



BLUE WATER TASK FORCE O'AHU

WATER QUALITY REPORT

2021



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MAHALO TO BWTF VOLUNTEERS AND SUPPORTERS

The goal of Blue Water Task Force is to provide year-round water quality information to the public in order to supplement monitoring done by the Hawai'i Department of Health. This data is used to inform safe beachgoing and aquatic recreation on the island of O'ahu.

MAHALO to the Volunteers, Partners, and Supporters of Surfrider Foundation's O'ahu Chapter. Your support and commitment make this program possible. Special thanks to University of Hawai'i at Mānoa's Kewalo Marine Laboratory for providing laboratory space in 2021.

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INTRODUCTION

The Blue Water Task Force (BWTF) is the Surfrider Foundation's citizen/community science program that provides critical water quality information to protect public health at our beaches.

The O'ahu Chapter launched its BWTF program in 2015. In 2021, the BWTF monitored 23 sites representing each geographic region of the island. Our BWTF Team is composed of trained volunteers who attempt to sample each site twice a month throughout the year.

Water quality samples are tested for the presence of *Enterococcus*, a fecal bacteria that indicates the presence of human or animal waste in the water. Elevated levels of *Enterococcus* increase the likelihood that other pathogens that can make people sick may be present.

The goal of BWTF is to fill in monitoring gaps and quickly communicate with the public where it is safe to swim and where bacteria levels are elevated. Water quality results are compared to the standards used by the Hawai'i Department of Health

(HDOH) to make beach closure decisions. Known as the Beach Action Value (BAV), this threshold is set at 130 colony forming units of *Enterococcus* per 100mL sample (130 CFU/100mL).

The water quality information generated by the BWTF augments the data that the HDOH provides through its beach water quality monitoring program. HDOH services test only a specific number of beaches on O'ahu, primarily those with lifeguards and in popular tourist areas, while the BWTF covers a variety of areas popular with recreational users including surf spots and local bathing beaches.

Beachgoers should take precautions swimming, surfing, or recreating after heavy rain events for 24-48 hours. Do not enter brown water areas or where there is a warning sign for high bacteria levels.

Community members are encouraged to check water quality results posted online before they head to the beach at bwtf.surfrider.org/explore/44. Current and historic data are available.



WHERE WE TEST

NORTH SHORE

Chocolates
Kaiaka Bay
Kahaone Loop Pools
Pua'ena Point
Pūpūkea Tidepools
Waialua Pipe

SOUTH SHORE

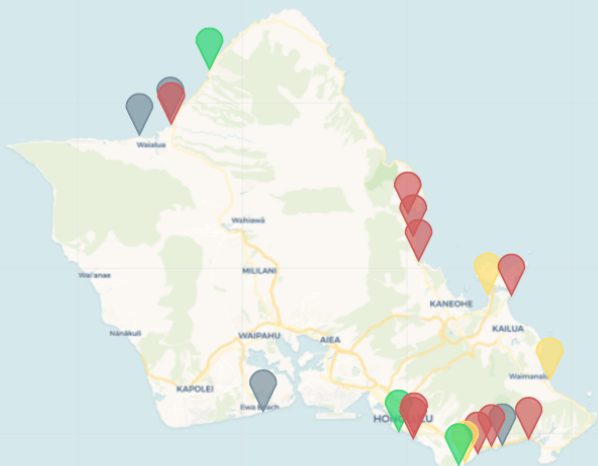
Black Point / Cromwells
Black Point/ East
Kuli'ou'ou Stream
Magic Island Canoe Launch
Magic Island Bowls
Point Panic - Stairs
Wai'alae Beach Park
Wailupe Beach Park
Wailupe Stream

WEST SHORE

'Ewa Beach Canal

EAST SHORE

Haikipu'u Boat Ramp
He'eia Stream
Kahalu'u
Kaimalino
South Kāne'ohe Bay
Waiāhole Beach Park
Waimānalo Bay Beach Park



SITE DETERMINATION & SAMPLING

In 2021, trained BWTF volunteers sampled 23 sites. During this time period, 432 samples were collected, generating water quality information for recreational waters along the island's North, South, East, and West shores. Samples are processed at the University of Hawai'i at Mānoa's Kewalo Marine Laboratory. Three new sites were added in December 2021 (Kahaone Loop Pools, Kaiaka Bay, and He'eia Fishpond), but due to limited data, these sites are not included in the 2021 report.

Our BWTF team maintains a regular two week interval between sampling and will sample both after rain events and during Brown Water Advisories (barring dangerous conditions). This ensures that the BWTF data set captures water quality information during both wet and dry conditions. This data allows us to gain a more comprehensive understanding of water quality conditions on O'ahu.

BWTF prioritizes sites to augment the sites sampled by the HDOH. The BWTF covers a variety of areas popular with local residents and recreational users including surf spots, boat launches, and local bathing beaches. The BWTF additionally tests potential freshwater sources of pollution that discharge onto the beach, like streams and stormwater outflows, as well as sites to determine if cesspool wastewater is a source of bacteria to coastal waters.

BWTF also periodically re-assesses its site selection. Sites that reveal good water quality and low bacteria levels, for example, may be replaced by sites that indicate more chronic pollution issues. This was the case in 2021 with the addition of sampling at Waiahole Beach Park and concerns with cesspool contamination.

Community concerns may also prompt the BWTF to prioritize new sites, as with the Hakipu'u sites added in 2020.



2021 DATA SUMMARY

This report provides an analysis of water test results for 20 sites that were monitored in 2021. Our water quality results indicate that certain sites frequently experience high bacteria levels that exceed state health standards (**Table 1**).

High bacterial counts indicate the presence of human or animal waste in these waters, which may threaten public health. The data is also important in identifying chronically polluted sites that should continue to be prioritized for ongoing monitoring, as well as potential investigation on behalf of the Department of Health.

TABLE 1: PERCENT OF SAMPLES EXCEEDING HEALTH STANDARDS (> 130 MPN/100ML)

SITE NAME	TOTAL SAMPLES	MAXIMUM BACTERIA (mpn Enterococcus/100mL)	% HIGH BACTERIA (>130 mpn/100mL)
‘Ewa Beach	12	10	0%
Point Panic Stairs	26	96	0%
Waimānalo Bay Beach Park	23	41	0%
Pūpūkea Tidepools	24	10,462	4%
Pua‘ena Point	18	1,274	6%
Waialua Pipe	18	1,259	6%
Black Point/East	24	10,422	8%
Black Point/Cromwells	24	432	8%
Wailupe Beach Park	11	1,259	9%
Kaimalino	27	1,112	11%
S. Kāne‘ohe Bay	25	350	20%
Magic Island Bowls	25	546	24%
Wai‘alae Beach Park	24	4,884	33%
Wailupe Stream	14	3,255	36%
Magic Island Canoe Launch	26	8,164	50%
Hakipu‘u Boat Ramp	26	6,131	77%
Kahalu‘u	25	8,664	80%
Waiāhole Beach Park	13	4,611	85%
Kuli‘ou‘ou Stream	26	24,196	88%
Chocolates	21	2,359	95%

Table 1. Indicates the percentage of total samples taken at respective sites that exceeded HDOH health standards for *Enterococcus* bacteria (>130 mpn/100mL). Note that the number of total samples is not consistent across sites.

KEY OUTCOMES

In particular, six sites (Magic Island Canoe Launch, Kahalu'u, Hakipu'u, Waiāhole, Kuli'ou'ou Stream, and Chocolates) had 50% of their samples exceed state health standards.

Kahalu'u is located in a Priority 1 Cesspool area, meaning that there is known wastewater contamination. Kahalu'u, Hakipu'u, and Waiāhole are furthermore all characterized by high concentrations of coastal cesspools. The chronic pollution documented at these sites by the BWTF indicates the potential impact of sewage pollution in these areas.

In addition, these six sites are located at the mouth of streams or rivers. Chronic pollution at these sites may therefore also be attributed to land-based runoff from upland areas that is carried by freshwater streams and released into the ocean.

Cesspool derived water is also a known component of streams on O'ahu and may contribute to elevated bacteria levels, particularly in areas where cesspools are concentrated along stream beds or coastlines.



