

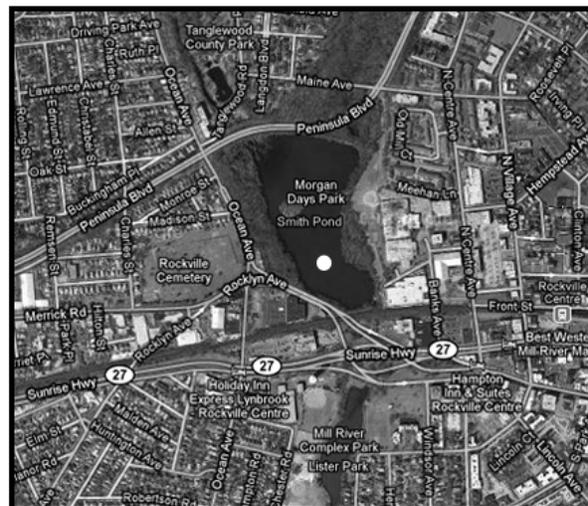
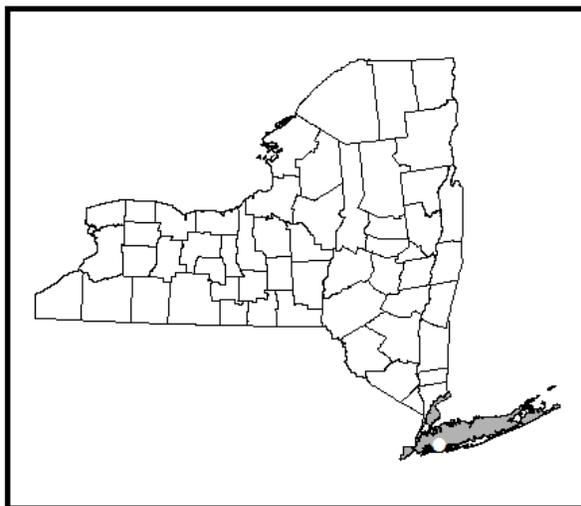
LCI Lake Water Quality Summary

General Information

Lake Name:	Smith Pond
Location:	Rockville Centre, Town of Hempstead, Suffolk County, New York
Basin:	Atlantic Ocean/Long Island Sound Basin
Size:	7.8 hectares (19.3 acres)
Lake Origins:	man-made/ concrete dam
Major Tributaries:	South Pond, Hempstead Lake and a minor unnamed tributary from Halls Pond
Lake Tributary to?:	Mill River
Water Quality Classification:	C (best intended use: secondary contact recreation)
Sounding Depth:	1 meter (3 feet)
Sampling Coordinates:	Latitude: 40.65981, Longitude: -73.46200
Sampling Access Point:	Municipal Parking area off Nassau Street
Monitoring Program:	Lake Classification and Inventory (LCI) Survey
Sampling Dates:	6/25/2009, 7/22/09, 8/21/2009, 9/21/2009
Samplers:	Scott Kishbaugh, NYSDEC Division of Water David Newman, NYSDEC Division of Water, Albany Steven Finnemore, NYSDEC Division of Water, Albany
Contact Information:	Scott Kishbaugh, NYSDEC Division of Water sakishba@gw.dec.state.ny.us ; 518-402-8282

Lake Map

(sampling location marked with a circle)



Background and Lake Assessment

Smith Pond is located just north of the Sunrise Highway in the village of Rockville Centre, Nassau County. The pond is associated with Morgan Days Park and is managed by the Village of Rockville Centre. The pond has an overgrown paved walking path along the eastern shore as well as a small fishing pier. The pond supports fishing. The pond has two inlets—one on the north eastern side coming from Hempstead Lake State Park, and the other on the north western side which originates in the Garden City area. The latter inlet flows through a few small impoundments, including Halls Pond, before reaching Smith Pond. The watershed of the pond is largely developed in high density housing although the area immediately around Smith Pond and the area around Hempstead Lake are lightly forested.

The pond was included in the New York State DEC Division of Water's 2009 intensive (monthly sampling) Lake Classification and Inventory (LCI) survey of the Atlantic Ocean/ Long Island Sound (AO/LIS) basin. Inclusion in the survey was based on an "Impacted Segment" listing in The 2000 AO/LIS Waterbody Inventory and Priority Waterbodies List (WIPWL). The WIPWL states:

Fish consumption in Smith Pond is impaired due to a specific NYS DOH health advisory that recommends eating no more than one meal per month of white perch because of elevated chlordane. (2000-01 NYS DOH Health Advisories).

