Briarcliffe Acres, Mouth of Swash: Monitoring E. Coli, Enterococci

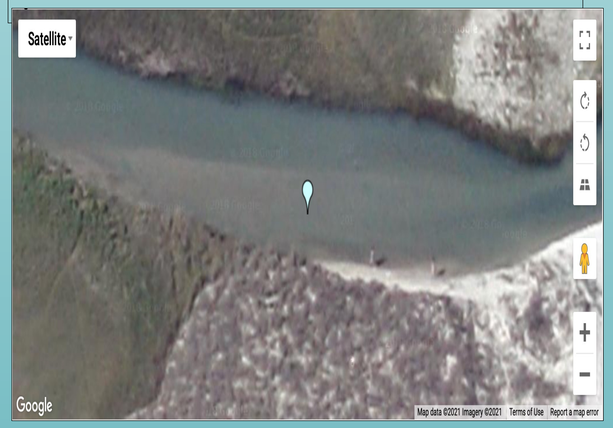
Tyrone Mitchell & Dr. Monica Gray

Introduction

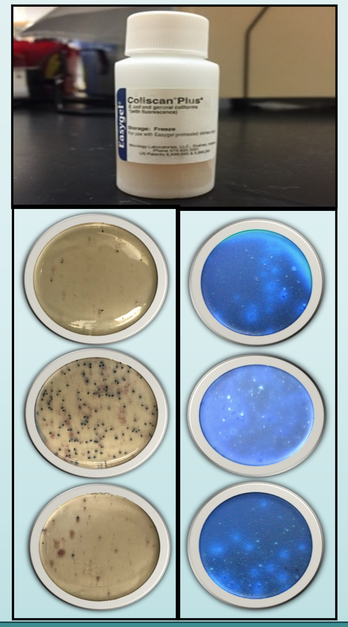
- Enterococci is an indicator bacteria that is used to measure the presence of fecal contamination in marine and fresh water. Water quality monitoring is important to safeguard public and ecosystem health
- Clean water act was created and implemented in 1972 to regulate discharges of pollutants into the waters of the United States and regulating quality standards for surface water.
- The monitoring of fecal indicator bacteria is important for levels to be at EPA water quality standard of 104-501 cfu/100mL

Background

- Water pollution caused by fecal contamination is a serious problem due to the potential for contracting diseases from pathogens.
- Fecal bacteria indicators: typically, non-pathogenic (not harmful) bacteria are tested to determine possible sewage contamination because they are commonly found in human and animal feces.
- In addition to the possible health risk associated with the presence of elevated levels of fecal bacteria, they can also cause cloudy water, unpleasant odors, and an increased oxygen demand.



Methods



IDEXX Enterolert™-Quanty-Tray™Method (SM 9230D-2007).

The media fed the bacteria and grew the colonies. Bacteria concentration is a direct measure of water quality. Bacterial concentrations were determined by counting colonies with the resulting unit of measure; Colony Forming Units (CFU)/100 mL.

- Took samples at Mouth of Swah into a Coliscan Plus* solution.
- Poured mixed media into sterile petri dish
- Incubated at ~35° C for ~24 hours
- Counted pink colonies, then counted blue colonies that glow under a UV light
- Glowing colonies represent E. coli, both glowing and pink colonies represent total coliform

Results

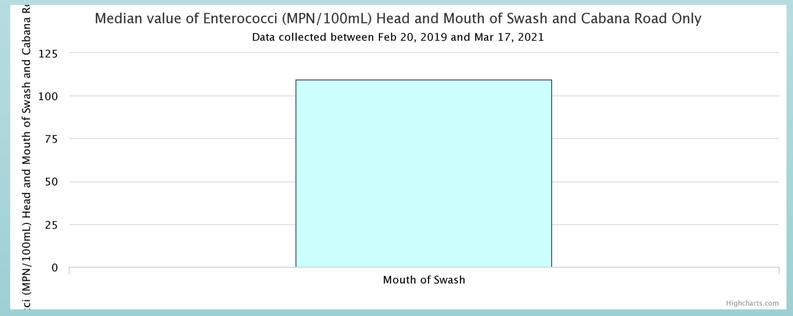


Figure 1: Median Enterococci over monitoring period at Mouth of Swash.