O'ahu BWTF volunteers sample water in Kāne'ohe Bay.

From our data, it is additionally clear that many locations have elevated levels of fecal indicator bacteria after rain events and during brown water events. Beginning in November, the rainy season is characterized by large storm events with heavy rainfall.

Particularly in the early part of the season, these storms serve to "flush" the island and can result in large amounts of water, sediments, wastewater, and pollutants flowing downhill into the ocean. Storms in November and December likely contributed to the exceptionally high bacteria readings at Kuli'ou'ou Stream (24,196 mpn/100mL), Pūpūkea Tide Pools (10,462 mpn/100mL), and Black Point/East (10,422 mpn/100mL).

Families, ocean users, and the public should be aware of the poor water quality conditions in these freshwater flows and seek to avoid them. The public should be particularly aware after heavy rain events that lead to increased runoff and can prompt Brown Water Advisories. Even if you do not see a public notice posted, avoid brown water until conditions clear.

More exposed beaches and those that do not have direct freshwater inputs from streams or rivers generally test clean. These sites seldom show high bacteria levels because of the high volumes of water exchange and mixing that occurs at these sites. Bacteria at these sites, however, can be elevated after rainfall or other heavy storm events.

KEY OUTCOMES

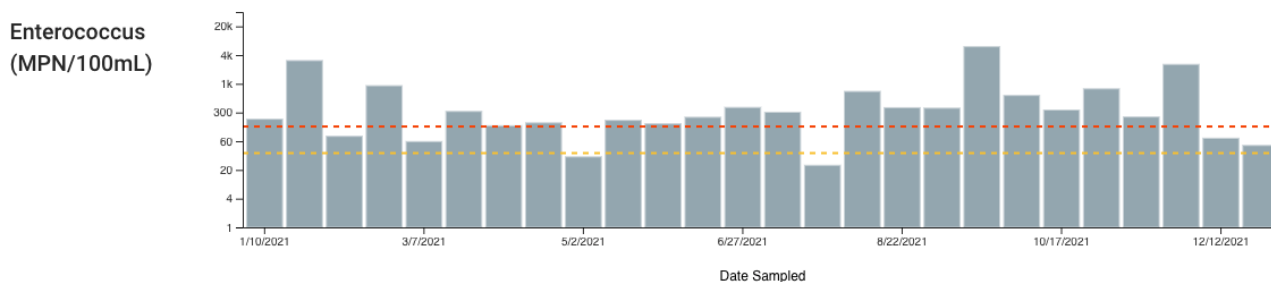
PRIORITY SAMPLE SITE: HAKIPU'U

In the summer of 2020, concerns over pollution from nearby cesspools and construction prompted the communities of Kāne'ohe Bay to launch water quality monitoring. Since August 2020, local volunteers have collected samples from Hakipu'u. Of the 26 Hakipu'u samples tested in 2021, 77% exceeded HDOH health standards for bacterial counts. The high bacterial counts indicate there is human or animal waste present in these waters, which may threaten public health and coral reefs.

77%

OF HAKIPU'U SAMPLES
IN 2021 **EXCEEDED**
HEALTH STANDARDS
FOR BACTERIAL
COUNTS

Hakipu'u Boat Ramp Results



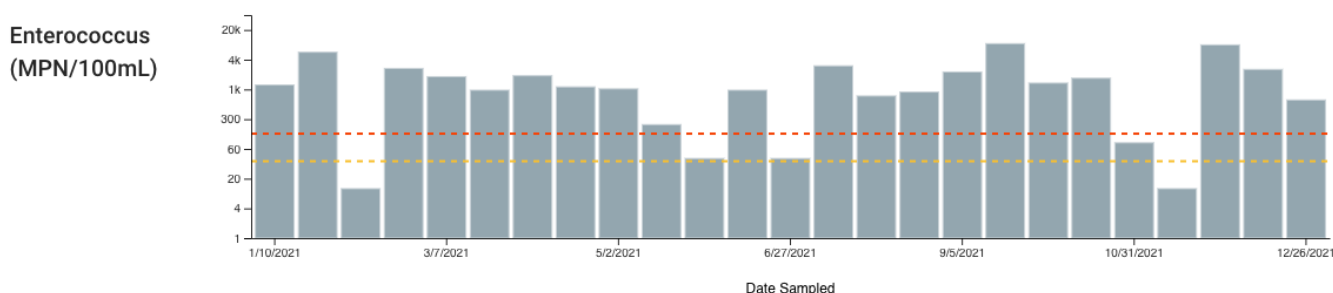
PRIORITY SAMPLE SITES: KAHALU'U

Since 2018, BWTF monitoring has indicated chronically high bacteria levels at Kahalu'u. In 2021, 80% of the samples collected at Kahalu'u exceeded health standards. Two important factors seem to contribute to the high bacteria readings at Kahalu'u. First, Kahalu'u is located at the mouth of a river and thus receives high amounts of land-based runoff. Secondly, Kahalu'u has a high density of coastal cesspools and is considered a Priority 1 Area (wastewater contamination is documented). The chronically high bacteria readings at Kahalu'u indicate the potential impact of wastewater contamination from cesspools.

80%

OF KAHALU'U SAMPLES
IN 2021 **EXCEEDED**
HEALTH STANDARDS
FOR BACTERIAL
COUNTS

Kahalu'u Results



KEY OUTCOMES

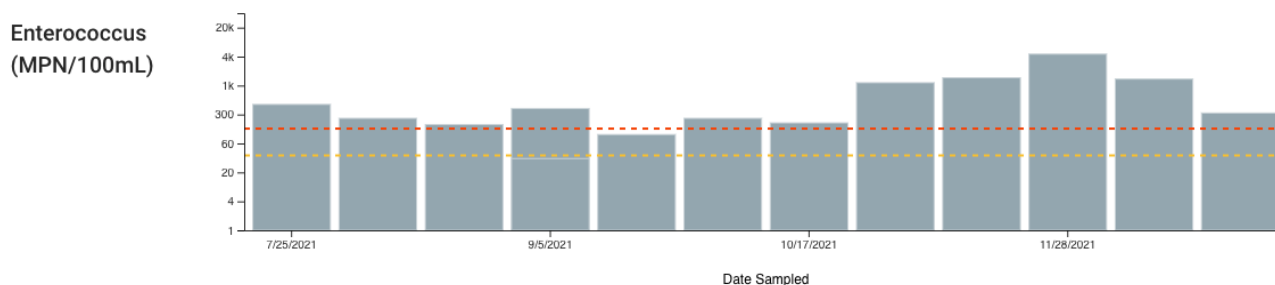
PRIORITY SAMPLE SITE: WAIĀHOLE BEACH PARK

Waiāhole Beach Park was added as a new site in 2021 and chosen based on the high concentration of cesspools in the area. Waiāhole Beach Park is located just to the northwest of the Kahalu'u Priority 1 Cesspool area. In 2021, 85% of the water samples from Waiāhole exceeded state standards. This data indicates the potential impact of the area's cesspools on ocean water quality.

85%

OF WAIĀHOLE SAMPLES
IN 2021 **EXCEEDED**
HEALTH STANDARDS
FOR BACTERIAL COUNTS

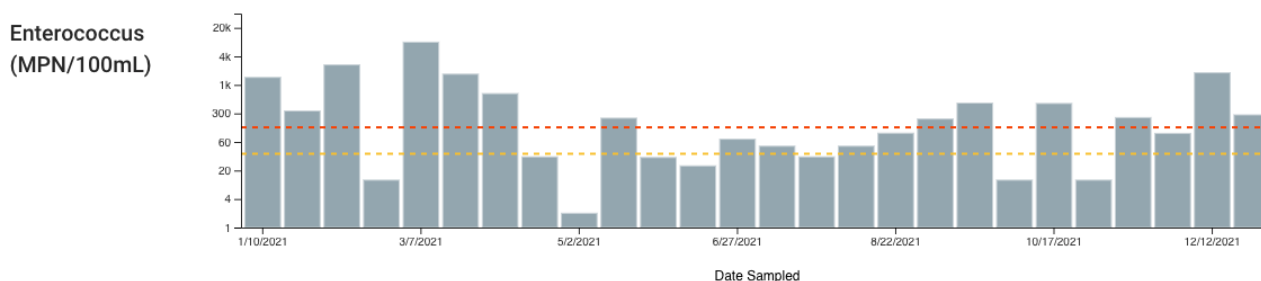
Waiāhole Beach Park Results



PRIORITY SAMPLE SITES: MAGIC ISLAND BOWLS & CANOE LAUNCH

Magic Island Bowls ("Bowls") and Magic Island Canoe Launch ("Canoe Launch") are both located at the mouth of the Ala Wai Canal in Honolulu. Canoe Launch, however, is located almost directly at the canal's entrance while Bowls is located further offshore. In addition to water, runoff from the Ala Wai Canal can carry sediment, pollutants, nutrients, and bacteria. In 2021, for example, 50% of the samples collected at Canoe Launch exceeded bacteria standards, compared to only 24% of samples collected at Bowls. This indicates that upstream runoff carried by the Ala Wai Canal contains possible sewage and other pollutants that concentrate at the canal's entrance. Bacteria is still present at Bowls, but is more diluted as you move further offshore.

