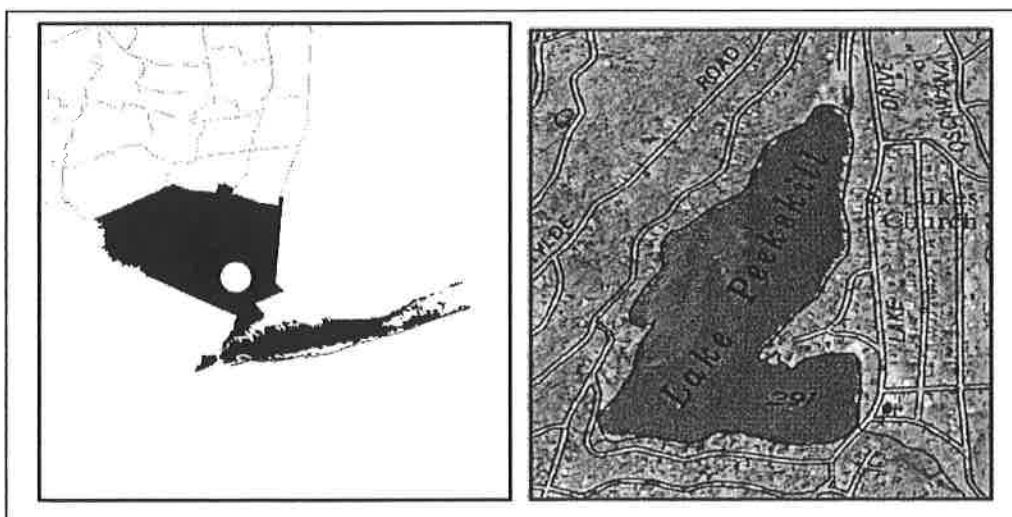


CSLAP 2010 Lake Water Quality Summary:
Lake Peekskill

General Lake Information

Location	Town of Putnam Valley
County	Putnam
Basin	Lower Hudson River
Size	23.3 hectares (57.6 acres)
Lake Origins	Natural
Watershed Area	286 hectares (706.4 acres)
Retention Time	0.5 years
Mean Depth	3.7 meters
Sounding Depth	7.5 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To...	unnamed outlet to Peekskill Hollow Creek to Annsville Creek to Hudson River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	41.337
Lake Outlet Longitude	-73.880
Sampling Years	1990-1994, 1996, 1998, 2000-2010
2010 Samplers	Mark Wisniewski and Patrick Gillease
Main Contact	Ted Muniak

Lake Map



Background

Lake Peekskill is a 57 acre, class B lake found in the Town of Putnam Valley in Putnam County, in the lower Hudson River region of New York State. It was first sampled as part of CSLAP in 1990.

It is one of 11 CSLAP lakes among the more than 75 lakes found in Putnam County, and one of 41 CSLAP lakes among the more than 360 lakes and ponds in the Lower Hudson River drainage basin.

Lake Uses

Lake Peekskill is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing—and non-contact recreation—boating and aesthetics, although the lake is for aesthetics and by aquatic life. The lake is used by lake residents and invited guests for a variety of recreational purposes—the lake has no public access.

The state does not stock Lake Peekskill; it is not known if any private stocking occurs. General statewide fishing regulations are applicable in Lake Peekskill.

Historical Water Quality Data

CSLAP sampling was conducted on Lake Peekskill from 1990 to 1994, 1996, 1998, and 2000 to 2010. Some of the CSLAP reports for Lake Peekskill are found on the NYSFOLA website at www.nysfola.org, under NYS Lake Association Lake List.

Lake Peekskill was not sampled through any of the major NYS monitoring programs. It is not known if private monitoring has been conducted to support resource management (water or fisheries).

Lake Association and Management History

Lake Peekskill is represented by the Lake Peekskill Improvement District (and Preservation Committee). In addition to involvement in CSLAP, the district is involved in a boat tagging program (to keep track of residential boats) and other lake management activities.

It is not known if the district or preservation committee maintains a website.

Summary of 2010 CSLAP Sampling Results

Evaluation of Eutrophication Indicators

Secchi disk transparency, chlorophyll *a* and total phosphorus readings in Lake Peekskill were close to normal in 2010. However, water clarity readings have decreased since the early 1990s, consistent with a long-term increase in total phosphorus readings (and despite the lack of a long-term change in algae levels). The lake continues to be characterized as *mesoeutrophic*, based on water clarity (typical of *mesotrophic* lakes), chlorophyll *a* and total phosphorus readings (both typical of *eutrophic* lakes). The trophic state indices (TSI) evaluation suggests

that the trophic indicators are “internally consistent,” meaning that each of the trophic indicators are in the expected range given the other indicators. Phycocyanin levels were below the levels indicating susceptibility for harmful algal blooms (HABs) in 2009; these readings were not collected in 2010. An analysis of algae samples in 2009 indicated microcystin levels below the levels needed to support safe swimming. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are regularly high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not classified for this purpose. Lake Peekskill is not thermally stratified, at least on a consistent basis, so deepwater samples have not regularly been collected in the lake. The limited deepwater phosphorus data indicates that any deeper intakes may be compromised for potable water use, due to depressed oxygen levels. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Conductivity and color levels were higher than normal in 2010, and readings for both indicators have changed since the early 1990s. It is not known if this has resulted in any ecological impacts. None of these other indicators has exhibited any clear long-term trends, and it is likely that the small changes in these other indicators from year to year represent normal variability. Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Biological Condition

The 1992 phytoplankton survey of the lake exhibited low biomass dominated by green algae. It is not known if this was representative of normal conditions in the lake.

Very limited macrophyte surveys have been conducted through CSLAP at Lake Peekskill. These surveys found a small number of native plant species, but no evidence of either exotic or protected plants. The very limited dataset and modified floristic quality index (FQI) calculations indicate that the quality of the aquatic plant community is “excellent.”

Zooplankton and macroinvertebrate surveys have not been conducted through CSLAP. The composition of the fish community is not known, although it is likely that Lake Peekskill supports a warmwater fishery.

Biological conditions in the lake are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Lake Perception

Recreational assessments were less favorable than normal in 2009 and 2010, consistent with the long-term increase in phosphorus readings and decrease in water clarity. However, this

has not translated into clear long-term changes in indicators of lake perception. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Neither air temperature nor water temperature were significantly different in 2010, and neither measure of local climate change has exhibited significant long-term change. It is not known if this is an indication of the lack of local climate change or if these changes cannot be well evaluated through CSLAP.

Lake Condition Summary

Category	Indicator	Min	90-10 Avg	Max	2010 Avg	Classification	2010 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.04	2.12	4.50	1.68	Mesotrophic	Within Normal Range	Decreasing Slightly
	Chlorophyll <i>a</i>	0.29	12.07	47.20	9.31	Eutrophic	Within Normal Range	No Change
	Total Phosphorus	0.003	0.026	0.061	0.031	Eutrophic	Within Normal Range	Increasing Slightly
Potable Water Indicators	Hypolimnetic NH4							
	Hypolimnetic As							
	Hypolimnetic Iron							
	Hypolimnetic Mn							
Limnological Indicators	Hypolimnetic TP	0.053	0.319	0.924		Elevated Deepwater TP		Not known
	Nitrate + Nitrite	0.00	0.02	0.10	0.03	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.04	0.44	0.05	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.01	0.45	1.00	0.56	Low Total Nitrogen	Within Normal Range	No Change
	pH	6.62	7.85	9.33	7.99	Alkaline	Within Normal Range	No Change
	Specific Conductance	143	316	558	483	Hardwater	Higher than Normal	Increasing Significantly
	True Color	2	12	98	24	Intermediate Color	Higher than Normal	Increasing Slightly
	Calcium	16.7	23.4	29.2	26.6	Highly Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.7	5	2.2	Definite Algal Greenness	Within Normal Range	No Change
	Plant Coverage	1	1.7	4	2.7	Subsurface Plant Growth	Less Favorable than Normal	No Change
	Rec. Assessment	1	2.5	5	2.2	Slightly Impaired	Within Normal Range	No Change
Biological Condition	Phytoplankton					Dominated by green algae?	Not known	Not known
	Macrophytes					Excellent quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Not available through CSLAP	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	5	24.9	38	27.1		Within Normal Range	No Change
	Water Temperature	10	24.2	30	24.6		Within Normal Range	No Change

Evaluation of Lake Condition Impacts to Lake Uses

The 2008 NYSDEC Priority Waterbody Listings (PWL) for the Lower Hudson River drainage basin indicate that *recreation* and *aquatic life* in Lake Peekskill may be *stressed* by poor cover (due to habitat modification). The 2008 PWL listing for the lake is shown in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Lake Peekskill, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not classified for this use. These data suggest that any "unofficial" use of the lake for potable water may be compromised by excessive algae.

Contact Recreation (Swimming)

The CSLAP dataset at Lake Peekskill, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation may be *impaired* by excessive algae and poor water clarity, although algae levels in 2010 were more indicative of *stressed* conditions. Bacterial data are needed to evaluate the safety of the lake for swimming.

Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Lake Peekskill, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation should be fully supported.

Aquatic Life

The CSLAP dataset on Lake Peekskill, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *stressed* by anoxic conditions, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

The CSLAP dataset on Lake Peekskill, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics should be fully supported, although this use may be occasionally *threatened* by excessive algae.

