

Southern Gulf Islands Electoral Area Stormwater Quality Program Report

2021-2022

Capital Regional District | Parks & Environmental Services, Environmental Protection



Prepared by
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**SOUTHERN GULF ISLANDS ELECTORAL AREA
STORMWATER QUALITY PROGRAM REPORT 2021-2022**

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SOUTHERN GULF ISLANDS ELECTORAL AREA STORMWATER QUALITY PROGRAM REPORT 2021-2022

BACKGROUND

The Capital Regional District (CRD) Stormwater Quality Program works to identify and minimize impacts of stormwater runoff on environmental and public health in the Southern Gulf Islands Electoral Area (SGI EA). Program activities include monitoring water and sediment from storm drains, watercourses, potable water bodies and nearshore marine waters. When contamination is found, staff conduct investigations to find the sources.

The SGI EA is located within the CRD and is comprised of Galiano, Mayne, North and South Pender and Saturna islands.

THE CAPITAL REGIONAL DISTRICT'S ROLE

The *Southern Gulf Islands Stormwater Quality Management Extended Service Establishment Bylaw No. 1, 1996* allows the CRD to reduce and eliminate pollution in stormwater runoff by investigating, monitoring and reporting on stormwater and sediment quality; and prioritize areas for investigation, carry out public education programs and coordinate stormwater quality management programs.

Sewage treatment in the study areas consists mostly of septic tanks and fields or small sewage treatment plants (with in-ground disposal). Malfunction of these systems has potential to contaminate stormwater discharges, potable water and the marine environment.

Authority to implement mitigative programs is the responsibility of Island Health Authority, First Nations and other government agencies, such as:

- Islands Trust
- BC Ministry of Transportation and Infrastructure
- BC Ministry of Environment & Climate Change Strategy (ENV)
- Fisheries and Oceans Canada

SAMPLE COLLECTION

CRD staff collect environmental quality data from stormwater discharges, creeks and the marine environment, and assign public health and contaminant concern ratings. Each year, staff sample discharges with high or moderate public health concern and cycle through a selection of discharges with low public health concern over a five-year period to confirm ratings have not changed.

Staff collect water and sediment samples from:

- stormwater entering the ocean from Galiano, Mayne, North and South Pender and Saturna islands.
- stormwater entering potable water lakes on North Pender and Saturna islands.
- watercourses on each island.
- marine surface water in Bennett Bay on Mayne Island.

PUBLIC HEALTH CONCERN

Stormwater Discharge Assessments

CRD staff sampled stormwater from 91 discharges (Figures 1-4) in 2021 and 2022 for measurement of *Escherichia coli* (*E.coli*). Of these, 70 were sampled in both years. Staff prioritized the discharges by assigning a public health concern rating to each discharge based on bacterial level and potential for public contact with the discharge.



Stormwater discharges with bacterial contamination are assigned a higher public health concern rating when there is potential for public contact.

Public Health Concern Ratings

Staff assigned only one discharge a high public health concern rating in 2021 and 2022. The total is down from five in 2019 and 2020. The high-rated discharge is 7614 (Miners Bay, Mayne Island) which has been previously high-rated. Eight discharges were assigned a moderate public health rating including two of the previously high-rated discharges.

Staff assigned lower ratings to four of the previously high-rated discharges in 2022 (7613, 7621 and 7623 in Miners Bay and 7600 [Deacon Creek]) due to lower bacterial counts. The previous high counts in two of the discharges were likely driven by a rain event followed by the summer dry season (first flush) in 2020. As contamination may still be present during these rain events, staff will continue to monitor these discharges.

Bacterial Source Investigations

CRD staff investigate discharges of concern to determine the source of contamination through upstream sampling, dye testing, caffeine levels, and/or genetic analyses to determine if the bacteria are from humans or animals. Caffeine indicates the presence of sewage and was not detected in discharge 7614 or the marine receiving environment indicating that sewage may not be the source of contamination. Staff will continue investigations.

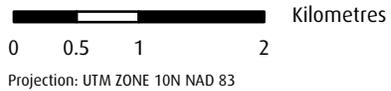


Figure 1
Southern Gulf Islands - Galiano Island
Stormwater
Sampling Locations

Important This map is for general information purposes only. The Capital Regional District (CRD) makes no representations or warranties regarding the accuracy or completeness of this map or the suitability of the map for any purpose. **This map is not for navigation.** The CRD will not be liable for any damage, loss or injury resulting from the use of the map or information on the map and the map may be changed by the CRD at any time.