Magic Island Canoe Launch



SOURCES OF POLLUTION

While the causes of bacterial pollution are multi-faceted, water quality at the beach is influenced by stormwater, groundwater, wastewater, and animal waste.

CESSPOOLS & SEPTIC SYSTEMS

O'ahu has 11,300 cesspools that discharge 7.5 million gallons of untreated sewage each day. Areas along Honolulu/Waikīkī, Kāne'ohe Bay, and Waialua/Hale'iwa have particularly high concentration of cesspools along the coastline. For homes or businesses that utilize cesspools, all the water that goes down the drain is stored in an underground pit. The wastewater then leaches slowly back into the ground, without treatment.

As a result, the State of Hawai'i passed Act 120 in 2016 that bans the construction of new cesspools. The following year, Hawai'i passed Act 125 mandating the upgrade of all existing cesspools by 2050.

Septic systems are slightly more advanced systems, yet both cesspools and septic systems contribute to water pollution.

For example, when groundwater levels are high, or when a heavy rain occurs, untreated wastewater can leach out of cesspools and septic systems polluting both ground and surface waters. In fact, even when a conventional septic system, without advanced treatment capabilities is functioning 100% properly, the effluent that is discharged still contains nutrients such as nitrogen and phosphorus, which pollute both groundwater and surface waterways.

STORMWATER

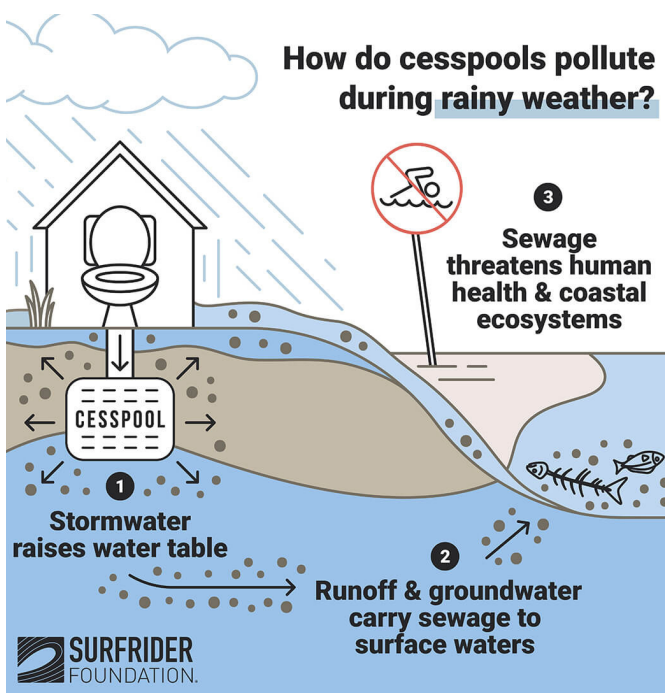
When water samples are collected during or just following a rain event, results are more likely to yield high bacteria levels due to stormwater runoff. Stormwater runoff occurs when rain hits hard surfaces, collects pollutants (animal waste, fertilizers, pesticides, car oil and dust) and carries them into our coastal bays and ocean. This can also be exacerbated by "sunny day runoff," when overuse of water, especially by mismanaged and misdirected irrigation, can create runoff that carries contaminated water to local waterways.

GROUNDWATER

Heavy rain and lunar cycles can also cause flooding and groundwater levels to rise. This can be particularly problematic in areas where residences and businesses are serviced by on-site wastewater systems (cesspools and septic systems) that leak and overflow when the ground is saturated.

ANIMAL WASTE

Enterococcus is abundant in the digestive tract of warm-blooded animals. Its presence in the water can therefore also indicate fecal pollution from animal sources. On O'ahu, piggeries and cattle farms may contribute to elevated bacteria levels downstream at sites such as Chocolates. Pet waste or waste from feral pigs or cats can also elevate bacteria levels in coastal waters.



STOP SEWAGE POLLUTION

In 2021, Surfrider Foundation launched its [STOP Sewage Pollution program](#) to raise awareness about the impact of sewage spills and failing wastewater infrastructure on coastal water quality.

Sewage can contain bacteria, viruses & parasites that make people sick with gastrointestinal symptoms, rashes, flu-like symptoms, skin and eye infections and worse! Sewage discharges also pollute waterways with excess nutrients that wreak havoc on coastal ecosystems by fueling harmful algal blooms that put human health at risk, cause fish kills and smother coral reefs.

CESSPOOLS IN HAWAII

Cesspools are essentially pits or holes in the ground that receive wastewater, including untreated human waste, from homes or businesses. Cesspools do not provide any wastewater treatment but instead, temporarily hold onto household effluent and let it seep into the surrounding ground water.

With an estimated 88,000 cesspools, Hawai'i has one of the highest cesspools per capita the United States. O'ahu has 11,300 cesspools that discharge 7.5 million gallons of untreated sewage each day. This untreated sewage contributes to high nitrogen levels in ground and surface waters, and can contain pathogens that can make people sick.

Local flooding conditions caused by rising sea levels and extreme weather events makes this situation even worse. Connections to sewers and other advanced wastewater treatment systems are needed in order to stop the flow of pathogens and nutrient pollution into local waterways and to reverse the human health and ecosystem damage caused by these systems in many communities.

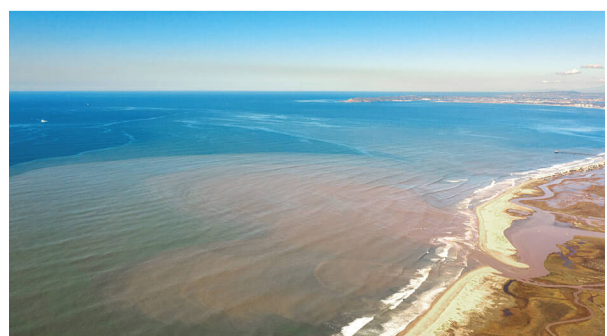
CONVERT YOUR CESSPOOL

If you're a homeowner with a cesspool, the most important way you can help STOP Sewage Pollution is by converting your cesspool. Visit the [Potty Portal](#) (developed by partner organization [WAI](#)) for numerous cesspool conversion resources. New and cheaper technologies for toilets and human waste management are also quickly improving. Take WAI's [Cesspool Homeowner's Quiz](#) to see which option maybe best for you.

HOW YOU CAN HELP

1. Convert your cesspool
2. Share your knowledge about the impacts of cesspools on water quality
3. Inspect and pump your septic tanks and cesspools regularly.
4. Don't use septic additives.
5. Only flush the three P's (pee, poop and toilet paper)
6. Don't pour cooking grease or oils down the drain.
7. Conserve water inside your home.
8. Soak up the rain and reduce runoff by directing roof downspouts into a rain barrel or vegetated area.

Over 20% of U.S. households are not serviced by sewers, but instead are connected to out-dated, individual systems like cesspools that do not treat wastewater.



