Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.
This journal is © The Royal Society of Chemistry 2020

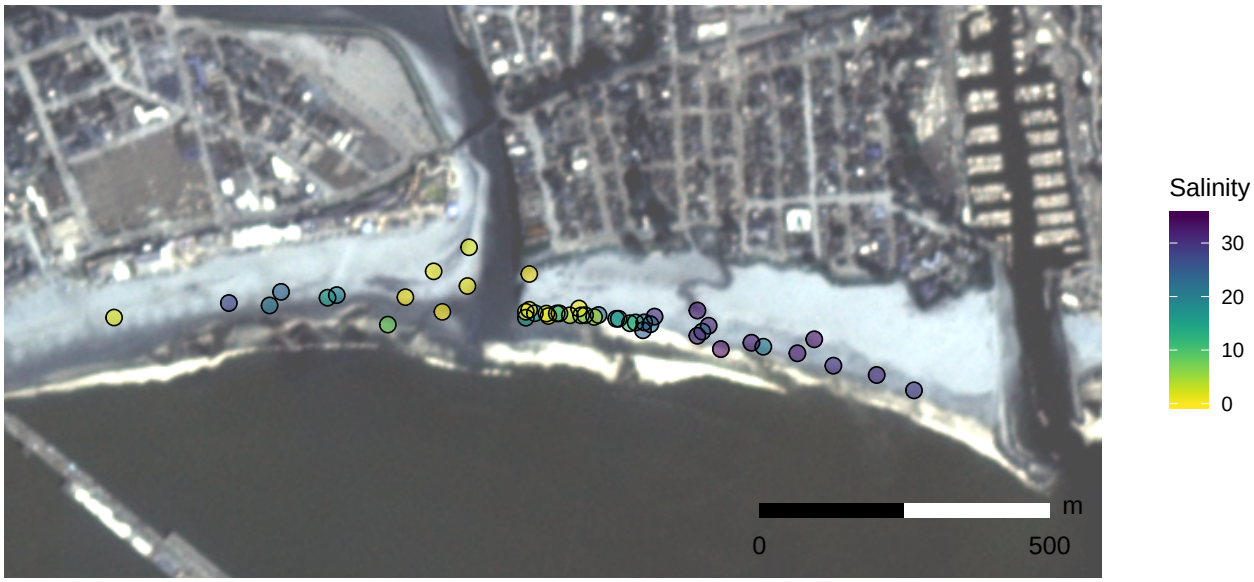
Data Report for Main & Seabright Beaches, Santa Cruz

Stanford Beach Project

3/10/2019 - 3/22/2019

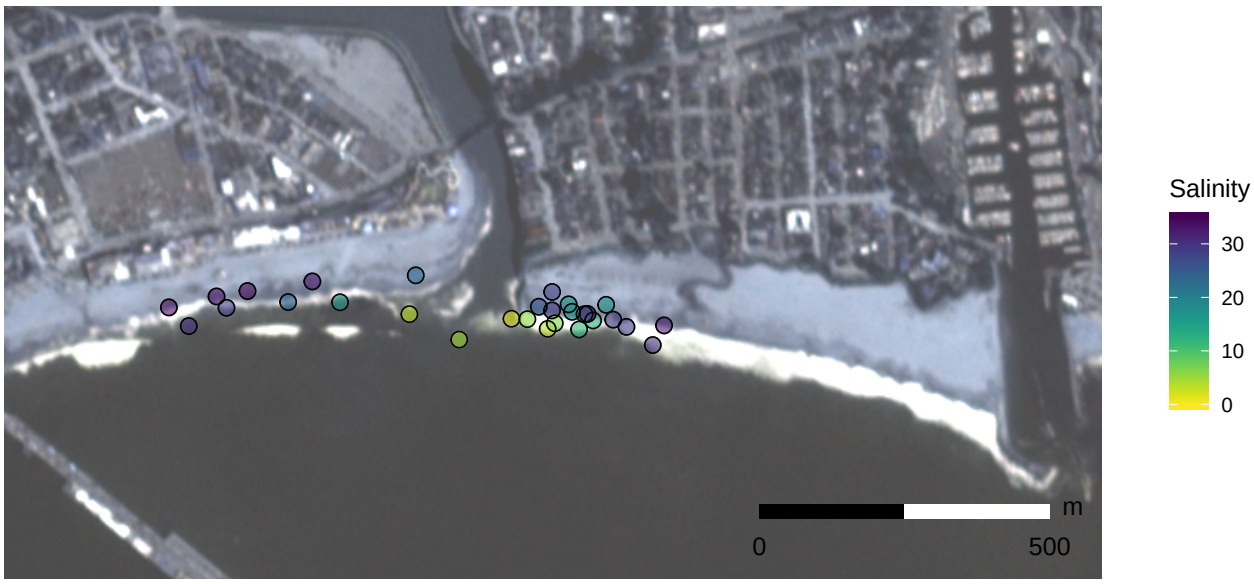
Salinity: Mar 10-16, 2019: relatively low flow conditions

This figure shows salinity measurements made between Mar 10 - 22 by our awesome water quality monitors. Remember that completely freshwater has a salinity near 0 PSU (Practical Salinity Units), while local marine water has a salinity of about 34 PSU. In this figure, you can see that the distance alongshore impacted by freshwater is shorter, at least along Seabright Beach, than in previous weeks when flow was higher.



