

2025

ECOSYSTEM MONITORING REPORT

Crackatuxet Pond

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Study Area

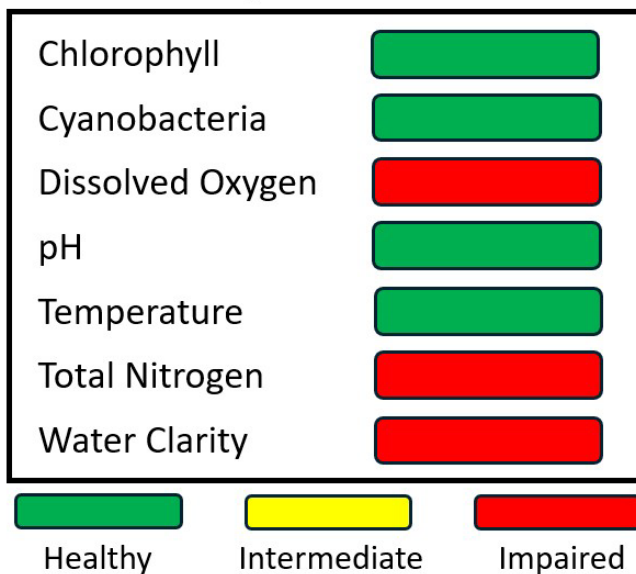
Crackatuxet Pond (CRX) is a 33-acre coastal pond located in the Town of Edgartown, MA. CRX was historically connected to the neighboring Edgartown Great Pond (EGP), but the two were separated by the installation of a sluiceway in the 1970s. Despite this, EGP is still capable of spilling over into CRX if the former reaches a high enough elevation. CRX is also connected to Katama Bay via Mattakesett Herring Creek, although this connection has become restricted in recent years.



Sampling Regime 2025

In 2025, Great Pond Foundation (GPF) continued its ecosystem monitoring program on CRX for the 5th consecutive year. A total of 11 bi-weekly monitoring trips were conducted between June and September. During each trip, water quality data was obtained for 5 monitoring sites (see map to left). Nutrient samples were collected at 3 of the regular 5 monitoring sites in June and August.

Summary of Metrics, 2025



*The "Summary of Metrics" tool assigns health rankings to individual water quality metrics. Refer to the *Appendix* for information on how rankings are assigned.

Pond Summary 2025

Crackatuxet Pond (CRX) continues to exhibit signs of ecosystem stress in 2025, however, levels of impairment have not reached the extremes observed in 2022, possibly suggesting a degree of resilience and a potential gradual improvement in the overall ecosystem health. Flooding remains a major concern within the CRX and Herring Creek community. Flooding occurs when water spills over the sluiceway from EGP and is unable to drain through Herring Creek due to overgrowth of phragmites. The Town of Edgartown initiated a Herring Creek phragmites removal project which started in October of 2024.

Introduction

Crackatuxet Pond (CRX) is a 33-acre pond located in Edgartown, Massachusetts. Also known as Crackatuxet Cove, the pond was historically connected to and even once considered a part of Edgartown Great Pond (EGP). Since the 1970s this connection has been restricted due to the installation of a sluiceway (**Figure 1**) by the Army Corps of Engineers. This sluiceway serves as a vital tool for managing water levels in EGP through the addition or removal of wooden boards, with the number of boards present dictating EGP water flow (west to east) into CRX. Although this connection is intentionally closed, CRX remains hydrologically connected below ground to EGP via groundwater. The physical barrier of the sluiceway on the surface has caused CRX and EGP ecosystems to evolve and diverge over the last 5 decades.

CRX is also connected to Katama Bay via Mattakesett Herring Creek, which historically facilitated water exchange between the 2 systems. In the past several years, however, this connection

has become increasingly restricted due to sand buildup and the growth of invasive species, particularly phragmites. The resulting blockage in Herring Creek has caused limited water exchange, flushing, and drainage in CRX, ultimately increasing the risk of flooding and poor water quality. Flooding is a major concern within the CRX and Herring Creek community, and many have been directly impacted by it throughout the years. The Town of Edgartown is working to restore the water flow to Herring Creek by removing phragmites, an invasive plant. This project began in October of 2024 and is ongoing.

Overall, CRX continued to exhibit signs of ecosystem stress in 2025, however, levels of impairment have not reached the extremes of 2022. In 2022, CRX experienced a late season cyanobacteria bloom, impacting the pond's water quality. Since 2022 the pond has stayed relatively consistent in terms of water quality parameters such as cyanobacteria, nitrogen, total algae, and turbidity. Although water quality has improved since 2022, the pond is still exhibiting ecosystem stress. The surrounding CRX and Herring Creek community have observed this impairment and live with its impacts. The community expressed a high level of concern regarding CRX water quality, including the presence of cyanobacteria blooms.

