Coral Bay Supplemental Water Quality Sampling

Testing done 10 31 22 and 12 15 2023 by UVI Environmental Analysis Laboratory for the

Coral Bay Community Council

CORAL BAY
Community Council
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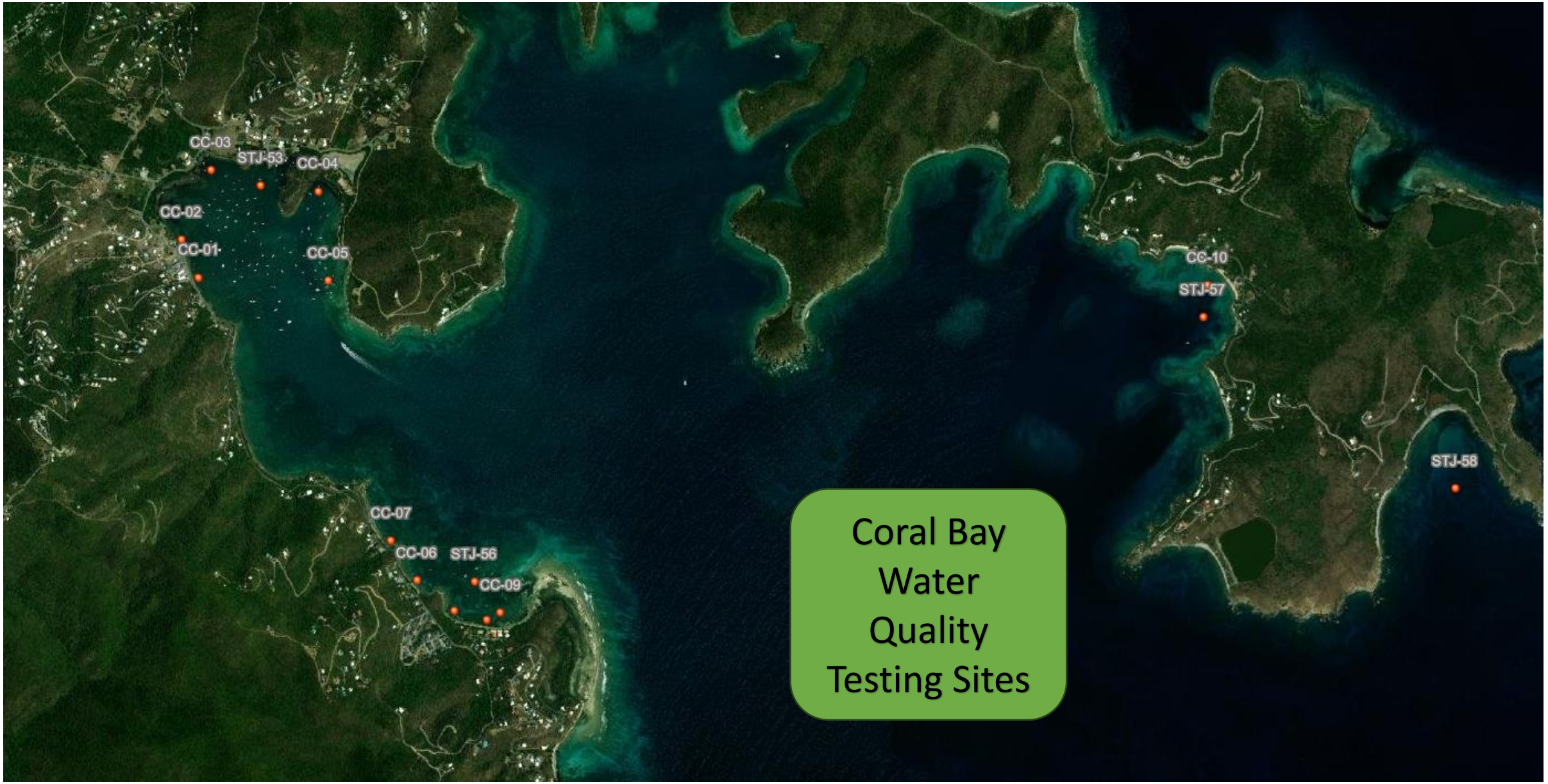

https://sjcf.maps.arcgis.com/apps/instant/basic/index.html?appid=4936bd33e9b042f0bf1a00235e74d38d