Salinity: Mar 17-22, 2019: even lower flow conditions

This plot suggests that freshwater is not making it very far in either direction, along Seabright or Main. Welcome to Spring!

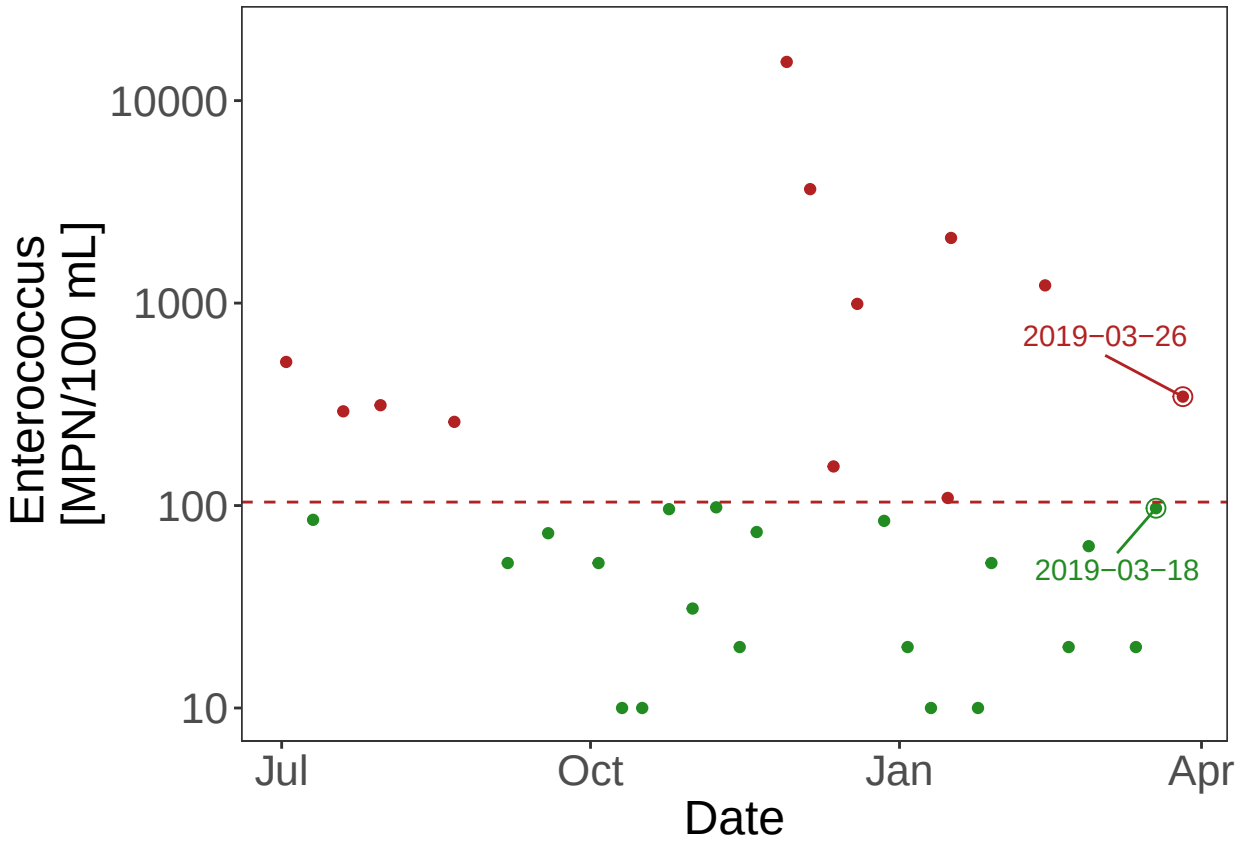


Stuff worth knowing:

- These measurements are calibrated, but they are still preliminary, so there may be a couple funny numbers from time to time.
- We have not yet factored in river flow, tides, currents, or waves. This will get us more nuanced information about the data we observe here.
- This is a satellite image from Planet Labs.

Fecal pollution at San Lorenzo River Mouth

This figure shows the levels of *Enterococcus* measured at San Lorenzo River Mouth by Santa Cruz County each week from July 2018 until the end of March. Each data point is one *Enterococcus* measurement, and the two most recent measurements are labeled. Red points indicate levels higher than the level considered safe for swimming, and green points represent levels considered safe for swimming.

