Alaska Department of Environmental Conservation Waterbody Field Report Inner Point Sophia Beach and Gartina Harbor Way Beach, Hoonah, Alaska

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Abstract

The objective of the study was to assess bacteria concentrations in recreational beaches near Hoonah, AK. Gartina Harbor Way Beach and Inner Point Sophia Beach were sampled by Southeast Alaska Watershed Coalition and Hoonah Indian Association weekly from May to September, 2021 for fecal coliform and enterococci bacteria, and once in August for Microbial Source Tracking. This was the first year of sampling, and no Alaska water quality criteria for recreation were exceeded at either beach. Alaska water quality criteria for seafood processing and raw shellfish harvest were exceeded at Gartina Harbor Way Beach. At Gartina Harbor Way Beach near the shellfish harvest area, Microbial Source Tracking detected fecal bacteria from dog, gull, and bird. At Inner Point Sophia Beach, only bacteria from gull and bird were detected. No human source was detected at either location. Two or more years of data are needed to determine attainment or impairment status.

Basic Waterbody Information

Table 1. Basic Waterbody Information

Assessment Unit ID	AK_B_1901021 (21AKBCH – AK998211)	AK_B_19901021 (21AKBCH – AK103349)
Assessment Unit Name	Inner Point Sophia Beach (HB-InnerPtSoph)	Gartina Harbor Way (HB-GartinaHbrWay)
Location description	Port Frederick-Frontal Icy Strait; HUC 190102110906	
Water Type	Marine beach	
Area sampled	Point sample representing 0.36 miles of coastline	Three point samples representing 0.43 miles of coastline
Time of year sampled	May 25-September 7, 2021	

Water Quality Evaluation

Background

Inner Point Sophia Beach and Gartina Harbor Way Beach are two recreational beaches near Hoonah, AK, a community of approximately 800 people on northern Chichagof Island in southeast Alaska (Figure 1. Map of sampling locations at Inner Point Sophia Beach and Gartina Harbor Way Beach. Three sampling

[1] Southeast Alaska Watershed Coalition, project # ACWA-21-B10 funded by DEC

[2] Nonpoint Source Pollution, Water Quality, Division of Water, Department of Environmental Conservation

locations at Gartina Harbor Way Beach are shown in the insert). Local residents use the areas for boating, swimming, fishing, and shellfish harvesting. The two locations were identified as Tier I [3] beaches by the Alaska Department of Environmental Conservation (DEC) in 2021, and were high priority for sampling to assess potential fecal contamination. Potential sources of bacteria include the city wastewater treatment facility, onsite septic systems, landfill, stormwater drain outfalls, a small boat harbor, commercial vessel dock, cruise ship, ferry, and barge passages, a seafood processing plant, wildlife, and pet feces (Figure 2).

No known monitoring of fecal bacteria has occurred at these beaches previously (other than permit-required monitoring at the wastewater treatment plant outfall, DEC permit AKG572022). A Quality Assurance Project Plan (QAPP) was developed for this project and is available at beaches.alaska.gov and from DEC Southeast staff in Juneau, AK.

Figure 1. *Map of sampling locations at Inner Point Sophia Beach and Gartina Harbor Way Beach. Three sampling locations at Gartina Harbor Way Beach are shown in the insert.*

[3] The Alaska Beach Program uses a tiered monitoring approach that addresses bacteria testing at recreational marine water beaches based on the nature, extent and frequency of recreational use by the public, the proximity of recreational waters to known point and nonpoint sources of pollution, and the effect of storm events. Tier 1 are the highest priority beaches due to high risk of bacteria in the marine water and/or high public use of the beach.