Fish Consumption

There is no fish consumption advisories posted for Lake Peekskill.

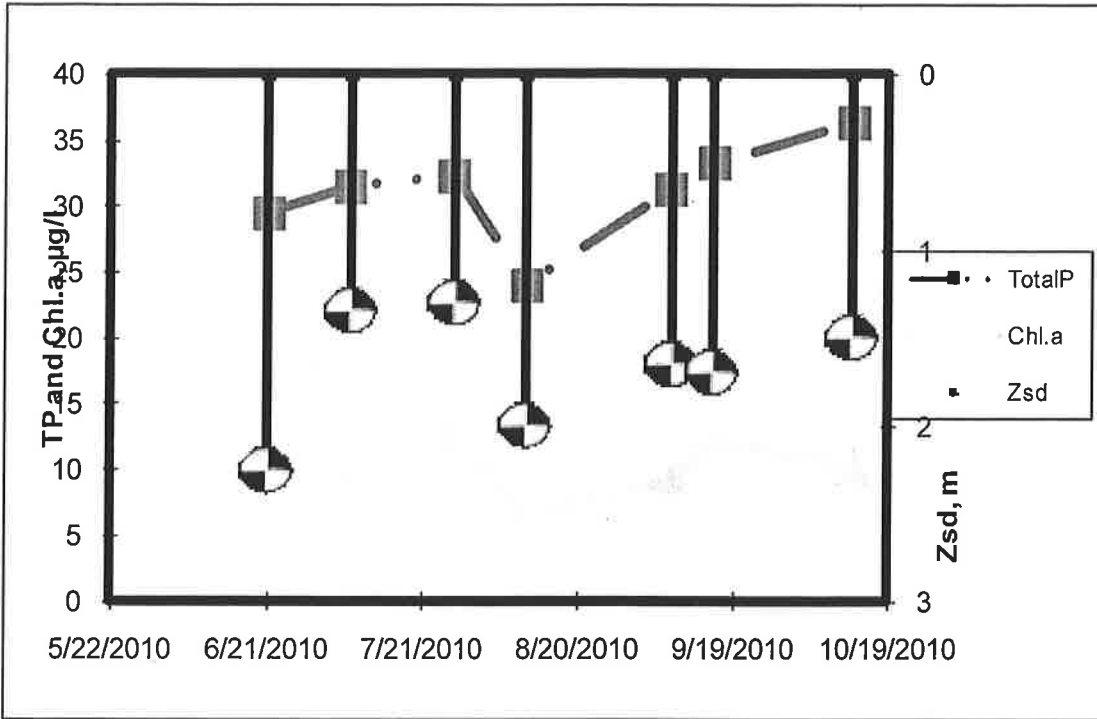
Additional Comments and Recommendations

It is not known if any exotic plant species have been introduced to the lake; the sampling volunteers should conduct any aquatic plant inventory.

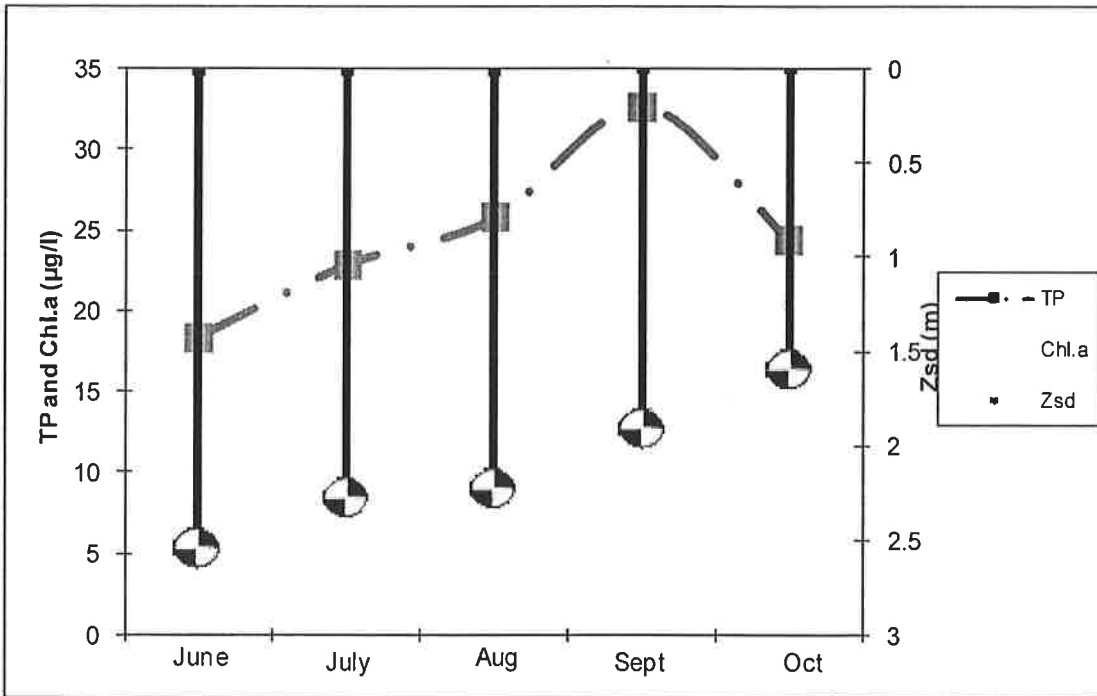
Aquatic Plant IDs-2010

None submitted for identification

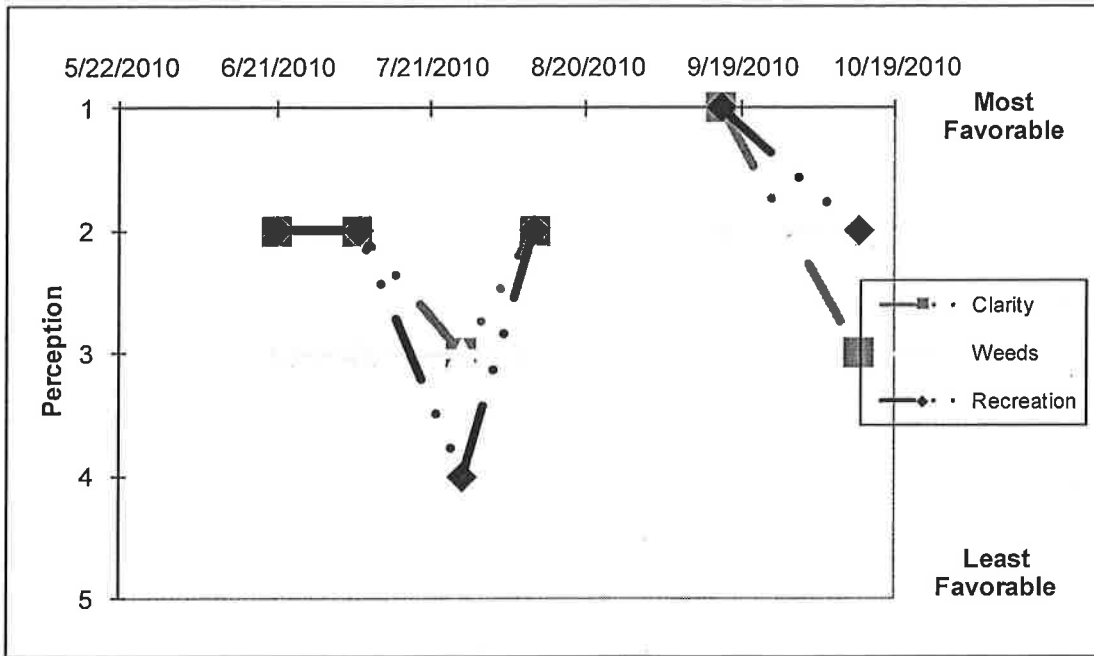
Time Series: Trophic Indicators, 2009



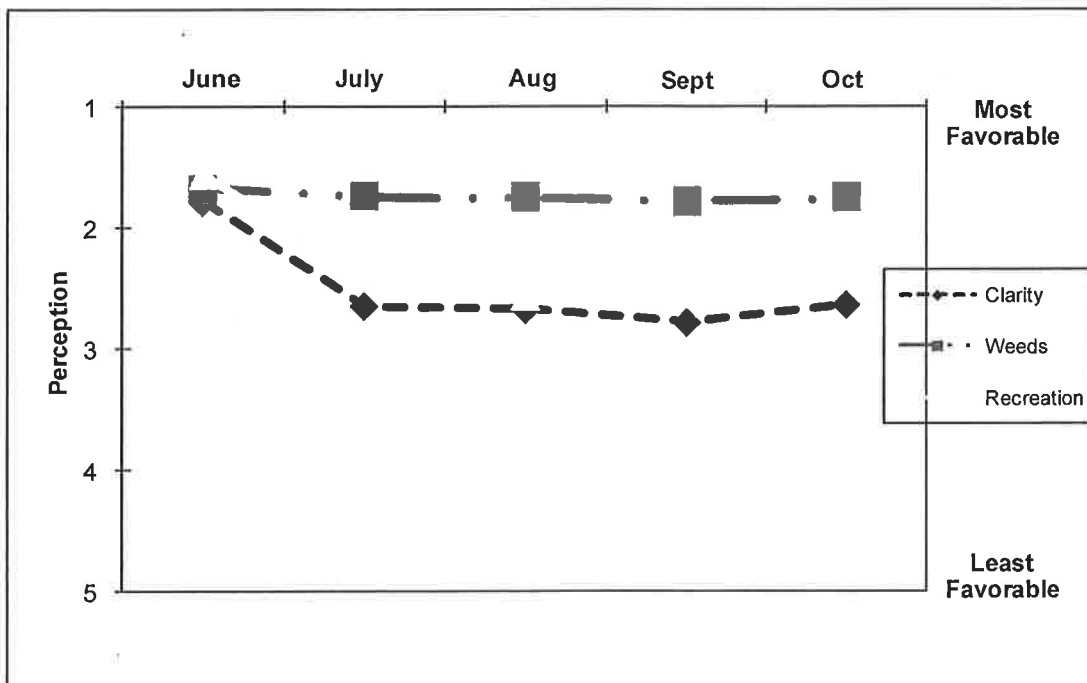
Time Series: Trophic Indicators, Typical Year (1990-2010)