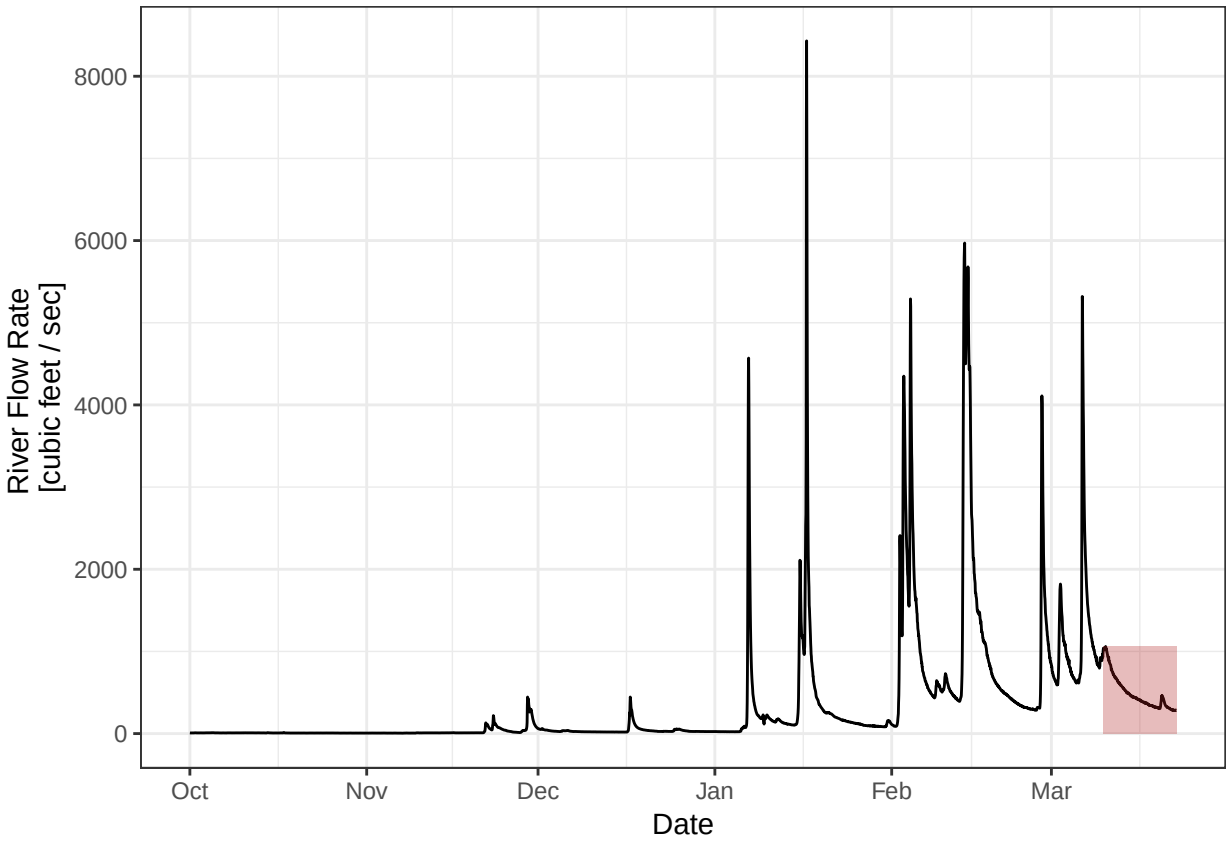


Stuff worth knowing:

- The dashed red line corresponds to 104 MPN/100 mL, which is the threshold for *Enterococcus* used by California to determine the safety of swimming water.
- The *Enterococcus* measured are fecal indicator bacteria (FIB), just like *E. coli*. FIB are used to indicate fecal contamination because feces can carry an array of pathogens that cause illness to humans. However, most enterococci themselves are not pathogens; they merely reside in the guts of healthy warm-blooded animals.
- MPN is a unit commonly used to measure the level of FIB. It stands for Most Probable Number. You can understand it as our best estimate of the number of bacteria in a water sample. MPN/100 mL is our estimate of the number of bacteria in a 100 milliliter water sample. 100 mL is the standard volume used in water quality testing.

River flow conditions

This figure shows freshwater flows near the mouth of San Lorenzo River. Note how much flow changes, spiking after rain events. When flow is higher, we expect that you will detect freshwater in your samples farther from the mouth of the River. We will perform more data analysis to examine this and other relationships.



Stuff worth knowing:

- The red box indicates flow for the period corresponding to the salinity measurements above. Rain was pretty light during these weeks.
- These data are from the US Geological Survey, which has a gage on the River.