Aquatic life support and recreational uses (swimming, fishing, boating) in the pond are also affected by high nutrient loads, silt, sedimentation, excessive aquatic weed growth (spatterdock) and occasional algal blooms. Stormwater and urban nonpoint runoff are the sources of pollutants. The pond is included in the Nassau County Suburban Pond Management Plan. (Nassau County WQCC, 1998).

There continues to be a fish consumption advisory that recommends eating no more than one meal per month of white perch because of elevated chlordane (2009-2010 NYS DOH Health Advisories).

From the data collected in 2009, Smith Pond can generally be characterized as *mesoeutrophic*, or moderately to highly productive. The average water clarity reading (TSI = 63, typical of *eutrophic* lakes) was lower than expected given the average phosphorus reading (TSI = 51, typical of *mesoeutrophic* lakes), and lower than expected given the chlorophyll *a* reading (TSI = 42, typical of *mesotrophic* lakes). These data suggest that baseline nutrient levels may support persistent algae blooms; however, algal production may be limited by something other than phosphorus.

The pond was observed to have a slight brown color throughout the summer. The water clarity readings in June and July were one meter or less. *Nuphar sp.* (spatterdock), *Ceratophyllum demersum* (coontail), and *Utricularia sp.* (unknown bladderwort) were observed to be growing in the pond. All three are native species and commonly found in other Long Island ponds. Spatterdock was observed to be growing in high densities throughout the pond, drastically reducing the amount of open water in the pond. This finding would be consistent with the "excessive aquatic weed growth" listing in the WIPWL. A more detailed plant specific survey would be needed to rule out the presence of any invasive species.

Like most shallow water bodies, Smith Pond does not exhibit thermal stratification, in which depth zones (warm water on top, cold water on bottom during the summer) are established. Temperate and dissolved oxygen reading were comparable throughout the water column. pH readings indicate slightly alkaline waters during most of the summer, which is typical of ponds exhibiting high levels of algae. The conductivity readings indicate moderately hard water (high ionic strength). High conductivity levels were typical among other ponds sampled in Nassau County and can be attributed to high levels of dissolved salts associated with runoff from developed areas. Smith Pond was at the lower end of the conductivity readings found at other ponds sampled in Nassau County.

Smith Pond appears to be typical of other suburban/urban hardwater, uncolored, alkaline ponds. Other ponds with similar water quality characteristics often support warmwater fisheries. Although fisheries habitat cannot be fully evaluated through this monitoring program, the DEC Fisheries website does indicate that the pond at least historically supported a wide variety of warm water fish species. Coldwater fish species are unlikely to be supported, given the lack of cold water necessary to protect any salmonids or aquatic life susceptible to high summer temperatures.

Total phosphorus levels exceeded the state guidance value during all but one of the sampling events; the levels observed may support persistent algal blooms in the pond. Nitrate levels were also elevated. Iron levels were also above the state drinking water standard. Sodium and chloride levels were both high, indicating significant impacts from road salting and or stormwater runoff from developed areas.

Evaluation of Lake Condition Impacts to Lake Uses

Potable Water (Drinking Water)

Smith Pond is not classified for use as a potable water supply. Although the LCI data are not sufficient to evaluate potable water use, these data suggest that the lake water would require substantial treatment to serve as a potable water supply. Surface water withdrawals may be impacted by high phosphorus levels, and elevated sodium and iron levels.

Contact Recreation (Swimming)

Smith Pond is not classified for contact recreation. It is not known if people currently or historically swam in the pond. Bacteria data are needed to evaluate the safety of Smith Pond for swimming-these are not collected through the LCI program. The water clarity reading taken in June and July were below the State Department of Health's guidance value of 1.2 meters to protect the safety of swimmers. The high density of spatterdock would make swimming in the pond very difficult.

Non-Contact Recreation (Boating and Fishing)

Smith Pond is classified for non-contact recreation. Boats are currently prohibited on the pond but the high density of spatterdock made boating difficult. At least one individual was seen fishing from the shoreline of the pond during one of the sampling events. The DEC Fisheries website also indicates that the high density of spatterdock makes fishing difficult. However, the DEC Fisheries website indicates that the pond historically supported largemouth bass, chain pickerel, bluegill, pumpkinseed, yellow and white perch, carp, goldfish, brown bullhead, and American eel. A fish survey would need to be conducted to determine if these species are still supported in the pond. There continues to be a fish consumption advisory that recommends

eating no more than one meal per month of white perch because of elevated chlordane (2009-2010 NYS DOH Health Advisories).