Time Series: Lake Perception Indicators, 2010



Time Series: Lake Perception Indicators, Typical Year (1990-2010)



Appendix A- CSLAP Water Quality Sampling Results for Lake Peekskill

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
73	L Peekskill	7/8/1990	7.5	3.38	1.5	0.013	0.05				8	7.33	206		4.07
73	L Peekskill	7/22/1990	7.8	4.13	1.5	0.013	0.02				7	7.56	180		5.74
73	L Peekskill	8/5/1990	8.0	3.50	1.5	0.015	0.01				8	8.01	190		6.96
73	L Peekskill	8/19/1990	6.8	3.00	1.5	0.015	0.01				11	7.87	165		9.40
73	L Peekskill	9/10/1990	7.6	2.38	1.5	0.021	0.01				18	7.90	143		21.30
73	L Peekskill	9/24/1990	7.6	1.63	1.5	0.027	0.01				15	7.76	176		31.00
73	L Peekskill	10/7/1990	7.6	1.63	1.5	0.018	0.01				19	7.83	145		31.00
73	L Peekskill	7/22/1991	6.5	2.71	1.5	0.019	0.01				11	8.51	188		7.81
73	L Peekskill	7/28/1991	6.5	1.58	1.5	0.033	0.01				10	7.89	183		13.20
73	L Peekskill	8/4/1991	6.8	1.58	1.5	0.030	0.01					8.20	152		8.74
73	L Peekskill	8/11/1991	7.0	2.00	1.5	0.023	0.01				11	7.67	198		13.20
73	L Peekskill	8/18/1991	7.0	2.00	1.5	0.014	0.01				10	7.89	149		8.28
73	L Peekskill	8/25/1991	7.3	2.00	1.5	0.026	0.01				12	7.39	162		14.30
73	L Peekskill	9/2/1991	7.0	3.00	1.5	0.020	0.01				7	7.85	199		10.30
73	L Peekskill	9/8/1991	7.0	2.00	1.5	0.024	0.01				6	8.00	199		11.10
73	L Peekskill	9/15/1991	7.0	1.50	1.5	0.021	0.02				6	7.87	163		21.70
73	L Peekskill	6/7/1992	7.0	2.00	1.5	0.031	0.01				12	7.81	211		9.30
73	L Peekskill	6/20/1992	8.3	2.00	1.5	0.023					6	7.88	213		13.00
73	L Peekskill	7/5/1992	8.0	2.63	1.5	0.015	0.01				7	7.81	214		15.50
73	L Peekskill	7/19/1992	8.0	2.00	1.5	0.018					10	7.80	212		9.60
73	L Peekskill	8/2/1992	8.0	2.00	1.5	0.022	0.01				8	7.71	214		11.60
73	L Peekskill	8/16/1992	8.5	2.50	1.5	0.016					8	7.68	216		9.18
73	L Peekskill	8/30/1992	8.0	3.88	1.5	0.018	0.01				9	7.88	215		3.58
73	L Peekskill	9/13/1992	8.0	3.00	1.5	0.023	0.01					7.88	214		
73	L Peekskill	6/20/1993	8.0	2.63	1.5	0.018					7	8.82	269		3.16
73	L Peekskill	6/27/1993	8.5	2.25	1.5	0.018	0.01				6	8.71	269		4.46
73	L Peekskill	7/11/1993	7.3	2.50	1.5	0.009					3	8.80	270		4.00
73	L Peekskill	7/25/1993	8.1	3.13	1.5	0.013	0.01				2	8.40	265		47.20
73	L Peekskill	8/8/1993	8.0	3.50	1.5	0.017					4	7.49	276		4.72
73	L Peekskill	8/22/1993	7.8	4.50	1.5	0.011	0.01				4	7.90	272		6.20
73	L Peekskill	9/5/1993	8.0	4.00	1.5	0.015					5	7.80	272		6.38
73	L Peekskill	9/26/1993	7.1	3.00	1.5	0.014	0.03				6	7.91	272		19.80
73	L Peekskill	6/11/1994	8.0	3.00	1.5	0.013	0.01				3	7.90	290		5.97
73	L Peekskill	6/19/1994	8.1	2.88	1.5	0.007					4	8.29	286		6.18
73	L Peekskill	7/10/1994	8.0	3.50	1.5	0.009	0.01				2	9.08	276		11.60
73	L Peekskill	7/26/1994	7.8	2.38	1.5	0.012					2	8.96	278		3.94
73	L Peekskill	8/7/1994	7.5	3.25	1.5	0.020	0.01				2	7.39	284		6.18
73	L Peekskill	8/21/1994	8.0	3.50	1.5	0.010	0.01				8	7.89	281		4.71
73	L Peekskill	9/4/1994	8.0	3.50	1.5	0.010	0.01					7.54	281		
73	L Peekskill	7/14/1996		2.00	1.5		0.01				10	7.19	291		1.80
73	L Peekskill	8/25/1996		1.50		0.026	0.01				10	7.86	303		13.80
73	L Peekskill	9/15/1996	8.0	1.50	1.5	0.036	0.01				10	7.15	303		31.40
73	L Peekskill	10/6/1996	8.0	1.50	1.5	0.022	0.01				6	7.04	294		38.10
73	L Peekskill	6/28/1998	7.0	4.00	1.5	0.028	0.01				3	6.79	275		4.20
73	L Peekskill	7/19/1998	6.5	3.13	1.5	0.015	0.01				5	7.77	276		8.84
73	L Peekskill	7/26/1998	7.0	2.50	1.5		0.01				2	8.19	279		19.60
73	L Peekskill	8/2/1998	7.0	1.50	1.5	0.039	0.01				18	7.60	278		33.80
73	L Peekskill	9/10/2000		2.00	1.5	0.042	0.01				9	7.62	278		19.20
73	L Peekskill	9/24/2000		1.38	1.5	0.034	0.01				9	7.89	274		33.90
73	L Peekskill	7/1/2001		2.00	1.5	0.020	0.01				8	8.51	310		
73	L Peekskill	7/15/2001	3.2	1.80	1.5	0.029	0.01				7	7.66	313		13.60
73	L Peekskill	7/29/2001	4.2	1.60	1.5	0.034	0.01				5	6.73	323		8.20
73	L Peekskill	8/12/2001	4.0	2.10	1.5	0.025	0.01				8	8.02	320		23.91
73	L Peekskill	6/23/2002	6.8	1.95	1.3	0.027	0.10	0.03	0.69	25.88	5	7.83	337		2.71
73	L Peekskill	7/7/2002	6.6	1.20	1.2	0.025	0.00	0.04			11	6.62	350		2.45
73	L Peekskill	7/21/2002	3.9	1.06	1.5	0.025	0.03	0.07	0.51	20.40	11	8.98	353		7.23
73	L Peekskill	8/4/2002	4.1	1.17	1.5	0.028	0.00	0.01	0.55	19.47	9	9.33	347		2.11
73	L Peekskill	8/18/2002	4.2	1.50	1.5	0.024	0.00	0.04	0.66	27.04	7	8.96	349		5.72
73	L Peekskill	9/2/2002	4.2	1.70	1.5	0.027	0.00	0.03			10	7.59	354		8.64
73	L Peekskill	9/16/2002	4.7	2.15	1.5	0.034	0.00	0.05	0.54	15.95	11	7.28	367		7.19
73	L Peekskill	10/6/2002	5.5	1.80	1.5	0.011	0.05	0.06	0.64	56.78	4	8.06	266		0.29
73	L Peekskill	7/13/2003	4.1	2.91	1.5	0.015	0.035	0.083	0.58	39.9	3	7.5	438	24	3.54
73	L Peekskill	7/30/2003	6.7	3.05	1.5	0.012	0.010	0.019	0.10	8.3	9	7.6	430		1.78