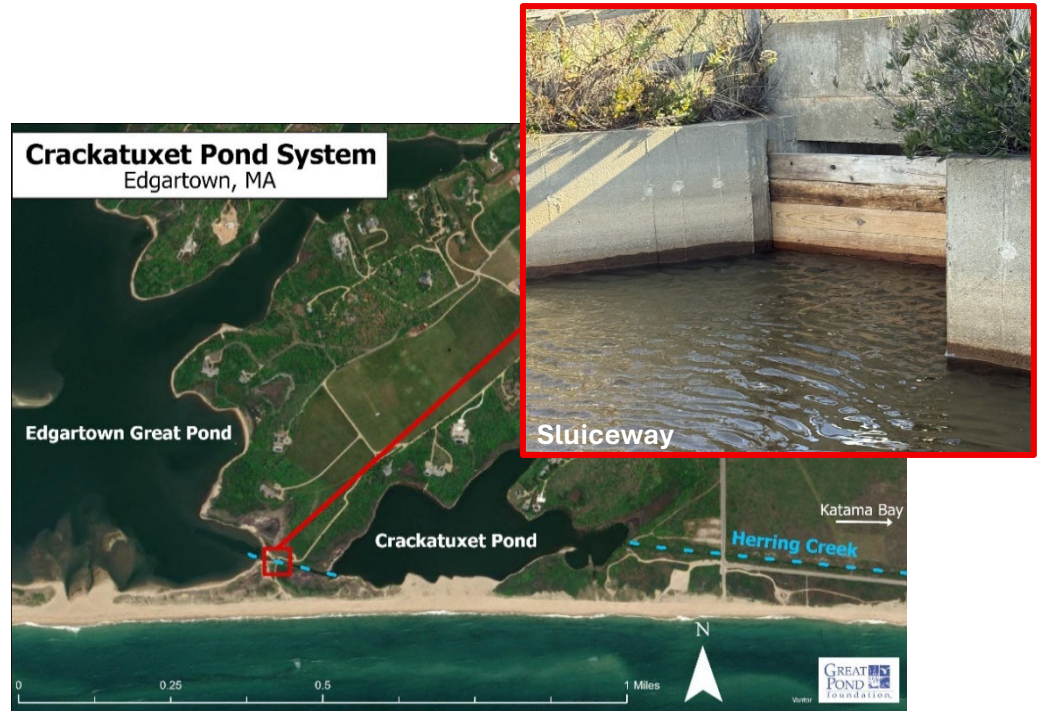


Figure 1. CRX pond system and sluiceway between EGP & CRX connection.

CRX Water Quality

A preliminary survey created by GPF was sent out in January of 2026 to better understand the CRX and Herring Creek community's concerns, perspectives, and knowledge surrounding this area. Based on survey results, the primary concerns are poor water quality and cyanobacteria blooms. Following closely behind are flooding and erosion with 80% of people identifying them as a top concern (**Figure 2**).

These, however, are not just concerns, but the reality of challenges the neighborhood faces. According to the survey results, 40% of participants (and their households) reported having been directly affected *most* by poor pond water quality in the past 5 years with the rest of the greatest impacts evenly split between erosion and flooding. In fact, according to community responses, 80% agree that the overall pond conditions including water quality, cyanobacteria, and biodiversity have worsened since 2020.

Per ecosystem monitoring data, the CRX ecosystem continued to show signs of impairment, with consistently elevated levels of nitrogen, total algae, and turbidity. However, these conditions in the past 3 years (2023-2025) have not

been as severe as those recorded in 2022. The 2022 late-season cyanobacteria bloom marked the highest level of ecosystem stress observed since monitoring began in 2021. In general, the past three years indicate ongoing stress but at noticeably lower levels.

The 2022 cyanobacteria bloom had concentrations that exceeded 100 µg/L. This is the highest average cyanobacteria concentration the pond has seen throughout the monitoring years and fortunately has not experienced since. From 2023-2025 (months of May-October) cyanobacteria levels have not exceeded the MV CYANO orange "Bloom Watch" threshold (**Figure 3**). In 2025 the pond experienced its highest cyanobacteria concentrations in September due to a shift in phytoplankton communities. This phytoplankton shift was likely triggered by an over wash event (ocean water spilling over the barrier beach into the pond) in mid-August. Following this over wash, green algae and diatoms had a sudden decrease, and this coincided with a cyanobacteria increase (**Figure 4**). This cyanobacteria growth was short-lived; concentrations dropped to 0 µg/L for the remainder of the sampling season, while green algae and diatoms quickly rebounded. Green algae and diatoms are normal and non-toxic members of pond ecosystems. Elevated concentrations of cyanobacteria are of concern because of their potential to produce cyanotoxins, which can be harmful to humans, companion animals, livestock, and wildlife.

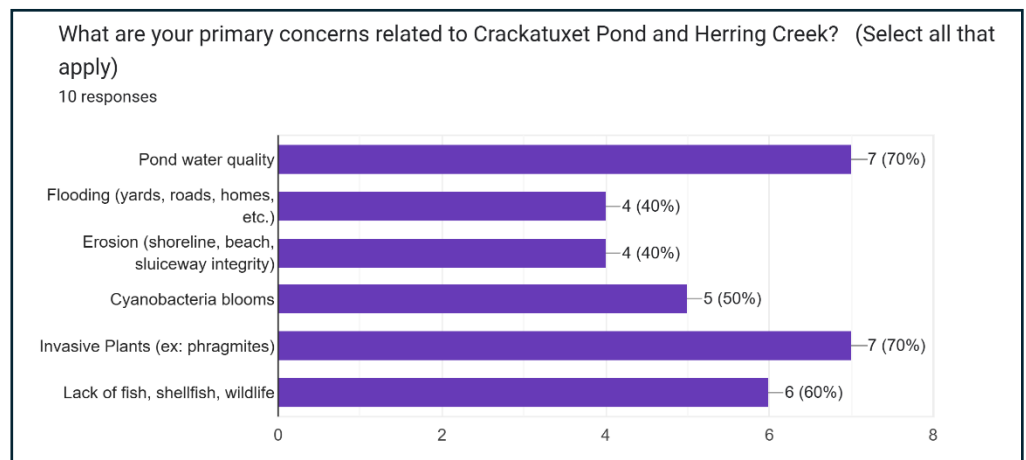


Figure 2. Preliminary survey results showing the CRX and Herring Creek community's primary concerns regarding the ecosystem.

