

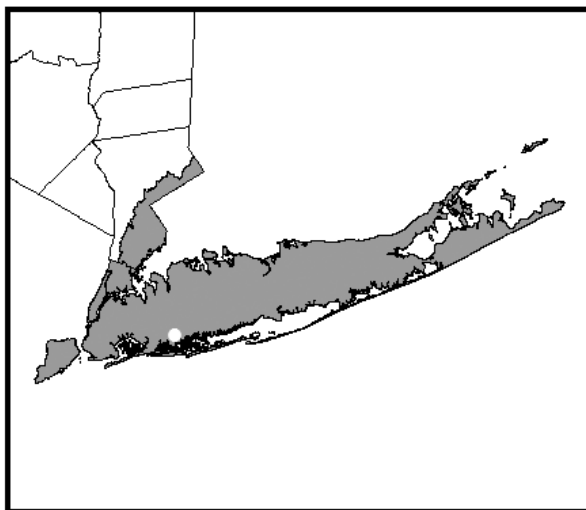
# LCI Lake Water Quality Summary

## General Information

<b>Lake Name:</b>	<b>Lofts Pond</b>
<b>Location:</b>	Lofts Pond County Park, Baldwin, Town of Hempstead, Suffolk County, New York
<b>Basin:</b>	Atlantic Ocean/Long Island Sound Basin
<b>Size:</b>	1.8 hectares (4.5 acres)
<b>Lake Origins:</b>	man-made
<b>Major Tributaries:</b>	none
<b>Lake Tributary to?:</b>	Middle Bay via the Parsonage Canal
<b>Water Quality Classification:</b>	C (best intended use: secondary contact recreation)
<b>Sounding Depth:</b>	2 meters (6.5 feet)
<b>Sampling Coordinates:</b>	Latitude: 40.65445, Longitude: -73.62047
<b>Sampling Access Point:</b>	Corner of Merrick Road and Windsor Road
<b>Monitoring Program:</b>	Lake Classification and Inventory (LCI) Survey
<b>Sampling Dates:</b>	6/24/2009, 7/21/09, 8/20/2009, 9/21/2009
<b>Samplers:</b>	Scott Kishbaugh, NYSDEC Division of Water David Newman, NYSDEC Division of Water, Albany Steven Finnemore, NYSDEC Division of Water, Albany
<b>Contact Information:</b>	Scott Kishbaugh, NYSDEC Division of Water <a href="mailto:sakishba@gw.dec.state.ny.us">sakishba@gw.dec.state.ny.us</a> ; 518-402-8282

## Lake Map

(sampling location marked with a circle)



## Background and Lake Assessment

Lofts Pond is a small urban/suburban pond in Baldwin, NY. The pond is part of Lofts Pond County Park. Nassau County manages the pond as well as sidewalks and a walkway over a portion of the pond. The Nassau County Park website indicates that the pond was part of a capital improvement restoration project in 2007 that included dredging sediments, harvesting of aquatic vegetation as well as planting native vegetation both in and around the pond. Aerators are used in the pond to help with water quality issues. The pond receives most of its water from runoff from the surrounding residential developments.

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, "Aquatic life support and recreational uses (swimming, fishing, boating) in the pond are affected by high nutrient loads, excessive aquatic weed growth and occasional algal blooms. The pond is included in the Nassau County Suburban Pond Management Plan. (Nassau County WQCC, 1998) (NYSDEC 2002)." There is also a fish consumption advisory that recommends eating no more than one meal per month of car or goldfish because of elevated chlordane levels (2009-2010 NYS DOH Health Advisories).

Lofts Pond can generally be characterized as *eutrophic*, or highly productive. The average water clarity reading (TSI = 65, typical of *eutrophic* lakes) was higher than expected given the average phosphorus reading (TSI = 72, typical of *eutrophic* lakes), but was lower than expected given the average chlorophyll *a* reading (TSI = 59, typical of *mesoeutrophic* lakes). These data indicate that algae levels tend to be high in the pond and that baseline nutrient levels support persistent algal blooms. These data also indicate that chlorophyll *a* levels may not be the only factor controlling water clarity.