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
73	L Peekskill	8/18/2003	3.9	2.83	1.5	0.015	0.003	0.011	0.34	23.1	4	7.3	420		3.22
73	L Peekskill	9/7/2003	3.9	1.95	1.5	0.022	0.037	0.012			11	7.5	434		16.43
73	L Peekskill	9/28/2003	3.8	1.88		0.021	0.098	0.040	0.43	20.7	8	7.5	416	24	13.80
73	L Peekskill	10/13/2003	3.5	2.27	1.5	0.003	0.009	0.007	0.16	45.8	11	7.3	436		
73	L Peekskill	10/26/2003	4.8	1.85											
73	L Peekskill	11/9/2003	2.9	2.02	1.5										
73	L Peekskill	7/25/2004	6.2	1.60	1.5		0.01	0.01	0.01		20	7.88	494	29.1	1.7
73	L Peekskill	8/9/2004	4.4	1.40	1.5	0.028	0.04	0.02	0.36	12.79	12	8.05	322		8.9
73	L Peekskill	8/15/2004	4.7	1.60	1.5	0.026	0.09	0.04	0.34	12.76	8	8.41	382		10.0
73	L Peekskill	8/22/2004	4.7	1.50	1.5	0.027	0.07	0.02	0.56	21.02	19	7.70	346		15.6
73	L Peekskill	7/25/2005	3.7	1.95	1.0	0.017	0.08	0.01	0.17	10.48	14	8.56	346	19.8	2.8
73	L Peekskill	8/3/2005	6.9	2.34	1.5	0.037	0.01	0.01	0.20	5.30	18	8.46	410		1.0
73	L Peekskill	8/18/2005	7.4	1.80	1.5	0.032	0.07	0.01	0.25	7.71	8	8.39	388		1.8
73	L Peekskill	9/1/2005	7.2	1.52	1.5	0.046	0.02	0.01	0.15	3.33	12	8.53	398		14.3
73	L Peekskill	9/11/2005	7.2	1.15	1.5	0.047	0.01	0.01	0.16	3.43	6	7.76	378	16.7	36.9
73	L Peekskill	9/24/2005	7.3	1.08	1.5	0.045	0.01	0.01	0.21	4.54	10	8.02	409		26.0
73	L Peekskill	10/30/2005	8.9	1.69	1.5	0.038	0.10	0.44	0.61	15.95		7.60	349		14.6
73	L Peekskill	7/9/2006	7.5	1.50	1.5	0.049	0.01	0.10	0.75	33.59	17	8.37	368	20.0	7.08
73	L Peekskill	8/13/2006	5.5	1.04	1.5	0.041	0.02	0.06	0.71	38.30	8	8.08	408		23.74
73	L Peekskill	9/4/2006	7.1	1.17	1.5	0.045	0.02	0.09	0.74	36.45	7	7.15	388		36.96
73	L Peekskill	9/17/2006	6.9	1.37	1.5	0.049	0.02	0.14	1.00	45.07	27	7.39	331		19.11
73	L Peekskill	8/5/2007	4.0	2.33	1.5	0.033	0.00	0.02	0.95	62.94		8.08	370	20.9	
73	L Peekskill	8/12/2008	7.0	1.30	1.5	0.038	0.01	0.02	0.39	22.64	10	8.33	393	21.9	17.19
73	L Peekskill	8/18/2008	3.0	1.43	1.5	0.048	0.01	0.02	0.39	17.54	24	8.06	351		2.24
73	L Peekskill	9/2/2008	7.5	1.80	1.5	0.023	0.01	0.00	0.39	37.20	8	7.84	390		11.63
73	L Peekskill	9/10/2008	7.4	1.75	1.5	0.061	0.00	0.01	0.33	11.96	19	7.52	558		10.56
73	L Peekskill	9/17/2008	5.5	1.60	1.5	0.053	0.01	0.01	0.32	13.33	7	7.86	389	21.3	6.34
73	L Peekskill	9/29/2008	6.8	1.40	1.5	0.031	0.01	0.05	0.50	34.95	16	7.81	392		21.04
73	L Peekskill	10/6/2008	4.0	1.20	3.0	0.029	0.01	0.02	0.34	25.82	7	7.14	387		24.56
73	L Peekskill	10/13/2008	6.3	1.45	1.5		0.02	0.00	0.44		50	7.31	340		23.72
73	L Peekskill	07/27/2009	6.3	2.45	2.0	0.030	0.05	0.04	0.46	33.33	26	7.47	333	25.6	1.46
73	L Peekskill	08/04/2009	6.4	2.20	1.5	0.048	0.04	0.02	0.34	15.59	21	7.61	289		6.33
73	L Peekskill	08/18/2009	7.1	2.40	1.5	0.022	0.02	0.03	0.36	35.16	13	7.68	306		5.80
73	L Peekskill	09/01/2009	6.2	1.75	1.5	0.030	0.04	0.04	0.39	28.30	8	7.13	396		12.70
73	L Peekskill	09/15/2009	7.0	1.20	1.5	0.048	0.01	0.01	0.40	18.03	24	7.57	345	28.0	10.60
73	L Peekskill	09/29/2009	4.5	1.65	1.5	0.047	0.01	0.03	0.39	18.43	48	7.35	435		1.75
73	L Peekskill	10/13/2009	6.0	1.35	1.5	0.037	0.01	0.07	0.51	30.42	20	6.90	314		15.20
73	L Peekskill	6/21/2010	7.1	2.25	1.5	0.030	0.01	0.01			14	7.89	440	29.2	5.50
73	L Peekskill	7/7/2010	6.5	1.35	1.5	0.032	0.02	0.02	0.49	34.22	11	8.64	482		8.70
73	L Peekskill	7/27/2010	6.1	1.30	1.5	0.032	0.01	0.02			11	8.52	482		12.90
73	L Peekskill	8/10/2010	7.0	2.00	1.5	0.024	0.02	0.01	0.39	35.29	10	8.23	503		6.40
73	L Peekskill	9/7/2010	7.0	1.65	1.5	0.031	0.02	0.02	0.44	30.79	98	8.12	498	24.0	9.20
73	L Peekskill	9/15/2010	8.0	1.70	1.5	0.033	0.01	0.05	0.79	52.42	12	7.24	501		12.30
73	L Peekskill	10/12/2010	4.0	1.50	1.5	0.036	0.09	0.19	0.71	42.79	14	7.26	476		10.20
73	L Peekskill	7/26/1998	7.0		6.0	0.053									
73	L Peekskill	9/4/2006				0.924									
73	L Peekskill	9/17/2006				0.139									
73	L Peekskill	8/5/2007				0.159									

LNum	PName	Date	Zbot	Zsd	Zsamp	TAir	TH20	QA	QB	QC	QD
73	L Peekskill	7/8/1990	7.5	3.38	1.5						
73	L Peekskill	7/22/1990	7.8	4.13	1.5	26	28				
73	L Peekskill	8/5/1990	8.0	3.50	1.5	24	28				
73	L Peekskill	8/19/1990	6.8	3.00	1.5	21	27				
73	L Peekskill	9/10/1990	7.6	2.38	1.5	25	23				
73	L Peekskill	9/24/1990	7.6	1.63	1.5	14	19				
73	L Peekskill	10/7/1990	7.6	1.63	1.5	25	19				
73	L Peekskill	7/22/1991	6.5	2.71	1.5	27	29				
73	L Peekskill	7/28/1991	6.5	1.58	1.5	28	25				
73	L Peekskill	8/4/1991	6.8	1.58	1.5	23	26				
73	L Peekskill	8/11/1991	7.0	2.00	1.5	28	28				
73	L Peekskill	8/18/1991	7.0	2.00	1.5	26	27				
73	L Peekskill	8/25/1991	7.3	2.00	1.5	20	24				
73	L Peekskill	9/2/1991	7.0	3.00	1.5	17	23				
73	L Peekskill	9/8/1991	7.0	2.00	1.5	21	25				

