



SIERRA CLUB  
MAUI GROUP



TERAN JAMES YOUNG FOUNDATION



HAWAII  
W R C  
University of Hawaii at Hono



MAYOR'S OFFICE OF  
ECONOMIC  
DEVELOPMENT  
MAUI COUNTY

Savitt Family  
Foundation

# 2024 -2025 Report

## HA'IKŪ STREAM PROJECT

Monitoring Stream Health to Support  
Safer Recreation and Stewardship



Ha'ikū  
Community  
Association

# HUELO & HA'IKŪ STREAM STORIES

Stream Quality Monitoring Project  
2024-2025 Report



HA'IKŪ  
COMMUNITY  
ASSOCIATION

## Executive Summary

This report presents findings from the Ha'ikū Community Association's Stream Monitoring Program from 2024–2025, based on over 300 water quality samples collected across streams in Huelo and Ha'ikū. The primary focus is on human health indicators, alongside measurements that reflect stream ecosystem conditions.

Overall, typical bacteria levels were generally below Hawai'i Department of Health (DOH) freshwater recreational water quality guidelines. Short-term exceedances did occur, most often during or following rainfall and higher stream flow. Results varied by stream, reinforcing the importance of watershed-specific context when interpreting water quality data. These findings highlight the value of long-term, community-based monitoring for understanding patterns, informing safer recreation, and supporting future watershed stewardship.



Document published on January, 31, 2026 by the Ha'ikū Community Association

# Table of Contents

Executive Summary	2
Acknowledgments	4
Program Overview	5
• About the Team	6
• Report Navigation	7
Key Findings	9
Meet The Streams	11
Data Results	13
Next Steps	15



## Take-Away



The story emerging from the data is that Huelo/Ha'ikū streams are generally healthy, but highly responsive; water quality changes quickly with rain, flow, and seasonal conditions.

# Acknowledgements



## Mahalo to our Supporters



This work is made possible through the time, trust and collaboration of 'āina, wai, community, partners, and supporters. Monitoring stream health in Huelo and Ha'ikū is a shared effort to better understand local water conditions and support informed stewardship.

### **Generous Funders & Program Support**

County of Maui: Office of Economic Development - Maui County: Environmental Protection and Sustainability Division - Savitt Family Foundation - Teran James Young Foundation - Friends of Twin Falls - Ha'ikū Community Association supporters and donors

### **Community Members**

Thank you to the community members who provided stream access, shared observations, and supported sampling and outreach efforts. We appreciate your support!

### **Partners & Technical Support**

Ha'ikū Community Association: **Lucienne De Naie, Scott Werden, Kristine Kozuki**, & Board

Friends of Twin Falls: **Ute Viole**, Ramana Sawyer, Maile Davis, & Parking Team

University of Hawai'i - Water Resources Research Center (WRRC): **Dr. Chris Shuler, Autumn McCarter**, & Summer Wong

University of Hawai'i Maui Campus - Water Quality Lab: Laura Martinez Robles, Crystal Henkel, & Shawn Pedron

State of Hawai'i: Division of Aquatic Resources

Sierra Club Maui

Surfrider Foundation

# Program Overview



The Ha'ikū Community Association (HCA) Stream Monitoring Program tracks water quality in streams across Huelo and Ha'ikū, Maui to better understand conditions that affect human health and stream ecosystem health.

**We regularly test 4 main streams, weekly:** Nā'ilī'ilihale, Kailua, Honopou, & Ho'olawa. We also branch out to more streams when streamflow allows (Hanehoi, Kuiaha, Maliko).

### Collected 300 samples



300 Samples collected from  
7 main stream sites

### Created 66 Reports

**Stream Snapshot of October 16th's in-situ data.**

Overall stream conditions across Hāmākualoa remained healthy, with most sites showing good dissolved oxygen levels, low turbidity, and pH within the healthy range. Ho'olawa Stream/Cave Man showed elevated bacteria, with Ho'olawa/CaveMan also recording the highest turbidity of the day.

