

Kenai Beaches Monitoring 2018 Field Report

March 2019



Alaska Department of Environmental Conservation



Acknowledgements

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Work was completed in cooperation with EPA, City of Kenai, Kenai Watershed Forum and DEC Water Quality Standards, Assessment and Restoration Program.

Report cover photo was taken by Kenai Watershed Forum at the North Kenai Beach during the July 2018 Personal Use Dipnet Fishery.

Project Summary

The Alaska BEACH program was initiated along the beaches at the mouth of the Kenai River to evaluate background levels of bacteria during high use summer recreational periods. Marine water samples were collected weekly at five monitoring locations from June through September 2018. Two of the monitoring stations were located on public beaches, two monitoring locations were chosen for proximity to the gull rookery, and one site used in previous Kenai beaches monitoring projects as a reference site (Figure 1). The overall purpose of the 2018 Kenai Beaches monitoring survey was to evaluate potential health risks indicated by fecal coliform and enterococci bacteria, and to notify the public if levels exceed state standards. Table 1 provides specific site locations and descriptions and Tables 2-4 provide summaries of the analytical results from the 2018 Kenai Beach monitoring project. Data was collected under a DEC-approved Quality Assurance Project Plan (dated May 2018) which can be viewed upon request.



Figure 1 – 2018 Kenai BEACH Monitoring Locations

The 2018 analytical tests for enterococci revealed that both of the public Kenai Beach monitoring sites failed to meet Alaska water quality standard (WQS) statistical threshold value (STV) criterion for recreation use, and both of the beaches failed to meet Alaska WQS geometric mean criterion for recreation use.

The 2018 analytical tests for fecal coliform bacteria revealed that both of the public Kenai Beach monitoring sites failed to meet Alaska WQS single sample criteria for aquaculture, seafood processing, and harvesting for consumption uses and both sites failed to meet Alaska WQS geometric mean criterion for harvesting for consumption use.

Table 1. Monitoring Locations and Site Descriptions

Site ID	Latitude	Longitude	Site description
Kenai River Gull Rookery 1 (KGR1)	60° 32' 11.76" N 60.5366	-151° 15' 14.40" W -151.254	Monitoring location located upstream of the gull rookery located on the south bank of the Kenai River approximately 1.5 miles upstream of the mouth of the river. Data collected here is used for informational purposes only.
Kenai River Gull Rookery 2 (KGR2)	60° 33' 6.48" N 60.5518	-151° 14' 38.40" W -151.244	Monitoring location located downstream of the gull rookery on the south bank of the Kenai River, approximately 2.0 miles upstream from the river's mouth. Data collected here is used for informational purposes only.
North Kenai Beach (NKB)	60° 33' 2.052" N 60.55057	-151° 16' 19.416" W -151.27206	North Kenai Beach, located at the base of the gully, at about the 46th post.
South Kenai Beach (SKB)	60° 32' 48.228" N 60.54673	-151° 15' 47.448" W -151.26318	South Kenai Beach monitoring location on the south side of the mouth of the Kenai River from the Royal Street access road to the mouth of the Kenai river.
Warren Ames Bridge (BRG1)	60° 31' 32.24" N 60.5259	-151° 12' 28.836" W -151.20801	South bank of Kenai River upstream of Warren Ames Bridge; reference site.

Numerous potential bacteria sources are present along the Kenai River coast, including: wildlife (two established Gull rookeries), private and/or public sewer treatment system outfall(s), sewer line breaks, individual septic tanks, pet feces, boats in harbor and launch areas, and private watercraft. The data collected to date are not sufficient to determine which bacteria sources are negatively affecting the marine water.

Beginning in the summer of 2015 and continuing through the present, City of Kenai (CoK) has implemented Best Management Practices (BMPs) to remove fish carcasses and other fish waste discarded on Kenai River recreational beaches during the July Sockeye Salmon Personal Use Fishery (dipnet fishery). City of Kenai implemented the BMPs to prevent the fish waste from becoming an attractant to seagulls and other birds and to consequently reduce the bacteria from seabird waste. Results of bacteria testing from the 2018 monitoring season showed levels of both fecal coliform and Enterococci exceeding state water quality standards before, during, and after the dipnet fishery.

DEC, in conjunction with Alaska Department of Fish & Game (ADF&G), Kenai Watershed Forum (KWF) and CoK have conducted an annual outreach campaign since 2015 during the dipnet fishery to inform the public about the importance of proper handling of salmon to avoid bacterial contamination. The dipnet fishery was open from July 10-30, 2018; an emergency closure occurred on July 30 at 12:01 AM. In 2018, an

informational booth was operated 12 out of 18 days during the dipnet fishery. A total of 531 visitor interactions were recorded.

