

Harbor Isle City of St. Petersburg

Water Quality Analysis

Sample date: 11/10/2021

Report date: 11/16/2021

Produced by:

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|------------------|---|
| Report | 2 |
| Aquatic Glossary | 3 |

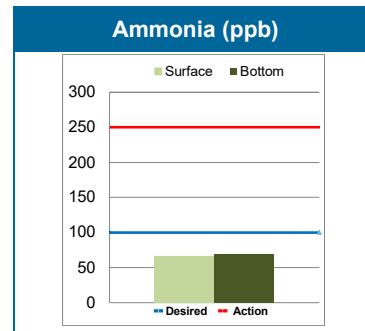
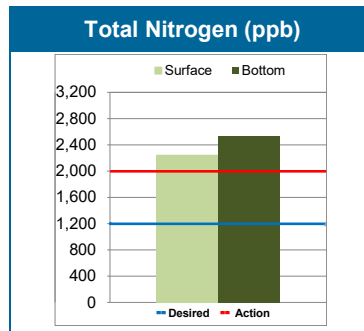
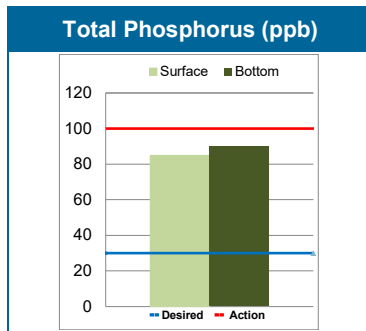
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Water Quality Data: Harbor Isle, Site #3

Date: 11/10/2021

| Site Readings | | | | | |
|------------------------------|---------------|--------------|---------|--------|---------------|
| Test | Desired Range | Action Level | Surface | Bottom | This lake is: |
| Nutrients - Total Phosphorus | < 30 ppb | > 100 ppb | 85 | 90 | Normal |
| Nutrients - Total Nitrogen | < 1200 ppb | >2000 ppb | 2,244 | 2,531 | High* |
| Nutrients - Ammonia | < 100 ppb | >250 ppb | 66 | 69 | Normal |
| Alkalinity | >80 ppm | N/A | 92 | 92 | Normal |
| Clarity - Turbidity | < 5 NTU | NA | 10.4 | 11.7 | High* |
| Salinity | < 0.5 ppt | NA | 4.0 | 4.0 | High* |
| pH reading | 6.5 | 8.5 | 7.8 | 7.8 | Normal |
| Water Clarity - Secchi Depth | ≥ 4 Feet | N/A | 3 | | Low* |



The TN/TP Ratio is: 27.29

When the TN/TP ratio is < 75, the chances of having toxin producing cyanobacterial blooms (blue-green algae) as plankton or filamentous mats increase. Water column phosphorus needs to be reduced to promote more desirable algal groups.

The trophic lake health index is: 69

Eutrophic lakes have a TSI of 41-100 and usually have intermittent plankton algae blooms, fair water clarity, muck accumulation, occasional odor, moderate dissolved oxygen levels, dense submersed plant growth and algae mats.

Observations

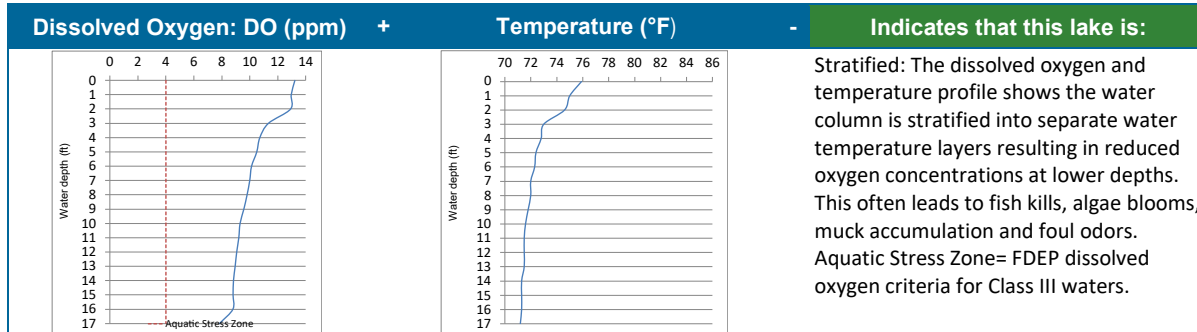
Since last month's sampling event, phosphorus and nitrogen levels have increased. Phosphorus levels are within the desired range but very close to the action level; however, nitrogen levels are above the action level.