Stream Monitoring - October 16, 2025

Parameters	Nā'ilī'ihale Bamboo Forest	Kailua Dog Pond	Honopou	Hō'olawa Twin Falls	Hō'olawa Cave Man	EPA Guideline
E. coli (CFU/100mL)	0	73.8	3.1	20.7	94.5	<20 CFU/100mL
Enterococcus (CFU/100mL)	13.7	16.3	3.1	6.4	83.1	<11 CFU/100mL
Turbidity (NTU)	1.48	1.34	1.56	2.97	7.59	N/A
Temperature (°F)	76.9 F	75.3 F	76.3 F	77 F	73.6 F	68-80 F
Dissolved Oxygen (mg/L)	7.6	6.4	7	7.7	6.3	>5 mg/L
pH	7.69	7.02	7.16	7.07	6.66	6.5-8.5 pH

64 Weekly Reports and  
2 Newsletters

Monitoring focuses on streams that are frequently used for recreation and flow through diverse watersheds. Sampling is conducted during both dry conditions and after rainfall to capture how water quality changes with stream flow. This data helps identify patterns over time, compare conditions between streams, and inform safer recreation.

# Program Overview



## Meet The Stream Team



Raina Myers, Field Technician



Lilia Davis, Program Data Manager

Project Support: Lucienne de Naie, Scott Werden, Ute Virole, Kristine Kozuki

Notable Alumni: Alex Buttaro (Program Manager), Reese Wallete (Field Technician), 'Āina Wai Community Planning

Interested in creating a Water Quality Program for your community? Visit our Website or Contact Us!

<https://www.haikumaui.org/haiku-water-quality/>



Mahalo to the Friends of Twin Falls for hosting our dedicated Water Lab Space.

# Report Navigation



YSI Multiparameter Water Quality Instrument

## We Monitor:

**E. coli & Enterococcus:** indicator bacteria used to assess potential human health risk

**Temperature & Dissolved Oxygen:** indicators of stream conditions for aquatic life

**Conductivity, Salinity & Turbidity:** help describe water source characteristics, mixing, and physical disturbance within the stream

**Nutrients (DIN):** provide insight into ecosystem processes

**Streamflow:** Collect data from USGS Stream Gauges located at Honopou & Nā'ilī'ilihaele

**Kilo:** visual and contextual observations recorded during sampling

# How to Read This Report



This report summarizes long-term water quality patterns in Huelo and Ha'ikū streams using data collected from 300 samples in 2024–2025. Streams are shown side-by-side to highlight how watersheds respond differently to rainfall, flow, and use. If interested in specific datasets, please reach out to [liliawd@hawaii.edu](mailto:liliawd@hawaii.edu) or [scottwerden@gmail.com](mailto:scottwerden@gmail.com).

## Important Note



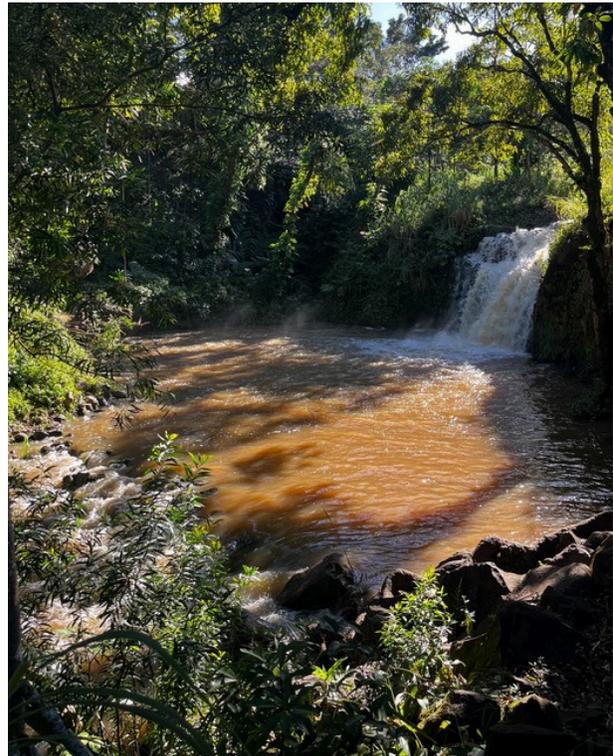
Stream conditions change quickly. This report summarizes observed patterns and **does not replace real-time advisories or site-specific guidance.**

## Understanding the Data

- **E. coli and Enterococcus** are indicator bacteria used by the Hawai'i Department of Health (DOH) to assess potential recreational exposure risk in freshwater streams.
- Bacteria results are reported in **MPN/100 mL** (most probable number per 100 milliliters) using standardized laboratory methods (UHMC Water Lab).
- Other parameters (temperature, dissolved oxygen, conductivity, salinity, turbidity) describe physical and chemical stream conditions observed at the time of sampling and help provide context for stream health and bacteria results.

