0.01
769	-394	375	51.3%	0.03	4.15	4.14	(0.01)	(0.04)	-0.02	(0.02)
3875	-1178	2697	30.4%	0.15	4.14	4.16	0.02	(0.14)	-0.05	(0.09)
3406	-918	2489	26.9%	0.14	4.16	4.17	0.01	(0.12)	-0.04	(0.09)
2375	-1025	1350	43.2%	0.09	4.17	4.10	(0.07)	(0.17)	-0.04	(0.13)
2112	-928	1185	43.9%	0.08	4.10	4.11	0.01	(0.07)	-0.04	(0.04)
4089	-418	3672	10.2%	0.16	4.11	4.17	0.06	(0.10)	-0.02	(0.09)
1132	-467	665	41.3%	0.05	4.17	4.07	(0.10)	(0.14)	-0.02	(0.13)
1625	-632	993	38.9%	0.06	4.07	4.08	0.01	(0.05)	-0.03	(0.03)
1373	-641	732	46.7%	0.05	4.08	4.08	(0.00)	(0.06)	-0.03	(0.03)
1477	-653	824	44.2%	0.06	4.08	4.00	(0.08)	(0.14)	-0.03	(0.11)
2015	-431	1585	21.4%	0.08	4.00	4.08	0.09	0.01	-0.02	0.03
4786	-783	4003	16.4%	0.19	4.08	4.16	0.07	(0.12)	-0.03	(0.09)
2402	-297	2105	12.4%	0.10	4.16	4.13	(0.03)	(0.13)	-0.01	(0.11)
1003	-89	914	8.8%	0.04	4.13	4.13	0.01	(0.03)	0.00	(0.03)
1237	-15	1222	1.2%	0.05	4.13	4.16	0.03	(0.02)	0.00	(0.02)
1013	-402	611	39.7%	0.04	4.16	4.01	(0.15)	(0.19)	-0.02	(0.18)
2311	-689	1622	29.8%	0.09	4.01	4.12	0.11	0.02	-0.03	0.05
2734	-210	2524	7.7%	0.11	4.12	4.19	0.07	(0.04)	-0.01	(0.03)
2497	-140	2357	5.6%	0.10	4.19	#N/A	#N/A	#N/A	-0.01	#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	