Aquatic Life

There were no direct observations of threats to aquatic life; however, there is a fish consumption advisory pertaining to elevated chlordane levels which may adversely affect aquatic life. Additional biological studies would be needed to look at stressors to aquatic life.

Aesthetics

The high density of spatterdock and low water clarity detracts from the aesthetic appeal of the pond.

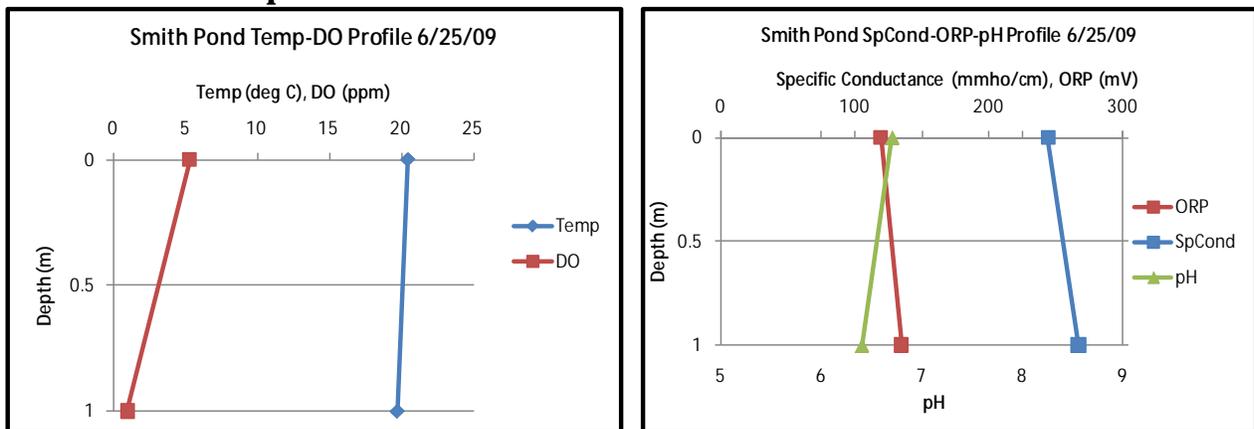
Additional Comments

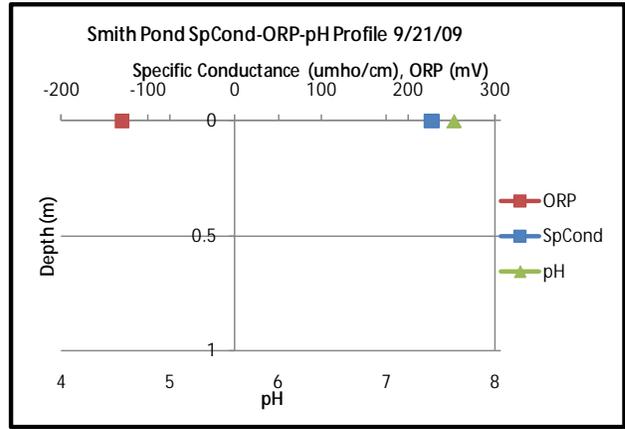
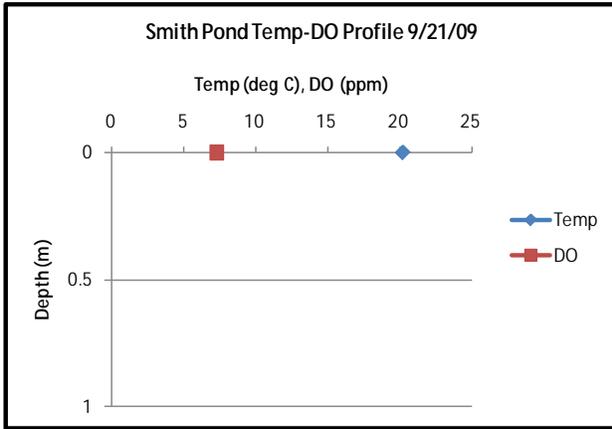
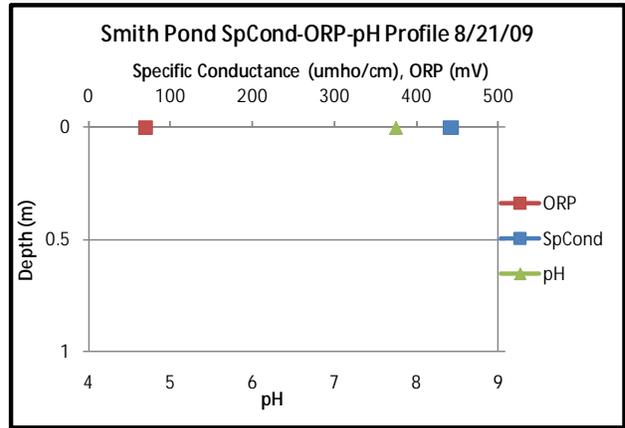