This document does not evaluate whether the coastal waters are impaired under Clean Water Act section 303(d), although the data summarized in this report may be used in a future impairment determination when preparing the 2020 Integrated Report. Prior to making a decision on impairment DEC will issue a public notice and comment period for the community, agencies, and local and tribal governments, and other interested stakeholders.

Next Steps

Further bacteria and microbial source testing is planned for the 2019 Kenai beach monitoring program which will help determine local bacteria pollution sources, support the development of solutions, and the implementation of bacteria source reduction in these areas.

A comprehensive, more detailed report will be prepared following a second year of data collection in late 2019. The comprehensive report will be posted on the Beach website <http://dec.alaska.gov/water/water-quality/beach-program/> and Water Quality Reports website at <http://dec.alaska.gov/water/water-quality/reports>.

Alaska's Beach Program

In response to increased occurrences of water-borne illnesses U.S. Congress passed the Beaches Environmental Assessment and Coastal Health (BEACH) Act in 2002. U.S. Environmental Protection Agency (EPA) administers grant funds to states, tribes and territories under the Act to establish monitoring and public notification programs. The BEACH grant program has established national marine water quality monitoring and reporting standards for fecal waste contamination and notifies the public when levels exceed state standards.

Congress passed the BEACH Act because pathogens in recreational waters can be naturally occurring, or they can be introduced through contamination events with the feces of humans and other warm-blooded animals. Two groups of bacteria, fecal coliform and enterococci, are measured as indicators of fecal waste contamination in marine waters. Commonly documented health issues from swimming in contaminated recreational waters include gastrointestinal illness, respiratory illnesses, skin rashes, and ear, eye, and wound infections. People who get an illness from swimming in contaminated water do not always associate their illness with swimming because the onset of the illness is delayed. For example, viral gastrointestinal illness is often mild, short-lived, and self-limiting, and symptoms usually take up to 24 hours to appear. Outbreaks of disease are usually documented when many people seek medical assistance because of a similar illness or the severity of the illness. However, people with mild illness often do not seek medical assistance. Therefore, disease outbreaks are often inconsistently recognized and the outbreak information in the literature is likely underestimated¹.

Alaska DEC's Division of Water uses EPA grant funds for the Alaska BEACH grant program. Alaska's BEACH grant program provides funds to municipalities, watershed organizations, and tribal groups to conduct water quality monitoring on high-priority public beaches. Beach monitoring has been conducted in

¹ EPA National Beach Guidance and Required Performance Criteria for Grants, 2014 Edition (EPA-823-B-14-001).

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15 Alaskan communities including Kenai. The Kenai beach monitoring program was developed in collaboration with the City of Kenai (CoK) and Kenai Watershed Forum (KWF). In 2018, KWF, a contractor for the CoK, performed the monitoring activities at the five Kenai Beach sites; the Kenai beach monitoring program began in 2010.

Table 2. 2018 Kenai beach monitoring results. Fecal coliform (FC) is reported in colony forming units (CFU)/100 ml. Enterococci (Enterococci) units are Most Probable Number (MPN)/100 ml. Results exceeding WQS are color coded based on color of criteria narratives below the table.

Date	Kenai Gull Rookery 2		Kenai Gull Rookery 1		South Kenai Beach		Warren Aims Bridge 1		North Kenai Beach	
	FC	Enterococci	FC	Enterococci	FC	Enterococci	FC	Enterococci	FC	Enterococci
14-Jun ²	130	230	230	31	6100	860	990	2	[310, (420)]	[1,100, (640)] ³
29-Jun ²	NA ⁴	2	3	ND ⁵	275	154	15	NA	8 (18) ⁶	6 (4)
3-Jul	147	10	91	1	200 (100)	15 (15)	1	ND	88	11
10-Jul	Dipnet fishery opens									
13-Jul	26	50	54	15	1010	1,990	43	19	36 (42)	21 (38)
18-Jul	2	13	52	11	18 (10)	67 (8)	12	ND	ND	5
25-26-Jul	NT ⁷	NT	NT	NT	241 AV ⁸	200 AV	NT	NT	121 AV	89 AV
30-Jul	Dipnet fishery closes by emergency order									
2-Aug	82	37	50	15	22 (32)	82 (130)	8	1	56	75
10-Aug	60	47	50	23	820	816	56	5	27 (54)	73 (67)
15-Aug	12	12	80	50	32 (12)	39 (55)	5	2	8	61
24-Aug	108	32	35	1	280	173	56	4	58 (86)	44 (24)
29-Aug	28	34	72	66	48 (37)	81 (84)	12	2	25	29
7-Sep	NT	NT	NT	NT	58 (52)	41 (45)	32	17	40	21
Water recreation, contact		In a 30-day period, the geometric mean of samples may not exceed 35 enterococci CFU/100 ml, and not more than 10% of the samples may exceed a STV of 130 cu/100 ml.								
Water recreation, secondary		In a 30-day period, the geometric mean of samples may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml.								
Harvesting for consumption of raw mollusks or other raw seafood		The geometric mean of samples may not exceed 14 fecal coliform/100 ml; and not more than 10% of the samples may exceed: 31 CFU per 100ml for a membrane filtration test.								

