



BLUE WATER TASK FORCE

HAWAI'I WATER QUALITY REPORT

2023



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INTRODUCTION

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

In 2023, the BWTF programs collected 869 water samples at 65 sites throughout the islands of Kaua'i (18), Maui (23), and O'ahu (24). Our BWTF Teams are composed of trained volunteers who sample biweekly on O'ahu and once a month on Kaua'i and Maui.

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 each island, primarily those with lifeguards and in popular tourist areas, while the BWTF covers a variety of areas popular with local families and recreational users including surf spots and local swimming 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. Current and historic data are available.



ACCESSING DATA

BWTF data is posted online 24-hours after it is collected (see websites below). If you have questions about a specific island's data, please reach out to the below coordinators. You can also direct questions to Lauren Blickley (LBlickley@surfrider.org), Surfrider Foundation's Hawai'i Regional Manager.

The BWTF would not be possible without the dedication of our many volunteers and program coordinators (who are also volunteers) on each island. We appreciate our volunteers tremendously.

KAUA'I

Program Coordinator:

- Rob Brower (rob@browerhomes.com)

View Data: <https://bwtf.surfrider.org/explore/23>

O'AHU

Program Co-Coordinators:

- Dr. Dan Amato (bwtf@oahu.surfrider.org)
- Arleen Velasco (bwtf2@oahu.surfrider.org)

View Data: <https://bwtf.surfrider.org/explore/44>

MAUI

Program Co-Coordinators:

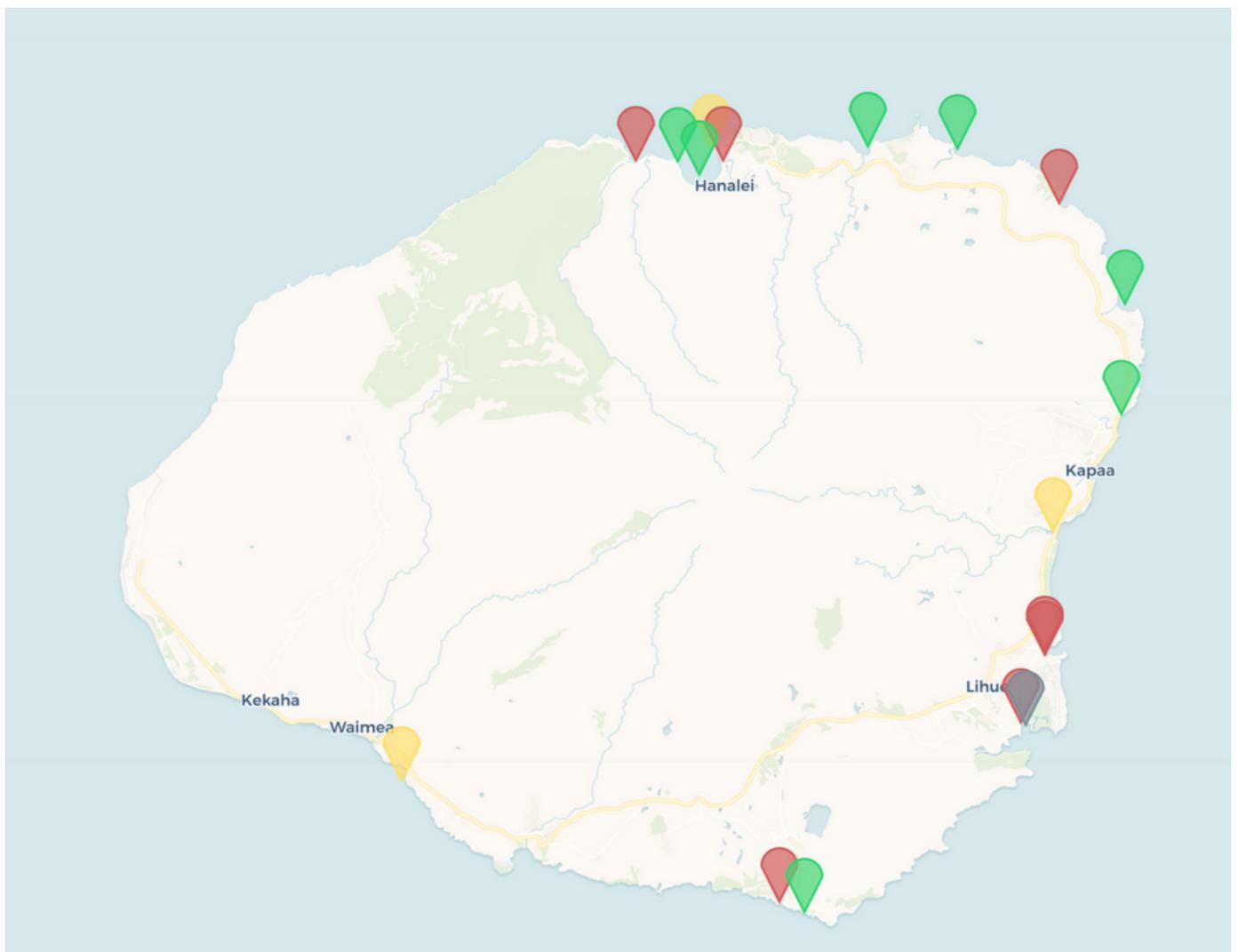
- Greg Masessa (bwtf@maui.surfrider.org)
- Kristina McHugh (bwtf2@maui.surfrider.org)