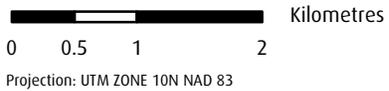
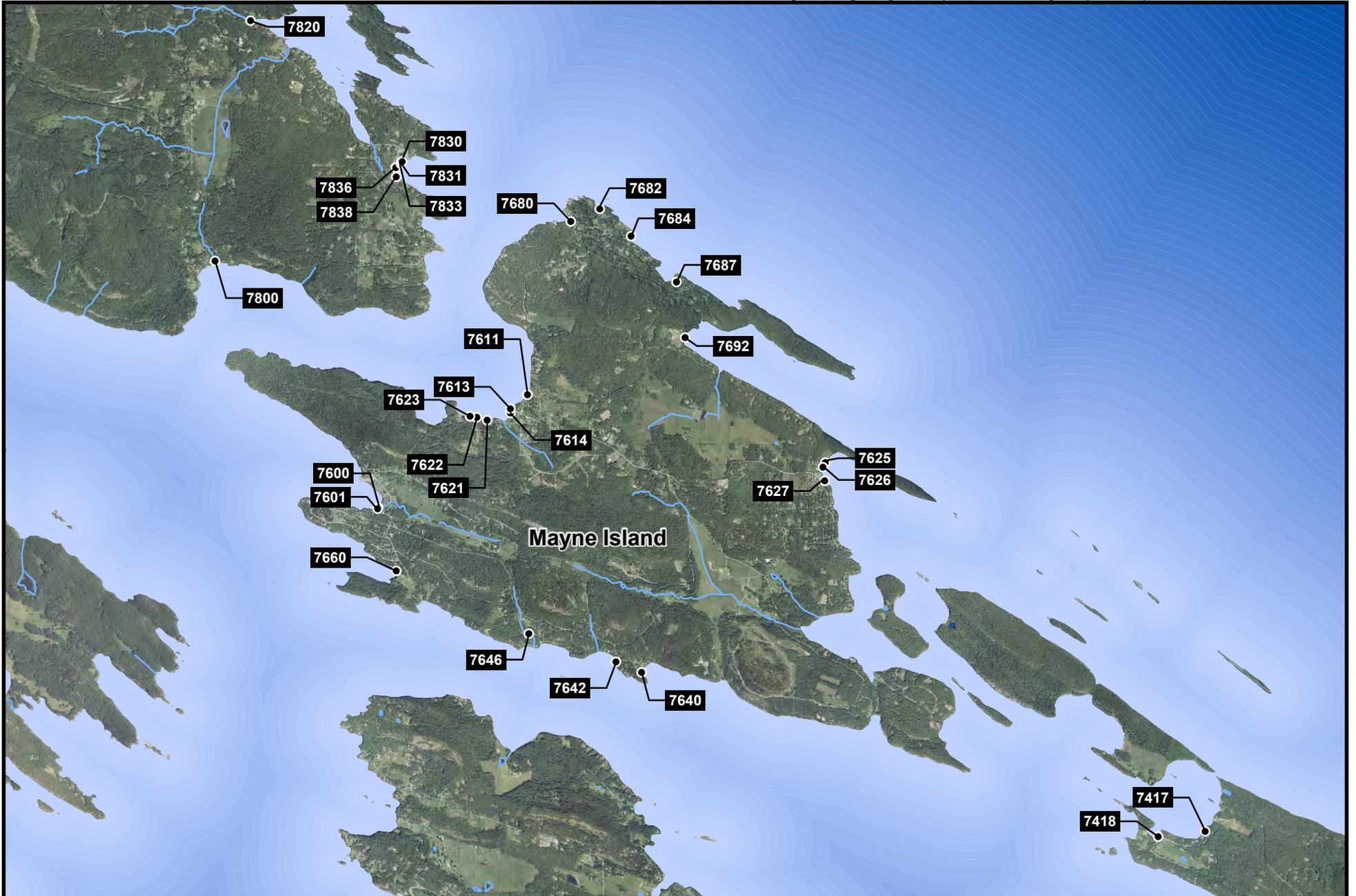


Figure 2
Southern Gulf Islands - Mayne Island
Stormwater
Sampling Locations

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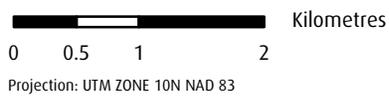


Figure 3
Southern Gulf Islands - Pender Islands
Stormwater
Sampling Locations

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0 0.5 1 2 Kilometres
Projection: UTM ZONE 10N NAD 83