## Interpreting the Charts

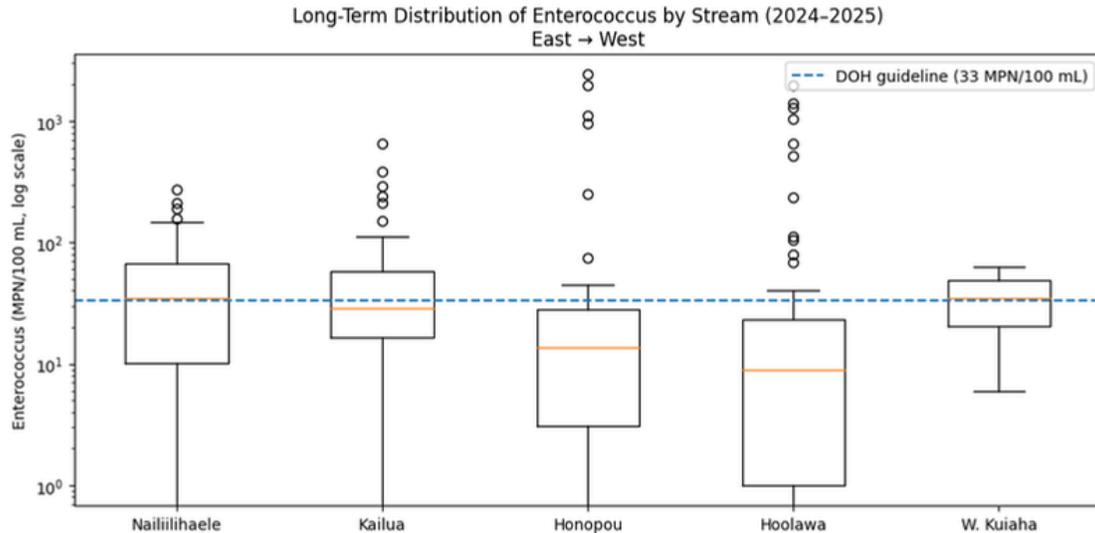
- Most figures show distributions, averages, or trends over time, not single-day results.
- Streams are ordered from East to West, reflecting a gradient from higher (East) to lower (West) rainfall and streamflow.
- **Box plots** illustrate typical conditions (the median) as well as variability and occasional high values.
- **Heat charts** use color to show when conditions were cooler, warmer, clearer, or more turbid across months.
- Dashed reference lines indicate Hawai'i DOH Freshwater recreational water quality guidelines, based on EPA Recreational Water Quality Criteria (2012).



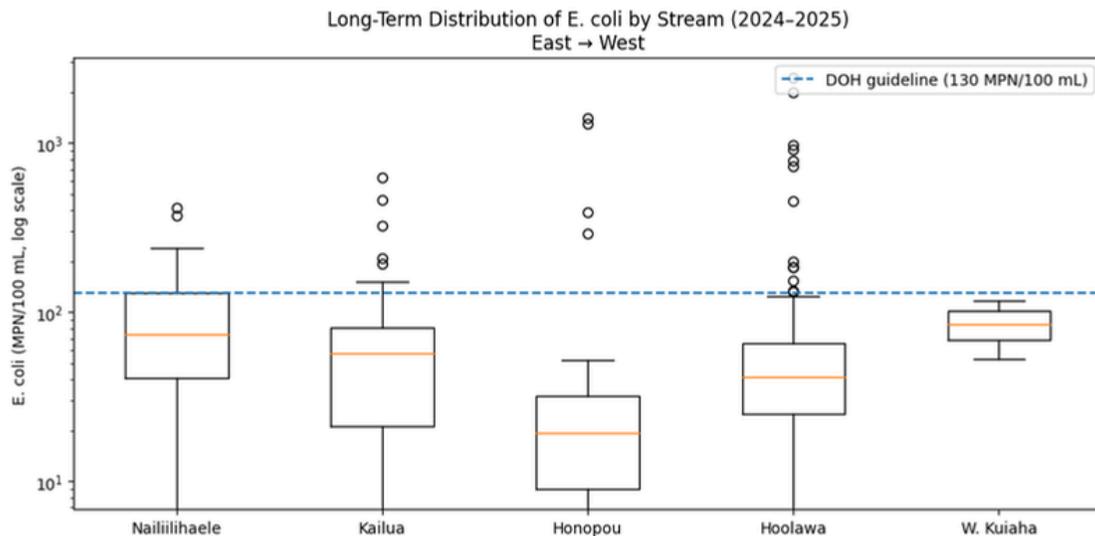
Exceeding a guideline does not automatically mean a stream is unsafe, and we are not able to test for Leptospirosis, but it may indicate increased risk. Short-term exceedances are common in natural systems, while frequent exceedances may signal watershed issues.