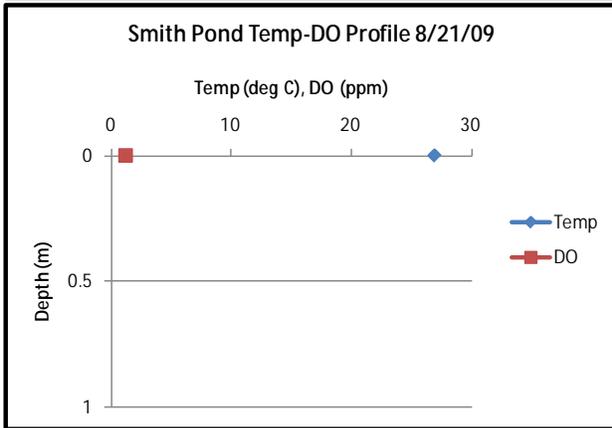
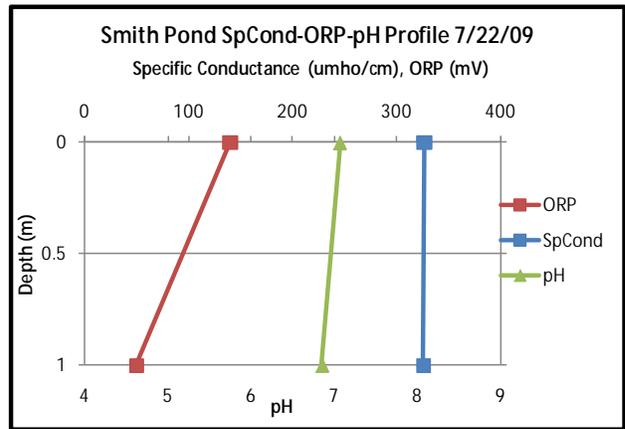
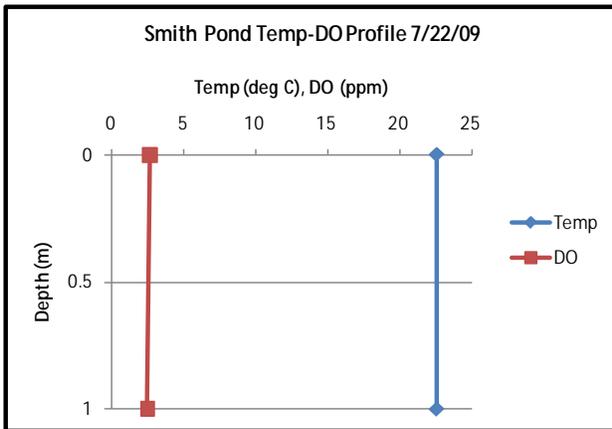
1. Water quality parameters were similar to those observed in Halls Pond, a small upstream impoundment, but water quality conditions are much more favorable than in Hempstead Lake. This suggests that a watershed wide management approach may be needed to see any drastic improvements to water quality in Smith Pond.
2. Periodic surveillance for invasive exotic plant species may help to prevent the establishment and spread of any new invaders, given the escalating problems with exotic aquatic weeds.