View Data: <https://bwtf.surfrider.org/explore/51>

KAUA'I DATA SUMMARY

This report provides an analysis of water test results for 18 Kaua'i sites (**Map 1**) monitored in 2023. Our water quality results indicate that certain sites frequently experience high bacteria levels that exceed state health standards (**Table 1**). Note that the Kaua'i BWTF program tests at the actual surf break, unless otherwise noted as a stream or river mouth. BWTF results are recorded as Most Probable Number (MPN/100 mL), due to our testing methods.

High bacterial counts indicate the presence of human or animal waste in these waters, which may threaten public and ecosystem 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 into the sources of the pollution.



Map 1. Blue Water Task Force sites on Kaua'i that are sampled once per month. This map was taken from the Kaua'i BWTF December 2023 results. Red = sites with high bacteria (>130); Yellow = sites with medium bacteria (36-130); Green = sites with low bacteria (0-35).

KAUA'I DATA SUMMARY

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

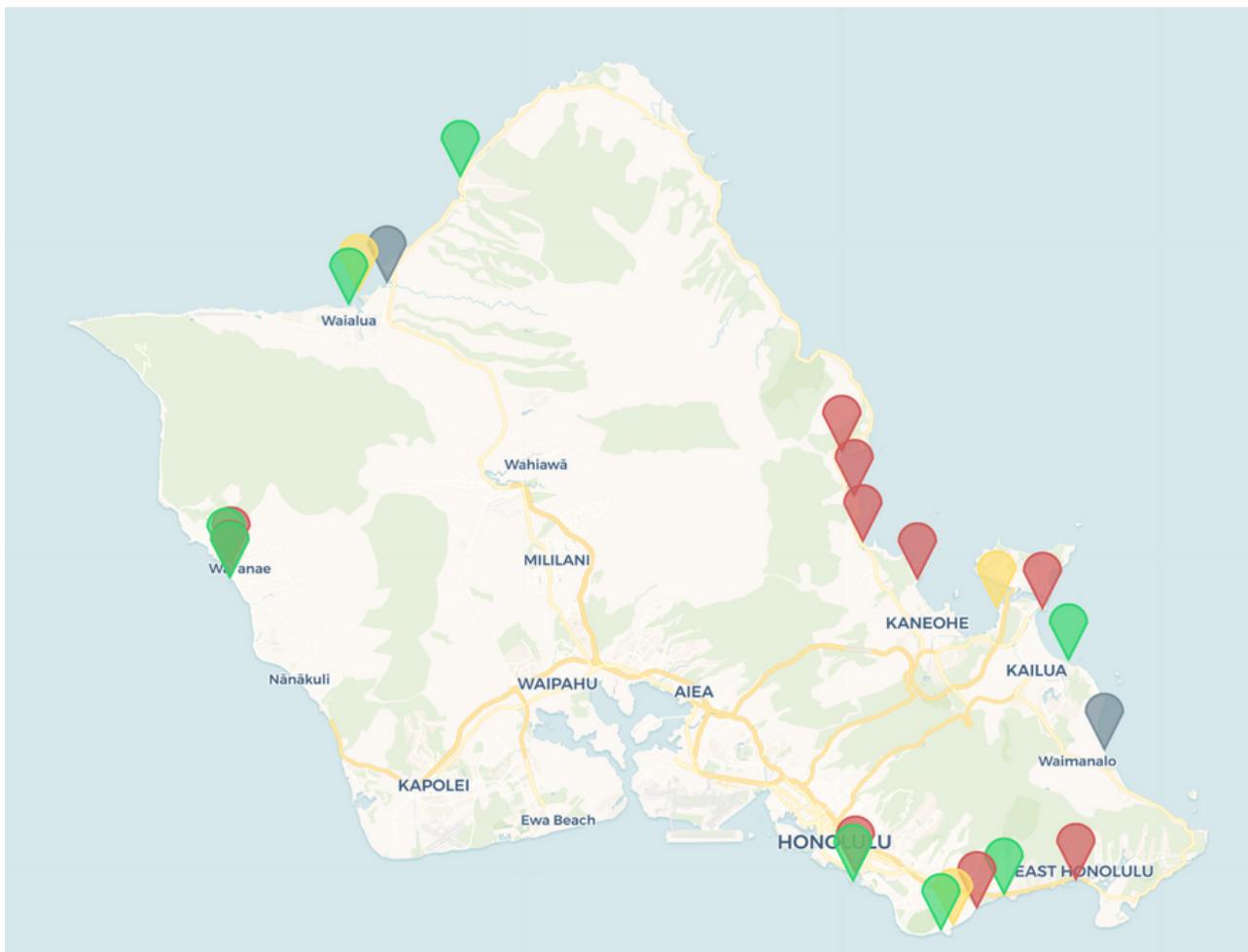
SITE NAME	TOTAL SAMPLES	% HIGH BACTERIA (>130 MPN/100ML)
Keālia (surf)	12	0%
Waikoko (surf) - Hanalei	11	0%
Waiohai (surf) - Poipu	10	0%
Anahola Bay (surf)	12	8%
Middles (surf) - Hanalei	12	8%
Kalihiwai (surf)	12	17%
Rock Quarry (surf) - Kilauea	12	17%
Kalapak'i Bay (surf)	11	18%
Pakala's (surf)	11	27%
Wailua River Mouth	11	27%
The Bowl (surf) - Hanalei	12	42%
Wainiha Stream Mouth	12	58%
Hanama'ulu Beach	12	83%
Waikomo Stream - Koloa Landing	10	90%
Hanalei River (at Weke Rd)	12	92%
Hanama'ulu Stream Mouth	12	100%
Moloa'a Stream Mouth	12	100%
Nāwiliwili Stream	12	100%