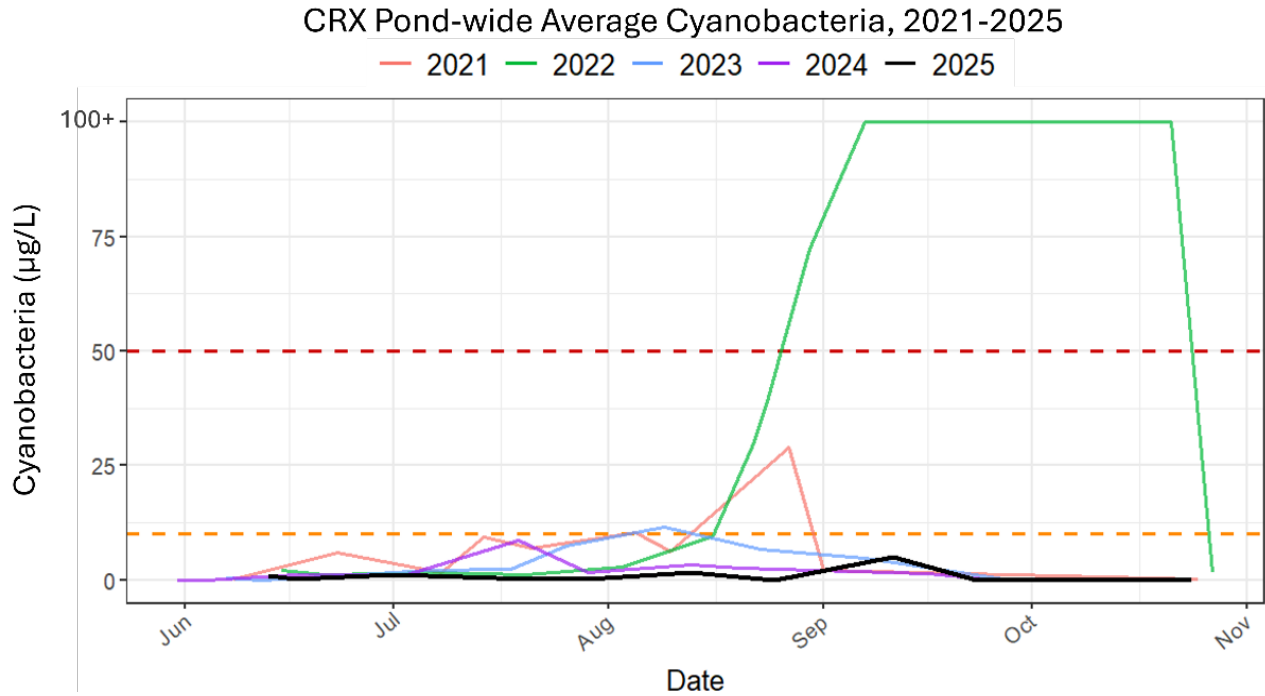


Figure 3. Pond-wide average cyanobacteria concentrations (ug/L) for the years 2021-2025. Dashed orange line refers to the 10 ug/L orange MV CYANO “bloom watch” threshold. Dashed red line refers to the 50 ug/L red MV CYANO “bloom advisory” threshold. Note: y-axis capped at 100 ug/L.

Water quality conditions have remained relatively consistent over the past three seasons and have remained improved relative to 2022. During the 2022 cyanobacteria bloom, the pond experienced its highest recorded levels of total nitrogen, total algae, and turbidity. High total nitrogen levels feed phytoplankton growth leading to murkier (more turbid) water. From 2023 onward, total nitrogen has stayed just above the 0.5 mg/L Massachusetts management threshold, a management threshold borrowed from the adjacent EGP, as CRX does not have pond-specific targets. Total algae and turbidity have followed a similar pattern, showing the same general decline, demonstrating improved conditions since 2022 (**Figure 5**). In fact, averages in each of these water quality metrics from 2023-2025 were close to those documented in 2021, the first year of monitoring. Although CRX continues to show signs of ecological stress and impairment, the absence of extreme conditions since 2022 and the steadying of water quality parameters to a consistent baseline suggest a degree of resilience and a potential gradual improvement in overall ecosystem health.