# Key Findings

## Bacteria Results Across Streams



**Enterococcus:** levels are generally within expected ranges, with short-term increases occurring under certain conditions. While eastern streams tend to show more variability, higher concentrations are not consistently sustained in any one location. Overall, the chart suggests that Enterococcus responds more to changing flow conditions than to a strong geographic pattern alone.



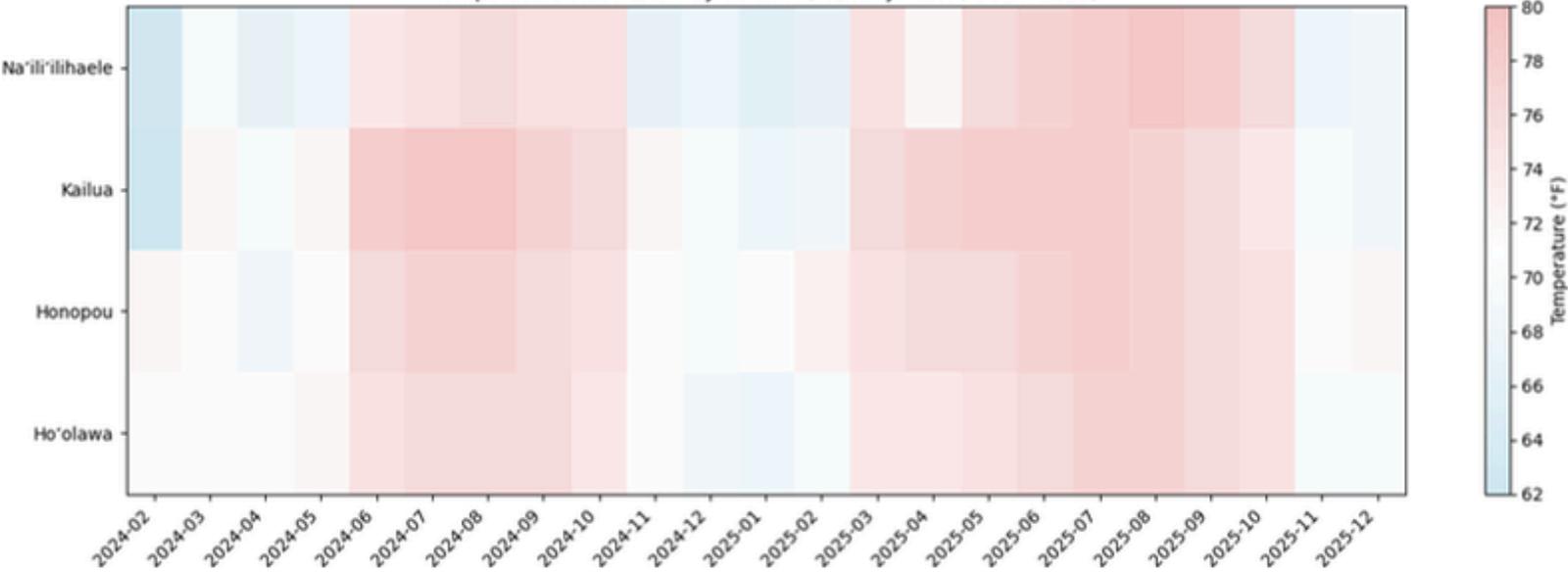
**E. coli** levels are generally low, with higher measurements occurring intermittently. When higher values do appear, they are typically associated with conditions such as low flow or runoff, which can temporarily concentrate bacteria in the stream. Na'ili'ilihaele, on average, has the highest

**What does this mean for recreation?** Stream conditions are suitable for recreation, but it's a good idea to be cautious during and after heavy rain or when streams are very low and slow-moving.