The pond had a brown turbid coloration to it throughout the summer, with green and yellow tints during the June and September sampling events. The observed water color indicates a combination of both algae and suspended sediment or silt. Filamentous algae were observed on many of the plants during the August sample and a slight algal bloom was observed during the September sampling event. *Nuphar sp.* (spatterdock) was observed to be growing in high densities at the northern end of the pond and at lower densities at a few other places around the pond. *Lemna minor* (duck weed) was observed in the shallow near shore area between the wooden bridge and the pond's shoreline.

Like most shallow ponds, Lofts Pond does not exhibit thermal stratification, in which depth zones (warm water on top, cold water on bottom during the summer) are established. Temperature and dissolved oxygen readings were consistent throughout the water column. pH readings ranged from acidic to alkaline. The alkalinity in the pond was low, indicating the pond has a poor buffering capacity to acidic inputs. The September pH reading was below the state's lower water quality standard. The conductivity readings indicate soft water (low ionic strength), and were consistently low, atypical for other ponds in Nassau County that were sampled. This may indicate that the pond receives less storm water from developed areas than the other ponds that were sampled.

Lofts Pond appears to be typical of moderately soft water, weakly colored urban ponds. Other ponds with similar water quality characteristics often support warmwater fisheries, though perhaps less so than other lakes in the region. However, fisheries habitat cannot be fully evaluated through this monitoring program. Chloride levels were slightly elevated, indicating moderate impact from road salting or runoff from developed areas, but were noticeably lower in Lofts Pond than many of the other Nassau County ponds that were sampled. Iron and total phosphorus levels were above the state water quality standards and nitrogen levels were elevated.

A sediment sample was taken from the pond and analyzed for contaminants as well as toxicity. Sediment from the pond was found to have levels of lead, chrysene and pyrene above the Threshold Effect Concentration (TEC). The TEC represents the concentration below which adverse effects to sediment biota are not expected to occur. Chrysene and pyrene are both polycyclic aromatic hydrocarbons and are released in the atmosphere when incomplete combustion of coal, oil, and gas are burned. There was no indication of elevated chlordane levels in the sediment sample. The Microtox® analysis showed the sediment to be non-toxic.

## **Evaluation of Lake Condition Impacts to Lake Uses**

### **Potable Water (Drinking Water)**

Lofts 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 elevated algae levels, high nutrient levels, and elevated iron levels.

### **Contact Recreation (Swimming)**

Lofts Pond is not classified for contact recreation- swimming and bathing. It is not known if people currently swim in the lake. Bacteria data are needed to evaluate the safety of Lofts Pond for swimming-these are not collected though the LCI. The data collected through the LCI show that the water clarity was consistently below the New York State Department of Health's standard of 1.2 meters to protect the safety of swimmers.

### **Non-Contact Recreation (Boating and Fishing)**

There is a fish consumption advisory that recommends eating no more than one meal per month of catfish or goldfish because of elevated chlordane levels.

### **Aquatic Life**

The low pH levels (measured in September) and the elevated levels of lead, chrysene and pyrene in the sediment may impact some aquatic life. Additional biological studies would have to be conducted to fully evaluate impacts to aquatic life.

### **Aesthetics**

Reduced water clarity, occasional algal blooms and high densities of rooted aquatic vegetation may detract from the pond's aesthetic appeal.