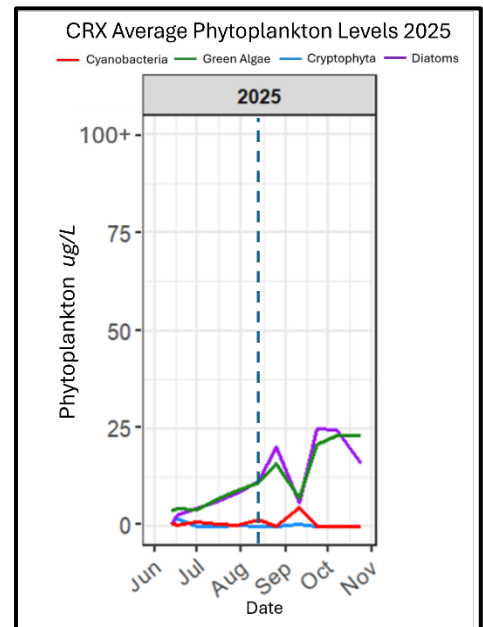


Figure 4. Phytoplankton concentrations (ug/L) in 2025. Different colors correspond to different phytoplankton communities. Dashed blue line represent over wash event.

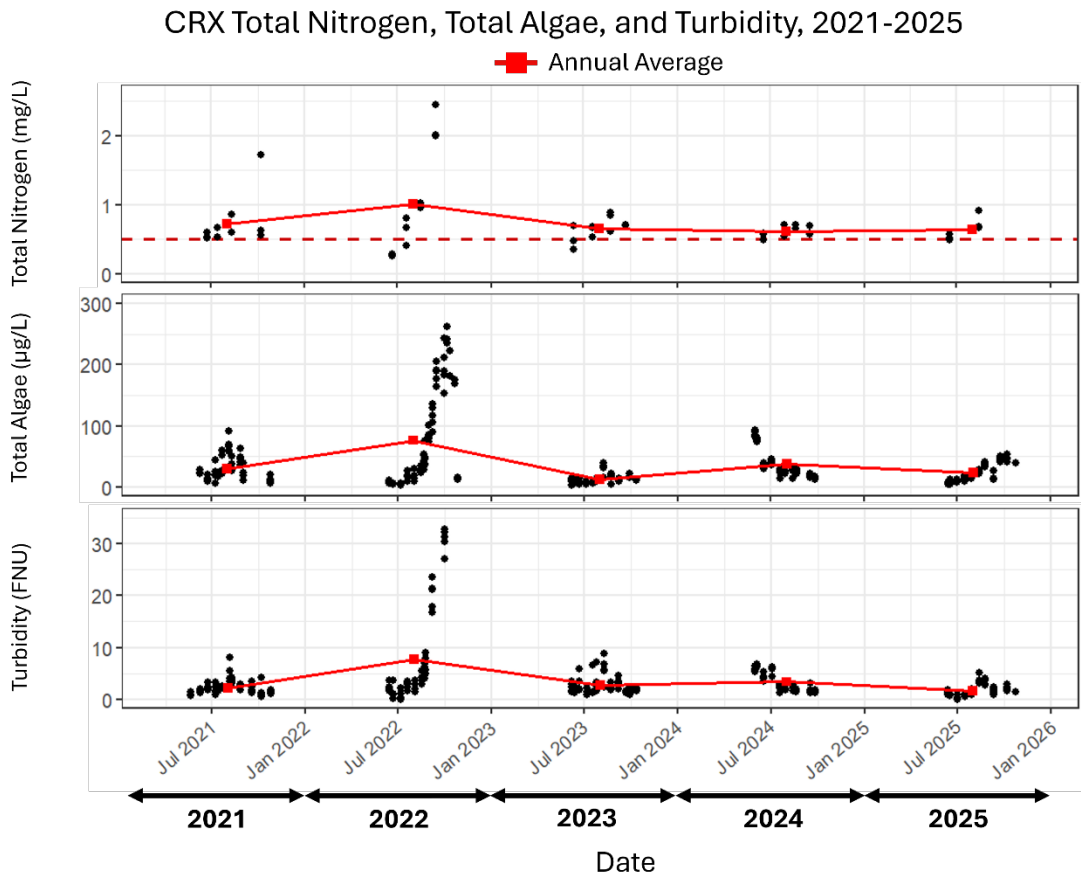


Figure 5. Scatterplots of total nitrogen (mg/L), total algae (ug/L) and turbidity (FNU) measurements in CRX taken during the monitoring season (May-Oct) each year from 2021 to 2025. The dashed red line on the nitrogen plot represents the State’s 0.5 mg/L total nitrogen (TN) threshold. Numbers above the threshold indicate impairment. Overlying red lines represent annual averages for each year shown.

CRX Flooding & Remediation

Flooding is a major concern within the Crackatuxet and Herring Creek community, with nearly all participants indicating that restoring the flow to Herring Creek is the most important restoration project. Restoring flow to Herring Creek would not only reduce flooding in and around CRX but also improve water quality by shortening water residence time and enhancing the flushing of excess nutrients, especially nitrogen.

Flooding of CRX and the surrounding land area occurs when water spills over the sluiceway from EGP and is unable to drain eastward through Herring Creek and into Katama Bay. Spillovers from EGP to

CRX are evident in the elevation patterns of both ponds. An early, atypical example occurred in summer 2021, when several sluiceway boards were missing, allowing direct surface water exchange between EGP and CRX for approximately two weeks before the boards were reinstalled.