# Key Findings

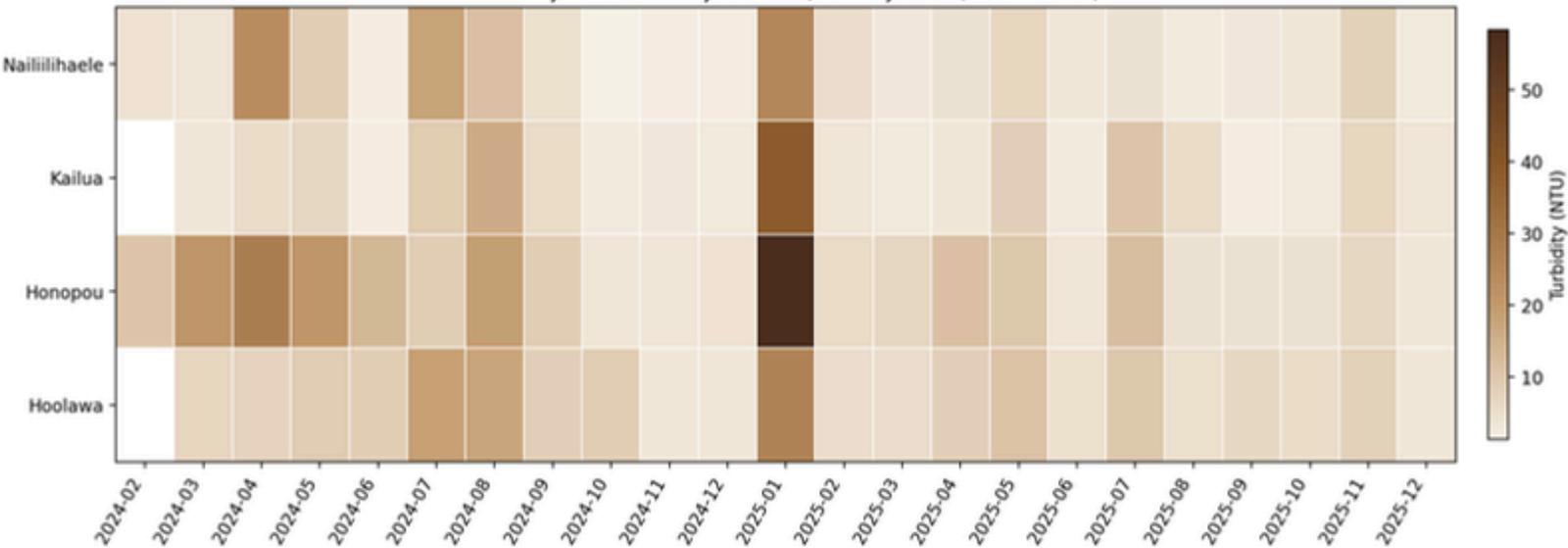


Temperature Heat Chart by Stream (Monthly Mean, 2024–2025)



**Temperature (2024–2025):** Temperatures follow a clear seasonal pattern, with cooler (blue) winter months and warmer (red) summer months across all streams. Kailua and Honopou consistently exhibit higher temperatures, while Na'ililiihaele remains the coolest stream throughout this period.

Turbidity Heat Chart by Stream (Monthly Mean, 2024–2025)



**Turbidity (2024–2025):** Turbidity measures how cloudy water is, and is low most months, indicating generally clear water. Short-term increases, especially in **Honopou** and Ho'olawa, occur during winter periods, showing that sediment impacts are temporary rather than constant.

# Meet the Streams

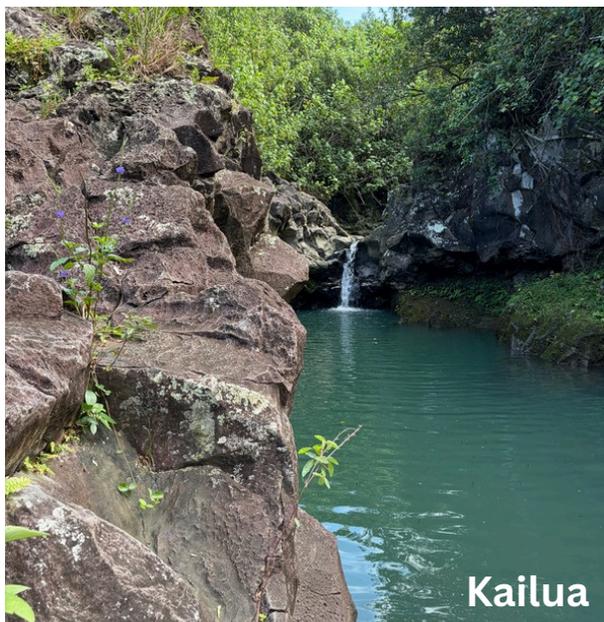


## Nā'ili'ilihaele (*Walking Pebbles (Parker, 1922)*)

Nā'ili'ilihaele Stream, located in the Ahupua'a of Hanawana Komohana, and nicknamed Bamboo Forest, drains one of the highest-elevation watersheds in the Huelo area and flows about 11–12 miles. Elevations range from over 5,000 ft in the upper watershed, helping sustain year-round flow. Data show that this stream tends to have **higher bacteria levels more often than others**, though values still vary with conditions. The stream is valued for its scenic waterfalls, and ecological importance. However, **parking and access are prohibited**, and it is on private property. (Hawai'i Watershed Atlas)



