

# Water Quality of Holly Pond

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## INTRODUCTION

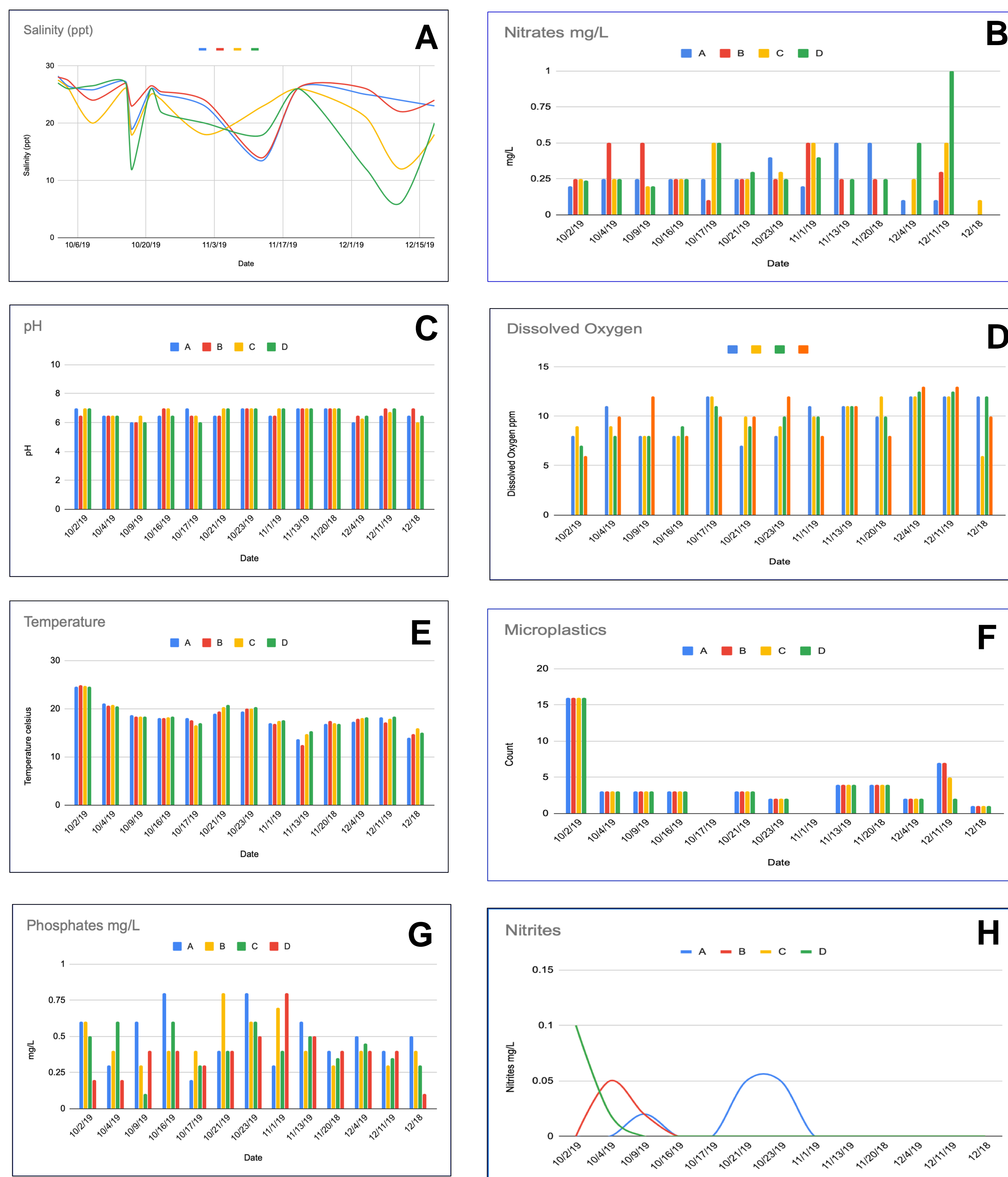
Many pollutants enter our waterways during storms creating an environmental issue. Urban waterways, in particular, are vulnerable to the pollutants from the surrounding areas. Stormwater management policies are important to control pollutants from humans, agriculture, and industry to mitigate harmful effects on aquatic habitats that support wildlife residing in or around these ecosystems. Waterways, including rivers, ponds, lakes and streams are particularly vulnerable to pollutants and runoff from road salt contamination, agricultural products and lawn applications.

The purpose of this project is to understand the water quality of Holly Pond in Stamford, CT. The brackish pond is located near Interstate 95 and adjacent to the Long Island Sound near Cove Island Park in Stamford. A previous study of Holly Pond looked at temperature, pH, salinity, and dissolved oxygen.<sup>1</sup> However, no data has been collected on pollutants, such as nitrates, nitrites, phosphate and microplastics so that the goals of this study include:

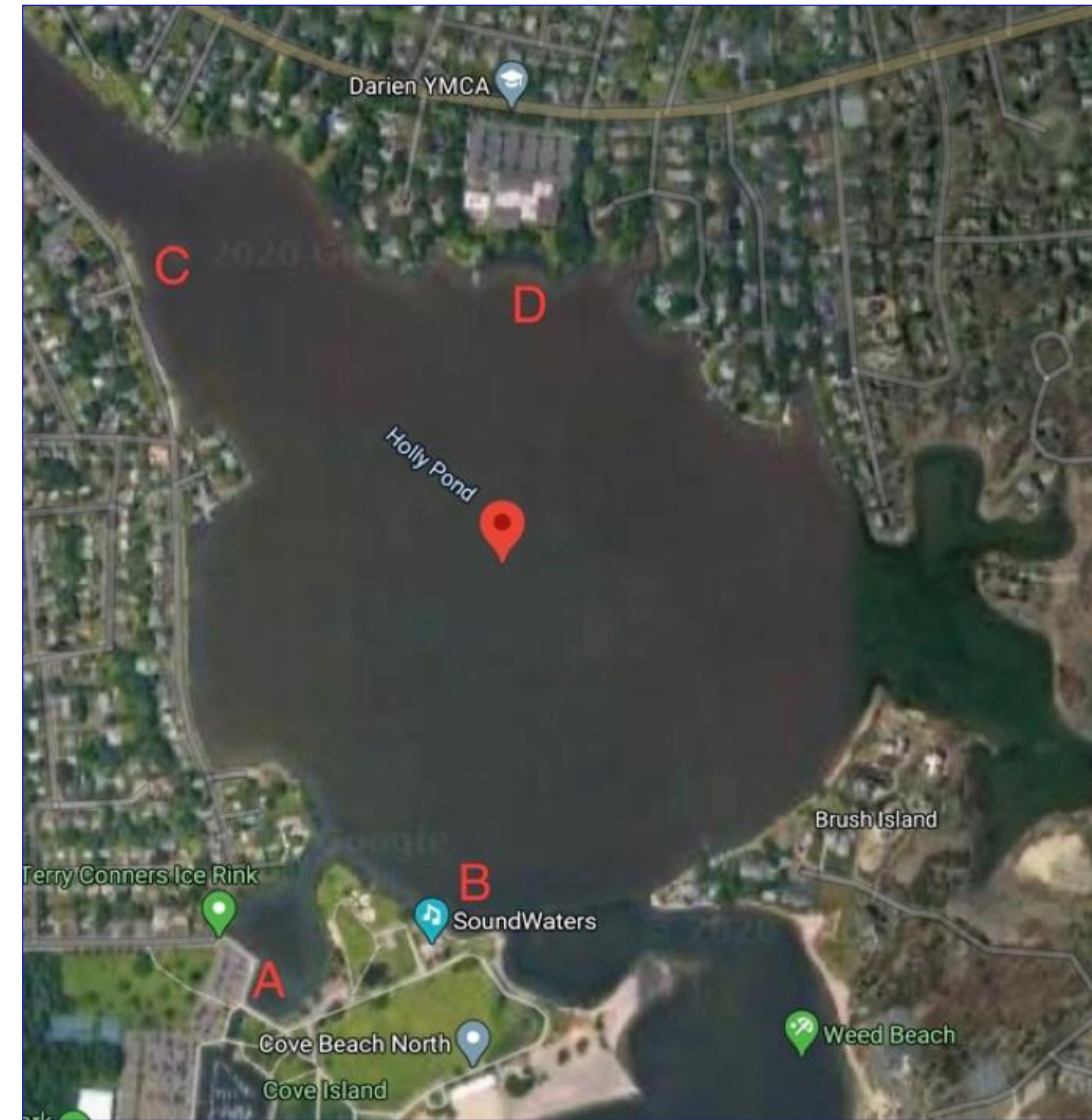
1. Obtain baseline data on the water quality of Holly Pond with regard to pollutants
2. Identify to what degree the water quality is impacted after storm events.

## RESULTS

A=- B=- C=- D=-



**Figure 1.** Results of Water Quality testing of:  
A. Salinity; B. Nitrates; C. pH; D. Dissolved Oxygen; E. Temperature;  
F. Microbeads; G. Phosphates; H. Nitrites



**Figure 2.** Aerial satellite map of Holly Pond in Stamford, CT showing collection sites A, B, C, D (Source: Google Maps)

**Figure 3. Water Quality Standards** 2, 3, 4, 5

pH	6.5-8.5
Phosphates	0.0-0.1mg/L
Nitrates	0-10 mg/L
Nitrites	0.0-0.01 mg/L
Salinity	1-38 ppt
Dissolved Oxygen	4-5 ppm minimum to support marine life
Microplastics	No current federal standards
Temperature	15-25 Celsius

## MATERIALS AND METHODS

- Between October 2019 and December 2019, water quality testing was conducted at 4 sites on Holly Pond in Stamford, CT (see Fig. 2).
- Water quality was observed by testing salinity, nitrates, nitrites, pH, dissolved oxygen, temperature, and microbeads.
- Equipment utilized for testing included: thermometer, hydrometer, nitrate/nitrite testing strips, pH testing strips, phosphate testing kit, and DO automatic probe. In addition, a microscope, filter, and hematoxylin stain were used to test for microplastics.
- Testing was performed weekly, as well as periodically after a significant rainstorm (>.25 inches).



**Figure 4.** Using a microscope to determine the presence of microbeads



## CONCLUSION

Salinity was relatively stable over time. The few observed dips were following a rain event. Dissolved Oxygen increased over time but was always in an appropriate range. Temperature decreased, which was to be expected as we moved from Fall to Winter. The pH was consistent over time. All of these were consistent with the data from the previous study.<sup>1</sup> Nitrates and nitrites were relatively low. Phosphates were high overall. While the average was consistent across time, there was a lot of variability. Microplastics were relatively low. The phosphate level is of concern as this could increase algae growth and decrease oxygen in the pond. Holly Pond is near a residential area and fertilizers used in lawn applications could contribute to the high phosphate level.

Overall, Holly Pond had low levels of most pollutants, with the exception of phosphates, which were high. Environmental organizations should continue to monitor Holly Pond as its location places it at risk of contamination from pollutants. This data can be used to help raise awareness and funds for Holly Pond to help clean it up and protect it, as well as the wildlife that relies on it.

## REFERENCES

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