More typical spillover patterns have been documented in later years. These events are generally indicated when EGP’s elevation plateaus while CRX’s elevation begins to rise. This pattern is seen in the late winter 2023, when the rate of fill in EGP slowed while CRX’s elevation increased, resulting in approximately 2 months of spillover and CRX reaching elevations over 3 ft NAVD88 before dropping following an EGP cut (**Figure 6**). A similar sequence occurred in late winter of 2025, with EGP’s elevation plateauing from January through March while CRX continued to rise, followed by declines in both systems after an EGP cut. In addition to these spillover events, CRX experienced rapid elevation increases during storms in January 2024 due to substantial precipitation and over wash in which ocean water spilled over the barrier beach and entered the pond.

It is important to note that spillover alone does not necessarily result in flooding; flooding occurs when elevated water levels coincide with limited drainage capacity through Herring Creek. The Town of Edgartown initiated a phragmites removal project in Herring Creek will improve water flow and reduce the likelihood of prolonged elevated water levels in CRX.

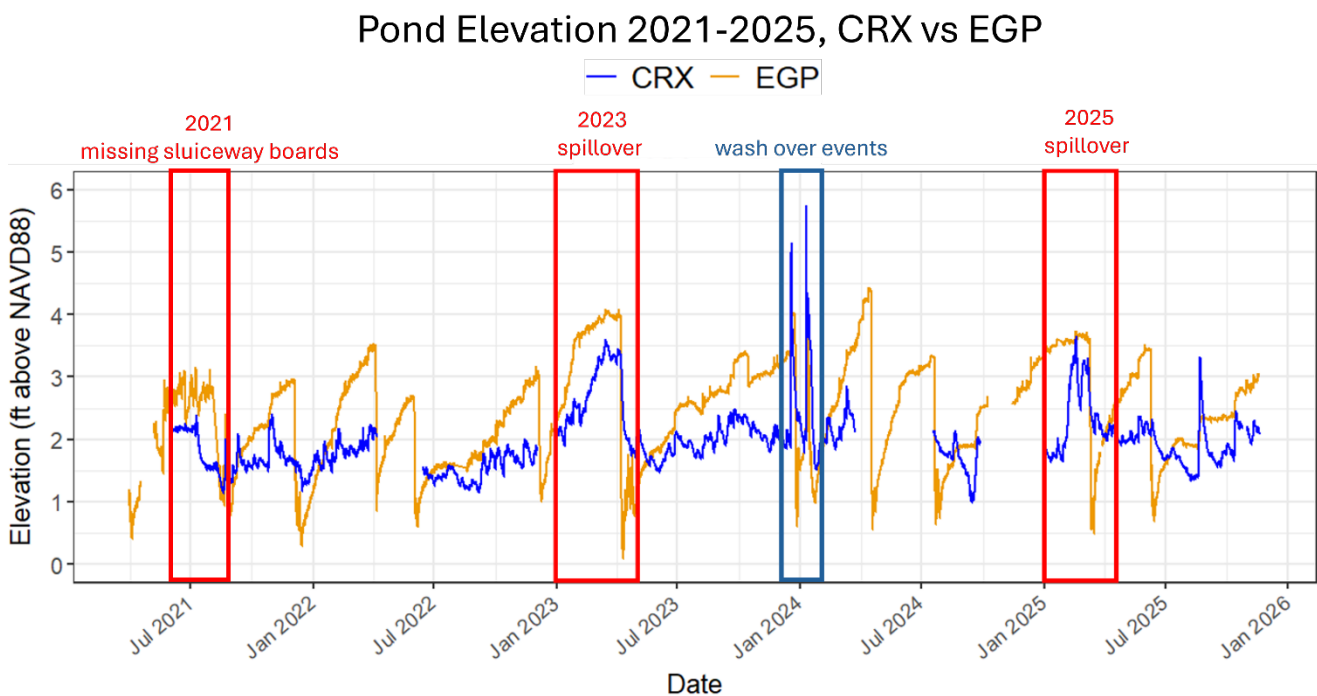


Figure 6. Pond elevation (ft above NAVD88) of CRX (blue line) and EGP (orange line) from 2021 to 2026. The red squares highlight spillover (EGP to CRX) events and the blue square highlights CRX over wash events.

Water was once able to flow directly between CRX and Katama Bay via Herring Creek. This connection however has been restricted by sand buildup and overgrowth of invasive species such as phragmites.

Even in the past 5 years overgrowth and blockage are evident through aerial imaging (**Figure 7**), aligning with the community’s observations of flooding becoming worse since 2020.