Table 1: Variation of Enterococci over monitoring period.

Site Name	# Samples	Mean	S.D.	Median	Max	Min	10th	25th	75th	90th
Mouth of Swash	48	467	831	110	4106	9	.9	31	397	1417

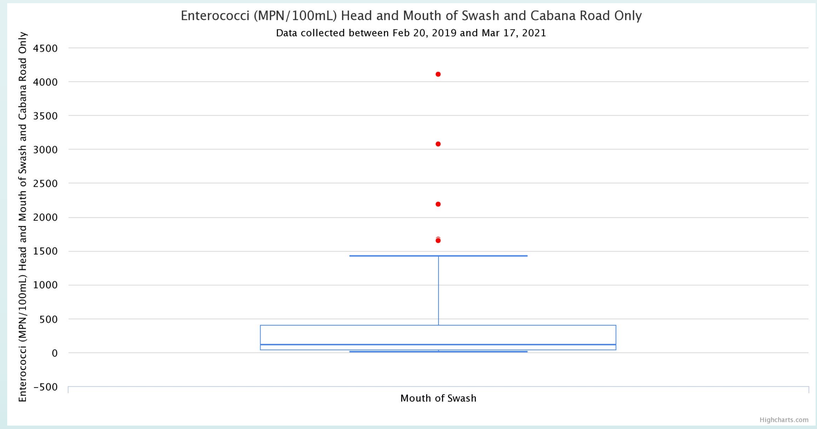


Figure 2: Box Plot Enterococci over monitoring period at Mouth of Swash

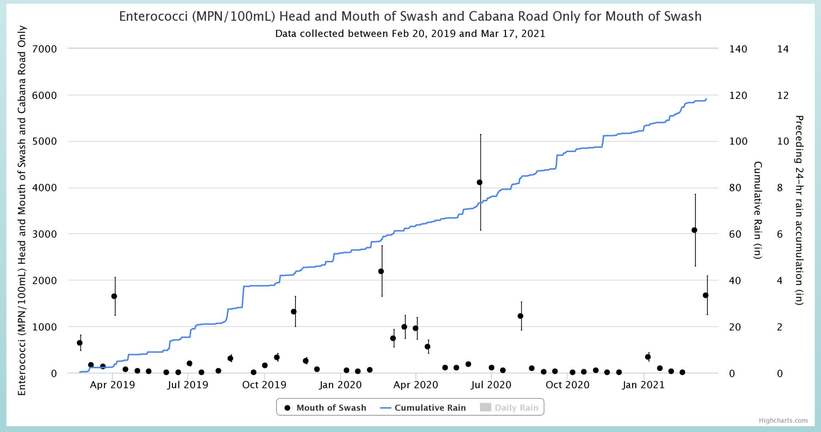


Figure 3: Enterococci over monitoring period at Mouth of Swash

Conclusion

- The mean result was 384 CFU/100mL, which is within the water quality standard of 104 – 501 CFU100mL for single samples proposed by the EPA.
- Until levels of Enterococci surpass EPA water quality standards the waters do not need to be on watch for harmful waterborne pathogens.
- Mouth of Swash experiences sewage runoff which effects the levels of Enterococci.
- Briarcliffe Acres community keeps the levels of Enterococci to standard so they tourist and locals have a healthy environment to enjoy recreations and different types of fish.
- Public data results displayed on http://bccmws.coastal.edu/volunteermonitoring/index.html

Acknowledgments: *Advisor, Dr. Monica Gray mgray2@coastal.edu*