Coastal Water Quality Testing in Coral Harbor

- Supplemental testing in various coastal locations to seek evidence of groundwater or point-source contamination of coastal waters - 10 sites
- Usual DPNR UVI quarterly testing at STJ-53 and STJ -56 by UVI, DPNR
- Johnson Bay area – a good place to study impacts of WW systems
- Address local concerns that boats cause unhealthy water
- Collected samples/measurements from surface depth of about 1.6 ft and 1.6 ft off the seafloor bottom (varied at each site).
- Results analyzed, future value

Summary of Water Quality Results

- The additional 10 sampling locations were for the dual purposes of
- 1) seeking evidence of wastewater pollution sources at stormwater and groundwater inlet points to the bay or from boats or water users, and
- 2) responding to voiced community concerns that current monitoring that generally shows safe water for recreational purposes was not checking enough individual points in the bay for some residents to feel secure in safely swimming or wading.
- **The sampling results found safe recreational waters at all tested locations and no evidence of point sources of wastewater pollution was identified.** The bay waters, including six (6) sampling locations in Coral Harbor, met standards for bacteria contamination, turbidity and several other Water Quality measures .

Site Description	Sample Station ID	Total Depth (m)	Sample Depth	Sample Depth (m)	Tempertaure (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (s.u.)	Turbidity (NTU)	Secchi (m)	Enterococci (MPN/100 mL)	Total Suspended Solids (mg/L)	Total Volatile Solids (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
Oct 31 2022 Testing 2019 USVI Water Quality Standards fo Class B Waters					Not exceed 32° Celsius at any time, nor as a result of waste discharge to be greater than 1.0°C above natural conditions. *Areas where coral reef ecosystems are located shall not exceed 25-29°C at any time, nor as a result of waste discharge to be greater than 1.0°C above		No less than 5.5 mg/L (except when due to natural forces).	Not be outside 7.0 to 8.3 standard units. Normal range of pH must not be extended at any location by more than ±0.1 pH unit.	Maximum of 3 NTUs. **For areas where coral reef ecosystems are located, a maximum of 1 NTU	A secchi disc shall be visible at a minimum depth of 1 m. For waters where the depth does not exceed 1 m the bottom must be visible. **In areas where coral reef ecosystems are located, a secchi disc shall be visible at a minimum depth of 15 m. For such waters where the depth does not exceed 15 meters, the bottom must be visible.	* If the sample is found to have more than 70 colonies per 100ml, the beach is considered to be unsafe for swimming. The 30-day geometric mean for enterococcus shall not exceed 30 colony-forming units/100 mL and no more than 10 percent of the samples collected in the same 30 days shall exceed 110 colony-forming units/100 mL.	(Not used in WQS) None from wastewater sources which will cause disposition or be deleterious for the designated uses shall be present in any waters.		Not exceed 207 µg/L (or .207 mg/L) in more than 10 percent of samples over a three-year period in estuarine, marine and coastal waters.	50 µg/L or .05 mg/L