Aquatic Plant IDs

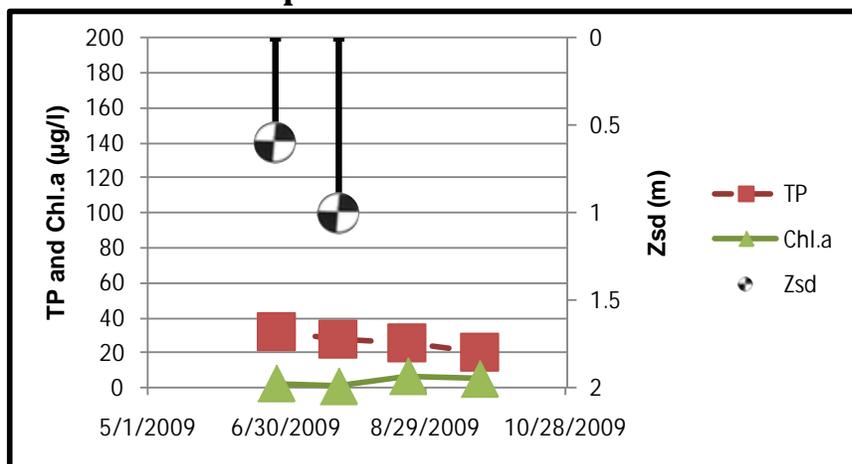
Exotic Plants: None observed
Native Plants: *Nuphar sp.* (Spatterdock)
Ceratophyllum demersum (coontail)
Utricularia sp. (unknown bladderwort)

Time Series: Depth Profiles





Time Series: Trophic Indicators



WQ Sampling Results

Surface Samples

	UNITS	N	MIN	AVG	MAX	Scientific Classification	Regulatory Comments
SECCHI	meters	2	0.6	0.8	1	Eutrophic	100% of readings violate DOH guidelines
TSI-Secchi			67.4	63.2	60.0	Eutrophic	No pertinent water quality standards
TP	mg/l	4	0.0199	0.0264	0.032	Eutrophic	75% of readings violate DOH guidelines
TSI-TP			47.2	51.3	54.1	Eutrophic	No pertinent water quality standards
TSP	mg/l	4	0.0061	0.0137	0.0215	High % soluble Phosphorus	No pertinent water quality standards
NOx	mg/l	4	0.0517	0.3822	0.739	Elevated nitrate	No readings violate DOH guidance value
NH4	mg/l	4	0.024	0.055	0.081	Low ammonia	No readings violate DOH guidance value
TKN	mg/l	4	0.33	0.41	0.48	Low organic nitrogen	No pertinent water quality standards
TN/TP	mg/l	4	32.42	66.17	88.11	Phosphorus Limited	No pertinent water quality standards
CHLA	ug/l	4	ND	3.23*	6.9	Mesotrophic	No pertinent water quality standards
TSI-CHLA			ND	41.95	49.5	Mesotrophic	No pertinent water quality standards
Alkalinity	mg/l	4	26.5	29.6	31.5	Poorly Buffered	No pertinent water quality standards
TCOLOR	ptu	4	ND	14.4 [®]	20	Uncolored	No pertinent water quality standards
TOC	mg/l	4	3.1	3.6	4.3		No pertinent water quality standards
Ca	mg/l	4	11.9	13.9	15	Minimally Supports Zebra Mussels	No pertinent water quality standards
Fe	mg/l	4	0.483	0.638	0.824	Taste or odor likely	100% of readings violate DOH guidelines
Mn	mg/l	4	0.0387	0.0984	0.13		No readings violate DOH guidance value
Mg	mg/l	4	3.1	3.44	3.66		No readings violate DOH guidance value
K	mg/l	4	2.33	2.45	2.54		No pertinent water quality standards
Na	mg/l	4	38.4	40.28	41.8		100% of readings violate DOH guidelines
Cl	mg/l	4	65.3	68.4	70.8	Significant road salt runoff	No readings violate DOH guidance value
SO4	mg/l	4	10.4	12.38	14		No readings violate DOH guidance value

* The chlorophyll a average was calculated with non-detects being treated as equal to half the detection limit or 1.0 ug/l

[®] The true color average was calculated with non-detects being treated as equal to half the detection limit or 2.5ptu.