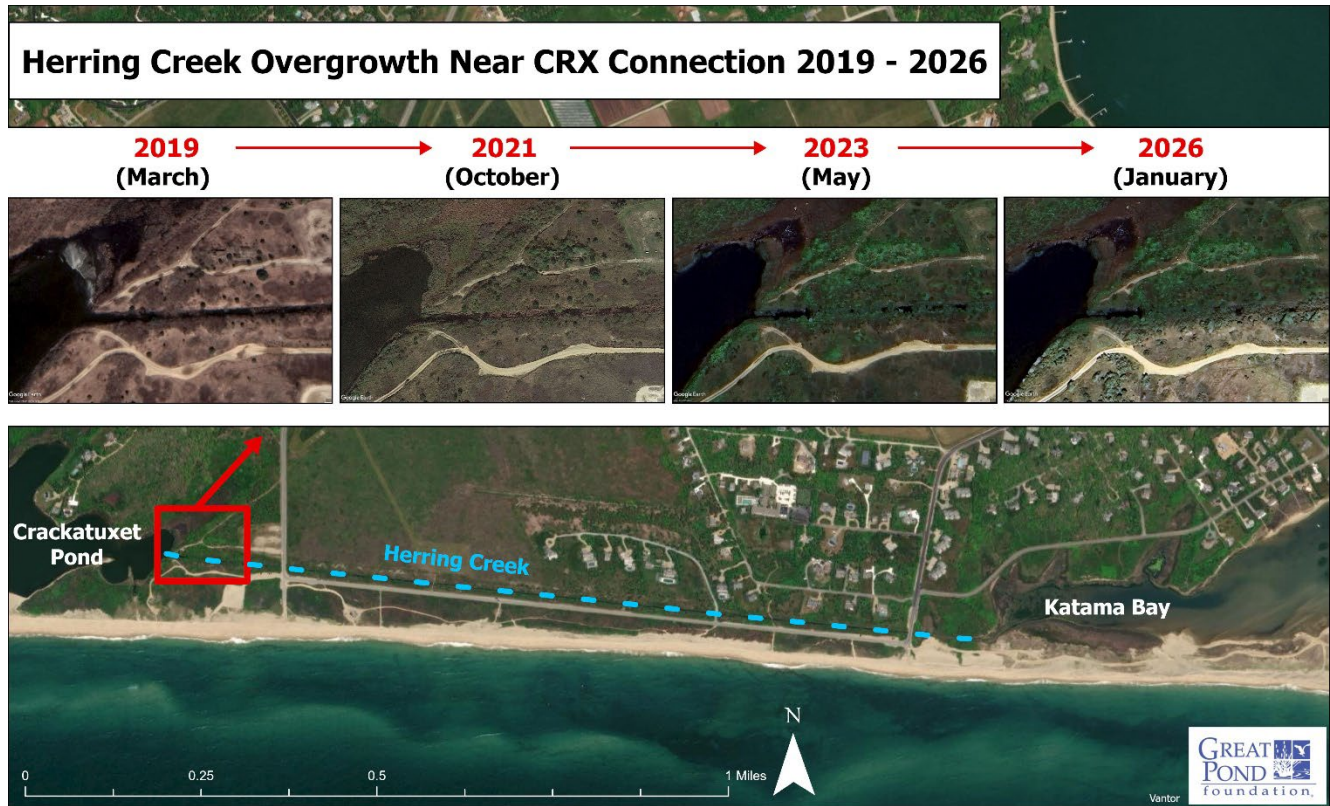


Figure 7. Aerial imaging (Google Earth) of the Herring Creek opening on the CRX side from the years 2019-2026. Imaging shows overgrowth within this portion of the creek throughout the years.

The phragmites removal in Herring Creek led by the Town of Edgartown began on October 21st, 2024. Due to missing elevation data, the immediate effect of the restoration project on CRX elevation cannot be determined. However, pond elevations from January through December 2025 appear comparable to those from previous years, showing no clear change attributable to the project (**Figure 8**). Rainfall in 2025 had similar averages compared to earlier monitoring years (**Figure 1 in appendix**), indicating that precipitation did not have a strong influence on elevation patterns during this period.