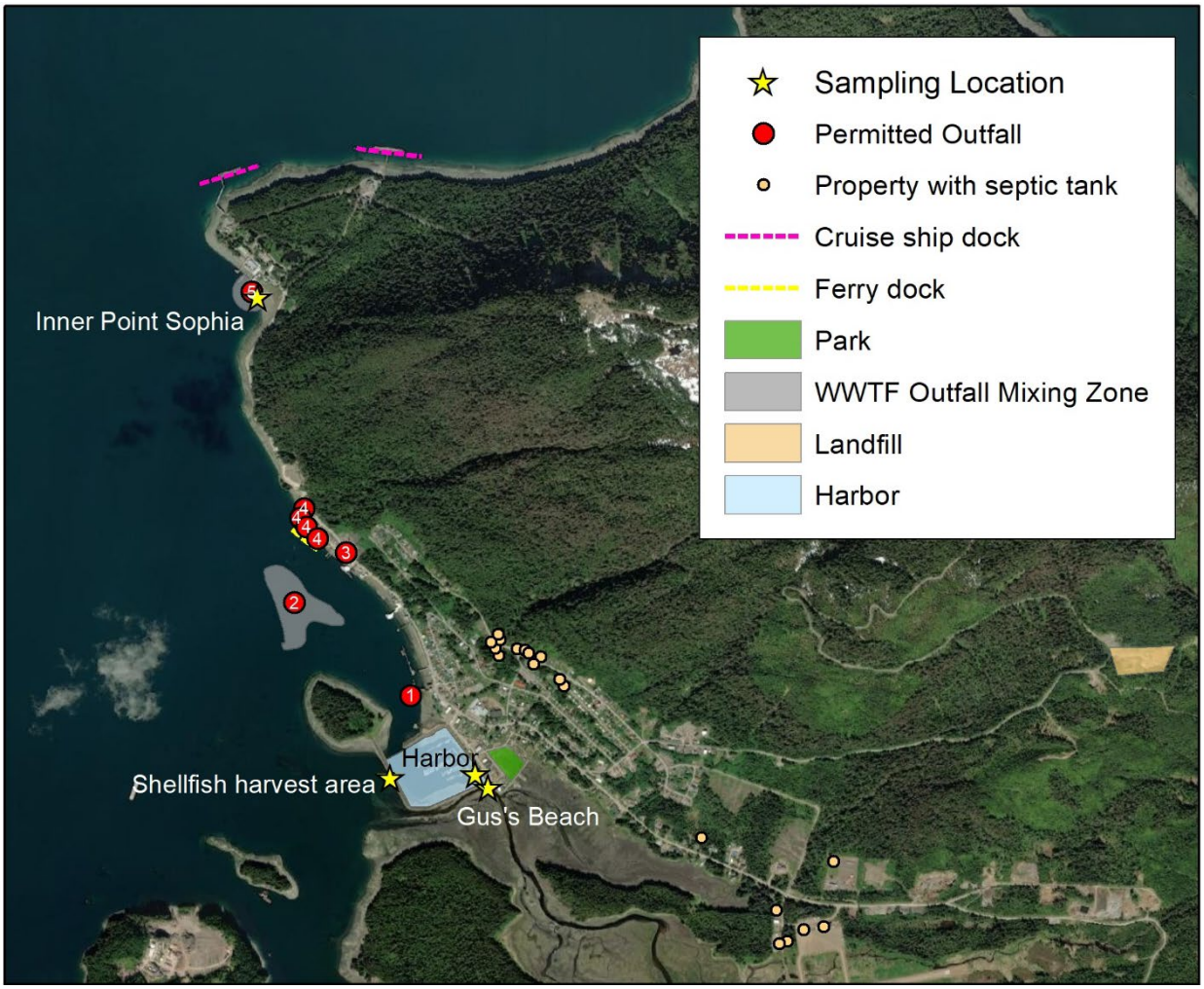

Figure 2. *Locations of potential bacteria sources to Hoonah area beaches.*

Objective

The primary objective of this DEC BEACH Monitoring Program project is to protect human health and the environment by sampling the beaches for fecal indicator organisms (fecal coliforms and enterococci bacteria) that signify the presence of fecal contamination. This information will be used to notify the public in the event an exceedance of allowable levels of indicator organisms in accordance with Alaska Water Quality Standards (WQS).

Methods

One grab sample was collected at each beach weekly from May 25 through September 7, 2021. The sampling plan called for five samples to be collected at each location within a 30-day period to allow calculation of the geometric mean. Samples were shipped to Admiralty Environmental laboratory in Juneau for fecal coliform and enterococci analyses. EPA Marine Sanitary Surveys were conducted for each beach and sampling date, and in situ water quality parameters (temperature, pH, turbidity) were collected using a hand-held Hanna meter and a Hach turbidimeter. Grab samples for Microbial Source

Tracking (MST) were collected once on August 10 at both beach locations, and shipped to LuminUltra laboratory in Miami Lakes, FL for analysis.