Harolds Way	CC-01	1.9	Surface	0.5	29.17	33.51	7.4	7.91	0.8		<10	2.9	1.6	0.203	0.0035
Harolds Way	CC-01		Bottom	1.4	29.05	33.52	7.22	7.93	0.8	1.9					
Island Blues	CC-02	1.9	Surface	0.5	29.36	33.52	7.02	7.97	0.8		<10	4.3	2.3	0.228	0.0061
Island Blues	CC-02		Bottom	1.4	29.32	33.52	7.4	7.98	0.8	1.9					
Pickles	CC-03	1.9	Surface	0.5	29.78	33.51	7.85	7.91	1.8		<10	6.6	2.4	0.262	0.0021 (J)
Pickles	CC-03		Bottom	1.4	29.7	33.51	7.85	8.03	2.5	1.9					
Coral Harbor Dock	STJ-53	2.1	Surface	0.5	29.14	33.59	6.16	7.95	2.2		<10	3.3 (H;J)		0.296 (J)	0.0031 (J)
Coral Harbor Dock	STJ-53		Bottom	1.6	29.08	33.6	6.02	7.95	2.2	2.1					
Flamingo Pond	CC-04	1.9	Surface	0.5	29.22	33.35	7.12	7.97	1		<10	4.0	2.4	0.252	0.0056
Flamingo Pond	CC-04		Bottom	1.4	29.13	33.35	7.11	7.97	1.5	1.9					
Fortsberg - Johnny Lime	CC-05	1.7	Surface	0.5	29.41	33.72	7.95	8.11	0.6		10	3.7	2.2	0.227	<0.0015 (U)
Fortsberg - Johnny Lime	CC-05		Bottom	1.2	29.35	33.77	8.38	8.13	1	1.7					
Calabash Market	CC-06	2.1	Surface	0.5	28.99	33.57	7.62	8.04	0.5		10	3.2	2.2	0.287	0.007
Calabash Market	CC-06		Bottom	1.6	28.98	33.59	7.91	8.05	0.6	2.1					
Shipwreck	CC-07	1.7	Surface	0.5	29.27	33.58	7.19	8.01	2.1		10	4.3	2.4	0.246	<0.0015 (U)
Shipwreck	CC-07		Bottom	1.2	29.12	33.58	7.39	8.03	1.1	1.7					
Johnson Bay - W - Calabash Boom Housing	CC-08	1.9	Surface	0.5	29.63	33.7	8.25	8.12	0.9		10	4.7	2.6	0.297	0.0032
Johnson Bay - W - Calabash Boom Housing	CC-08		Bottom	1.4	29.55	33.72	8.18	8.1	1.8	1.9					
Johnson Bay - Boats	STJ-56	2.2	Surface	0.5	29.27	33.68	7.75	8.11	0.5		<10	3.9 (H;J)	N/A	0.258 (J)	0.008 (J)
Johnson Bay - Boats	STJ-56		Bottom	1.7	29.19	33.7	7.71	8.1	0.5	2.2					
Johnson Bay - E - Shoreline Homes	CC-09	1.5	Surface	0.5	30	33.84	9.8	8.22	0.4		<10	4.0	2.1	0.235	0.0026 (J)
Johnson Bay - E - Shoreline Homes	CC-09		Bottom	1	29.87	33.83	10.05	8.23	0.6	1.5	<10	4.3	2.2	0.21	0.0075
Johnson Bay - Beach	I-29 / VI823989		Surface	0.3					1.42		<10				
Johnson Bay - Beach	I-29 / VI823989		Surface	0.3					1.42		<10				
Hansen Bay Beach - NW - Picnic Table	CC-10	2.6	Surface	0.5	28.78	33.99	6.8	8.09	0.2		<10	3.0	1.7	0.263	0.0058
Hansen Bay Beach - NW - Picnic Table	CC-10		Bottom	2.1	28.73	34.04	6.82	8.09	0.1	2.6					
Round Bay	STJ-57	7.7	Surface	0.5	28.86	33.99	6.63	8.08	0		<10	3 (H;J)		0.299 (J)	0.0106 (J)
Round Bay	STJ-57		Bottom	7.2	28.73	34.14	6.93	8.09	0.2	6					
Privateer Bay	STJ-58		Surface	0.5	28.87	34.08	6.63	8.07	0		<10	3.4 (H;J)		0.284 (J)	0.013 (J)
Privateer Bay	STJ-58	8.4	Bottom	7.9	28.73	34.07	6.6	8.08	0	8.4					

Enterococci 2022 - Density of organisms in 100ml of water: Less than 10 in Coral Harbor, Safe water for recreation and swimming – less than 70.