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.

O'AHU DATA SUMMARY

This report provides an analysis of water test results for 24 O'ahu sites (**Map 2**) that were monitored in 2023. Our water quality results indicate that certain sites frequently experience high bacteria levels that exceed state health standards (**Table 2**). Note BWTF results are recorded as Most Probable Number (MPN/100 mL), due to our testing methods.

High bacterial counts indicate the presence of human or animal waste in these waters, which may threaten public and ecosystem 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 into the sources of the pollution.



Map 2. Blue Water Task Force sites on O'ahu that are sampled once per month. This map was taken from the O'ahu BWTF December 2023 results. Red = sites with high bacteria (>130); Yellow = sites with medium bacteria (36-130); Green = sites with low bacteria (0-35).

O'AHU DATA SUMMARY

**TABLE 2: PERCENT OF O'AHU SAMPLES
EXCEEDING HEALTH STANDARDS (> 130 MPN/100ML)**

SITE NAME	TOTAL SAMPLES	% HIGH BACTERIA (>130 mpn/100mL)
Iroquois Point - Kapilina	5	0%
Pilila'au (Kaupuni Stream Mouth)	4	0%
Pūpūkea Tidepools	21	0%
Ka'alawai (Black Point/Cromwells)	23	4%
Kailua Beach Park	25	8%
Pōka'i Bay (bay side)	24	8%
Pōka'i Bay (ocean side)	24	8%
Kahaone Loop Pools	22	9%
Ka'alawai (Black Point/East)	22	9%
Wailupe Beach Park	25	12%
Magic Island - Bowls	24	17%
Magic Island - Canoe Launch	23	30%
Kaiaka Bay	22	32%
South Kāne'ohē Bay	25	32%
Wai'alae Beach Park	25	32%
Inoaole Stream	23	39%
Kaimalino	25	40%
Kaupuni Stream	24	58%
Waiāhole Beach Park	23	65%
Chocolates (Hale'iwa Beach Park)	21	67%
He'eia Stream	20	70%
Hakipu'u Boat Ramp	24	83%
Kauli'ou'ou Stream	25	84%
Kahalu'u	27	89%