Data Quality Review Summary

Field staff followed procedures for sample collection and transport as outlined in the project's QAPP. All laboratory preparation was completed within holding times, the cooler temperatures were within required limits, and no discrepancies, errors, data qualifiers, or QC failures were identified by the laboratory. Field calibration was completed as specified in the QAPP, and records indicate no calibration issues. One duplicate sample per analyte per sample event at one location was collected and analyzed. All duplicates were within the 60% relative percentage difference (RPD) except the August 3 sample for enterococci had a 122% RPD, and a result qualifier was added to the data in the Ambient Water Quality Monitoring System (AWQMS) database. The QAPP stated completeness goal of 80% was met at 100% and the data is usable[4].

One deviation from the sampling plan occurred due to the August 17 sample being collected but not analyzed. A new sample event was added to the project to meet the completeness goal. However the added sampling event did not occur in August and resulted in less than five samples collected within 30 days for geomean calculation during that time period.

Results Summary

Bacteria concentrations at both Inner Point Sophia Beach and Gartina Harbor Way Beach were generally low during the 2021 sampling season (Table 2, Figures 3 and 4). There were no water quality standard exceedances for recreation (for enterococci, in a 30-day period the geometric mean may not exceed 35 CFU/100 ml, and not more than 10% of samples may exceed 130 CFU/100 ml.). There were slightly elevated water quality results exceeding criteria for seafood processing and raw shellfish harvest (fecal coliform geometric mean of samples may not exceed 14 fecal coliform/100 ml, and not more than 10% of the samples may exceed 31 cfu/100 ml) at Gartina Harbor Way compared to Inner Point Sophia Beach; the water quality standards for raw shellfish harvest[5] were met at Inner Point Sophia Beach, but at Gartina Harbor Way Beach, 4 out of 15 (more than 10%) of fecal coliform samples exceeded 31 CFU/100 ml during the sampling season. No recreational advisories or public notices of beach bacteria pollution were issued during the recreational season.

The MST analyses indicated the presence of bacteria from dog at Inner Point Sophia Beach; gull and bird at both Point Sophia Beach and Gartina Harbor Way Beach. MST analysis did not detect human bacteria at either beach (Table 3) on the one sampling date.

In situ water quality measurements varied relatively little across the sampling season, were similar between sites, and did not indicate any water quality concerns (Table 4).

Sanitary surveys were conducted each week. Only one recreator was observed during one sampling event at Gartina Harbor Way Beach; however, sampling occurred during early weekday mornings each

[4] A completed Quality Assurance Checklist for the 2021 Hoonah beaches monitoring season is available from DEC upon request.

[5] 18 AAC 70(14)(D) Water Quality Standards amended as of March 5, 2020

week to meet shipping limitations, so this is not reflective of beach use during usual recreational times. Additionally, no floatables, debris, harmful algal blooms, or wildlife were observed during the sampling events.

Complete water quality and sanitary survey data can be obtained from the DEC Southeast staff in Juneau, AK.

Table 2. *Enterococci and Fecal Coliform sample results summary*

Sample Site	Pollutants	Mean	Median	Range	Max Geomean[1]
Inner Point Sophia Beach	Enterococci (MPN/100 ml)	7.0	<10[2]	ND – 20	6.6
	Fecal Coliform (CFU/100 ml)	4.1	2	ND – 23	2.3
Gartina Harbor Way	Enterococci (MPN/100 ml)	11.7	<10	ND – 41	10.0
	Fecal Coliform (CFU/100 ml)	25.6	10	ND – 130	8.4

[1] For enterococci, geomean of at least 5 samples over 30 days. For fecal coliform, geomean over the entire sampling season.

[2] The detection limit for enterococci was 10 MPN/100 ml. The detection limit for fecal coliform was 1 CFU/100 ml.

