



9353 Hill Road • Swartz Creek, MI 48473
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www.lakeproinc.com

Orange Lake, Oakland County

December 7th, 2017

Water Quality Summary

2017 was the ninth year that LakePro tested the water quality at Orange Lake. Individual results allow us to look at the water quality during each event. Compiling the historical data allows us to look at long term trends in the water quality.

During the 2017 tests, the water quality was very good. In general, there was enough oxygen for the aquatic organisms, nutrients were at acceptable levels, and the water chemistry was in the preferred ranges. The only issue was the spring concentrations of Phosphate were at the upper limit of the target range. By summer, the concentrations of this nutrient decrease to the middle of the target range.

While the results were good for this year, the long term trends reveal how the lake is changing. Most of the parameters show slight trends that are improving. The nutrients Phosphate and Nitrate both show strong upward trends over the testing history.

Phosphate is a major nutrient for algae and plant growth in the lake. Although still in the target range, the increasing concentrations show this nutrient is accumulating in the lake. There are many sources of phosphate in the watershed, including fertilizers, yard waste, septic systems, and soaps. Once in the lake, it is very difficult to remove phosphates. Possible solutions include dredging, plant harvesting, or chemical treatment.

Nitrate is another major nutrient for algae and plants. Although still in the target range, the increasing concentrations show this nutrient is accumulating in the lake. There are many sources of phosphate in the watershed, including fertilizers, yard waste, and septic systems. Once in the lake, it is very difficult to remove nitrates. Possible remediation methods include dredging, plant harvesting, and biological augmentation.

The accumulation of nutrients and worsening of plant growth is a natural process that all lakes experience. At Orange Lake, this process is expedited by the developed watershed that introduce more nutrients and provide faster pathways to the lake (as is the case with most developed lakes). It is important that everyone in the watershed practices responsible land management to ensure no excess nutrients reach the lake. Beyond that, the riparians must decide whether or not to undertake remediation to help mitigate these nutrient concentrations.

Beyond the nutrient concentrations, the water quality is very good and shows improvement in most areas.





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Historical Data

Test Date	Sample Site	Temperature (°F)	Dissolved Oxygen (mg/L)	Phosphate (ppb)	Nitrate (ppb)	Transparency (feet)	pH	Total Dissolved Solids (ppm)	Conductivity (µS)	Alkalinity (ppm)	Hardness (ppm)	Salinity (ppm)
7/1/2009	West	72.3	4.7			5.8	8.3	487	689	146	167	333
	East	71.8	6.5	50	308		8.1	489	690	150	180	334
9/22/2009	West	72.3	8.1		264	7.0	8.6	515	716	163	180	355
	East	73.2	6.8		176		8.6	518	730	163	180	352
4/29/2010	West	59.5	9.2	40	154	7.9	9.6	596	845	189	203	405
	East	59.5	9.1	35	198		9.4	605	849	194	201	403
6/29/2010	West	78.4	6.6	45	217	4.2	9.2	582	840	191	204	392
	East	77.0	6.0	38	253		9.4	586	847	194	212	394
5/9/2011	West	64.0	8.6	39	268	6.4	8.9	624	862	186	204	364
	East	64.4	8.9	42	274		9.2	616	856	188	210	372
8/11/2011	West	84.7	4.5	120	88	5.2	7.6	336	672	186	205	320
	East	84.2	4.9	30	176		7.8	336	673	192	216	328
5/11/2012	West	65.5	6.9	10	176	8.3	8.3	380	760	165	195	370
	East	65.9	10.2	20	132		8.2	362	724	172	204	350
7/19/2012	West	84.6	6.6	30	176	6.7	8.1	324	642	128	139	330
	East	87.3	6.4	40	220		8.0	315	628	114	126	330
5/13/2013	West	48.2	9.4	20	176	7.1	8.6	336	670	174	211	290
	East	55.7	8.2	40	176		8.4	325	652	163	201	290
8/5/2013	West	77.4	5.3	10	220	6.2	8.2	297	587	131	163	260
	East	78.6	4.5	50	308		8.1	311	619	129	155	270
5/6/2014	West	58.9	8.7	40	264	8.1	7.7	414	834	146	175	410
	East	58.9	8.2	60	308		7.0	446	893	138	171	440
7/18/2014	West	77.2	6.5	30	176	6.9	8.3	387	762	127	153	230
	East	78.4	6.1	50	264		8.0	406	803	116	147	280
5/4/2015	West	61.2	8.5	60	484	7.6	8.7	352	497	163	192	340
	East	63.7	8.3	80	572		8.1	348	482	151	188	320
8/25/2015	West	70.9	6.8	30	264	5.3	8.1	307	438	139	170	300
	East	74.9	6.0	50	396		7.5	299	425	118	146	280
4/27/2016	West	57.6	8.6	80	308	7.1	8.6	371	724	158	182	360
	East	56.8	7.9	60	396		8.4	355	701	142	169	330
8/24/2016	West	82.3	5.6	20	352	5.7	7.9	333	647	161	183	330
	East	83.5	5.2	30	396		7.6	319	631	144	170	320
5/11/2017	West	55.0	7.4	90	528	8.4	8.4	393	765	152	177	390
	East	56.8	7.1	110	660		8.2	402	795	143	170	400
8/1/2017	West	81.9	6.6	40	484	5.8	7.7	373	725	125	156	370
	East	83.3	5.4	60	528		7.8	386	764	122	149	380

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