

2021 WATER QUALITY SAMPLING DATA REVIEW

Data (see summary on following page) was reviewed from Friends of the Bay's 2021 water quality sampling of 19 sites in Oyster Bay and Cold Spring Harbor. The review finds generally healthy open water areas in the bay complex. Areas in the creeks (FB 13-18), near creek discharges (FB 1-3), and in confined areas (FB 12) were characterized by somewhat poorer water quality – days with low pH and dissolved oxygen (DO). These findings may be due to the accumulation of organic matter from stormwater flows and higher nitrogen from waterfowl inputs and groundwater seepage containing septic system drainage.

Phytoplankton concentrations (though not sampled) in some of the sites may be higher due to the availability of nutrients leading to the reported high pH and DO during morning sampling – a result of nighttime algal respiration. Microbiological 'nitrification' (ammonia to nitrite to nitrate) in the sediments that are likely muddy and rich with decaying organic matter can also lower pH and DO.

The data suggests that spring phytoplankton blooms may have occurred in FB 1-11 as evidenced by high pH and DO values. The absence of that evidence in FB 12-19 may be due to shellfish consumption of the algae. Perhaps shellfish populations are denser there as those areas are closed to shellfish culture and harvest. It is also possible that the microbiological activity in those areas is considerably higher lowering pH and DO and thus obscuring evidence of blooms.

As in prior years, the data indicates that FB 1 and 2 (Inner Harbor of Cold Spring Harbor) had the lowest pH. Low pH was also found in FB 14 (Mill Neck Creek). Lower pH may be due to algal or bacterial respiration and/or from the discharge of lower pH freshwater (Cold Spring Harbor ponds and Beaver Lake respectively).

Dissolved oxygen was very low in Cold Spring Harbor Inner Harbor (FB 1-3) with values below 4.8 where marine life is stressed and even below 3.0 (hypoxic) where most marine life cannot survive. Mill Neck Creek (FB 14, 15, 17) also exhibited low DO (below 4.8) during some sampling visits and in those sites that are shallow. Low DO was also observed in FB-12, where water is shallow and likely static.

SITE	MEAN SALINITY	TEMP LOW-HIGH	pH LOW-HIGH	DO LOW-HIGH	MEAN PH	MEAN DEPTH	NOTE 1	NOTE 2	BACTERIA
1	24.9	10.0-24.7	7.3-8.4	2.6-12.0	7.7	4.9	April -mid-May phyto blooms (high pH, high DO)	ph low several days; DO low several days	Several days elevated
2	25.3	9.8-26.4	7.3-8.2	2.0-11.3	7.8	6.1	April -mid-May phyto blooms (high pH, high DO)	ph low several days; DO low several days	Several days elevated
3	25.3	9.5-26.4	7.4-8.3	3.8-11.2	7.9	5.4	Apr-mid Jun and Oct phyto blooms (high pH, DO)	ph low several days; DO low several days	
4	26.1	9.2-24.9	7.5-8.3	5.0-11.7	8.0	6.0	April-early May phyto blooms (high pH, high DO)	pH low several days; DO normal	
5	26.2	10.2-24.5	7.6-8.2	4.7-10.7	7.9	5.1	April phyto bloom (high pH, high DO)	pH low several days; DO normal	
6	26.0	9.5-24.6	7.5-8.2	5.0-10.8	7.9	5.8	April phyto bloom (high pH, high DO)	pH low several days; DO normal	
7	25.8	10.5-24.8	7.6-8.2	5.1-10.2	7.9	2.8	April and Oct phyto blooms (high pH, high DO)	pH low several days; DO normal	
8	25.9	10.0-24.6	7.6-8.2	5.0-10.3	7.9	2.8	April and June phyto bloom (high pH, high DO)	pH low several days; DO normal	
9	25.9	10.1-25.2	7.5-8.2	5.0-10.3	7.9	2.6	April and June phyto bloom (high pH, high DO)	pH low several days; DO normal	
10	25.6	10.1-25.1	7.5-8.2	5.1-10.3	7.9	4.5	April and June phyto bloom (high pH, high DO)	pH low several days; DO normal	
11	25.7	10.3-25.5	7.6-8.3	4.8-10.4	7.9	3.2	April, May, June blooms (high pH, high DO)	pH low several days; DO normal	
12	25.6	11.3-26.2	7.4-8.1	4.6-9.2	7.7	2.6	little evidence of blooms	ph low several days; DO low several days	
13	25.3	11.1-25.4	7.4-8.1	4.8-9.8	7.8	3.5	little evidence of blooms	ph low several days; DO low several days	Some days with Entero
14	25.1	11.8-25.4	7.1-8.1	4.3-9.6	7.8	2.6	little evidence of blooms	ph low several days; DO low several days	Several days elevated
15	24.8	13.4-25.8	7.5-7.9	3.6-8.7	7.8	2.0	little evidence of blooms, too shallow to measure	ph low several days; DO low several days	Several days elevated
16	25.3	13.1-25.5	7.6-8.0	5.2-8.7	7.8	2.1	no evidence of blooms, too shallow to measure	pH low several days	
17	24.9	13.3-25.6	7.4-7.9	3.7-8.7	7.7	1.9	no evidence of blooms, too shallow to measure	ph low several days; DO low several days	two days elevated
18	25.4	11.0-25.4	7.4-8.1	4.8-10.0	7.8	2.4	possible April bloom	pH low several days	High Entero day - error?
19	25.3	10.9-26.1	7.5-8.1	5.1-10.2	7.8	4.6	possible April bloom	pH low several days; DO normal	one day higher Entero

<7.7;/>8.1	<5.0/>8.0
------------	-----------

<3.0