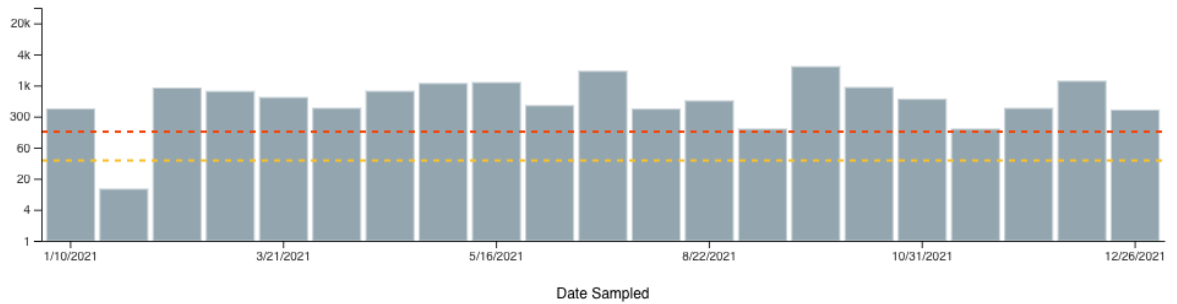
APPENDIX

NORTH SHORE



CHOCOLATES

Enterococcus
(MPN/100mL)



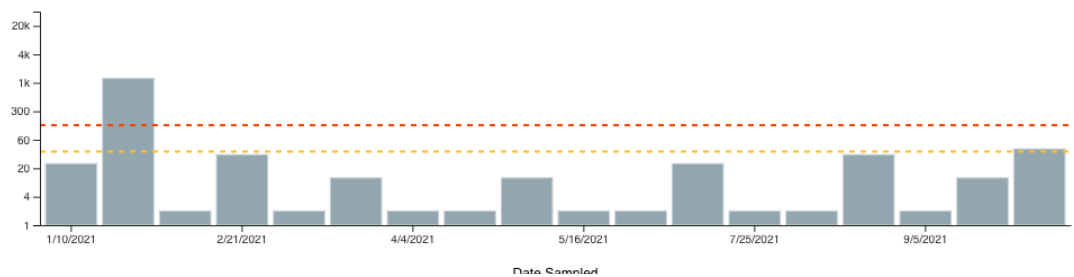
95%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



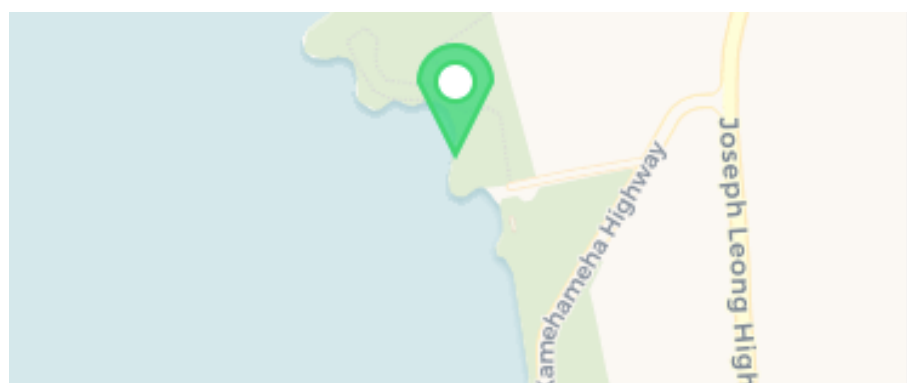
PUA'ENA POINT

Enterococcus
(MPN/100mL)

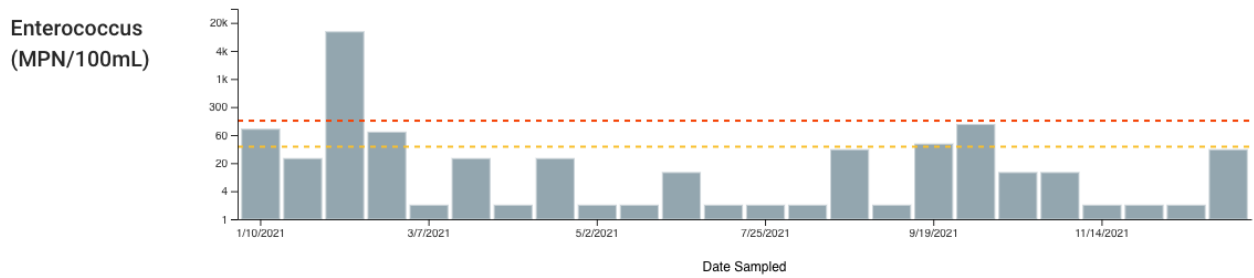


6%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.

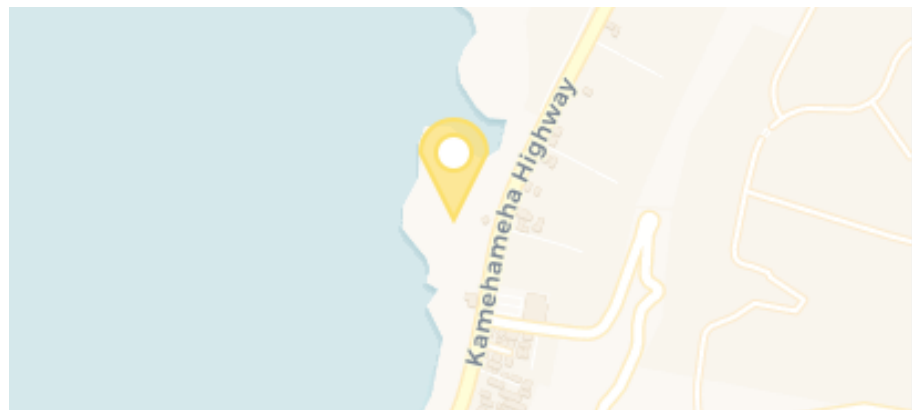


PŪPŪKEA TIDEPOLS

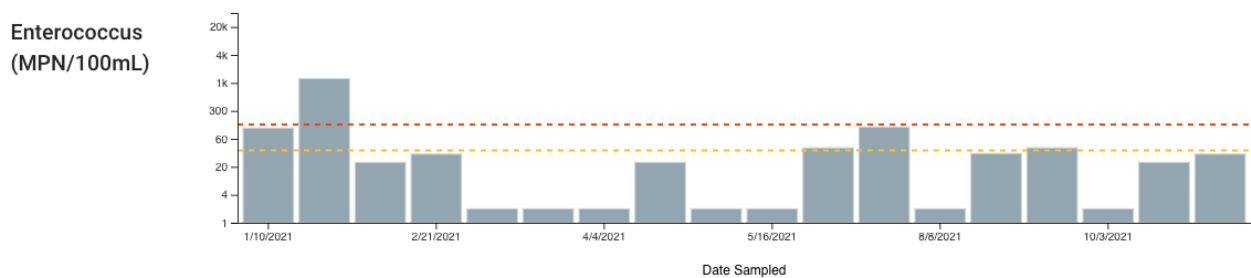


4%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



WAIALUA PIPE



6%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.