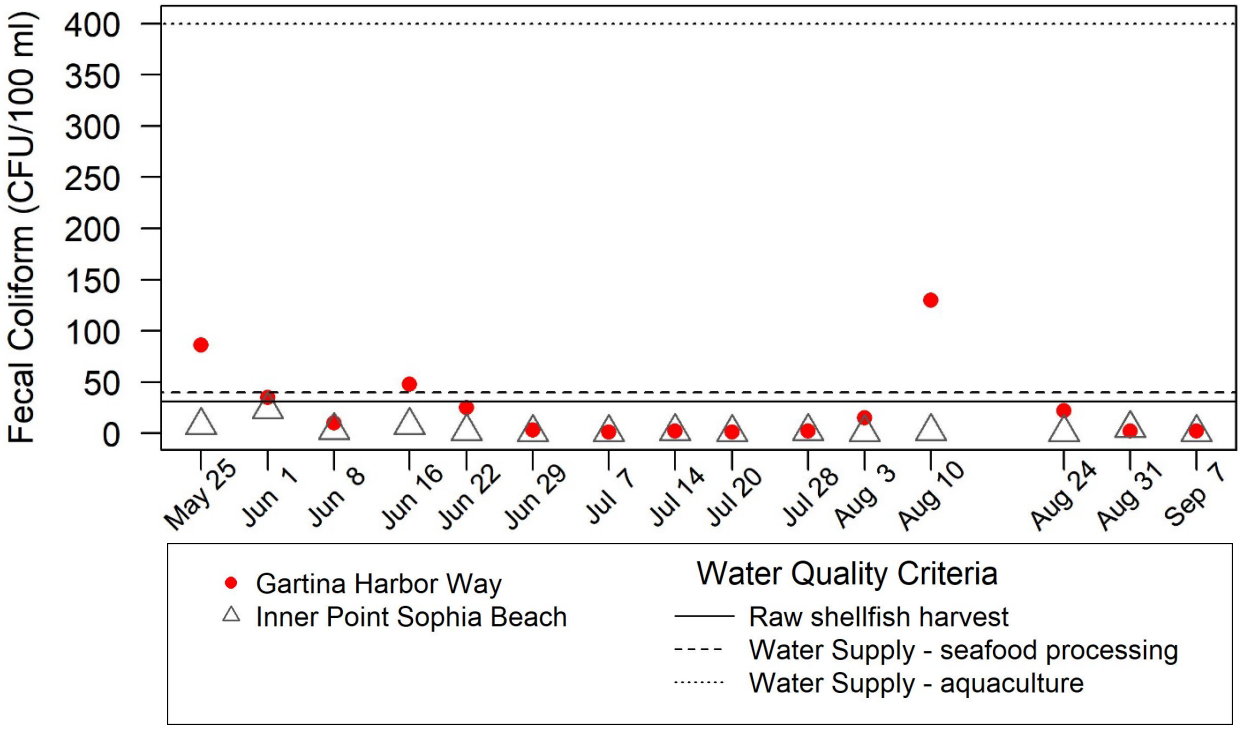

Figure 3. *Fecal coliform bacteria water results. All samples at Gartina Harbor Way Beach were collected from the harbor, except for June 8, when the sample was collected outside the harbor near the creek, and on August 10, when the sample was collected outside the harbor dike near the shellfish harvesting area (Figure 1).*