² Samples taken at NKB and SKB were collected at slightly different monitoring locations than used for sampling from June 29, 2018 to the rest of the season

³ [] indicates that duplicate results were taken at two different monitoring locations on the same section of beach

⁴ NA indicates that the sample was received by the laboratory, but not analyzed due to quality control concerns

⁵ ND indicates that the bacteria results were at levels below laboratory detection

⁶ () indicates that duplicate results were taken at the same monitoring locations

⁷ NT indicates that no sampling was done at this monitoring location

⁸ AV indicates that multiple sampling results were averaged

Table 3. Summary of Kenai Beaches Enterococci Bacteria Results for 2018. **Bolded red** results exceed criteria for contact recreation use for either the 30-day geomean (35 MPN/100 ml) or the 10% criteria provision (130 MPN/100 ml).

Monitoring Locations	# of Samples	Max sample results (MPN/100 mL)	% of samples > 130 MPN/100 ml STV	Maximum Rolling 30-Day Geometric Mean
SKB	12	1,990	50	394
NKB	12	1,100	1	93

Table 4. Summary of Kenai Beaches Fecal Coliform Bacteria Results for 2018. Bolded red font results exceed criteria for the harvesting use for either the 30-day geomean (14 cfu/100 ml) or the 10% criteria provision (31 cfu/100 ml).

Monitoring Locations	# of Samples	Maximum (CFU/100 mL)	% of 2018 Samples >31 cfu/100 ml	Geometric Mean of 2018 Data
SKB	12	6,100	92	203
NKB	12	420	66	46