LNum	PName	Date	Zbot	Zsd	Zsamp	TAir	TH20	QA	QB	QC	QD
73	L Peekskill	9/15/1991	7.0	1.50	1.5	19	22				
73	L Peekskill	6/7/1992	7.0	2.00	1.5	26	21	2	2	2	0
73	L Peekskill	6/20/1992	8.3	2.00	1.5	25	23	2	2	2	5
73	L Peekskill	7/5/1992	8.0	2.63	1.5	24	24	2	3	2	
73	L Peekskill	7/19/1992	8.0	2.00	1.5	26	25	2	1	2	5
73	L Peekskill	8/2/1992	8.0	2.00	1.5	24	23	3	3	3	26
73	L Peekskill	8/16/1992	8.5	2.50	1.5	19	25	3	3	2	5
73	L Peekskill	8/30/1992	8.0	3.88	1.5	24	25	1	2	1	0
73	L Peekskill	9/13/1992	8.0	3.00	1.5	20	26	2	3	3	2
73	L Peekskill	6/20/1993	8.0	2.63	1.5	27	28	2	1	1	56
73	L Peekskill	6/27/1993	8.5	2.25	1.5	23	28	1	3	1	
73	L Peekskill	7/11/1993	7.3	2.50	1.5	26	29	2	3	2	
73	L Peekskill	7/25/1993	8.1	3.13	1.5	34	26	3	2	1	1
73	L Peekskill	8/8/1993	8.0	3.50	1.5	21	25	2	2	2	6
73	L Peekskill	8/22/1993	7.8	4.50	1.5	27	22	1	4	3	2
73	L Peekskill	9/5/1993	8.0	4.00	1.5	22	27	1	3	2	2
73	L Peekskill	9/26/1993	7.1	3.00	1.5	21	20	2	3	2	5
73	L Peekskill	6/11/1994	8.0	3.00	1.5	22	23	1	1	1	5
73	L Peekskill	6/19/1994	8.1	2.88	1.5	38	29	3	1	2	1
73	L Peekskill	7/10/1994	8.0	3.50	1.5	32	28	2	3	3	2
73	L Peekskill	7/26/1994	7.8	2.38	1.5	33	27	4	4	3	2
73	L Peekskill	8/7/1994	7.5	3.25	1.5	22	25	2	4	3	2
73	L Peekskill	8/21/1994	8.0	3.50	1.5	27	26	1	3	2	
73	L Peekskill	9/4/1994	8.0	3.50	1.5	25	27	1	3	2	2
73	L Peekskill	7/14/1996		2.00	1.5	28	26	3	1	3	1
73	L Peekskill	8/25/1996		1.50		27	26				
73	L Peekskill	9/15/1996	8.0	1.50	1.5	15	18	2	1	2	6
73	L Peekskill	10/6/1996	8.0	1.50	1.5	7	16	2	1	1	5
73	L Peekskill	6/28/1998	7.0	4.00	1.5	21	24	1	1	1	
73	L Peekskill	7/19/1998	6.5	3.13	1.5	26	26	1	1	1	
73	L Peekskill	7/26/1998	7.0	2.50	1.5	25	25	1	1	1	
73	L Peekskill	8/2/1998	7.0	1.50	1.5	27	26	3	1	2	1
73	L Peekskill	9/10/2000		2.00	1.5	27	26				
73	L Peekskill	9/24/2000		1.38	1.5	25	22				
73	L Peekskill	7/1/2001		2.00	1.5	28	27	3	1	2	
73	L Peekskill	7/15/2001	3.2	1.80	1.5	27	24	2	1	2	
73	L Peekskill	7/29/2001	4.2	1.60	1.5	27	26	3	1	2	
73	L Peekskill	8/12/2001	4.0	2.10	1.5	24	28	2	1	2	
73	L Peekskill	6/23/2002	6.8	1.95	1.3	33	26	2	1	2	
73	L Peekskill	7/7/2002	6.6	1.20	1.2	29	27	3	1	2	
73	L Peekskill	7/21/2002	3.9	1.06	1.5	29	28	3	1	2	
73	L Peekskill	8/4/2002	4.1	1.17	1.5	35	30	3	1	2	
73	L Peekskill	8/18/2002	4.2	1.50	1.5	35	29	3	1	2	
73	L Peekskill	9/2/2002	4.2	1.70	1.5	19	21	3	1	2	
73	L Peekskill	9/16/2002	4.7	2.15	1.5	28	24	3	1	2	5
73	L Peekskill	10/6/2002	5.5	1.80	1.5	22	19	2	1	2	
73	L Peekskill	7/13/2003	4.1	2.91	1.5	27	26	3	1	3	8
73	L Peekskill	7/30/2003	6.7	3.05	1.5	28	28	3	2	3	
73	L Peekskill	8/18/2003	3.9	2.83	1.5	26	27	3	1	3	56
73	L Peekskill	9/7/2003	3.9	1.95	1.5	28	24	4	2	4	134
73	L Peekskill	9/28/2003	3.8	1.88		16	19	3	1	3	158
73	L Peekskill	10/13/2003	3.5	2.27	1.5	21	17	4	2	4	134
73	L Peekskill	10/26/2003	4.8	1.85		19	13	5	1	5	1345
73	L Peekskill	11/9/2003	2.9	2.02	1.5	5	10	4	1	5	1345
73	L Peekskill	7/25/2004	6.2	1.60	1.5	27	26	3	1	3	1
73	L Peekskill	8/9/2004	4.4	1.40	1.5	29	25	4	1	3	13
73	L Peekskill	8/15/2004	4.7	1.60	1.5	23	25	3	1	3	13
73	L Peekskill	8/22/2004	4.7	1.50	1.5	24	24	4	1	4	1346
73	L Peekskill	7/25/2005	3.7	1.95	1.0	31	29	3	1	4	1348
73	L Peekskill	8/3/2005	6.9	2.34	1.5	34	30	3	1	4	138
73	L Peekskill	8/18/2005	7.4	1.80	1.5	30	28	4	1	4	134

LNum	PName	Date	Zbot	Zsd	Zsamp	TAir	TH20	QA	QB	QC	QD
73	L Peekskill	9/1/2005	7.2	1.52	1.5	30	26	3	1	3	15
73	L Peekskill	9/11/2005	7.2	1.15	1.5	28	25	4	1	4	134
73	L Peekskill	9/24/2005	7.3	1.08	1.5	24	24	4	1	4	134
73	L Peekskill	10/30/2005	8.9	1.69	1.5	18	12	3	1	3	135
73	L Peekskill	7/9/2006	7.5	1.50	1.5	30	27	4	1	4	134
73	L Peekskill	8/13/2006	5.5	1.04	1.5	32	26	4	1	4	1
73	L Peekskill	9/4/2006	7.1	1.17	1.5	24	21	3	1	3	158
73	L Peekskill	9/17/2006	6.9	1.37	1.5	26	23	4	1	4	134
73	L Peekskill	8/5/2007	4.0	2.33	1.5	29	27	3	1	3	13
73	L Peekskill	8/12/2008	7.0	1.30	1.5	25	26	3	2	2	8
73	L Peekskill	8/18/2008	3.0	1.43	1.5	28	26	2	1	2	8
73	L Peekskill	9/2/2008	7.5	1.80	1.5	23	23	3	2	2	6
73	L Peekskill	9/10/2008	7.4	1.75	1.5	19	23	3	2	2	68
73	L Peekskill	9/17/2008	5.5	1.60	1.5	22	23	3	2	2	8
73	L Peekskill	9/29/2008	6.8	1.40	1.5	22	28	3	2	2	8
73	L Peekskill	10/6/2008	4.0	1.20	3.0	14	17	2	2	2	8
73	L Peekskill	10/13/2008	6.3	1.45	1.5	20	18	3	3	2	8
73	L Peekskill	07/27/2009	6.3	2.45	2.0	30	27	4	2	4	1368
73	L Peekskill	08/04/2009	6.4	2.20	1.5	29	26	4	2	3	1268
73	L Peekskill	08/18/2009	7.1	2.40	1.5	29	27	2	2	3	1368
73	L Peekskill	09/01/2009	6.2	1.75	1.5	24	22	3	2	3	8
73	L Peekskill	09/15/2009	7.0	1.20	1.5	28	23	2	2	2	18
73	L Peekskill	09/29/2009	4.5	1.65	1.5	19	18	3	2	4	58
73	L Peekskill	10/13/2009	6.0	1.35	1.5	16	13	3	2	3	1
73	L Peekskill	6/21/2010	7.1	2.25	1.5	32	27	2	3	2	0
73	L Peekskill	7/7/2010	6.5	1.35	1.5	29	27	2	3	2	0
73	L Peekskill	7/27/2010	6.1	1.30	1.5	31	28	3	3	4	18
73	L Peekskill	8/10/2010	7.0	2.00	1.5	32	28	2	3	2	8
73	L Peekskill	9/7/2010	7.0	1.65	1.5	29	25				
73	L Peekskill	9/15/2010	8.0	1.70	1.5	20	21	1	2	1	8
73	L Peekskill	10/12/2010	4.0	1.50	1.5	17	17	3	2	2	8
73	L Peekskill	8/5/2008	4.0	2.33	1.5	29	27	3	1	3	13

Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
General Information			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
Field Parameters			
Zbot	lake depth at sampling point, meters (m)		
Zsd	Secchi disk transparency or clarity	0.1m	1.2m (C)
Zsamp	water sample depth (m)	0.1m	none
Tair	air temperature (C)	-10C	none
TH20	water temperature (C)	-10C	none
Laboratory Parameters			
Tot.P	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l (C)
NOx	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
NH4	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
TN	total nitrogen (mg/l)	0.01 mg/l	none
TN/TP	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
TCOLOR	true (filtered) color (ptu, platinum color units)	1 ptu	none
pH	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
Cond25	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
Ca	calcium (mg/l)	1 mg/l	none
Chl.a	chlorophyll a (ug/l)	0.01 ug/l	none
Fe	iron (mg/l)	0.1 mg/l	1.0 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (ug/l)	1 ug/l	10 ug/l (S)
Lake Assessment			
QA	water quality assessment, 5 point scale; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
QB	aquatic plant assessment, 5 point scale; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
QC	recreational assessment, 5 point scale; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
QD	reasons for recreational assessment, 8 choices; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other		

Appendix B- Priority Waterbody Listing for Lake Peekskill

Lake Peekskill (1301-0147)

MinorImpacts

Waterbody Location Information

Revised: 04/29/2008

Water Index No:	H- 55- 7-P171	Drain Basin:	Lower Hudson River
Hydro Unit Code:		Str Class:	B
Waterbody Type:	Lake	Reg/County:	3/Putnam Co. (40)
Waterbody Size:	58.5 Acres	Quad Map:	PEEKSKILL (P-25-4)
Seg Description:	entire lake		

Water Quality Problem/Issue Information (CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Aquatic Life	Stressed	Suspected
Recreation	Stressed	Known

Type of Pollutant(s)

Known: ALGAL/WEED GROWTH, NUTRIENTS (phosphorus)
 Suspected: ---
 Possible: ---

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF
 Suspected: Agriculture
 Possible: ---

Resolution/Management Information

Issue Resolvability:	1 (Needs Verification/Study (see STATUS))	
Verification Status:	4 (Source Identified, Strategy Needed)	
Lead Agency/Office:	ext/WQCC	Resolution Potential: Medium
TMDL/303d Status:	n/a	

Further Details

Overview

Recreational uses in Lake Peekskill are known to experience minor impacts from nutrient loadings from nonpoint sources resulting in algal growth and eutrophic conditions.