## Kailua



Kailua Stream, located in the Ahupua'a of Hanawana Komohana, nicknamed **Dog Pond**, flows roughly **11 miles** from elevations near **6,500 ft** down to sea level. Monitoring results show **greater variability in bacteria levels** compared to some other streams, with higher readings occurring at times. This variability suggests Kailua is **more sensitive to changing conditions**, such as rainfall and flow fluctuations.

(Hawai'i Watershed Atlas)

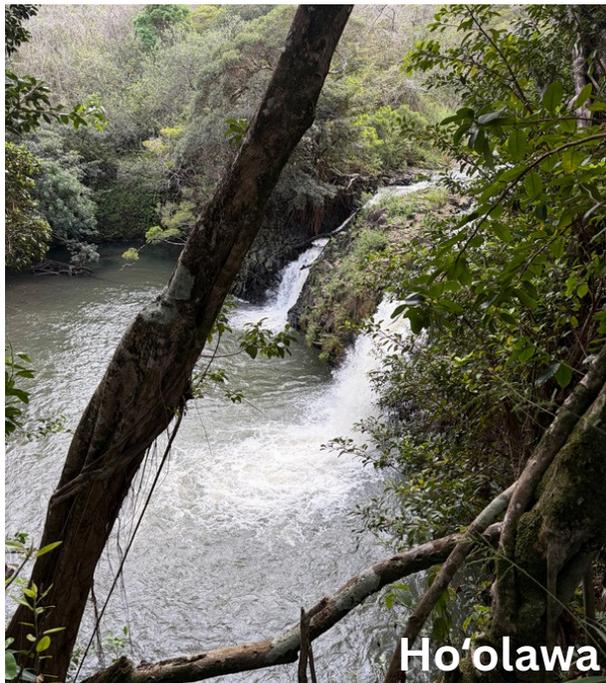
# Meet the Streams

## Honopou

Honopou Stream, in the Ahupua'a of Honopou, drains a large, steep watershed and flows approximately **10 miles** from about **2,287 ft** to sea level. Stream flow has been restored, and monitoring data show **consistently lower bacteria levels and less variability** compared to several neighboring streams. *Honopou is a stable streams, with generally good conditions and short-term changes tied mainly to storms rather than ongoing issues.* Honopou is located within a private road and **access is restricted.** (Hawai'i Watershed Atlas)

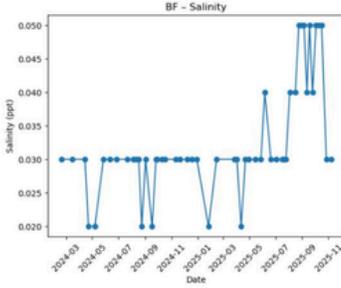
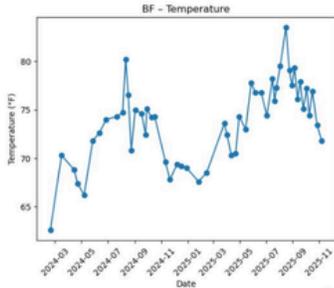


## Ho'olawa

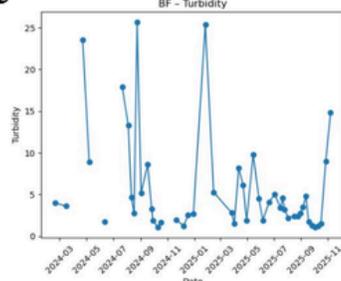
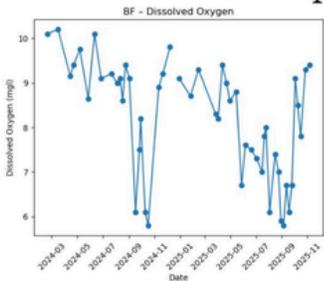