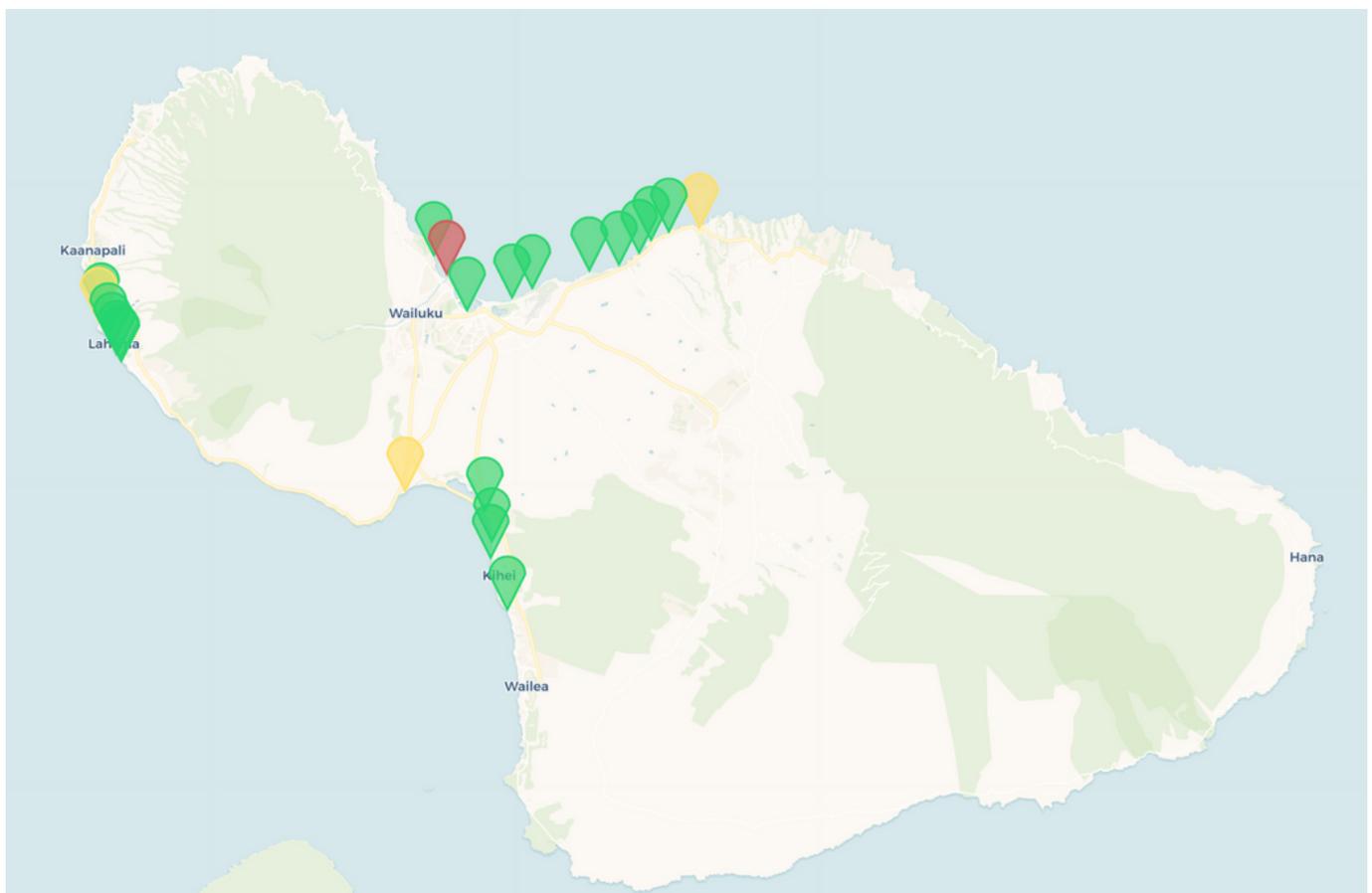
Table 2. Indicates the percentage of total samples taken at respective sites that exceeded HDOH health standards for *Enterococcus* bacteria (>130 mpn/100mL). Note that the number of total samples is not consistent across sites.

MAUI DATA SUMMARY

This report provides an analysis of water test results for 16 North & South Maui sites (**Map 3**) that were monitored in 2023. Overall, coastal water quality in the areas tested by the Maui BWTF meet state health standards more often than on Kaua'i and O'ahu (**Table 3**). Note that BWTF results are recorded as Most Probable Number (MPN/100 mL), due to our testing methods.

Seven Lāhainā sites were sampled a maximum of 4 times in 2023 (**Map 3**). None of the Lāhainā samples exceeded state health standards for *enterococcus*. Hāna sites were not tested on a consistent basis in 2023. In 2024, the Maui Chapter intends to resume regular water quality monitoring in Hāna, in partnership with Hāna High School.

High bacterial counts indicate the presence of human or animal waste in these waters, which may threaten public and ecosystem 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 into the sources of the pollution.



Map 3. Blue Water Task Force sites on Maui that are sampled once per month. This map was taken from the Maui BWTF December 2023 results. Red = sites with high bacteria (>130); Yellow = sites with medium bacteria (36-130); Green = sites with low bacteria (0-35).

MAUI DATA SUMMARY

TABLE 3: PERCENT OF NORTH MAUI SAMPLES EXCEEDING HEALTH STANDARDS (> 130 MPN/100ML)

SITE NAME	TOTAL SAMPLES	% HIGH BACTERIA (>130 MPN/100ML)
Baby Beach (North Shore)	7	0%
Ho'okipa Beach Park E	8	0%
Kū'au Bay/Tavares Bay	8	0%
Kahului Harbor	8	0%
Kanahā/Kalialinui Stream	7	0%
Kanahā Beach	8	0%
Kū'au Cove/Mama's Beach	7	0%
Pā'ia Bay	8	0%
The Cove	9	0%
Waipuilani	4	0%
Ma'alaea Bay	8	13%
Waiehu Stream	8	13%
Kīhei Canoe Club	8	13%
Kalepolepo Beach Park	9	22%
Wailuku Stream	8	25%
Māliko Bay	7	29%

Table 3. Indicates the percentage of total samples taken at respective sites that exceeded HDOH health standards for *Enterococcus* bacteria (>130 mpn/100mL).