Field observation suggests that planktonic algae were present in approximately 2.5 acres of the site. This density was mainly in the wind-driven coves of the lake. Treatment from 11/2/2021 seems to help reduce overall coverage from 7 acres to 2.5.

Water quality analysis suggests that this site is experiencing elevated nitrogen levels and poor water clarity.

Dense planktonic algae blooms can often lead to reduced water clarity.

Elevated nitrogen may be due to fertilizer runoff, decaying plant material, or low oxygen levels at the bottom of the water column.



| Trophic State Index (TSI) | | |
|--|----------------|--|
| <p>A Trophic State Index (TSI) provides a single quantitative result for the purpose of classifying and ranking lakes in terms of water quality.</p> <p>Nutrients such as phosphorus are usually the limiting resource for algae and plant abundance and therefore are used in creating a TSI reference number. Generally, the higher the lakes TSI the greater the likelihood of elevated nutrient levels, increased algae problems and decreased water clarity.</p> <p>Due to the dynamic nature of Florida's geology and differing climate zones, regional locations may differ slightly in what is considered a healthy water quality profile.</p> | | |
| TSI Values | Trophic Status | Attributes |
| 30-40 | Oligotrophic | Clear water, few plants and algae, small bass |
| 40-50 | Mesotrophic | Water moderately clear, but increasing probability of anoxia, green algae are likely dominant, balanced fishery with medium sized bass |
| 50-60 | Eutrophic | Decreased transparency, occasional light algal blooms, lots of available food making for large bass |
| 60-70 | Eutrophic | Dominance of blue-green algae, algal scums possible, extensive macrophyte problems possible, higher probability of anoxia, fishery starting to decline |
| 70-80 | Hypereutrophic | Dominance of blue-green algae, frequent algal scums, higher probability of anoxia, stunted fishery |
| >80 | Hypereutrophic | Algal scums, higher probability of anoxia, fish kills, few macrophytes, very poor water clarity |

More information on data sources available upon request.

Secchi depth

A mechanical test to judge water clarity, accomplished by lowering a black and white disk into the water and recording the point at which it can no longer be seen.

- Higher values indicate greater water clarity.
- Nutrient rich lakes tend to have Secchi depths less than 9 feet and highly enriched sites less than 3 feet.

| Nutrient Tested | Desired Range | Action Level | Issues with high levels | Likely causes of high levels |
|---|---------------|--------------|---|---|
| Total Phosphorus | < 30 ppb | > 100 ppb | >100 ppb can unbalance the ecosystem | Reclaimed water discharge, landscape fertilizer runoff and agricultural drainage, phosphorus laden bottom sediments |
| Total Nitrogen | < 1200 ppb | >2000 ppb | >1200 ppb can unbalance the ecosystem | Landscape fertilizer runoff |
| Ammonia | < 100 ppb | >250 ppb | >500 ppb can be toxic to fish and animals | Organic decomposition, landscape/fertilizer runoff, and anoxic conditions (low oxygen) |
| Nutrient Thresholds | | | | |
| <p>The desired range is the threshold value recommended for freshwaters in order maintain a balanced ecosystem.</p> <p>If nutrients are measured above the action level, it is likely that the nutrient levels may have a detrimental effect on aquatic life and long-term lake health. Action needs to be taken at this point to maintain a healthy ecosystem. Nutrients above the action level will require more maintenance.</p> | | | | |
| TN/TP Ratio | | | | |
| <p>The TN/TP ratio can provide a useful clue as to the relative importance of nitrogen or phosphorus toward the abundance of algae in a waterbody.</p> <p>In general, the lower the TN/TP ratio the more cyanobacteria bacteria will be present (i.e., Microcystis) and the higher the TN/TP ratio the more desirable green algae will be present. Studies done on TN/TP ratios have found good agreement in predicting the type of algae present (Schindler et al., 2008; Yoshimasa Amano et al., 2008).</p> | | | | |

Dissolved Oxygen

The most critical indicator of a lake's health and water quality.

- Oxygen is added to aquatic ecosystems by aquatic plants and algae through photosynthesis and by diffusion at the water's surface and atmosphere interface.
- Oxygen is required for fast oxidation of organic wastes including bottom muck.
- When the oxygen is used up in the bottom of the lake, anaerobic bacteria continue to breakdown organic materials, creating toxic gasses such as hydrogen sulfide.
- For a healthy game-fish population, oxygen levels should not go below 4.0 ppb