Water Quality Sampling

Lake Peekskill has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1990 and continuing through 2007. An Interpretive Summary report of the findings of this sampling was published in 2008. These data indicate that the lake continues to be best characterized as eutrophic, or highly productive. Phosphorus levels in the lake regularly exceed the state guidance values indicating impacted/stressed recreational uses. However corresponding transparency measurements typically meet what is the recommended minimum for swimming beaches. Measurements of pH typically fall within the state water quality range of 6.5 to 8.5. (DEC/DOW, BWAM/CSLAP, March 2008)

Recreational Assessment

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. This assessment indicates

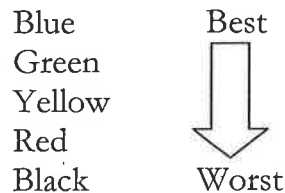
recreational suitability of the lake to be unfavorable in recent years. The recreational suitability of the lake is described most frequently as "slightly" impacted for recreational use. The lake itself is most often described as having "definite algal greenness." These assessment are consistent with measured water quality characteristics. Assessments have noted that aquatic plants do not typically grow to the lake surface and are not usually cited as impacting recreational uses. (DEC/DOW, BWAM/CSLAP, March 2008)

Lake Uses

This lake waterbody is designated class B, suitable for use as a public bathing beach, general recreation and aquatic life support, but not as a water supply. Water quality monitoring by NYSDEC focuses primarily on support of general recreation and aquatic life. Samples to evaluate the bacteriological condition and bathing use of the lake or to evaluate contamination from organic compounds, metals or other inorganic pollutants have not been collected as part of the CSLAP monitoring program. Monitoring to assess potable water supply and public bathing use is generally the responsibility of state and/or local health departments.

CSLAP Scorecard Criteria

The 2010 CSLAP Scorecard represents an initial attempt to review the results from the Citizens Statewide Lake Assessment Program (CSLAP) sampling at each program lake in a way that provides a quick and simple summary of water quality conditions, lake perception, biological health, and support of lake uses in 2010 and for the “typical” summer results measured since CSLAP sampling began on the lake. The scorecard uses a simple and consistent color scale to evaluate these categories:



For those categories with insufficient information is available, or for a category that does not apply (such as evaluating potable water use on a lake that is not classified for this use), a white color tab is show. For trends, more significant patterns (intensity and statistical robustness) are represented by larger green or red arrows.

There are many ways to quantify or score conditions related to water quality, lake perception, biological health, and lake usage. The following pages summarize the criteria used to create these scorecards.

It cannot be emphasized strongly enough that this is the first of several attempts to create a lake scorecard. As methods for measuring and evaluating water quality conditions, lake perception, biological condition, and lake usage are identified, and as updated information is received and evaluated, these scorecards (and the scores associated with these categories) will change. It should also be made clear that **water quality assessments and summaries of lake perception provided in these scorecards are limited to information collected through CSLAP, and could be inconsistent with information gathered from other sources.** Biological condition evaluations in particular will change as both CSLAP biological data, particularly macrophytes, macroinvertebrates, and benthic habitat continue to be evaluated, and as additional (non-CSLAP) information gets incorporated into the database for each lake. Water quality assessments are based on data collected from the deepest location in the lake from mostly June through September. Lake perception scores are based solely on responses to the user perception surveys conducted through CSLAP. Lake uses corresponded to the best designated uses identified through the state waterbody classification system, using water quality, lake perception, and biological assessment tools available through CSLAP (and described in the criteria summary).

As these assessments improve, lake scorecards will be updated.

CSLAP Scorecard Criteria

Water Quality Scorecard

General:

The CSLAP water quality dataset is comprised of about a dozen water quality indicators measured biweekly during the summer (June through September). This suite of indicators focuses on lake eutrophication (trophic status), a measure of the greenness of the water and the factors that contribute to or are affected by this greenness. These are measured by total phosphorus, chlorophyll *a* (a measure of a photosynthetic pigment in algae), and Secchi disk transparency. This dataset also includes indicators of general lake characteristics such as lake acidity and ion balance, as measured by pH and conductivity, and deepwater oxygen levels, as “inferred” by phosphorus, ammonia, nitrite, iron, manganese, and arsenic readings collected from the bottom waters of the lake (dissolved oxygen is not measured directly through CSLAP). Future generations of the scorecard may also include some of the other water quality indicators measured through CSLAP.

- **Trophic Status:**

- 2010 and All Years Score:

- Mean water clarity, chlorophyll *a*, and total phosphorus each assigned a trophic “score”:

- oligotrophic = 3, mesotrophic = 2, eutrophic = 1, based on NYS trophic designations:

- - Eutrophic = Water clarity < 2 meters, Chlorophyll *a* > 8 µg/l, Total phosphorus > 20 ppb
 - Mesotrophic = Water clarity 2-5 meters, Chlorophyll *a* 2-8 µg/l, Total phosphorus = 10-20 ppb
 - Oligotrophic = Water clarity >5 meters, chlorophyll *a* < 2 µg/l, Total phosphorus < 10 ppb

- - **Excellent** = sum of trophic scores > 7
 - **Good** = sum of trophic scores >5
 - **Threatened** = sum of trophic scores >3
 - **Poor** = sum of trophic scores = 3
 - **Not Known** = no trophic data for any of the trophic categories

- Trend Score (five years of data required):

- Annual summer mean water clarity, chlorophyll *a*, and total phosphorus assigned a regression score:

- Regression coefficient: adjusted $R^2 > 0.5 = 2$, adjusted $R^2 > 0.33 = 1$, adjusted $R^2 < 0.33 = 0$; P value < 0.01 = 2, P value < 0.05 = 1, P value > 0.05 = 0;

- X variable coefficient (direction trend curve): > 0 = 1, < 0 = -1

- - **Highly Improving** = sum of [(R^2 score) * (P value score) * (X variable)] for each trophic indicator > 9
 - **Improving** = sum of [(R^2 score) * (P value score) * (X variable)] for each trophic indicator > 6
 - **Stable** = sum of [(R^2 score) * (P value score) * (X variable)] for each trophic indicator ranges from 6 to -6

CSLAP Scorecard Criteria

Water Quality Scorecard (cont)

- **Trophic Status (cont):**

- **Degrading** = sum of [(R² score) * (P value score) * (X variable)] for each trophic indicator < -6
- **Highly Degrading** = sum of [(R² score) * (P value score) * (X variable)] for each trophic indicator < -9

- **pH Balance**

2010 and All Years Score:

NYS water quality standards are pH < 6.5 and pH > 8.5

- **Excellent** = not applicable
- **Good** = mean pH 6.5-8.5
- **Threatened** = mean pH >8.5 or conductivity < 50 µmho/cm
- **Poor** = mean pH < 6.5
- **Not Known** = no pH data available

- **pH Balance (cont)**

Trend Score (five years of data required):

Annual summer mean pH and conductivity assigned a regression score:

Regression coefficient: adjusted R² >0.5 = 2, adjusted R² >0.33 = 1, adjusted R² <0.33 = 0;

P value < 0.01 = 2, P value < 0.05 = 1, P value >0.05 = 0;

X variable coefficient (direction trend curve): > 0 = 1, < 0 = -1

- **Highly Improving** = [(R² score) * (P value score) * (X variable)] for pH > 3
- **Improving** = [(R² score) * (P value score) * (X variable)] for pH >1 or [(R² score) * (P value score) * (X variable)] for conductivity >1
- **Stable** = all other scores
- **Degrading** = [(R² score) * (P value score) * (X variable)] for pH < -1 or [(R² score) * (P value score) * (X variable)] for conductivity < -1
- **Highly Degrading** = [(R² score) * (P value score) * (X variable)] for pH < -3

- **Dissolved Oxygen**

2010 and All Years Score:

“Inferred” oxygen assigned an oxygen “score”: 6 = if deepwater ammonia or TP > (10* surface ammonia or TP); 5 = if deepwater ammonia or TP > (5* surface ammonia or TP); 4 = all other situations

- **Excellent** = not applicable
- **Good** = all unstratified lakes without evidence of oxygen deficits, if ammonia score = 4 or (ammonia + TP) score <10
- **Threatened** = if ammonia score = 5, (ammonia + TP) score = 10, or DO profiles show any DO measurements > 1ppb but < 5 ppb
- **Poor** = if ammonia score = 6 or DO profiles show any DO measurements < 1 ppm
- **Not Known** = if thermally stratified with no deepwater chemistry data

Trend Scores = not available in general; trends assessed only if site specific data are available about historic and present dissolved oxygen levels or “management” of hypolimnetic oxygen (with associated data)

CSLAP Scorecard Criteria

Lake Perception Scorecard

General:

The CSLAP lake perception dataset is generated from a standardized *Field Observations Form* completed by all sampling volunteers during each sampling session. These forms include four questions related to lake water quality perception in the open water sampling site, aquatic plant community evaluation in unmanaged nearshore areas (if possible), recreational perception in “areas where people swim and boat”, and factors influencing this recreational perception. Responses to the first three questions are offered on a five point scale, with 1 representing the most favorable response and 5 representing the least favorable response. These forms are completed prior to water sample collection to minimize bias toward measured conditions. The water quality and recreational use questions are identical to those used in volunteer lake monitoring programs throughout the country.