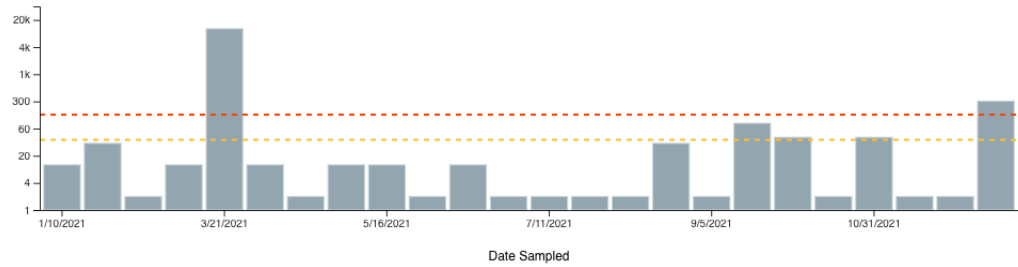


SOUTH SHORE



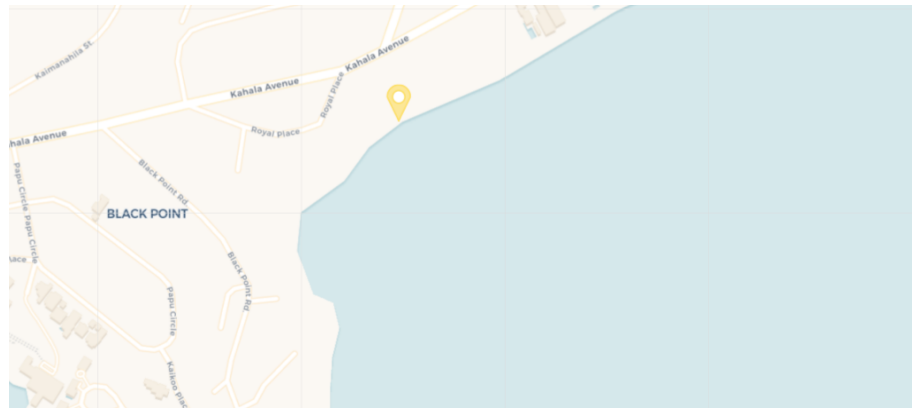
BLACK POINT / EAST

Enterococcus
(MPN/100mL)



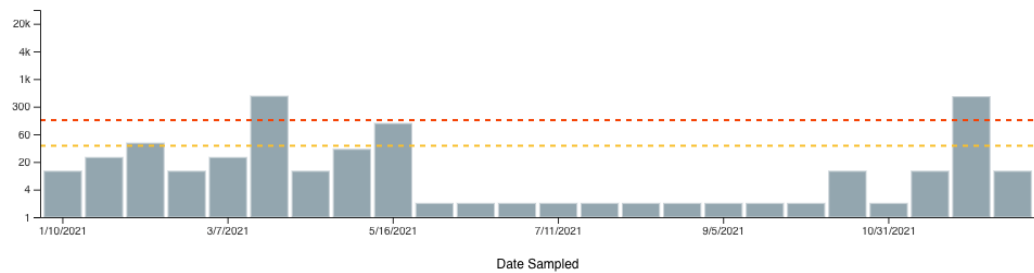
8%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



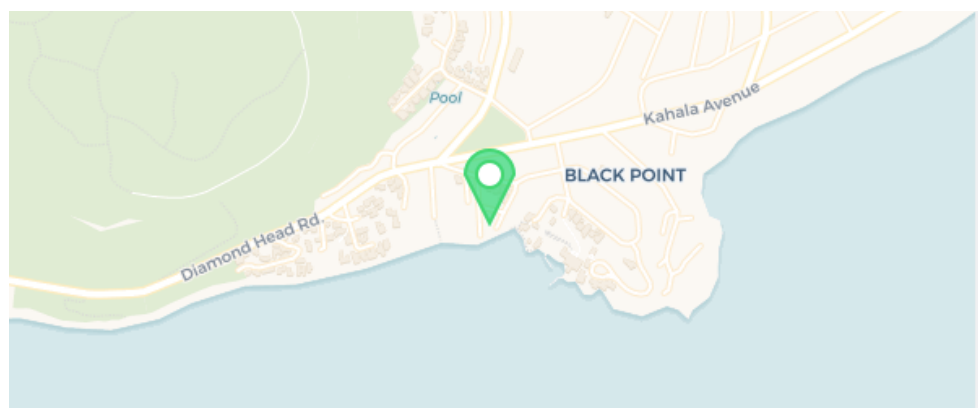
BLACK POINT/CROMWELLS

Enterococcus
(MPN/100mL)



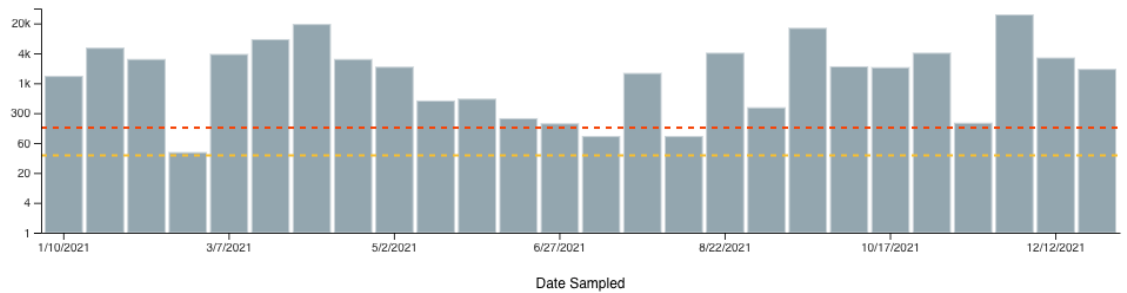
8%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



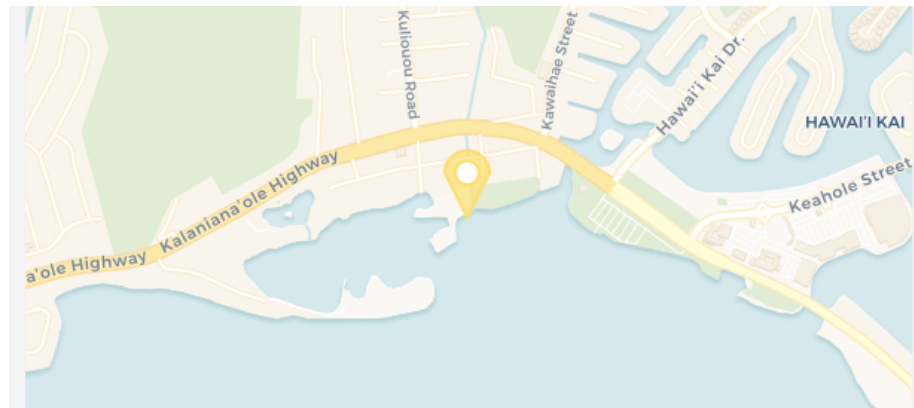
KULI'OU'OU STREAM

Enterococcus
(MPN/100mL)



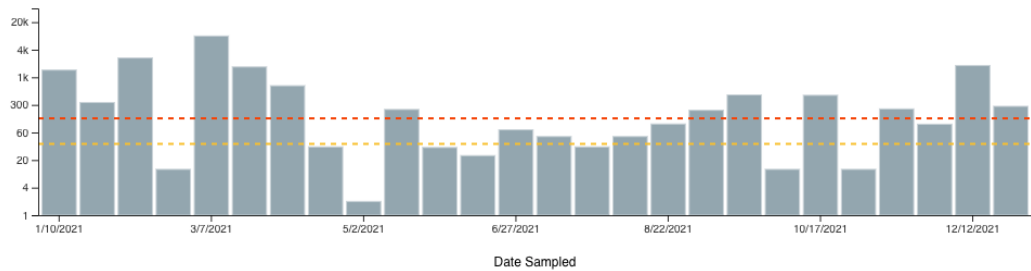
88%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



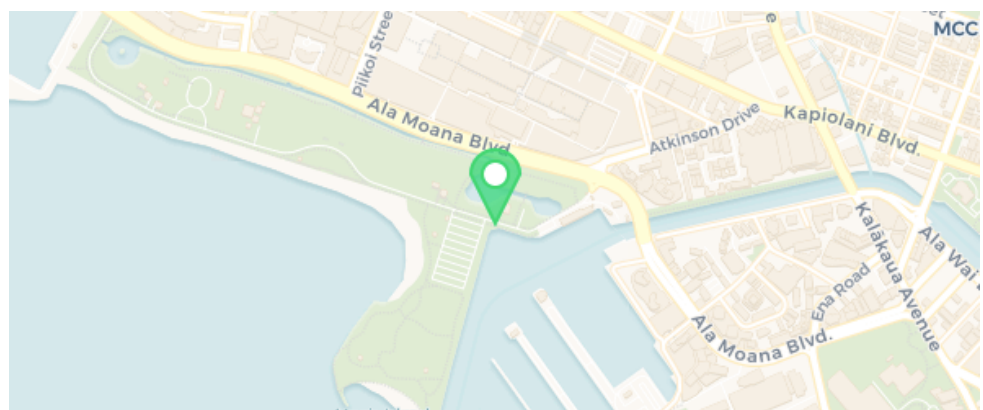
MAGIC ISLAND - CANOE LAUNCH

Enterococcus
(MPN/100mL)