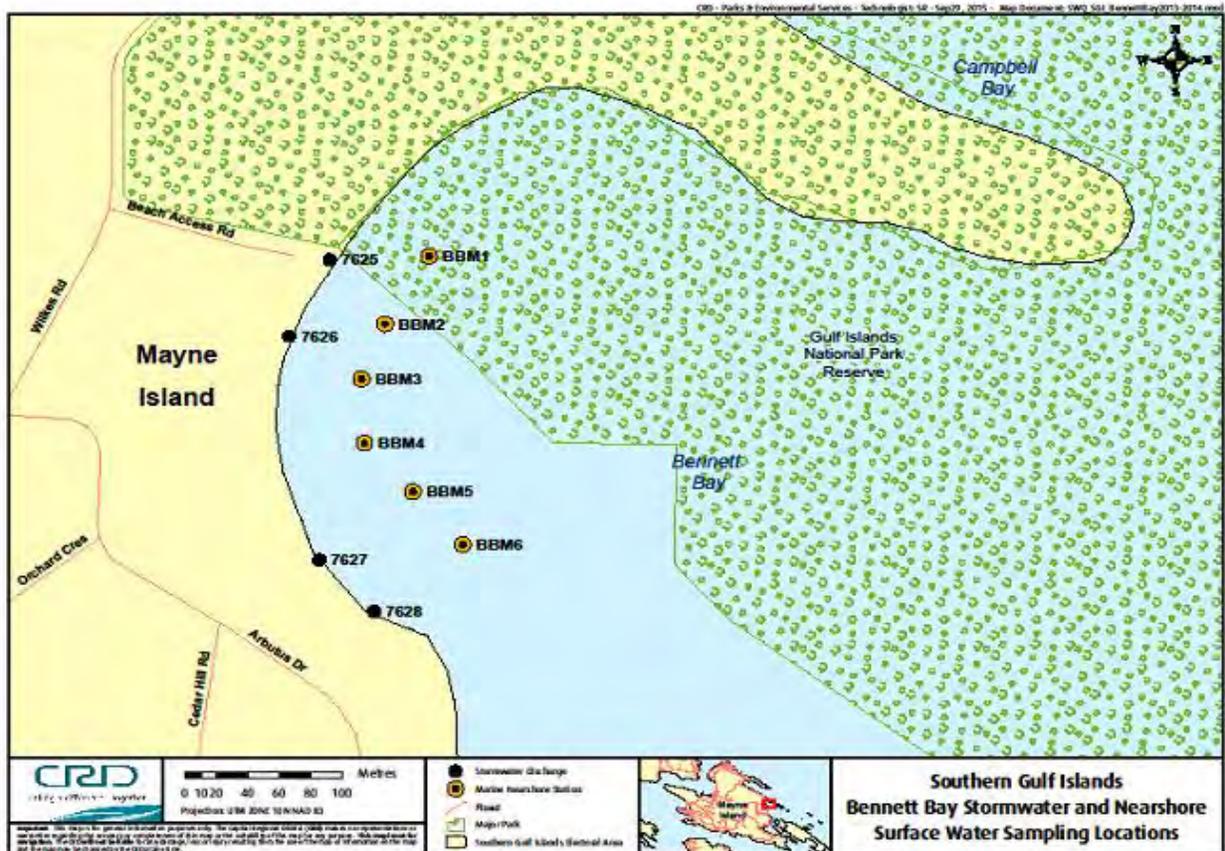
Figure 4
Southern Gulf Islands - Saturna Island
Stormwater
Sampling Locations

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MARINE MONITORING

Bennett Bay, Mayne Island

Stormwater discharges are the major pathway for contaminants from the land to the marine environment. Bennett Bay is a National Marine Park. CRD staff initiated annual monitoring of the bay in 2005 at the request of the CRD SGI EA director. Bacterial levels are routinely measured at six nearshore marine stations and four stormwater discharges entering the bay.



Stormwater and nearshore surface water sampling locations in Bennett Bay.

Elevated bacterial counts have been measured intermittently in Bennett Bay for several years. As a result, CRD staff increased monitoring efforts, conducted source investigations, and worked with Island Health to manage sources. Data indicates that bacterial concentrations in Bennett Bay are generally low, but widespread elevated bacteria can be present during rainfall.

Enterococci counts were low (below 20 CFU/100 mL) in all 34 samples collected from May 2021 to November 2022 except for one elevated count in 2021 at BBM3 (110 enterococci/100 mL) and one elevated count in 2022 (320 enterococci/100 mL) at BBM2. Both samples were taken following rainfall, but all other stations sampled in the bay on those days had low bacterial concentrations.