Lake Perception

	UNITS	N	MIN	AVG	MAX	Scientific Classification	Regulatory Comments
WQ Assessment	1-5, 1 best	4	3	3	3	Definite Algal Greenness	No pertinent water quality standards
Weed Assessment	1-5, 1 best	4	4	4.75	5	Dense Plant Growth at Lake Surface	No pertinent water quality standards
Recreational Assessment	1-5, 1 best	4	4	4.5	5	Substantially Impaired	No pertinent water quality standards

Legend Information

General Legend Information

Surface Samples	= integrated sample collected in the first 2 meters of surface water
N	= number of samples
SECCHI	= Secchi disk water transparency or clarity - measured in meters (m)
TSI-SECCHI	= Trophic State Index calculated from Secchi, = $60 - 14.41 * \ln(\text{Secchi})$

Laboratory Parameters

ND	= Non-Detect, the level of the analyte in question is at or below the laboratory's detection limit
TP	= total phosphorus- milligrams per liter (mg/l) Detection limit = 0.003 mg/l; NYS Guidance Value = 0.020 mg/l
TSI-TP	= Trophic State Index calculated from TP, = $14.42 * \ln(\text{TP} * 1000) + 4.15$
TSP	= total soluble phosphorus, mg/l Detection limit = 0.003 mg/l; no NYS standard or guidance value
NOx	= nitrate + nitrite nitrogen, mg/l Detection limit = 0.01 mg/l; NYS WQ standard = 10 mg/l
NH4	= total ammonia, mg/l Detection limit = 0.01 mg/l; NYS WQ standard = 2 mg/l
TKN	= total Kjeldahl nitrogen (= organic nitrogen + ammonia), mg/l Detection limit = 0.01 mg/l; no NYS standard or guidance value
TN/TP	= Nitrogen to Phosphorus ratio (molar ratio), = $(\text{TKN} + \text{NOx}) * 2.2 / \text{TP}$ > 30 suggests phosphorus limitation, < 10 suggests nitrogen limitation
CHLA	= chlorophyll <i>a</i> , micrograms per liter (µg/l) or parts per billion (ppb) Detection limit = 2 µg/l; no NYS standard or guidance value
TSI-CHLA	= Trophic State Index calculated from CHLA, = $9.81 * \ln(\text{CHLA}) + 30.6$
ALKALINITY	= total alkalinity in mg/l as calcium carbonate Detection limit = 10 mg/l; no NYS standard or guidance value
TCOLOR	= true (filtered or centrifuged) color, platinum color units (ptu) Detection limit = 5 ptu; no NYS standard or guidance value
TOC	= total organic carbon, mg/l Detection limit = 1 mg/l; no NYS standard or guidance value
Ca	= calcium, mg/l Detection limit = 1 mg/l; no NYS standard or guidance value
Fe	= iron, mg/l Detection limit = 0.1 mg/l; NYS standard = 0.3 mg/l
Mn	= manganese, mg/l Detection limit = 0.01 mg/l; NYS standard = 0.3 mg/l
Mg	= magnesium, mg/l Detection limit = 2 mg/l; NYS standard = 35 mg/l
K	= potassium, mg/l Detection limit = 2 mg/l; no NYS standard or guidance value
Na	= sodium, mg/l Detection limit = 2 mg/l; NYS standard = 20 mg/l
Cl	= chloride, mg/l Detection limit = 2 mg/l; NYS standard = 250 mg/l

SO4 = sulfate, mg/l
Detection limit = 2 mg/l; NYS standard = 250 mg/l

Field Parameters

Depth = water depth, meters
Temp = water temperature, degrees Celsius
D.O. = dissolved oxygen, in milligrams per liter (mg/l) or parts per million (ppm)
NYS standard = 4 mg/l; 5 mg/l for salmonids
pH = powers of hydrogen, standard pH units (S.U.)
Detection limit = 1 S.U.; NYS standard = 6.5 and 8.5
SpCond = specific conductance, corrected to 25°C, micromho per centimeter ($\mu\text{mho/cm}$)
Detection limit = 1 $\mu\text{mho/cm}$; no NYS standard or guidance value
ORP = Oxygen Reduction Potential, millivolts (MV)
Detection limit = -250 mV; no NYS standard or guidance value

Lake Assessment

WQ Assessment = **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
Weed Assessment = **weed coverage/density assessment**, 5 point scale, 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = plants cover surface
Recreational Assessment = **swimming/aesthetic assessment**, 5 point scale; 1 = could not be nicer, 2 = excellent, 3= slightly impaired, 4 = substantially impaired, 5 = lake not usable

References

NYSDEC. 2002. The 2000 Atlantic Ocean/ Long Island Sound Basin Waterbody Inventory and Priority Waterbodies List. NYSDEC, Albany, NY.
Available online at http://www.dec.ny.gov/docs/water_pdf/pwlatlv202.pdf.

NYSDOH. 2009. Chemicals in Sportfish and Game 2009-2010 Health Advisories. NYSDOH, Albany, NY.
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