- **Water Quality Perception**

- 2010 and All Years Score:

- Annual water quality perception score = mean of ordinal scores; (1) = crystal clear; (2) = not quite crystal clear; (3) definite algal greenness, yellowness, or brownness; (4) = high algae levels; (5) severely high algae levels

- **Excellent** = mean water quality perception score < 1.5
 - **Good** = mean water quality perception score = 1.5 – 2.5
 - **Fair** = mean water quality perception score = 2.5 – 3.5
 - **Poor** = mean water quality perception score = > 3.5

- Trend Scores(five years of data required):

- Annual summer mean water quality assessment assigned a regression score:

- Regression coefficient: adjusted $R^2 > 0.5 = 2$, adjusted $R^2 > 0.33 = 1$, adjusted $R^2 < 0.33 = 0$;

- P value < 0.01 = 2, P value < 0.05 = 1, P value > 0.05 = 0;

- X variable coefficient (direction trend curve): > 0 = 1, < 0 = -1

- **Highly Improving** = [(R^2 score) * (P value score) * (X variable)] > 3
 - **Improving** = [(R^2 score) * (P value score) * (X variable)] > 1
 - **Stable** = [(R^2 score) * (P value score) * (X variable)] = -1 to 1
 - **Degrading** = [(R^2 score) * (P value score) * (X variable)] < -1
 - **Highly Degrading** = [(R^2 score) * (P value score) * (X variable)] < - 3

- **Aquatic Plants Perception**

- 2010 and All Years Score:

- Annual aquatic plant perception score = mean of ordinal scores; (1) = not visible; (2) visible but not growing to the lake surface; (3) growing to the lake surface; (4) = growing densely at the lake surface; (5) growing densely to the surface in all but the deepest areas of the lake

- **Excellent** = mean aquatic plants perception score < 1.5
 - **Good** = mean aquatic plants perception score = 1.5 – 2.5
 - **Fair** = mean aquatic plants perception score = 2.5 – 3.5
 - **Poor** = mean aquatic plants perception score = > 3.5

CSLAP Scorecard Criteria

Lake Perception Scorecard (cont)

- **Aquatic Plants Perception (cont)**

Trend Scores (five years of data required):

Annual summer mean aquatic plant perception assigned a regression score:

Regression coefficient: adjusted $R^2 > 0.5 = 2$, adjusted $R^2 > 0.33 = 1$, adjusted $R^2 < 0.33 = 0$;

P value $< 0.01 = 2$, P value $< 0.05 = 1$, P value $> 0.05 = 0$;

X variable coefficient (direction trend curve): $> 0 = 1$, $< 0 = -1$

- **Highly Improving** = sum of (R^2 score) * (P value score) * X variable > 3
- **Improving** = sum of (R^2 score) * (P value score) * X variable > 1
- **Stable** = sum of (R^2 score) * (P value score) * X variable = -1 to 1
- **Degrading** = sum of (R^2 score) * (P value score) * X variable < -1
- **Highly Degrading** = sum of (R^2 score) * (P value score) * X variable < -3

- **Recreation Perception**

2010 and All Years Score:

Annual recreational perception score = mean of ordinal scores; (1) = could not be nicer; (2)

= minor aesthetic problems but excellent; (3) slightly impaired for recreational use; (4) =

substantially impaired for recreational use; (5) lake not usable

- **Excellent** = mean recreational perception score < 1.5
- **Good** = mean recreational perception score = 1.5 – 2.5
- **Fair** = mean recreational perception score = 2.5 – 3.5
- **Poor** = mean recreational perception score = > 3.5

Trend Scores (five years of data required):

Annual summer mean recreational assessment assigned a regression score:

Regression coefficient: adjusted $R^2 > 0.5 = 2$, adjusted $R^2 > 0.33 = 1$, adjusted $R^2 < 0.33 = 0$;

P value $< 0.01 = 2$, P value $< 0.05 = 1$, P value $> 0.05 = 0$;

X variable coefficient (direction trend curve): $> 0 = 1$, $< 0 = -1$

- **Highly Improving** = [(R^2 score) * (P value score) * (X variable)] > 3
- **Improving** = [(R^2 score) * (P value score) * (X variable)] > 1
- **Stable** = [(R^2 score) * (P value score) * (X variable)] = -1 to 1
- **Degrading** = [(R^2 score) * (P value score) * (X variable)] < -1
- **Highly Degrading** = [(R^2 score) * (P value score) * (X variable)] < -3

CSLAP Scorecard Criteria

Biological Condition Scorecard

General:

Biological condition can only be measured indirectly and incompletely through the CSLAP dataset. Invasive plant collections and identifications have been conducted in some lakes through CSLAP, and through other programs. The presence (and extent) of harmful algae blooms (HABs) are measured directly through the New York State Department of Health HAB project funded by the Centers for Disease Control (as microcystin-LR concentrations) in some lakes, and phycocyanin screening for the potential presence of cyanobacteria (blue green algae) often associated with HABs has been conducted since 2009 through CSLAP. The presence of invasive animals (such as zebra mussels and spiny waterflea) is not measured through CSLAP but has been verified by other programs in a small number of CSLAP lakes. Fisheries quality can be estimated by the relative weight of three indicator fish (yellow perch, smallmouth bass, and largemouth bass) given the length of the fish in fisheries studies, or by an application of a fish index for biotic integrity (IBI) for lakes with reliable historical (late 1980s) netting data in some CSLAP lakes. Plant diversity can be evaluated with the use of a modified floristic quality index (FQI) for lakes with extensive plant survey data; these FQIs will be updated in 2011. Benthic organism health can be predicted by looking at the frequency of highly intolerant macroinvertebrates; these predictions will be revisited as the state develops lake macroinvertebrate IBIs in the coming years.

- **Invasive Plants**

- 2010 and All Years Score:

- **Favorable** = no evidence of any invasive plants
 - **Threatened** = no evidence of invasive plants, but public launch found in lake or invasive plants found in nearby lake (within 5 miles)
 - **Unfavorable** = documented invasive species found in lake
 - **Not Known** = no aquatic plant information within lake or in nearby lakes

- Trend Scores:

- **Highly Improving** = active management reduces invasive plant population to scattered individuals for annual plants
 - **Improving** = active management significant reduces invasive plant population of annual or perennial plants
 - **Stable** = no evidence of change
 - **Degrading** = evidence of recent introduction of invasive species
 - **Highly Degrading** = evidence of substantial increase in invasive species populations

- **Harmful Algae**

- 2010 and All Years Score:

- **Favorable** = phycocyanin levels < 100 and microcystin-LR levels < 1
 - **Threatened** = phycocyanin levels > 100
 - **Unfavorable** = microcystin-LR levels > 1 (2010 data not yet available)
 - **Not Known** = no phycocyanin or microcystin-LR data

CSLAP Scorecard Criteria

Trend Scores: score not available

Biological Condition Scorecard (cont)

- **Invasive Animals**

2010 and All Years Score:

- **Favorable** = no evidence of any invasive animals
- **Threatened** = no evidence of invasive animals, but invasive animals found in nearby lake (within 5 miles) and/or calcium levels > 25 mg/l
- **Unfavorable** = documented invasive animals found in lake
- **Not Known** = no invasive animal information within lake or in nearby lakes

Trend Scores: score not available

- **Fisheries Quality**

2010 and All Years Score:

- **Favorable** = average relative mean size of collected largemouth bass, smallmouth bass, and yellow perch within 95% of expected or MN fish IBI > 60
- **Threatened** = average relative mean size of collected largemouth bass, smallmouth bass, and yellow perch 5-10% larger or smaller than expected, MN fish IBI = 40-60, or antidotal information from DEC fisheries evaluation
- **Unfavorable** = average relative mean size of collected largemouth bass, smallmouth bass, and yellow perch >10% larger or smaller than expected, MN fish IBI < 40, or antidotal information from DEC fisheries evaluation
- **Not Known** = no information about lake fisheries

Trend Scores: score not available

- **Plant Diversity**

Floristic quality index (FQI) calculated based on the average coefficient of conservatism for each plant species and the number of plant species, categorized as “excellent”, “fair”, “poor” or “very poor”- rating varies based on number of species (minimum five species identified)

2010 and All Years Score:

- **Favorable** = FQI = excellent
- **Threatened** = FQI = fair
- **Unfavorable** = FQI = poor or very poor
- **Not Known** = FQI not known or insufficient data to calculate FQI

Trend Scores: score not available

- **Benthic Organisms**

Modified macroinvertebrate ordinal quality index (mOQI) calculated using FQI formula, substituting ordinal pollution tolerance value for coefficient of conservatism

2010 and All Years Score:

- **Favorable** = mOQI >15 for >12 orders, mOQI > 12 for >8 orders, > 10 for < 8 orders
- **Threatened** = mOQI >8 and lake not identified as favorable
- **Unfavorable** = mOQI < 8
- **Not Known** = no or insufficient macroinvertebrate data

Trend Scores: score not available

CSLAP Scorecard Criteria

Lake Uses

General:

Lakes are evaluated by New York State as to whether they support their best designated uses. These include potable water, swimming, recreation, aquatic life, aesthetics and fish consumption (and shellfishing for saline ponds). Each of these uses is assessed against the pertinent state water quality standards and guidance values for a variety of water quality and use indicators. Many of these are not measured in CSLAP and as such **any use assessments based on CSLAP data alone are incomplete.** The use assessment categories can be broadly summarized as follows on the state Waterbody Inventory and Priority Waterbody List (WIPWL):