Caffeine has been detected several times in the bay and most recently at BBM3 in 2022. While surrounding storm drains rarely flow, caffeine was detected in two stormwater discharges and two marine stations following heavy rainfall in 2020. This pattern indicates that on-site sewage treatment systems are likely becoming overwhelmed during heavy rain. CRD staff have shared these results with Island Health.

ENVIRONMENTAL CONCERN

Stormwater Sediment

CRD staff collected 18 sediment samples in 2021 and 2022. Sediment was analyzed for eight metals (arsenic, cadmium, chromium, copper, lead, mercury, silver and zinc) and polycyclic aromatic hydrocarbons. Staff compared concentrations to sediment quality guidelines to assess potential impact on aquatic life and assign a contaminant rating.

Recent data resulted in all low and moderate contaminant ratings. Two upstream locations (Georgeson Creek and Miners Bay catchment 7613) that were rated high in previous years had lower contaminant levels and, therefore, received lower ratings; however, some elevated metals were still measured, as discussed below.

Mayne: Discharge 7613 (Miners Bay) has received high ratings, based on intermittently elevated zinc levels since 2008. Water testing shows that iron, phosphorus and zinc are also elevated upstream. CRD staff conducted upstream investigations that suggest the source of zinc extends above 430 Village Bay Road.

Galiano: Discharge 7800 (Georgeson Creek) has elevated levels of arsenic and zinc upstream. As arsenic and zinc have been low downstream and at the discharge, the contamination appears be isolated to one area upstream of Bluff Road. Upstream contamination is intermittent and likely due to historical practices.



Stormwater sediment is sampled from pipes, streams, ditches or manholes.

Watercourse Monitoring

CRD staff measure water quality in Buccaneer and Money creeks (North Pender), Lyall Creek (Saturna), Putter and Georgeson creeks (Galiano) and Deacon Creek (Mayne) to assess potential impacts to fish and other aquatic life. In 2021 and 2022, staff also collected data on metal concentrations from several creeks.

CRD staff compared water quality parameters (bacteria temperature, pH, dissolved oxygen, conductance, turbidity, nutrients and metals) to ENV guidelines for protection of freshwater aquatic life.

CRD data indicates that water quality is fair in these streams. Turbidity and phosphorus are most often outside guidelines; however, phosphorus is elevated in nearly all streams in the CRD. Elevated turbidity and phosphorus may impact drinking water quality and aquatic life. Potential sources include on-site sewage systems, poor agricultural practices, land clearing, and development.

In 2021 and 2022, phosphorus measurements were elevated above the Vancouver Island Objective in all streams assessed, however, any human activity in a watershed will result in phosphorus concentrations above the objective and concentrations were lower than many other CRD streams. A summary of the other water quality results from 2021 and 2022 follows:

Georgeson Creek

- Bacterial counts were lower at the mouth and continued to be low upstream.
- Metals were below BC guidelines for protection of aquatic life at the mouth, but iron and zinc were intermittently elevated upstream of Bluff Road.

Lyall Creek

- Turbidity continues to be slightly elevated.
- Metals were low.

Buccaneer Creek

- Turbidity was above guidelines during the winter and summer.
- Bacterial counts were intermittently elevated.
- Metals were not analyzed.

Putter Creek

- Turbidity was above guidelines during the summer and winter.
- Metals were low.

Deacon Creek

- Turbidity was above guidelines in all 2021 and 2022 measurements.
- Bacterial concentrations are similar to previous years (low in winter, elevated in summer).
- Metals were low.

Money Creek

- Iron was above the BC guidelines in one measurement.



PUBLIC EDUCATION

The CRD provides educational materials and workshops to promote healthy watersheds. The CRD also promotes best management practices (for preventing pollution) and reporting of spills to Emergency Management BC (1-800-663-3456).



2021 AND 2022 AT A GLANCE

Most SGI EA stormwater discharges and streams assessed were of low concern for public health and the environment. The CRD has identified some contamination in stormwater, creeks and the marine environment, likely due to human activities on land (e.g., malfunctioning on-site sewage systems, agricultural practices and development). It is anticipated that education and outreach will assist in mitigating some sources of contamination.



OUTLOOK FOR 2023-2024

CRD staff, in cooperation with the SGI EA director, will continue to monitor water and sediment quality of stormwater discharges, watercourses and the nearshore marine environment. Together, CRD staff, the SGI EA director, Island Health staff and the community will work towards identifying, reducing and eliminating sources of contamination.