	Enterococci (MPN/100 mL)
Harolds Way	<10
Harolds Way	
Island Blues	<10
Island Blues	
Pickles	<10
Pickles	
Coral Harbor Dock	<10
Coral Harbor Dock	
Flamingo Pond	<10
Flamingo Pond	
Fortsberg - Johnny Lime	10
Fortsberg - Johnny Lime	
Calabash Market	10
Calabash Market	
Shipwreck	10
Shipwreck	
Johnson Bay - W - Calabash Boom Housing	10
Johnson Bay - W - Calabash Boom Housing	
Johnson Bay - Boats	<10
Johnson Bay - Boats	
Johnson Bay - E - Shoreline Homes	<10
Johnson Bay - E - Shoreline Homes	<10
Johnson Bay - Beach	<10
Johnson Bay - Beach	<10

Total Nitrogen – 2022

- Total Nitrogen - Standards under development.
- Target: not to exceed .207 mg/L in more than 10% of samples over 3-yr period.

	Total Nitrogen (mg/L)
Harolds Way	0.203
Harolds Way	
Island Blues	0.228
Island Blues	
Pickles	0.262
Pickles	
Coral Harbor Dock	0.296 (J)
Coral Harbor Dock	
Flamingo Pond	0.252
Flamingo Pond	
Fortsberg - Johnny Lime	0.227
Fortsberg - Johnny Lime	
Calabash Market	0.287
Calabash Market	
Shipwreck	0.246
Shipwreck	
Johnson Bay - W - Calabash Boom Housing	0.297
Johnson Bay - W - Calabash Boom Housing	
Johnson Bay - Boats	0.258 (J)
Johnson Bay - Boats	
Johnson Bay - E - Shoreline Homes	0.235
Johnson Bay - E - Shoreline Homes	0.21
Johnson Bay - Beach	
Johnson Bay - Beach	
Hansen Bay Beach - NW - Picnic Table	0.263
Hansen Bay Beach - NW - Picnic Table	
Round Bay	0.299 (J)
Round Bay	
Privateer Bay	0.284 (J)
Privateer Bay	