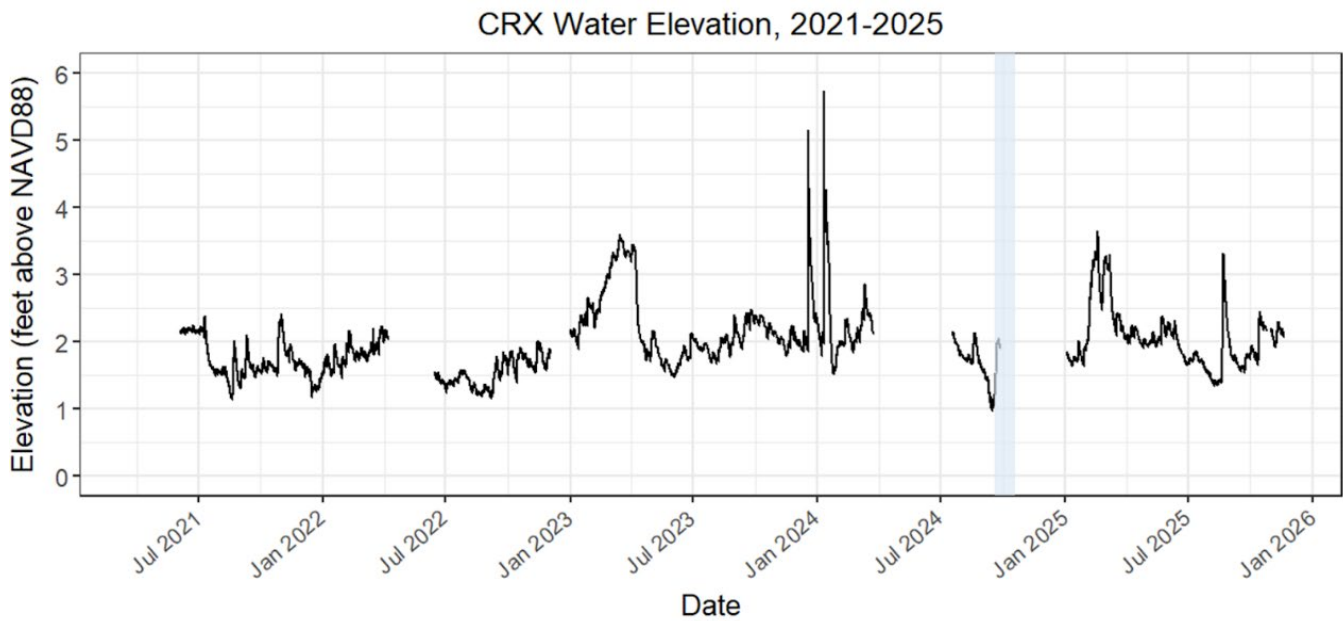


Figure 8. CRX elevation (ft above NAVD88; black line) from 2021 to 2026. Blue shaded area represents the start of the Herring Creek phragmites removal project in October of 2024.

While the effect of the restoration on flooding in CRX remains uncertain, one notable change in 2025 was the reduced number of days with high water temperatures compared to 2024. CRX experienced 21 days with mean daily water temperatures above 80°F in 2024, but only 5 days with this same standard in 2025 (**Figure 9**). This temperature shift appears specific to CRX as neighboring pond, Edgartown Great Pond, which is hydraulically connected to CRX did not experience this decrease in number of days with high temperatures. In fact, EGP experienced 38 days with mean daily temperatures above 80°F in 2025, this was a higher number of days than all previous monitoring years. Although this pattern does not confirm a response to the 2024 phragmites removal, the decrease in the number of days with high water temperatures which was only evident in CRX may indicate increased water movement which allows for more flushing of excess nutrients in the pond ecosystem.

Air temperature also does not appear to be a primary driver of the reduced number of days with high water temperatures observed in CRX in 2025. Annual average air temperatures in the Edgartown, MA area remained relatively consistent with previous years, despite 2025 having the lowest average of the past five monitoring seasons. Overall, the range in annual mean air temperature was narrow, varying only from approximately 52.0 to 54.2°F (**Figure 10**). Given this minimal variability, the reduction in high water temperature days in CRX is unlikely to be explained by regional air temperature differences. Together, these observations suggest that the reduced number of days with high water temperatures in CRX was not influenced by a significant change in regional air temperature and differed from neighboring EGP water system, reinforcing that this change was localized to CRX itself.

of days with mean daily temperatures above 80°F 2021-2025, CRX vs EGP

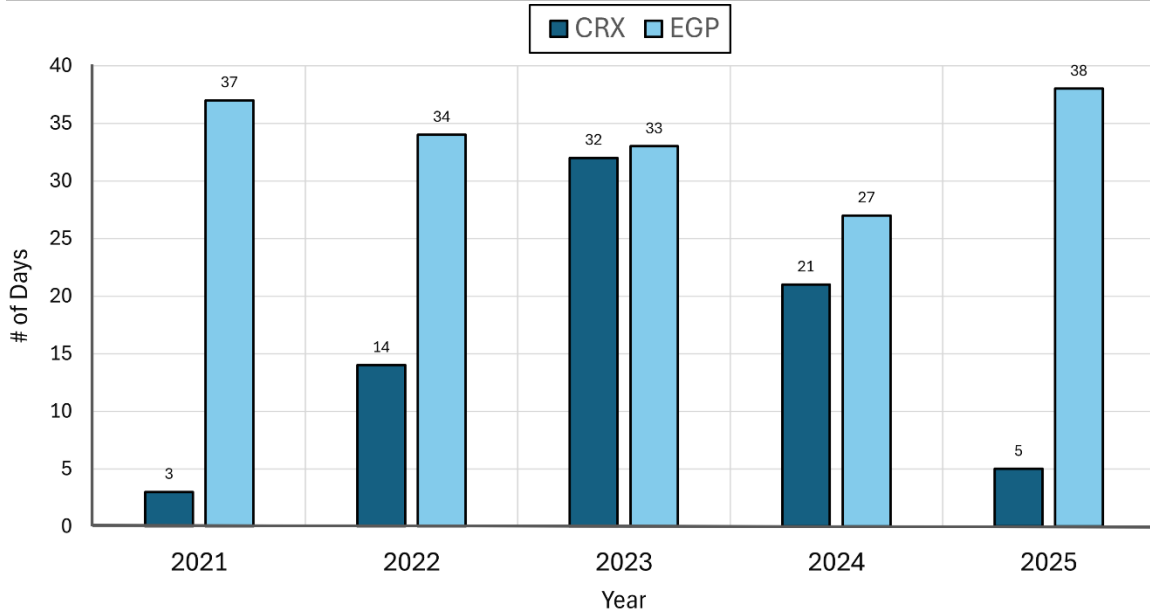


Figure 9. Number of days with mean daily temperatures above 80°F in CRX and EGP in the years 2021 through 2025.

Yearly Mean Average Temperature for Edgartown, MA

Year	Annual Average Air Temperature °F
2021	53.6
2022	53.7
2023	54.2
2024	53.3
2025	52.0

Mean	53.4
Max	54.2
Min	52.0

Figure 10. Yearly mean average air temperatures in Edgartown, MA. Data obtained from the National Weather Service.