KEY OUTCOMES

2023 BWTF results are consistent with water quality trends from previous years. Across Hawai'i, sites located at stream mouths, beaches with freshwater outlets, or in bays without much circulation are typically characterized by higher bacteria levels than at ocean sites with better circulation and more mixing. Streams located at many of the most contaminated sites could also carry runoff from cesspools and other pollution sources in the watershed such as animal waste from pets, agriculture, and wildlife.

Seven sites on both O'ahu and Kaua'i had 50% of their samples exceed state health standards. Three of these sites on Kaua'i (Nāwiliwili Stream Mouth, Moloa'a Stream Mouth, and Hanamā'ulu) exceeded state health standards in every BWTF sample collected during 2023. Hanalei River Mouth and Hanamā'ulu Beach on Kaua'i had 91% of their samples exceed state standards.

Kahalu'u on O'ahu and Nāwiliwili, Moloa'a, and Hanamā'ulu on Kaua'i are located in Priority 2 Cesspool areas, meaning that the cesspools pose significant hazard to human health and the environment. The chronic pollution documented at these sites by the BWTF, as well as the findings of the Kaua'i sucralose stream study, indicate the potential impact of sewage pollution in these areas.



BWTF data from sampling sites in Hawai'i also indicate that 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 islands and can result in large amounts of water, sediments, wastewater, and pollutants flowing downhill into the ocean.

Families, ocean users, and the public should be aware of the poor water quality conditions in these freshwater flows and avoid any contact with these freshwater flows. The public should be particularly cautious 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.

Note that not all high bacteria spikes were detected during brown water (for example, spikes on O'ahu and Kaua'i in the summer). This demonstrates the importance of regular water quality monitoring programs.

Before going to the beach, check current water quality conditions at bwtf.surfrider.org or the state [Water Quality Advisories](#).

KEY OUTCOMES

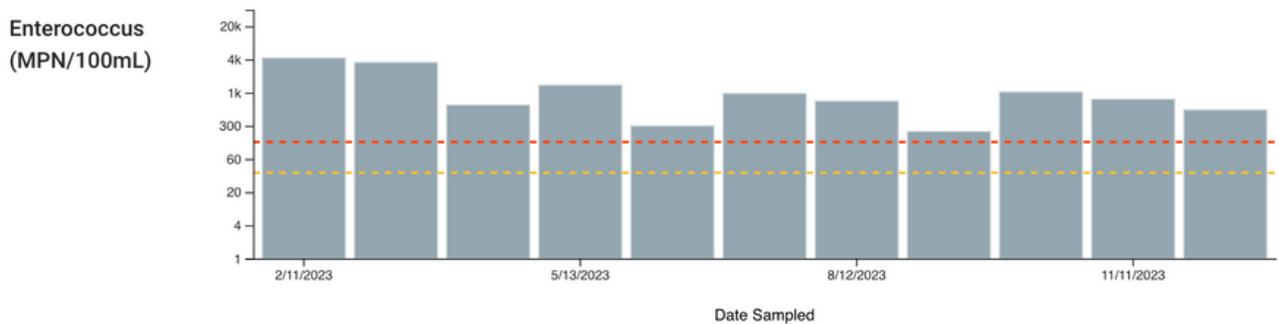
PRIORITY SAMPLE SITES: NĀWILIWILI STREAM (KAUA'I)

Nāwiliwili Stream feeds into Kalapakī Bay and is influenced by cesspools and industrial runoff in its watershed. In 2023, the average bacteria count (geomean) measured at Nāwiliwili Stream was 826 MPN, and every single sample collected by the Kaua'i Chapter since 2016 has failed to meet state health standards. This polluted water is not safe for recreation and a sign is needed to warn the families with children that regularly swim and play in the mouth of this stream.

100%

OF NĀWILIWILI STREAM SAMPLES IN 2023 EXCEEDED HEALTH STANDARDS FOR BACTERIAL COUNTS

Nāwiliwili Stream Results 2023



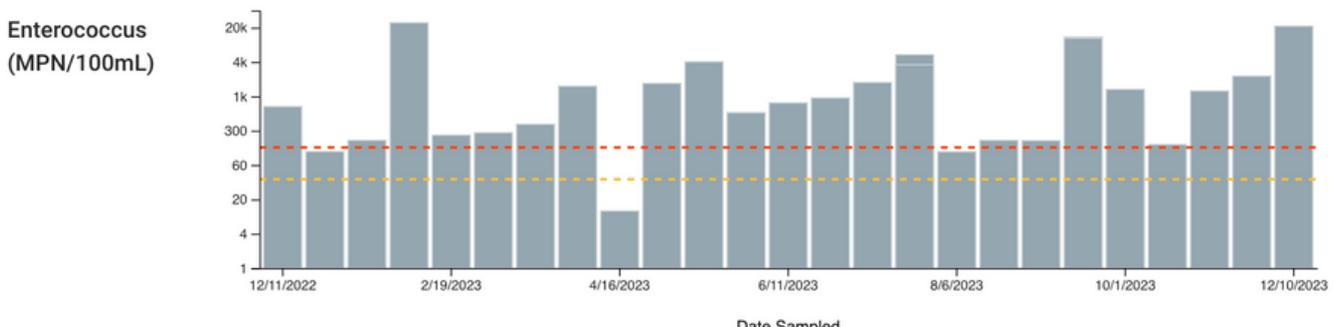
PRIORITY SAMPLE SITES: KAHALU'U (O'AHU)