Site Description	Sample Station ID	Sample Depth	Sample Depth (m) xx.x	Tempertaure (°C) xx.xx	Salinity (ppt) xx.xx	Dissolved Oxygen (mg/L) xx.xx	pH (s.u.) xx.xx	Turbidity (NTU) xx.x	Secchi (m) xx.x	Enteroccoci (MPN/100 mL) x	Total Suspended Solids (mg/L) xx.x2	Total Volatile Solids (mg/L) xx.x3	Total Nitrogen (mg/L) x.xxxx	Total Phosphorus (mg/L) x.xxxx2
December 15, 2023 testing **2019 USVI Water Quality Standards for Class B Waters**				**Not exceed 32° Celsius at any time, nor as a result of waste discharge to be greater than 1.0°C above natural conditions. °Areas where coral reef ecosystems are located shall not exceed 25-29°C at any time, nor as a result of waste discharge to be greater than 1.0°C above natural conditions.**	**N/A**	**No less than 5.5 mg/L (except when due to natural forces).**	**Not be outside 7.0 to 8.3 standard units. Normal range of pH must not be extended at any location by more than ±0.1 pH unit.**	**Maximum of 3 NTUs. ""For areas where coral reef ecosystems are located, a maximum of 1 NTU**	**A secchi disc shall be visible at a minimum depth of 1 m. For waters where the depth does not exceed 1 m the bottom must be visible. ""In areas where coral reef ecosystems are located, a secchi disc shall be visible at a minimum depth of 15 m. For such waters where the depth does not exceed 15 meters, the bottom must be visible.**	**" If the sample is found to have more than 70 colonies per 100ml, the beach is considered to be unsafe for swimming. The 30-day geometric mean for enterococcus shall not exceed 30 colony-forming units/100 mL and no more than 10 percent of the samples collected in the same 30 days shall exceed 110 colony-forming units/100 mL.**	**None from wastewater sources which will cause disposition or be deleterious for the designated uses shall be present in any waters**	**N/A**	**Not exceed 207 µg/L (or .207 mg/L) in more than 10 percent of samples over a three-gear period in estuarine, marine and coastal waters.**	**50 µg/L or .05 mg/L**
Harold's Way	CC-01	Surface	0.50	26.85	34.58	6.70	7.85	0.30		<10	2.6	1.8	0.255	0.0052
Harold's Way	CC-01	Bottom	0.80	26.85	34.60	6.82	7.85	0.30	1.3					
Island Blues	CC-02	Surface	0.50	26.72	34.56	5.90	7.81	1.00		<10	3.6	1.9	0.222	0.0073
Island Blues	CC-02	Bottom	1.40	26.70	34.56	6.14	7.83	1.80	1.9					
Pickles	CC-03	Surface	0.50	26.38	34.41	5.59	7.79	1.9		10	5.5	2.3	0.234	0.0028 (J)
Pickles	CC-03	Bottom	1.40	26.14	34.39	3.92	7.65	4.8	1.9					
Coral Harbor Dock	STJ-53	Surface	0.50	26.54	34.52	6.16	7.83	1.8		<10	3.7	N/A	0.522	0.0409
Coral Harbor Dock	STJ-53	Bottom	2.10	26.39	34.57	6.01	7.83	3.9	2.3 (J)					
Flamingo Pond	CC-04	Surface	0.50	26.55	34.54	6.32	7.86	1.3		<10	3.6	1.8	0.235	0.0067
Flamingo Pond	CC-04	Bottom	1.60	26.48	34.61	6.14	7.86	2.2	2.1					
Fortsberg - Johnny Lime	CC-05	Surface	0.50	26.55	34.65	6.18	7.87	0.3		<10	2.5	0.9	0.256	0.0017 (J)
Fortsberg - Johnny Lime	CC-05	Bottom	1.30	26.48	34.68	6.12	7.87	0.3	1.8					
Calabash Market	CC-06	Surface	0.50	27.07	34.70	6.30	7.88	0.3		10	5.0	2.0	0.243	0.0084
Calabash Market	CC-06	Bottom	1.40	27.11	34.74	6.25	7.88	0.4	1.9					
Shipurock	CC-07	Surface	0.50	27.08	34.72	6.33	7.89	0.5		<10	3.9	1.6	0.244	0.0021 (J)
Shipurock	CC-07	Bottom	1.30	27.09	34.73	6.62	7.90	0.7	1.8					
Johnson Bay - W - Calabash Boom Mouring	CC-08	Surface	0.50	27.14	34.70	6.35	7.88	1.7		<10	4.3	1.5	0.223	0.0054
Johnson Bay - W - Calabash Boom Mouring	CC-08	Bottom	1.50	27.04	34.73	6.23	7.87	2.3	2.0					
Johnson Bay - Beach	STJ-56	Surface	0.50	27.24 (J)	34.7	6.41	7.89	0.2		< 10	2.6	N/A	0.339	0.0084
Johnson Bay - Beach	STJ-56	Bottom	2.70	26.91 (J)	34.74	6.41	7.87	0.4	3.2					
Johnson Bay - E - Shoreline Harbor	CC-09	Surface	0.50	26.93	34.75	7.33	7.91	1.1		<10	3.4	0.6	0.272	0.0057
Johnson Bay - E - Shoreline Harbor	CC-09	Bottom	1.40	26.15	34.80	6.72	7.79	0.8	1.9					
Johnson Bay - Beach	STJ-29 / VI823989	Surface	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A
Johnson Bay - Beach	STJ-29 / VI823989	Bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Hansen Bay Beach - NW - Picnic Table	CC-10	Surface	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A
Hansen Bay Beach - NW - Picnic Table	CC-10	Bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
Round Bay	STJ-57	Surface	0.50	27.28	34.72	6.37	7.91	0.2		< 10	4.3	N/A	0.394	0.0059
Round Bay	STJ-57	Bottom	9.00	27.29	34.75	6.35	7.91	0.1	9.5					
Privateer Bay	STJ-58	Surface	0.50	27.47	34.83	6.34	7.92	0.2		< 10	3.6	N/A	0.53	0.0056
Privateer Bay	STJ-58	Bottom	7.40	27.33	34.83	6.17	7.91	0.2	7.9					