Conclusion

CRX continues to exhibit signs of ecological stress, but the monitoring data shows a system that has remained relatively consistent in recent years following the extreme stress conditions observed in 2022, a year in which the pond experienced the highly concentrated cyanobacteria bloom. These observations may suggest that while impairment persists, the pond has not shown the same level of acute ecosystem stress over the past three monitoring seasons (2023-2025).

Since CRX and EGP are hydrologically connected and drainage through Herring Creek remains somewhat restricted, flooding may continue to be a challenge the community faces. The Herring Creek phragmites removal project is a good start to managing the water level in CRX and improving the water quality. Findings of lower water temperatures in CRX represent possible signs of shorter residence time and improved drainage out of Herring Creek. These findings highlight the need for restoration and monitoring to continue.

Overall, the 2025 monitoring season shows a pond that remains impaired but stable, with consistent water quality conditions. Ongoing data collection coupled with targeted restoration efforts will be essential for understanding CRX's long-term health trends, informing management decisions, and improving the health and sustainability of this ecosystem.

Work Cited

Massachusetts Department of Environmental Protection. (2021, December 10). *314 CMR: Division of Water Pollution Control*. Commonwealth of Massachusetts. <https://www.mass.gov/doc/314-cmr-400/download>

National Weather Service. (2025). *NOWData – NOAA Online Weather Data*. <https://www.weather.gov/wrh/Climate?wfo=box>

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Appendix

Refer to GPF's [Summary of Metrics Methodology](#) page for information on how the Summary of Metrics rankings included in this report's executive summary were assigned.

	Rainfall (Inches)						
	May	June	July	August	September	October	Average
2021	4.73	1.69	M	M	7.9	4.7	4.755
2022	2.86	2.74	0.29	1.51	4.31	6.07	2.903
2023	1.35	3.11	2.52	3.73	7.5	1.68	3.315
2024	5.53	2.83	2.26	1.34	4.84	1.39	3.03
2025	6.33	1.69	2.69	3.53	1.5	3.82	3.26

Figure A1. Rainfall totals on Martha’s Vineyard. Data was obtained from the National Weather Service for the Martha’s Vineyard Airport.

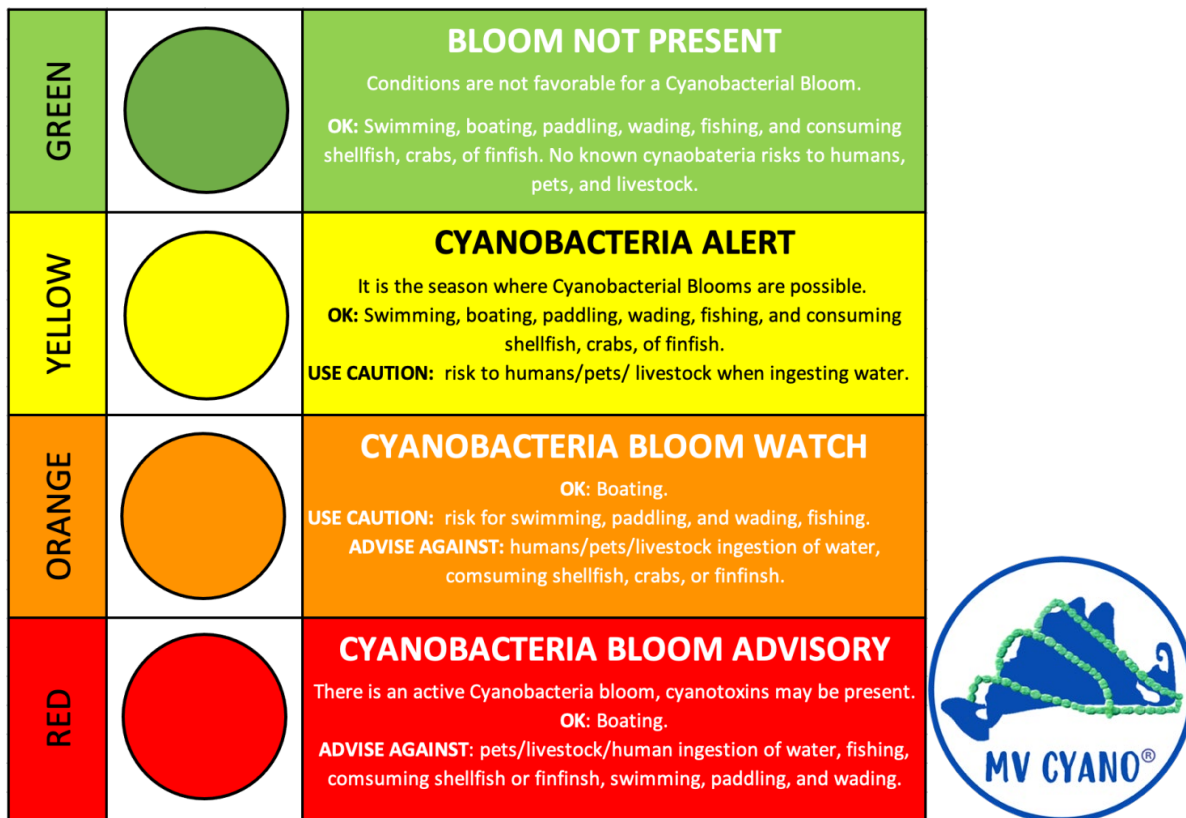


Figure A2. The color-coded risk matrix used by MV CYANO.