Ho'olawa Stream, nicknamed Twin Falls, flows about **11 miles** from the forested slopes of **3,500 ft** to sea level. It is in the Ahupua'a of Honopou. We test 5 sites here: Twin Falls, Bridge, 4, Caves (Ho'olawali'i), and Ho'olawanui. Monitoring data show that typical bacteria levels are generally within health guidelines, with occasional increases during wetter periods. Ho'olawa responds quickly to rain, with short-lived water quality changes that reflect runoff. **Ho'olawanui** has consistently **high bacteria** levels. As a popular site, Ho'olawa shows how recreation and stream stewardship can go hand in hand, by the work of Friends of Twin Falls. (Hawai'i Watershed Atlas)

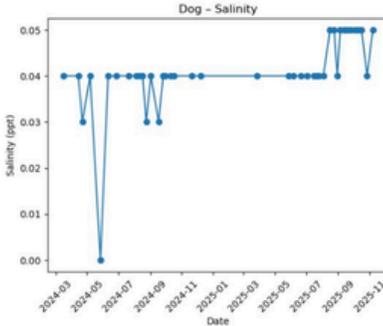
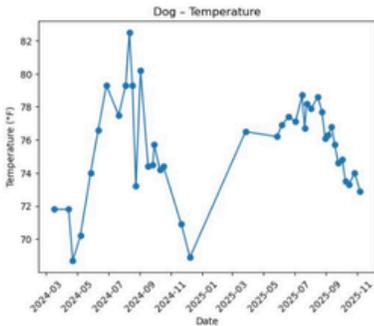
# Data Results



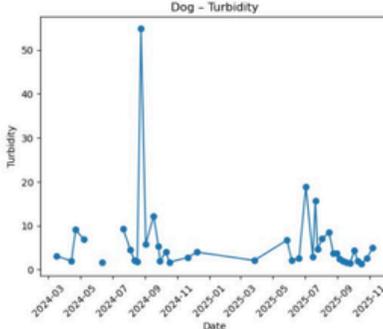
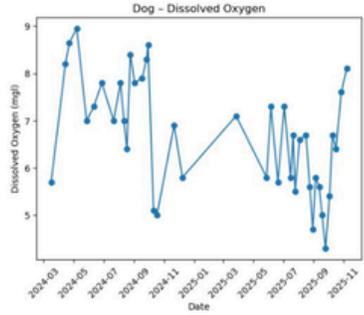
## Nā'ili'ilihaele



Nā'ili'ilihaele has okay freshwater conditions with the highest averages of Entero & E. Coli, high dissolved oxygen and occasional turbidity increases during wetter periods.