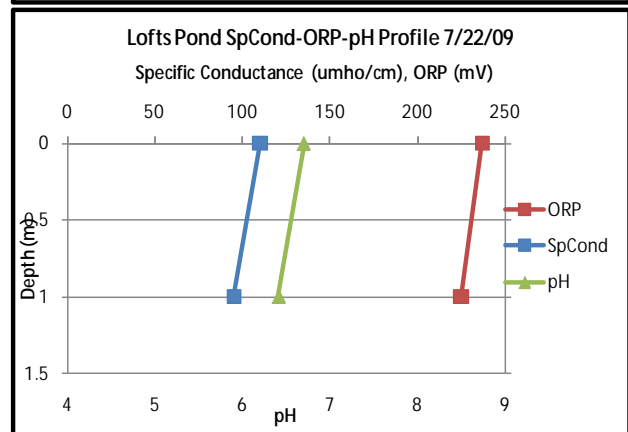
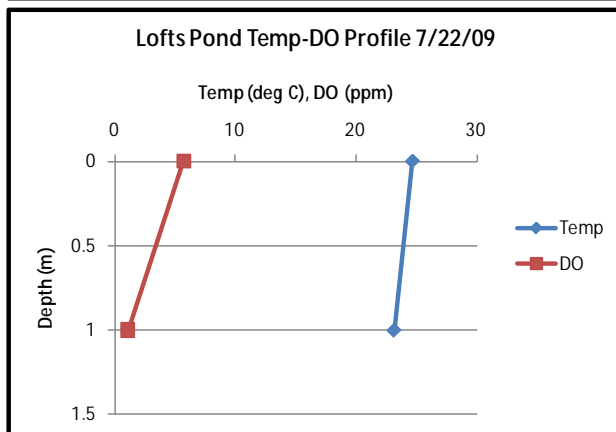
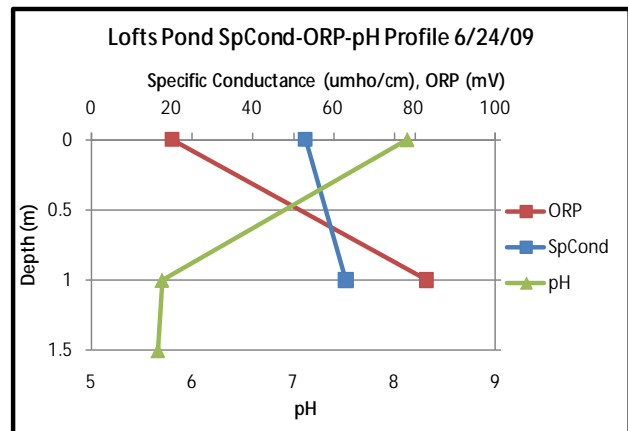
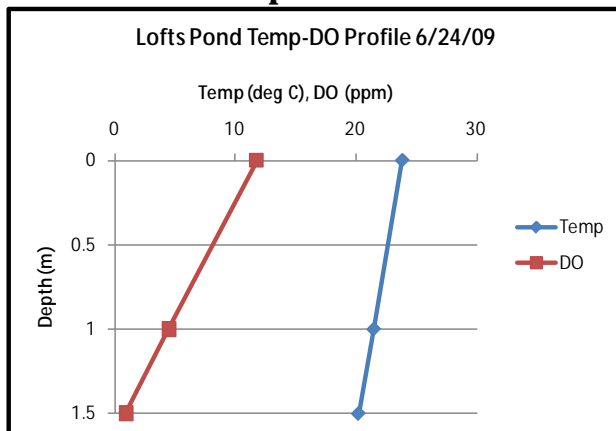
## Additional Comments