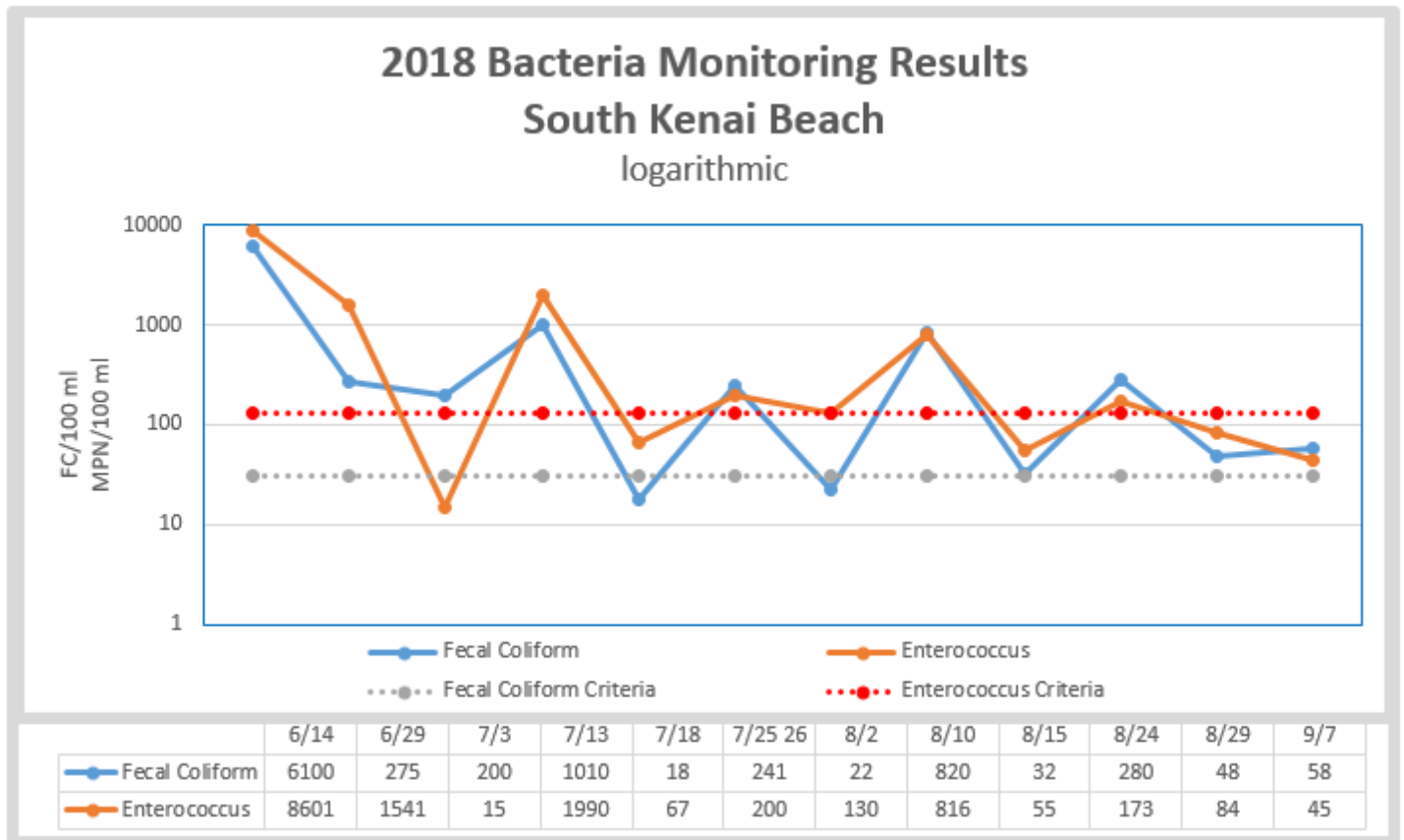


Figure 2 – 2018 South Kenai Beach Monitoring Results

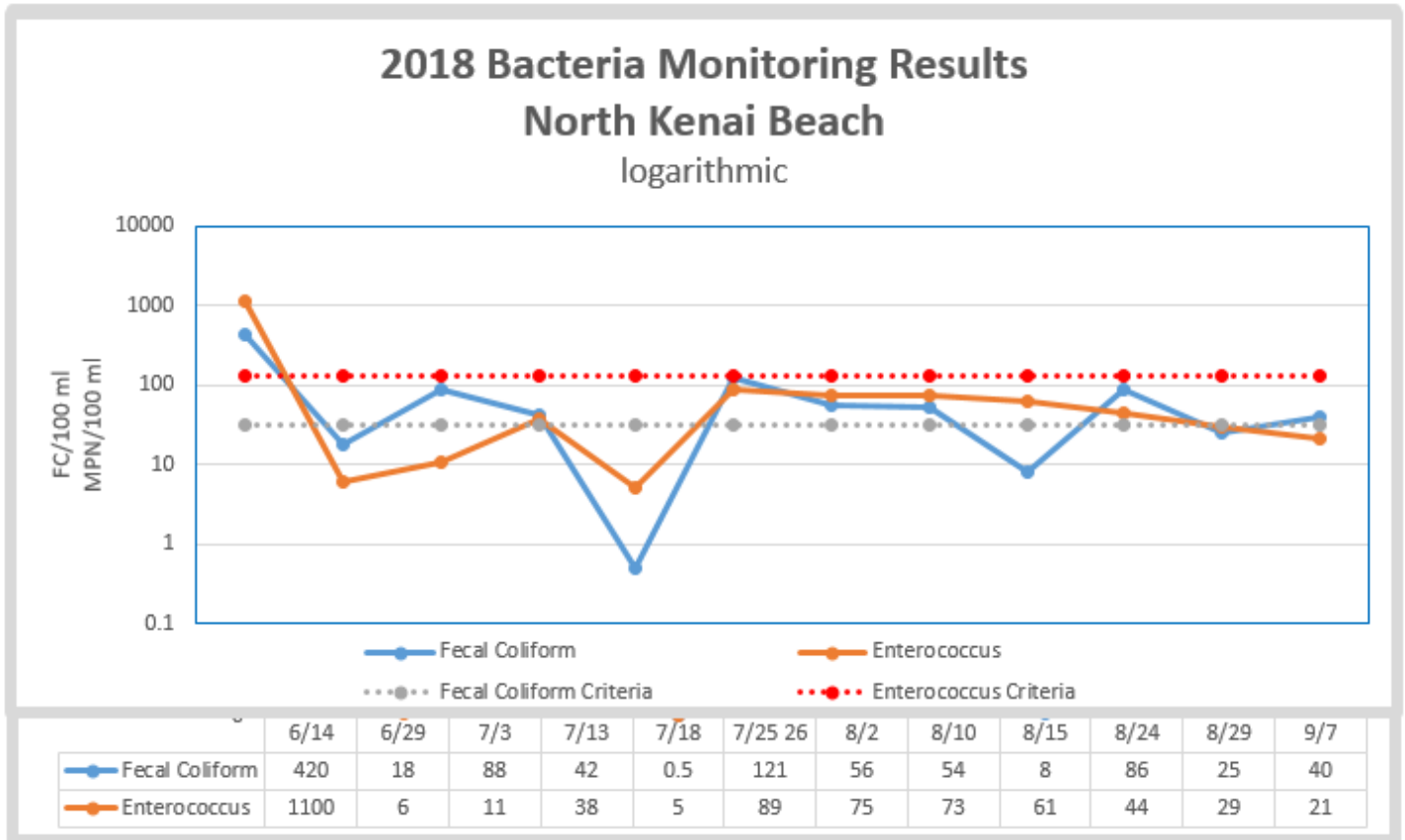


Figure 3 – 2018 North Kenai Beach Monitoring Results