Since 2018, O'ahu BWTF monitoring has indicated chronically high bacteria levels at Kahalu'u. In 2023, 89% of the samples collected at Kahalu'u exceeded health standards. University of Hawai'i research indicates wastewater from cesspools is likely contributing to the high bacteria levels. Located at the mouth of a river, this site also receives high amounts of land-based runoff from its watershed.

89%

OF KAHALU'U SAMPLES IN 2023 EXCEEDED HEALTH STANDARDS FOR BACTERIAL COUNTS

Kahalu'u Results 2023



LEGISLATIVE ACTION

In addition to filling in the state level water quality gaps and informing beach goers about the safety of coastal waters, the Hawai'i Blue Water Task Force programs and their data also help drive important policy changes.

In recent years, advocacy has focused on improving the state's water quality monitoring program and increasing signage at beach parks. These efforts are to protect public health and the community's right to know if coastal waters are clean and safe.

FEDERAL LEVEL ADVOCACY

In March, nine Surfrider Hawai'i volunteers traveled to Washington, D.C. to discuss, among other topics, coastal water quality with federal representatives. Each chapter shared its annual water quality report, highlighting chronic pollution areas along their respective coastlines. These reports became important when discussing Surfrider's requests to increase federal appropriations for the BEACH Act that provides funding for state coastal water quality monitoring. We also shared the immediate need for cesspool upgrades to meet wastewater infrastructure challenges.



IMPROVING STATE WATER QUALITY MONITORING PROGRAM

For the last four years, Surfrider Foundation has advocated for legislation that would require the HDOH to continue their regular scheduled testing during Brown Water Advisories (BWAs) and rain events. For over a decade, the HDOH has refused to sample beaches when the water is brown or during an active BWA. This practice not only biases the state's data to dry conditions, but can also suspend testing for weeks at a time while BWAs are active. The overall result is that there is very little information available from the state that describes water quality conditions at Hawai'i beaches during wet weather. Wet weather is also when *enterococcus* levels are most likely to be elevated.

POSTING 'BROWN WATER ADVISORY' SIGNAGE

The HDOH issues preemptive BWA warnings to the public to avoid coastal waters that are brown or have runoff due to potential health risks. BWAs, however, are only posted online and via local news outlets. The lack of signs posted at beaches leaves many beachgoers unaware of the potential threat of pollution, especially visitors. In 2024, the Maui Chapter is piloting a program to provide BWA signs to lifeguarded beaches across the island.

POSTING SIGNS AT CHRONICALLY POLLUTED BEACHES

There is also a lack of public notification and awareness of health risks at chronically polluted beaches - particularly on Kaua'i. Despite years of data confirming ongoing pollution at sites like Nāwiliwili stream mouth, the state and County of Kaua'i refuse to place permanent signage warning the public about health risks. The Kaua'i Chapter continues to push for signage at this and other key beaches to inform safe beach going.

COMMUNITY SCIENCE DRIVES POLLUTION SOLUTIONS

PŌKAĪ BAY

In the summer of 2022, Carmen Guzman-Simplicano was pushing her elected officials to undertake water quality studies in Pōkaī Bay on West O‘ahu. Carmen, a community member, advocate, and mother of four, was concerned about her children and fellow community members getting rashes and sick after swimming in Pōkaī Bay. For the last year and a half, Carmen and other West O‘ahu residents have been sampling four Blue Water Task Force sites in Pōkaī Bay and Kaupuni Stream. In 2023, 58% of the samples collected from Kaupuni stream exceeded state health standards.

The importance of both ongoing and expanded sampling along West O‘ahu was highlighted in Surfrider Foundation’s national [“Treat It Better”](#) video campaign.

The Blue Water Task Force is more than just collecting data - it is a program that empowers communities to investigate and understand what is happening in their local waterways. Armed with this data, activists like Carmen Guzman-Simplicano and her hui of community members on O‘ahu advocate for solutions at the local and state level. For her tireless efforts to improve water quality along the West O‘ahu coastline, Carmen Guzman-Simplicano has been nominated as part of Surfrider Foundation’s annual Wavemakers Awards.



FUNDING TO EXPAND WAI‘ANAE TESTING

In the fall of 2023, Surfrider Foundation O‘ahu Chapter and Wai‘anae High School were awarded a grant by the Hawai‘i Community Foundation to establish a new Blue Water Task Force lab at Wai‘anae High School. Having a lab at Wai‘anae High School will cut down on driving time for volunteers and also allow the community to expand its testing to additional sites along the West O‘ahu coastline, increase community awareness about water quality issues, and integrate high school students into water quality monitoring efforts. The lab is expected to begin analyzing samples in early 2024. Special thanks to Katie Kealoha who leads the Marine Science Learning Center at Wai‘anae High School and Carmen Guzman-Simplicano who continues to organize community members in collecting water quality samples.