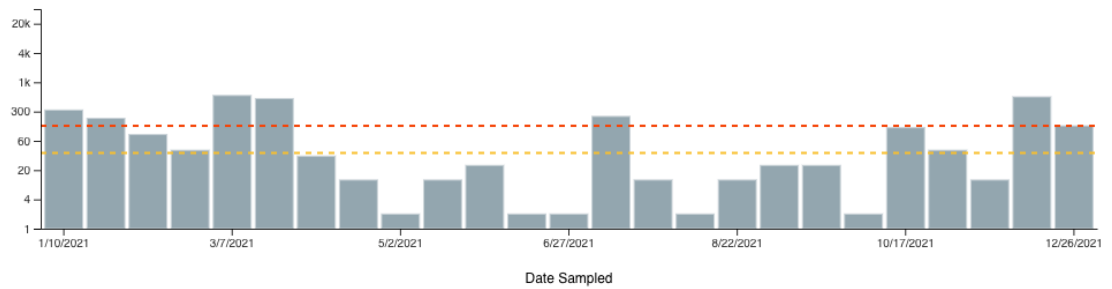
50%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



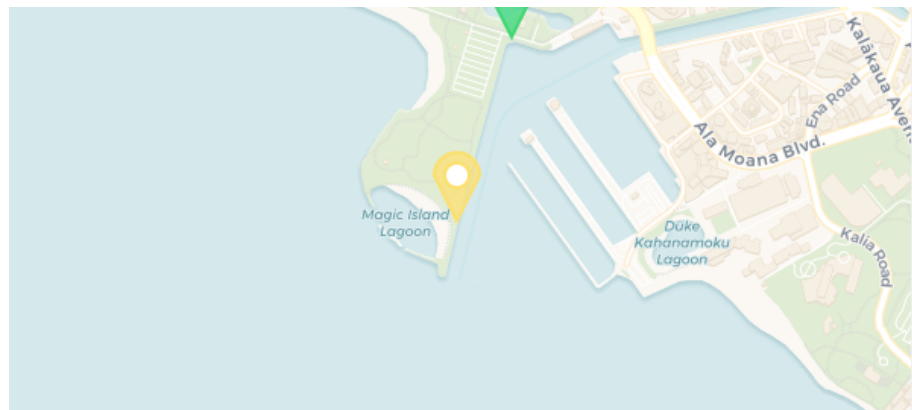
MAGIC ISLAND - BOWLS

Enterococcus
(MPN/100mL)



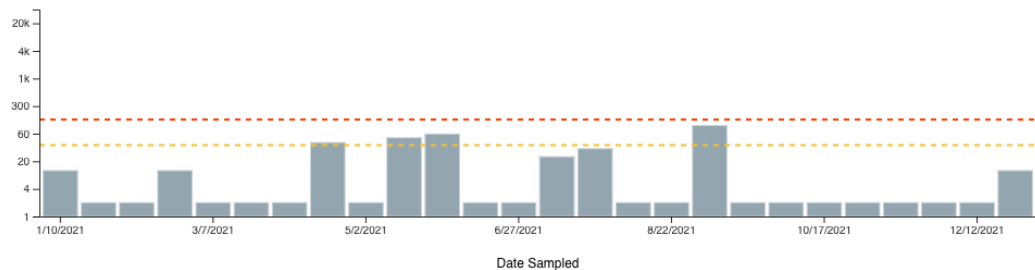
24%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



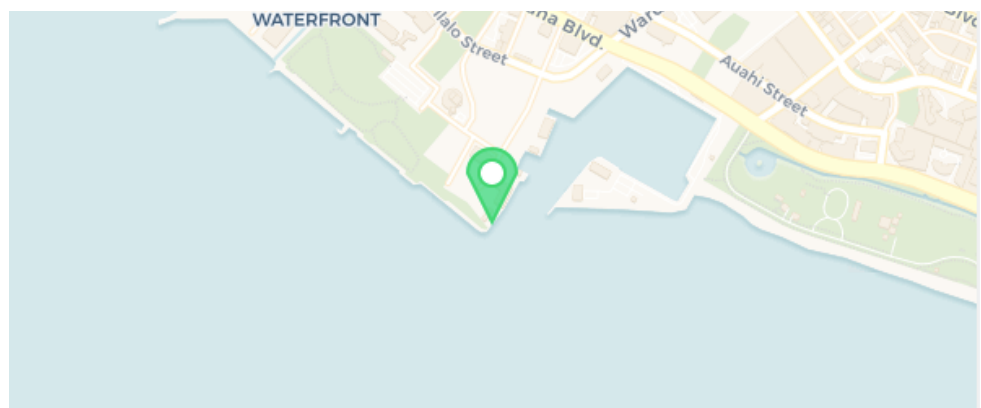
POINT PANIC - STAIRS

Enterococcus
(MPN/100mL)



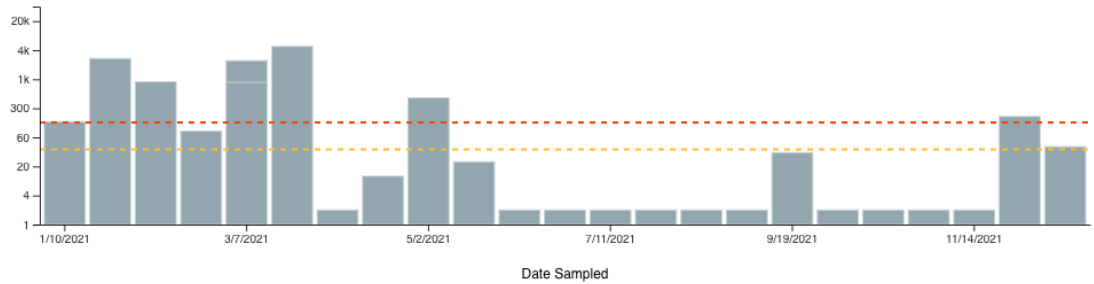
0%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



WAI'ALAE BEACH PARK

Enterococcus
(MPN/100mL)



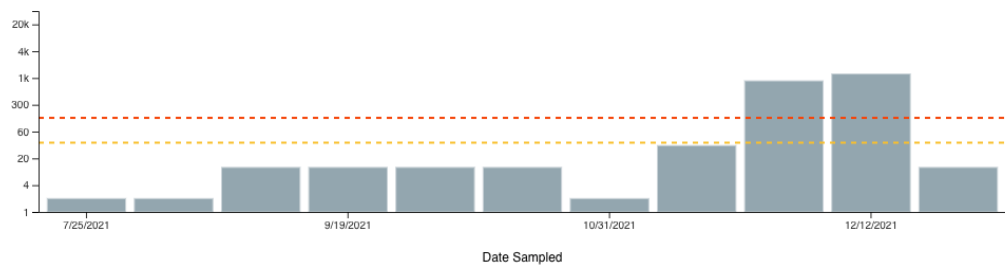
33%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



WAILUPE BEACH PARK

Enterococcus
(MPN/100mL)