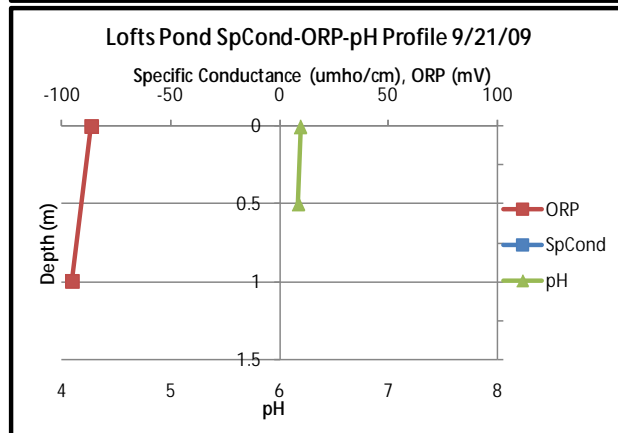
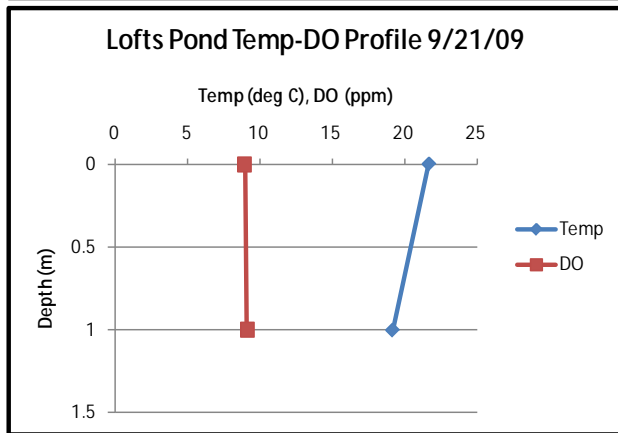
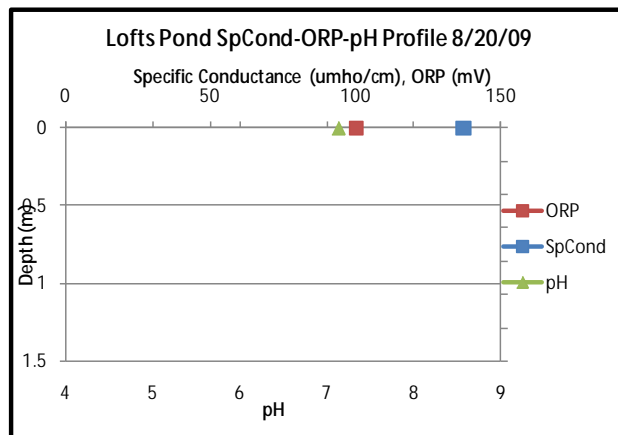
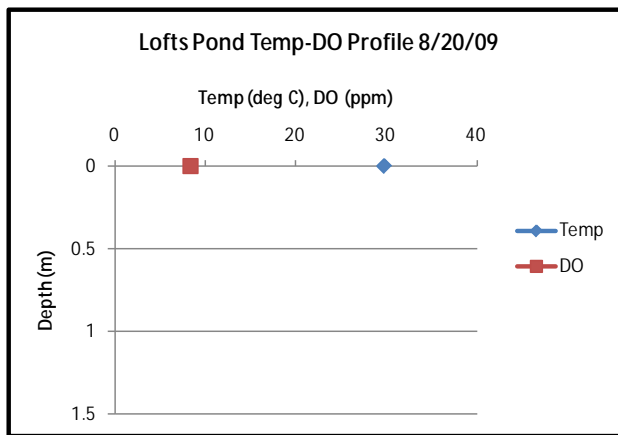
1. Periodic surveillance for invasive exotic plant species may help to prevent the establishment and spread of any new invaders, given the escalating problems with exotic aquatic weeds.
2. Additional biological monitoring may be warranted to evaluate the impact of elevated contaminants in the sediments, although the Microtox data suggests that sediment toxicity is minimal.

## Aquatic Plant IDs

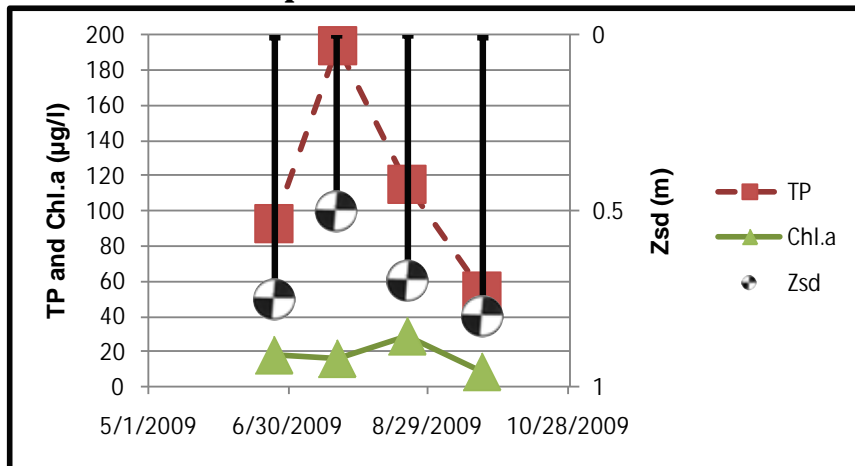
Exotic Plants: None observed  
 Native Plants: *Nuphar sp.* (spatterdock)  
*Lemna minor* (duck weed)