Precluded = frequent/persistent conditions prevents designated use

Impaired = occasional conditions periodically prevents, restricts, or limits use

Stressed = uses supported but occasional conditions periodically discourages use

Threatened = designated uses supported but threat to use exists

Supported = designated use supported

The U.S. Environmental Protection Agency identifies the first two categories as “not supporting use”, and the second two categories as “fully supporting” with “minor impacts” or “threats” to use, respectively

- **Potable Water**

- 2010 and All Years Score:

- Draft nutrient criteria to protect potable water based on lake classification (AA or A)

- **Supported** = if not impaired, stressed, or threatened
 - **Threatened** = mean phosphorus exceeds 110% of criteria
 - **Stressed** = mean phosphorus exceeds criteria; if mean deepwater Fe > 1 mg/l; if mean deepwater Mn > 0.5 mg/l
 - **Impaired** = mean chlorophyll exceeds criteria; if mean As > 10 ppm
 - **Not Known** = no chlorophyll or deepwater NH₄, Fe, Mn, As or lake not used as a potable water supply

- Trend Scores: score not available

- **Swimming**

- Draft nutrient criteria to protect swimming based on lake depth and location:

- 2010 and All Years Score:

- **Supported** = violate no criteria
 - **Threatened** = violate one of three pertinent Secchi disk transparency, chlorophyll *a*, total phosphorus criteria; “slightly impaired” recreational assessments > 10% frequency associated with “poor water clarity” or “excessive algae”
 - **Stressed** = violate two of three pertinent Secchi disk transparency, chlorophyll *a*, total phosphorus criteria; “slightly impaired” recreational assessments > 25% frequency associated with “poor water clarity” or “excessive algae”
 - **Impaired** = violate pertinent Secchi disk transparency, chlorophyll *a*, and total phosphorus criteria
 - **Not Known** = no information about trophic status or recreational assessment

CSLAP Scorecard Criteria

Lake Uses (cont)

- **Boating / Fishing**

- 2010 and All Years Score:

- **Supported** = “slightly impaired” recreational assessments <10% frequency associated with “excessive weeds”; mean pH > 6.5
 - **Threatened** = “slightly impaired” recreational assessments > 10% frequency associated with “excessive weeds”; presence of invasive plants; mean pH < 6.5
 - **Stressed** = “slightly impaired” recreational assessments > 25% frequency associated with “excessive weeds”
 - **Impaired** = choice not available
 - **Not Known** = no information about nuisance weeds or pH

- Trend Scores: score not available

- **Aquatic Life**

- 2010 and All Years Score:

- **Supported** = mean pH 7-8, inferred dissolved oxygen > 4, no evidence of invasive species
 - **Threatened** = dissolved oxygen (from ‘Water Quality’ score above) = ‘threatened’; if invasive species present; mean pH > 8 or mean pH < 7
 - **Stressed** = dissolved oxygen (from ‘Water Quality’ score above) = ‘poor’; mean pH > 8.5; invasive plants and animals present
 - **Impaired** = mean pH < 6.5
 - **Not Known** = no information about pH, inferred D.O., or invasive species

- Trend Scores: score not available

- **Aesthetics**

- 2010 and All Years Score:

- **Supported** = not “threatened” or “stressed”
 - **Threatened** = “lake looks bad” reported at frequency of > 10%; maximum chlorophyll *a* > 30 ug/l; “dense weed growth” at frequency of > 25%; presence of invasive plant species
 - **Stressed** = “lake looks bad” reported at frequency of > 25%
 - **Impaired** = choice not available
 - **Not Known** = no information about lake perception or chlorophyll *a* levels

- Trend Scores: score not available

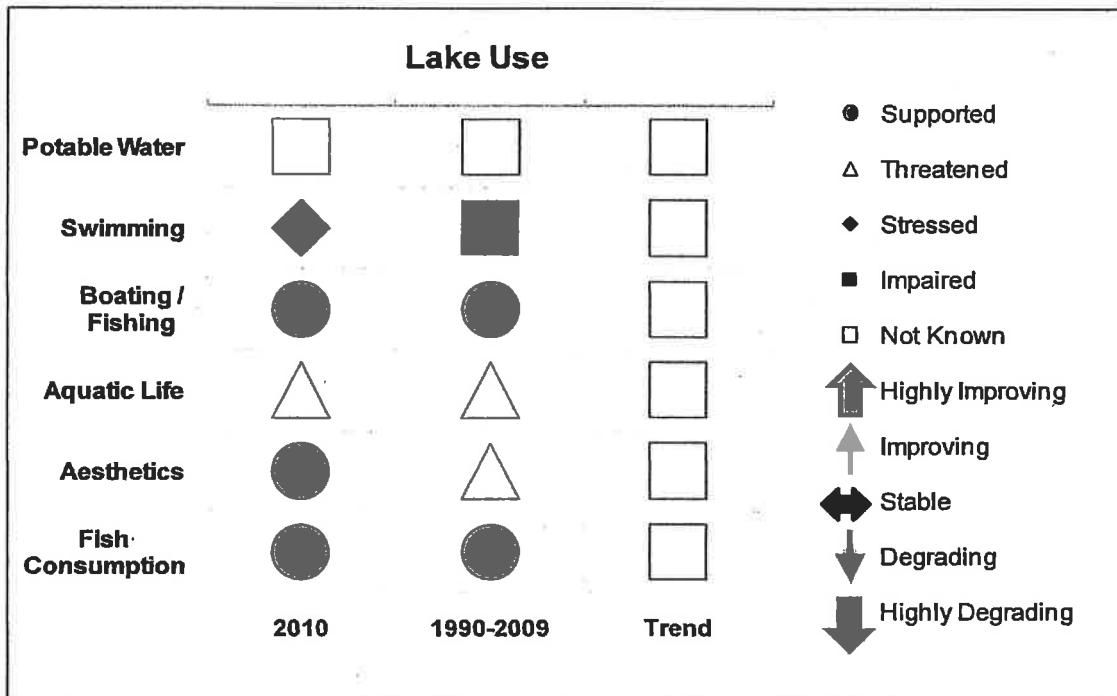
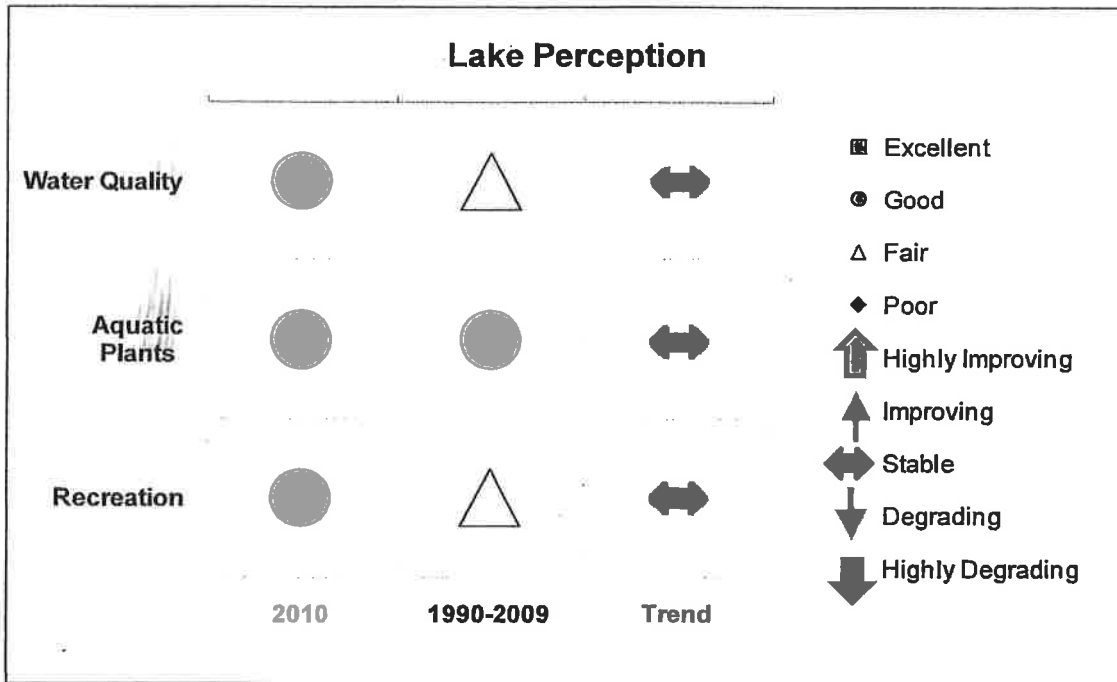
- **Fish Consumption**

- 2010 and All Years Score:

- **Supported** = no fish consumption advisories
 - **Threatened** = choice not available
 - **Stressed** = fish consumption advisory in hydrologically connected waterbody
 - **Impaired** = fish consumption advisory
 - **Not Known** = score not available

- Trend Scores: score not available

2010 Lake Peekskill Scorecard



The 2010 CSLAP annual report for Lake Peekskill can be found at http://www.dec.ny.gov/docs/water_pdf/cslrpt10LPeekskill.pdf

The 2009 CSLAP report for the Downstate region can be found at http://www.dec.ny.gov/docs/water_pdf/cslrpt09Downstate.pdf

2010 Lake Peekskill Scorecard