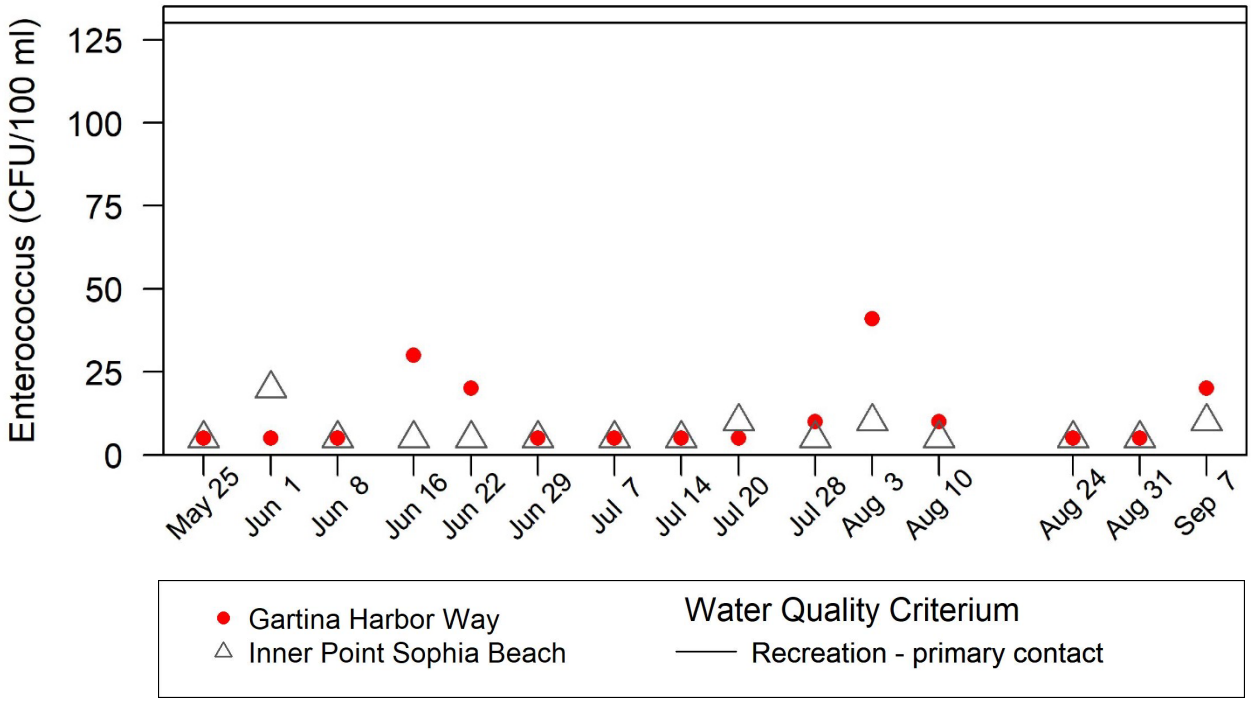

Figure 4. *Enterococci Bacteria water results. All samples at Gartina Harbor Way Beach were collected from the harbor, except for June 8, when the sample was collected outside the harbor near the creek, and on August 10, when the sample was collected outside the harbor dike near the shellfish harvesting area (Figure 1).*

Table 3. *Microbial Source Tracking results*

Sample Site	Bacteroidetes	Result Value[1]
Inner Point Sophia Beach	Human	ND
	Dog	ND
	Gull	DNQ
	Bird	DNQ
Gartina Harbor Way	Human	ND
	Dog	DNQ
	Gull	DNQ
	Bird	DNQ

[1]ND = Not detected; DNQ = Detected, not quantifiable

Table 4. *In situ water quality data summary*

Sample Site	Parameter	Mean	Median	Range
Inner Point Sophia Beach (HB-InnerPtSoph)	Turbidity (NTU)	5.3	4.2	0.5 – 15.4
	pH	7.83	7.87	7.30 – 8.40
	Temperature (°C)	12.3	12.2	9.3 – 15.6
Gartina Harbor Way (HB-GartinaHbrWay)	Turbidity (NTU)	3.1	3.1	1.6 – 4.7
	pH	8.00	7.99	7.41 – 8.45
	Temperature (°C)	13.1	13.9	6.9 – 16.5

Conclusion

The first year of fecal bacteria sampling at Inner Point Sophia Beach and Gartina Harbor Way Beach near Hoonah, AK indicated that bacteria concentrations are generally low. Alaska water quality standards for recreation were met at both beaches throughout the season, and, at least on the day that samples were collected for MST analyses, no human source of bacteria was detected. Periodic elevated fecal coliform concentrations at Gartina Harbor Way Beach suggest that pet and wildlife may be contributing to fecal bacteria present there.

Recommended Next Steps

Another season of bacteria sampling is recommended during the 2022 recreational season to evaluate marine water quality. The second year of sampling will potentially expand the range of weather conditions under which data is collected (2021 was a relatively cool and wet summer), and evaluate increasing tourism as the COVID-19 pandemic subsides and an expected influx of ships and people arriving in Hoonah occurs. Furthermore, an educational outreach campaign for proper dog feces disposal is recommended to assess the positive dog DNA marker found in the beach water in Gartina Harbor Way. DEC requires two years of data to make an attainment/impairment determination.