## Time Series: Depth Profiles





## Time Series: Trophic Indicators



# WQ Sampling Results

## Surface Samples

	UNITS	N	MIN	AVG	MAX	Scientific Classification	Regulatory Comments
SECCHI	meters	4	0.5	0.69	0.8	Eutrophic	100% of readings violate DOH guidelines
TSI-Secchi			70.0	65.4	63.2	Eutrophic	No pertinent water quality standards
TP	mg/l	4	0.0542	0.114	0.194	Eutrophic	100% of readings violate DOH guidelines
TSI-TP			61.7	72.4	80.1	Eutrophic	No pertinent water quality standards
TSP	mg/l	4	0.0284	0.0381	0.0534	High % soluble Phosphorus	No pertinent water quality standards
NOx	mg/l	4	0.0021	0.0349	0.109	Potentially high nitrate	No readings violate DOH guidance value
NH4	mg/l	4	0.018	0.053	0.137	Low ammonia	No readings violate DOH guidance value
TKN	mg/l	4	0.65	0.94	1.41	Elevated organic nitrogen	No pertinent water quality standards
TN/TP	mg/l	4	14.77	20.60	26.82	Nutrient Limitation Unclear	No pertinent water quality standards
CHLA	ug/l	4	8.5	17.83	28.8	Eutrophic	No pertinent water quality standards
TSI-CHLA			51.6	58.9	63.6	Eutrophic	No pertinent water quality standards
Alkalinity	mg/l	4	8.7	18.9	28.8	Poorly Buffered	No pertinent water quality standards
TCOLOR	ptu	4	ND	21.3	50	Weakly Colored	No pertinent water quality standards
TOC	mg/l	4	2.4	4.9	8.5		No pertinent water quality standards
Ca	mg/l	4	3.59	5.5	7.45	Does Not Support Zebra Mussels	No pertinent water quality standards
Fe	mg/l	4	0.336	0.747	1.38	Taste or odor likely	100% of readings violate DOH guidelines
Mn	mg/l	4	0.0198	0.0454	0.0726		No readings violate DOH guidance value
Mg	mg/l	4	1.18	1.61	1.85		No readings violate DOH guidance value
K	mg/l	4	1.1	1.54	2.06		No pertinent water quality standards
Na	mg/l	4	7.87	13.59	17.5		No readings violate DOH guidance value
Cl	mg/l	4	7.9	16.2	19.5	Moderate road salt runoff	No readings violate DOH guidance value
SO4	mg/l	4	4.5	6.95	9.6		No readings violate DOH guidance value

\* 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	3.75	4	High Algae Levels	No pertinent water quality standards
Weed Assessment	1-5, 1 best	4	3	3.5	4	Dense Plant Growth at Lake Surface	No pertinent water quality standards
Recreational Assessment	1-5, 1 best	4	3	3.5	4	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, = $14.42 \cdot \ln(\text{TP} \cdot 1000) + 4.15$
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), = $(\text{TKN} + \text{NOx}) \cdot 2.2 / \text{TP}$ > 30 suggests phosphorus limitation, < 10 suggests nitrogen limitation
CHLA	= chlorophyll <i>a</i> , micrograms per liter ( $\mu\text{g/l}$ ) or parts per billion (ppb) Detection limit = 2 $\mu\text{g/l}$ ; no NYS standard or guidance value
TSI-CHLA	= Trophic State Index calculated from CHLA, = $9.81 \cdot \ln(\text{CHLA}) + 30.6$
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](http://www.dec.ny.gov/docs/water_pdf/pwlatlv202.pdf).

NYSDOH. 2009. Chemicals in Sportfish and Game 2009-2010 Health Advisories. Available online at <http://www.nyhealth.gov/environmetnal/outdoors/fish/docs/fish.pdf>.