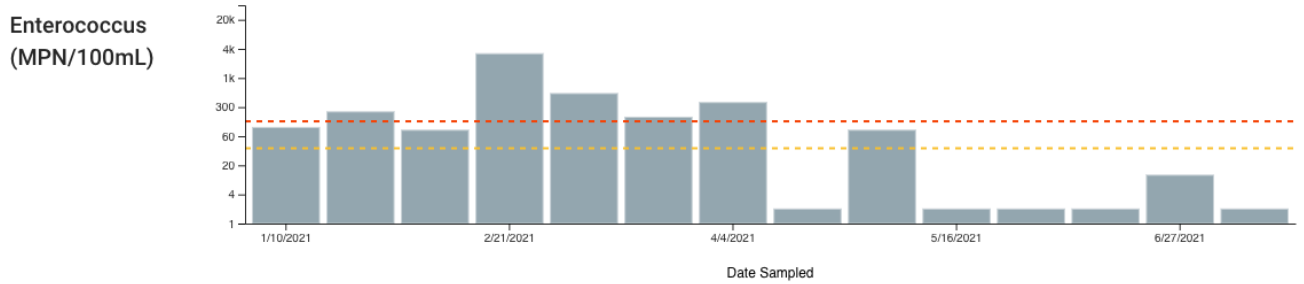


9%

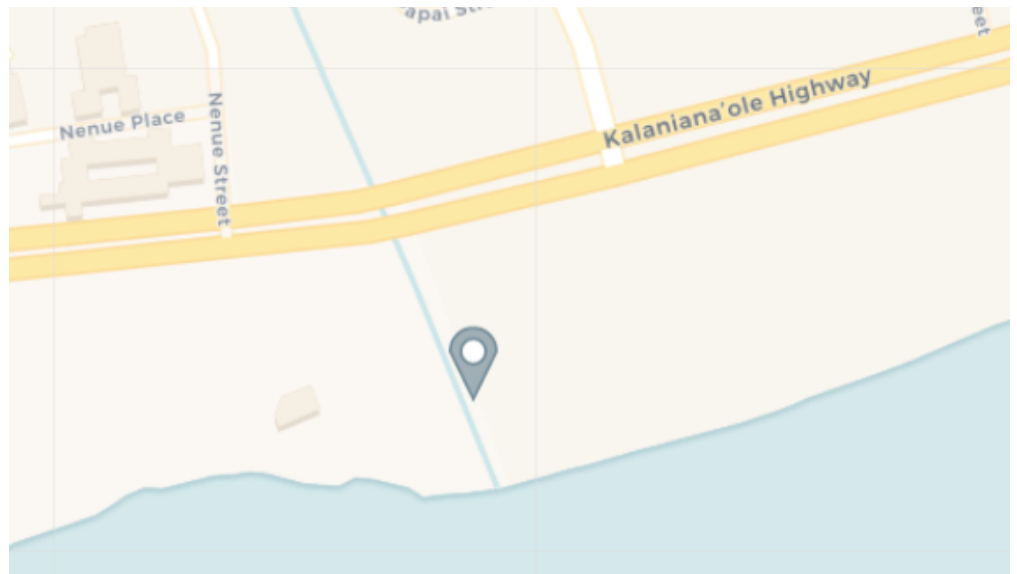
OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



WAILUPE STREAM



36%
OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.

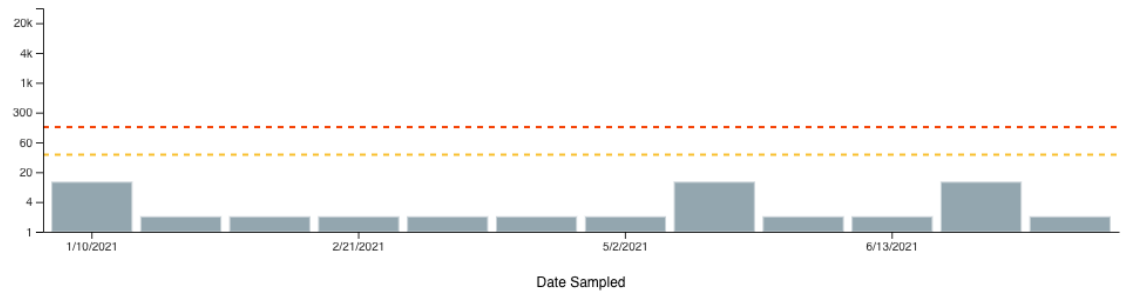


WEST SHORE



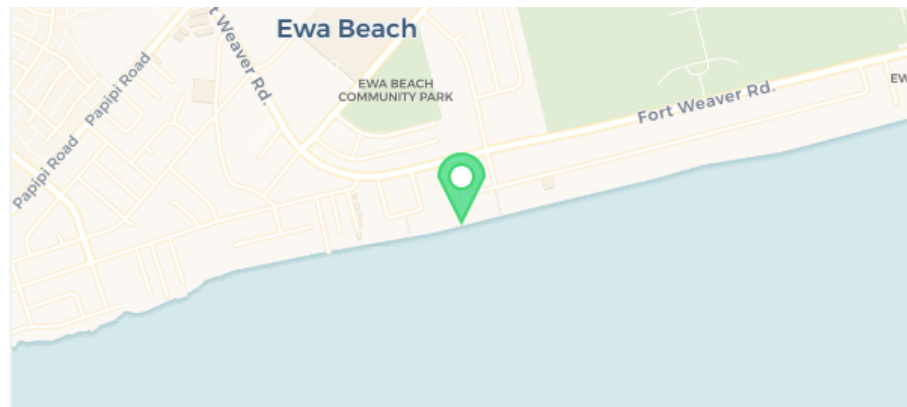
'EWA BEACH CANAL

Enterococcus
(MPN/100mL)



0%

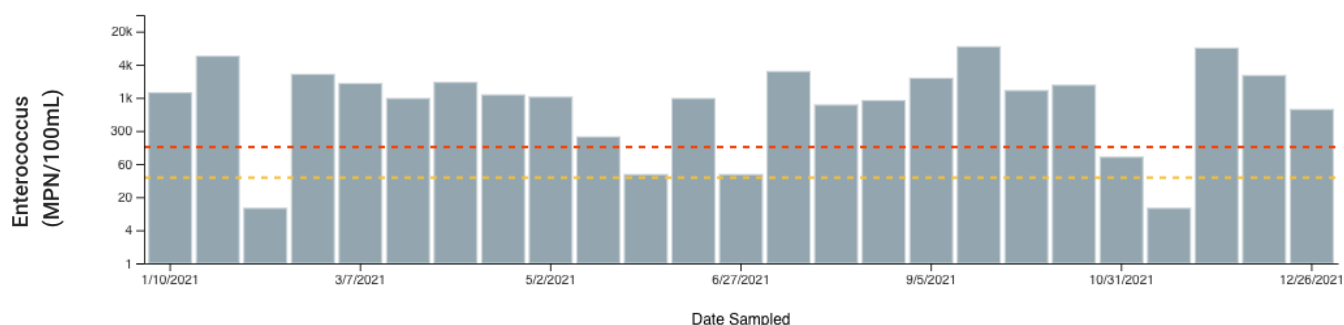
OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



EAST SHORE



KAHALU'U

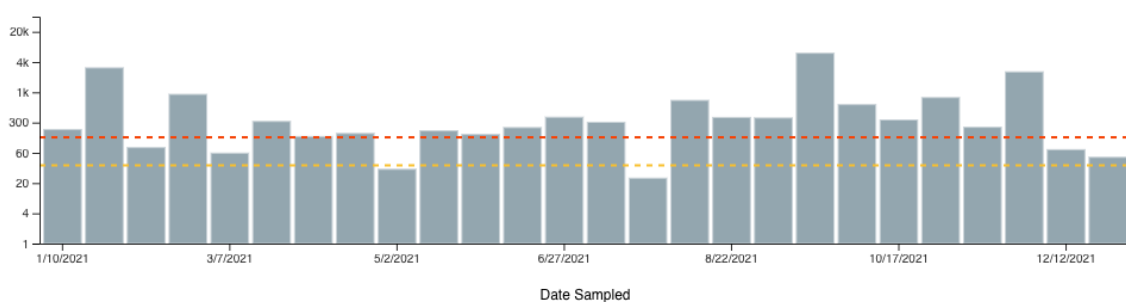


80%
OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.