GRANT FUNDED RESEARCH

The O‘ahu Chapter is excited about a new federal grant received in partnership with SeaGrant, the University of Hawaii and PacIOOS (Pacific Islands Ocean Observing System). The funding supports cutting edge research on O‘ahu to advance rapid testing methods and develop predictive models to forecast pollution events in coastal waters. Surfrider O‘ahu’s own Daniel Amato will coordinate the study and train community-based ‘extreme teams’ to conduct testing during and after extreme rain and tide events. This data will provide us with a better understanding of the impacts that large rain and tide events have on water quality and public safety.

KAUA'I SUCRALOSE STUDY

KAUA'I SUCRALOSE STUDY CONFIRMS CESSPOOL POLLUTION

In July 2023, the Kaua'i Chapter published results from its [sucralose stream study](#) in the peer-reviewed journal Environmental Monitoring and Assessment. An artificial sweetener, sucralose has been used worldwide to indicate the presence of human sewage in waterways.

In the Kaua'i study, sucralose was detected in 19 of the 24 Kaua'i streams sampled. In fact, sucralose was detected in at least 50% of the samples collected in 14 streams, indicating that these streams are contaminated with human sewage. Each stream was sampled four times.

All 24 streams also exceeded the state standards for enterococcus bacteria (a fecal indicator bacteria).

The results from the sucralose testing support the chronic water pollution that Surfrider Kaua'i has been tracking in streams across the island since 2008.



A HISTORY OF CHRONIC POLLUTION

For over a decade, the [Kaua'i Chapter's Blue Water Task Force](#) has tested surf breaks and stream mouths to complement the beach water quality monitoring program conducted by the Hawai'i State Department of Health.

[The Chapter's data](#) clearly demonstrates that while the surf breaks typically test clean, many of the streams they test are chronically polluted with extremely high levels of the fecal indicator bacteria *enterococcus*. One of their worst offenders, Nāwiliwili Stream at Kalapakī Bay, has failed every water test performed since 2016, landing this site on the Surfrider Foundation's [national list of polluted priority beaches](#).

WHERE IS THE POLLUTION COMING FROM?

Kaua'i has approximately 14,000 cesspools that leach untreated sewage into the ground and directly into surface waterways during storm events. While state legislation has been passed to mandate and encourage the replacement of cesspools with more advanced systems, progress is slow and will not happen without significant financial investments.

NEXT STEPS

The Kaua'i study describes the successful use of sucralose as an indicator of human wastewater, and thus significant public health risk, in recreational waters on the island of Kaua'i. This method can be used to identify priority areas to target management actions like cesspool upgrades. Meanwhile, people who enjoy getting into the water have the right to know where pollution could be putting their family's health at risk. The Kaua'i Chapter continues to advocate for signage to be posted at beaches where elevated bacteria results indicate probable health risks at the beach and in coastal recreational waters.

MAUI FIRE RESPONSE

The August 8 fires proved a significant turning point for the Maui Chapter. The collective grief and trauma to the community remains palpable, even months later. This unprecedented tragedy and environmental disaster has raised ongoing concerns about coastal water quality along West Maui.

IS THE OCEAN SAFE ON WEST MAUI?

Since August 8, the Maui Chapter has constantly fielded questions from the community about if, and where, it is safe to get in the ocean along West Maui.

The Lāhainā fire, however, was extremely unique given its proximity to the ocean, the age of the buildings that burned, and the large number of structures that were destroyed. Due to these factors, many unknowns remain with regards to both environmental and human health impacts.

What we do know is that a large number of dangerous toxins were released during the fire. In addition to the toxins and pollutants that immediately leaked from the sunken boats, the ash that continues to cover the burnt area of Lāhainā Town is contaminated with heavy metals and other toxins that are dangerous for humans to breathe or be exposed to.

This toxic ash still has the potential to become airborne with the winds and is a threat for inhalation. The ash can also pollute the water when it is deposited into streams and the ocean - either through the air or with stormwater when it rains. The EPA did apply a sticky substance called Soiltac to the ash in an effort to reduce the amount of ash that becomes airborne.

Toxins of particular concern include lead, asbestos, and arsenic, along with a host of other heavy metals, PAH's (carcinogens formed from the burning of materials at high heat), and nutrients like nitrogen and phosphorus that can harm coastal systems.

EXPANDED WATER QUALITY MONITORING

The Maui Chapter has been particularly focused on understanding how these post-fire toxins may impact ocean goers. This has been especially challenging given issues around access to the burned areas and a general lack of understanding of how these toxins react or change in the ocean environment. Another issue is the lack of human health and safety standards for these toxins in ocean water.