Enterococci 2023 - Density of organisms in 100ml of water: Less than 10 in Coral Harbor, Safe water for recreation and swimming – less than 70.

Site Description	Enteroccoci (MPN/100 mL) x
Harolds Way	<10
Harolds Way	
Island Blues	<10
Island Blues	
Pickles	10
Pickles	
Coral Harbor Dock	<10
Coral Harbor Dock	
Flamingo Pond	<10
Flamingo Pond	
Fortsberg - Johnny Lime	<10
Fortsberg - Johnny Lime	
Calabash Market	10
Calabash Market	
Shipwreck	<10
Shipwreck	
ohnson Bay - W - Calabash Boom Housir	<10
ohnson Bay - W - Calabash Boom Housir	
Johnson Bay - Boats	< 10
Johnson Bay - Boats	
Johnson Bay - E - Shoreline Homes	<10
Johnson Bay - E - Shoreline Homes	
Johnson Bay - Beach	
Johnson Bay - Beach	
Hansen Bay Beach - NW - Picnic Table	N/A
Hansen Bay Beach - NW - Picnic Table	
Round Bay	< 10
Round Bay	
Privateer Bay	< 10
Privateer Bay	

Total Nitrogen 2023

- Total Nitrogen - Standards under development.
- Target: not to exceed .207 mg/L in more than 10% of samples over 3-yr period.

Site Description	Total Nitrogen (mg/L) x.xxxx
Harolds Way	0.255
Harolds Way	
Island Blues	0.222
Island Blues	
Pickles	0.234
Pickles	
Coral Harbor Dock	0.522
Coral Harbor Dock	
Flamingo Pond	0.235
Flamingo Pond	
Fortsberg - Johnny Lime	0.256
Fortsberg - Johnny Lime	
Calabash Market	0.243
Calabash Market	
Shipwreck	0.244
Shipwreck	
ohnson Bay - W - Calabash Boom Housir	0.223
ohnson Bay - W - Calabash Boom Housir	
Johnson Bay - Boats	0.339
Johnson Bay - Boats	
Johnson Bay - E - Shoreline Homes	0.272
Johnson Bay - E - Shoreline Homes	
Johnson Bay - Beach	N/A
Johnson Bay - Beach	
Hansen Bay Beach - NW - Picnic Table	N/A
Hansen Bay Beach - NW - Picnic Table	
Round Bay	0.394
Round Bay	
Privateer Bay	0.53
Privateer Bay	

Should we expand this testing to identify contamination sources?

- Pros/Cons
- Identify Waste System Leakage
- Will info get people to upgrade practice
- Input for future TDML program
- Replace shoreline old septic systems
- Understand sargassum impacts and natural influences
- Next Analytic Steps
  - Hydrologic / Pollutant Load Modeling Review
  - Groundwater input to coastal waters
  - Robust monitoring system - choices

Thank You!

This material is based upon work supported under a grant by the Rural Utilities Service, United States Department of Agriculture.

Any opinions, findings, and conclusions or recommendations expressed in this material are solely the responsibility of the Coral Bay Community Council or the authors and do not necessarily represent the official views of the Rural Utilities Service.