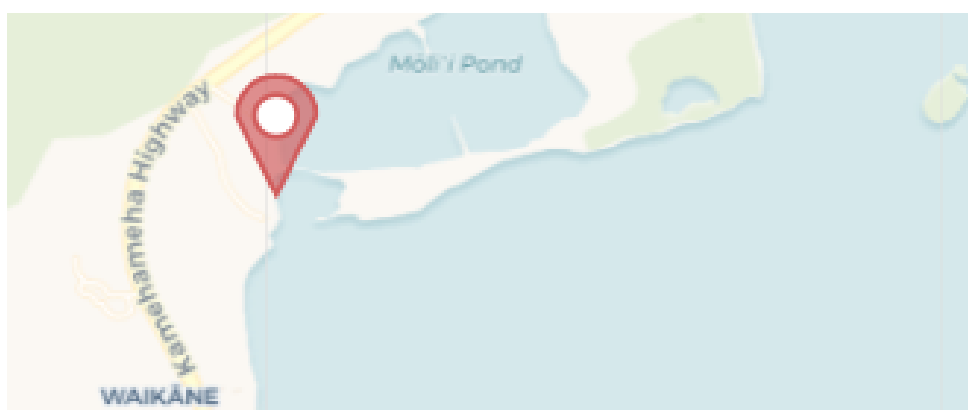


HAKIPU'U

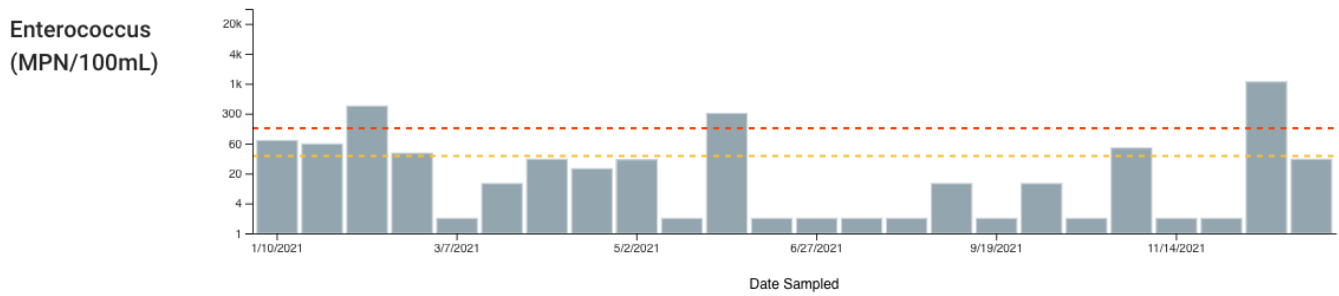
Enterococcus
(MPN/100mL)



77%
OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.

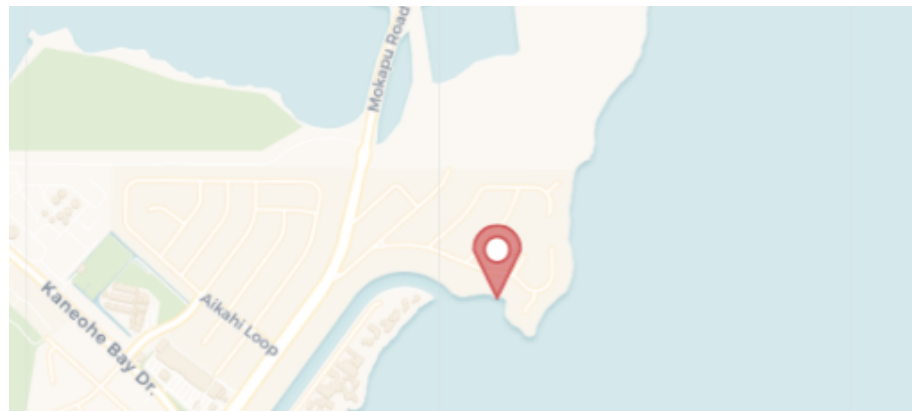


KAIMALINO

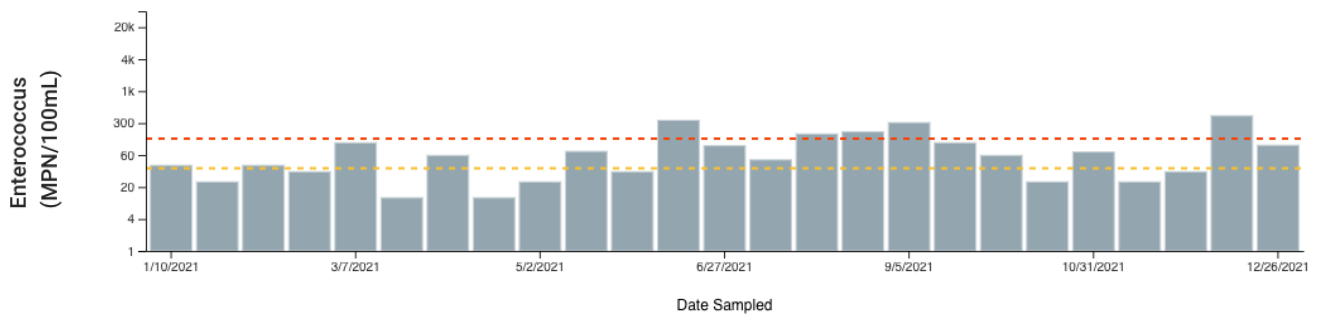


11%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



SOUTH KĀNE'OHE BAY



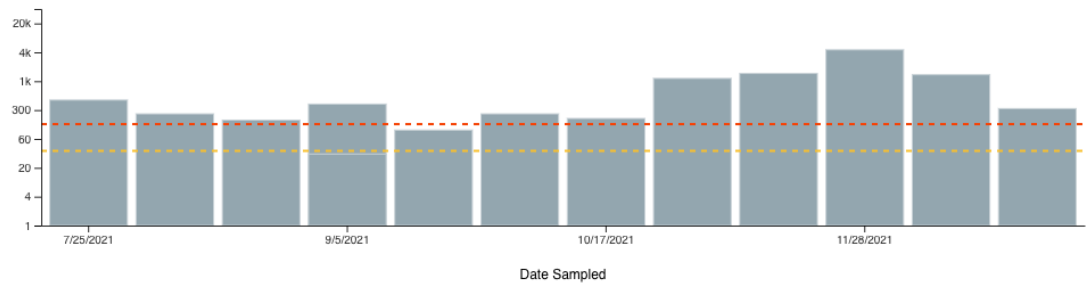
20%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



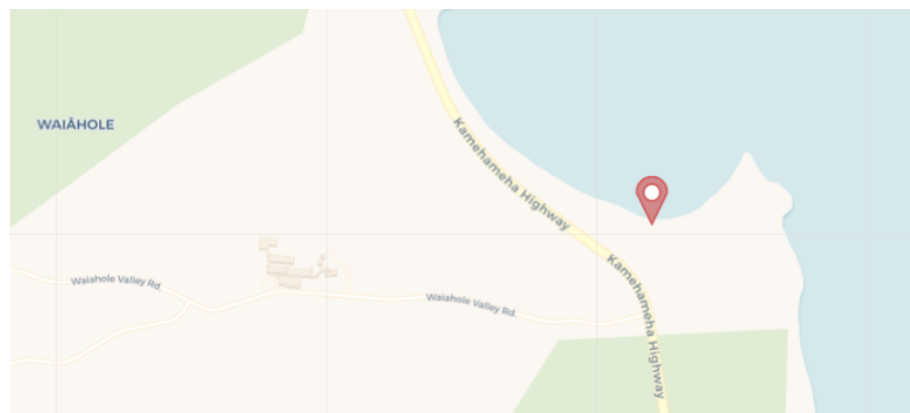
WAIĀHOLE BEACH PARK

Enterococcus
(MPN/100mL)



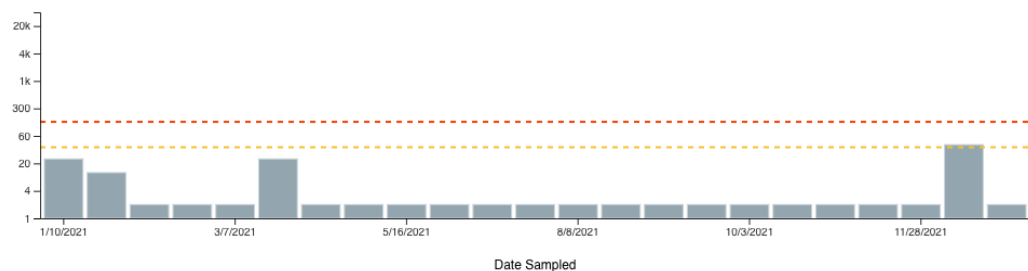
85%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.



WAIMĀNALO BAY BEACH PARK

Enterococcus
(MPN/100mL)



0%

OF SAMPLES EXCEEDED
HEALTH STANDARDS
FOR BACTERIAL COUNTS
AS INDICATED BY THE
RED LINE.