Despite these challenges, the Chapter was able to collect water quality samples along the Lāhainā coastline in early December 2023 and January 2024. These samples are currently being analyzed for the presence of heavy metals. Since September 2023, the Chapter has also partnered with the Hui O Ka Wai Ola to collect *enterococcus* samples from the Lāhainā area.

In November 2023, the Maui Chapter was awarded a \$48,000 grant from Hawai'i Community Foundation to support expanded water quality monitoring along West Maui and the hiring of a Maui Fire Response Coordinator.

In 2024, the Maui Chapter seeks to utilize ongoing water quality monitoring in the Lāhainā area to better understand the levels of harmful toxins in the nearshore coastal waters, with a specific focus on their potential impact to ocean goers.



PC: MAUREEN BROCK

CLEAN WATER SOLUTIONS

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 gastro-intestinal 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.

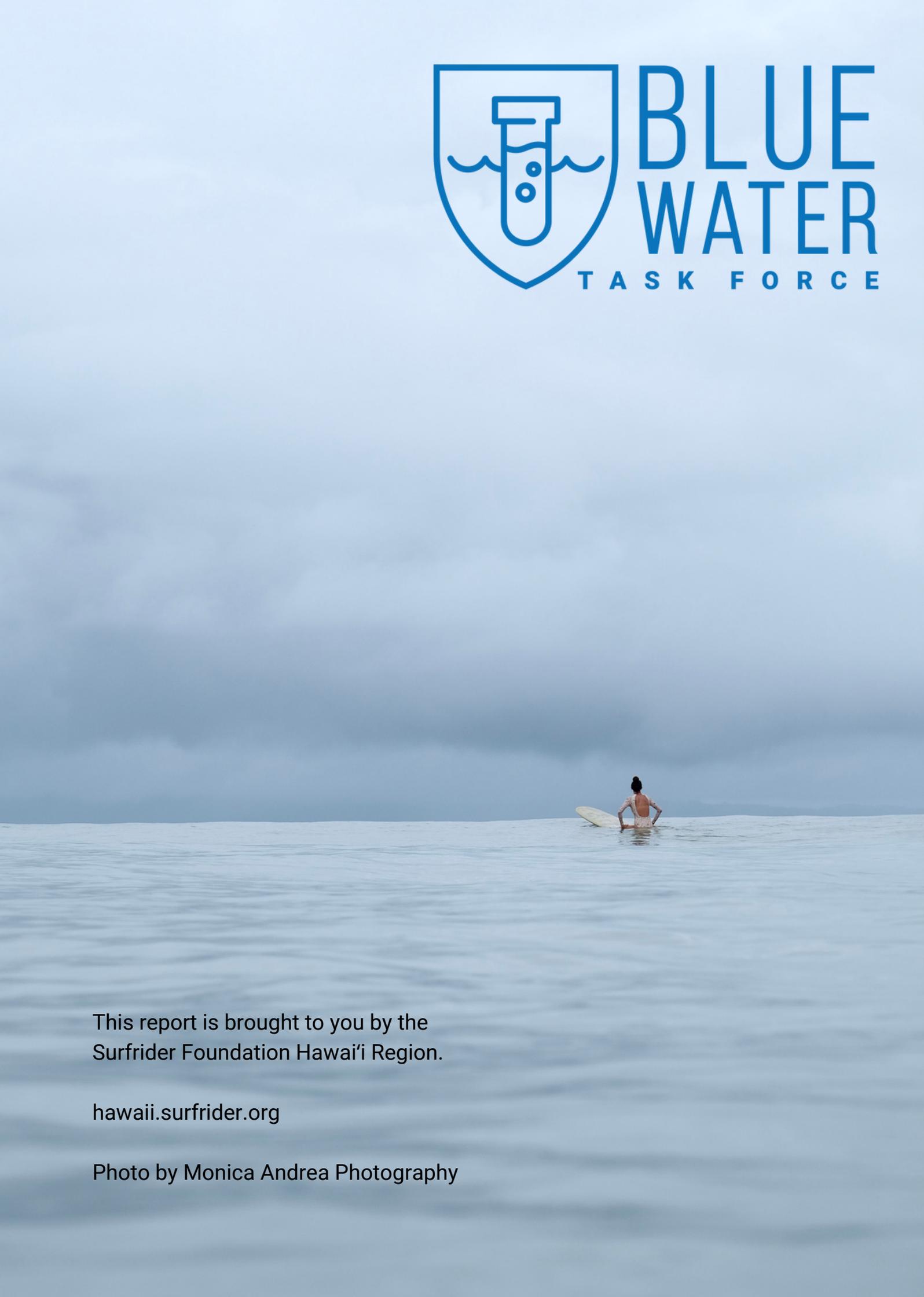
CONVERT YOUR CESSPOOL

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.





This report is brought to you by the
Surfrider Foundation Hawai'i Region.

hawaii.surfrider.org

Photo by Monica Andrea Photography