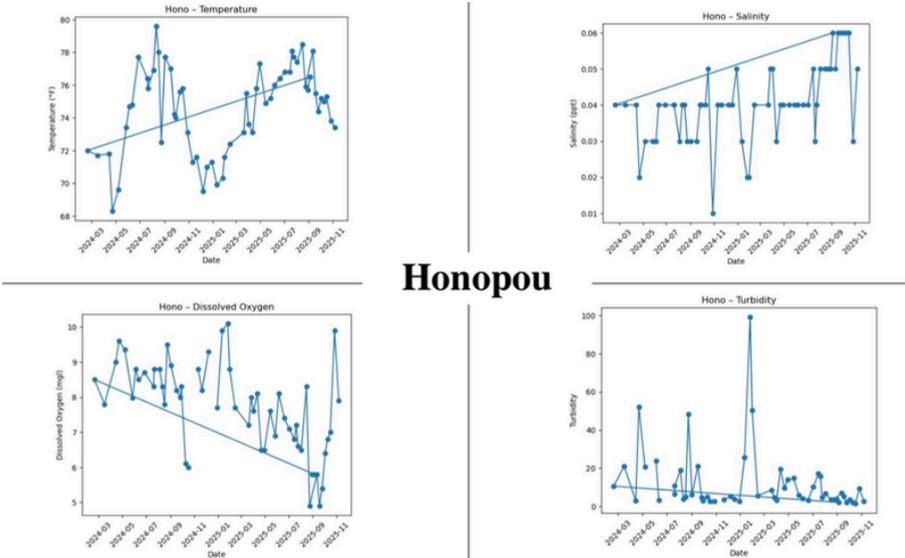


## Kailua



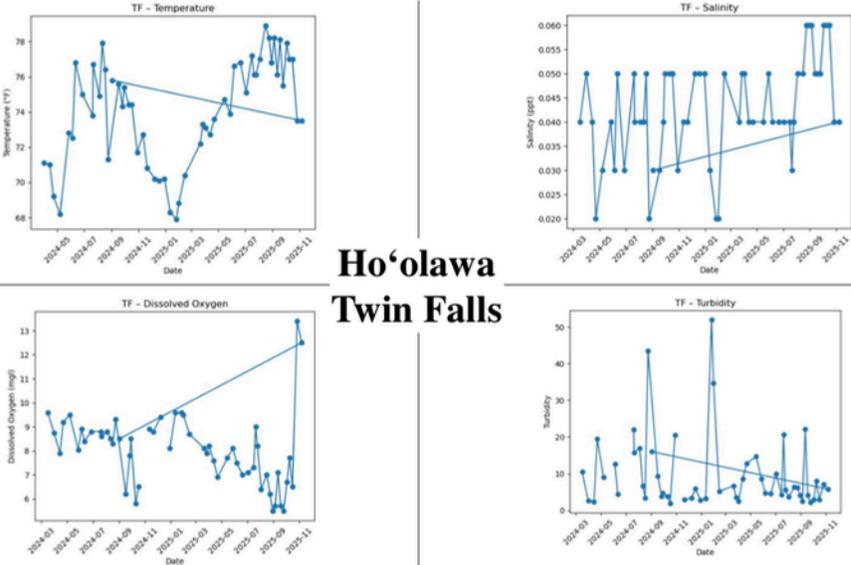
Kailua shows greater changes in water quality over time, with lower oxygen levels and occasional increases in bacteria during warm, slow-moving conditions. When flow is low, and has no outlet, the stream has less mixing and dilution, which can temporarily affect both aquatic life and how suitable the water is for recreation.

# Data Results



## Honopou

Honopou shows fairly steady water quality over time, with great oxygen levels and mostly clear water except during occasional rain events. Short spikes in turbidity and bacteria appear during these events but do not last long. Overall, Honopou generally supports healthy conditions for stream life and recreation, with extra caution recommended during and shortly after heavy rain.



## Ho'olawa Twin Falls

Ho'olawa usually has clear water and healthy oxygen levels, but heavy rain can briefly make the stream cloudier and change water quality. During these times, bacteria levels may increase for short periods, which can affect both stream life and safe recreation. Conditions typically improve once flows return to normal.

# Next Steps



## Program will continue into 2026!



- Collaborate with DAR & Chris Shuler to collect Ho'olawa Stream Flow Data
- Test storm events and add site locations
- Partner with the Friends of Twin Falls to train student researchers and expand monitoring in the Ho'olawa stream systems through the Kupu o Wai Ho'olawa program funded by a grant from the East Maui Water Authority.
- Share stream monitoring data with more researchers and agencies.

## Keep Up With Our Project:

- Weekly Results <https://www.haikumai.org/haiku-water-quality/>
- Quarterly Presentations at Ha'ikū Community Association Meetings
- Sign up for the HCA Newsletter List: [haikucommunitypm@gmail.com](mailto:haikucommunitypm@gmail.com)
  - Follow our Instagram ! @Haikustreamproject

The image shows a screenshot of the Instagram profile for @haikustreamproject. The profile name is 'haikustreamproject', it is marked as 'Following', and has 24 posts, 608 followers, and 825 following. The bio reads: 'Love your streams! Nonprofit organization @haikucommunityassociation Community research for healthy streams Follow for updates of Ho'olawa, Honopou, Kailua, ... more www.haikumai.org/haiku-water-quality'. Below the profile information are three small image thumbnails showing different views of waterfalls. To the right of the screenshot is a larger photo of several people jumping into a waterfall pool in a forest.

# MAHALO



## References:

EPA (2012). Recreational Water Quality Criteria. U.S. Environmental Protection Agency. <https://www.epa.gov/wqc/recreational-water-quality-criteria-and-methods>

Hawai'i Department of Health (CWB). Clean Water Branch. <https://health.hawaii.gov/cwb/>

Hawai'i Watershed Atlas. Makawao (East Maui) region. [https://www.hawaiiwatershedatlas.com/maui\\_makawao.html](https://www.hawaiiwatershedatlas.com/maui_makawao.html)

Nā Puke Wehewehe 'Ōlelo Hawai'i (Ulukau.org) \*Hawaiian diacritical marks are missing in graphs due to data formatting and coding limitations in the visualization software.

