

GRB WATER QUALITY DISCUSSIONS

August 11, 2023



GRB SAMPLING SITES



- Water quality samples have been collected at GRB and tested for enterococci (Flag Bacteria) since 2004.
- There are two sites along the main beach (GR-2 & GR-4).
- There is one site each at the mouths of the Little and Batson Rivers (GR-1 & GR-5, respectively) which represent the water quality within each river.

2023 WATER QUALITY TESTING

WHAT HAS CHANGED

- Nothing has changed along the GRB's main beach (GR-2 and GR-4) which comprises the vast majority of GRB's beach area.
 - We are following Maine Healthy Beaches' protocol of sampling twice a week and posting advisories when sample exceed EPA threshold for Flag Bacteria concentrations.
- The waters and river mouths of both the Little and Batson Rivers (GR-1 & GR-5, respectively) have been posted with a permeant water quality advisory. Data collection is continuing at both river mouths.
- Are the two rivers closed to swimming and wading?
 - NO – However, there is a persistent risk of contacting elevated bacteria.
- Are there times when the risk of contacting elevated bacteria are less than others?
 - YES – Low rainfall in past 48 hours, more than 3 hours from low tide, and during low tidal throws.

WHAT TYPES OF BACTERIA ARE WE TESTING FOR?

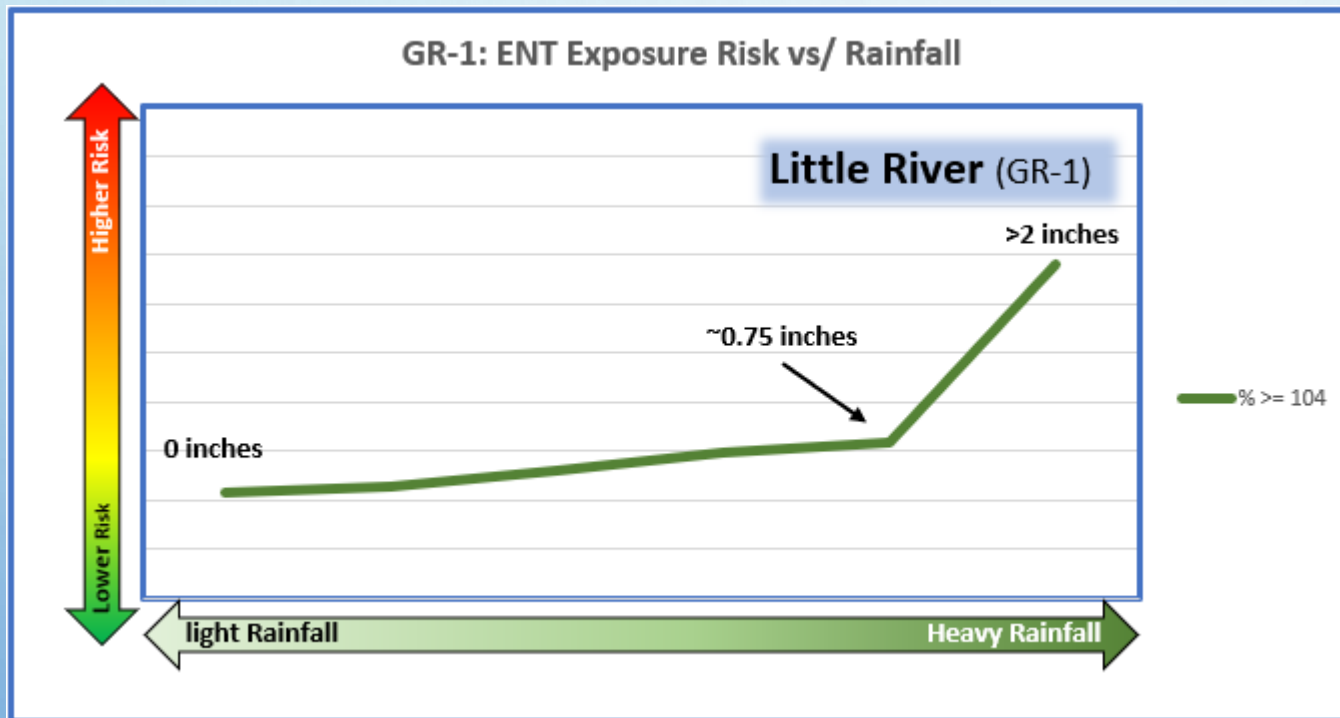
- We are testing for enterococcus bacteria – the EPA suggested “Flag Bacteria”
- Elevated levels of Flag Bacteria indicates the potential presence of other human-borne bacteria and viruses that are known to present human health risks.
- Elevated levels of Flag Bacteria are NOT conclusive evidence of a septic or sewage issues.
 - All warm-blooded animals have Flag Bacteria in their intestinal tracts.
 - Flag Bacteria is known to spontaneously multiply in saltmarshes, as well as decaying seaweed.
- At GRB, over the past 5 years, DNA testing has shown that the persistent levels of Flag Bacteria are from seagulls, small mammals (ruminants) and dogs – Not from septic or sewage leakage.
- If there were no septic tanks surrounding our saltmarshes, the levels of Flag Bacteria would remain largely unchanged.

HOW ARE WE TESTING FOR ANY POTENTIAL SEPTIC AND/OR SEWAGE ISSUES?

- The Town has begun sampling both the Little and Batson River mouths for the presence of human-sourced bacteria.
 - Sampling is performed every two weeks, with a 3-day turnaround time.
 - Results are immediately posted on the Town website.
 - When/If persistent human-source is detected, a prescribed testing routine moves upstream to locate the source.
- So far this summer:
 - Human-source was detected during the heavy rains in June and July, triggering upstream testing of the Little River in July.
 - After the rains ceased, the human-source dropped to zero in both rivers— assumption is that the source was further up in the larger watershed and washed down with the heavy rains.
 - Testing Continues...

WHEN IS THE RISK OF CONTACTING ELEVATED BACTERIA LOADS THE LEAST?

- When there has been less than 0.5 inches of rain in the past 48 hours.



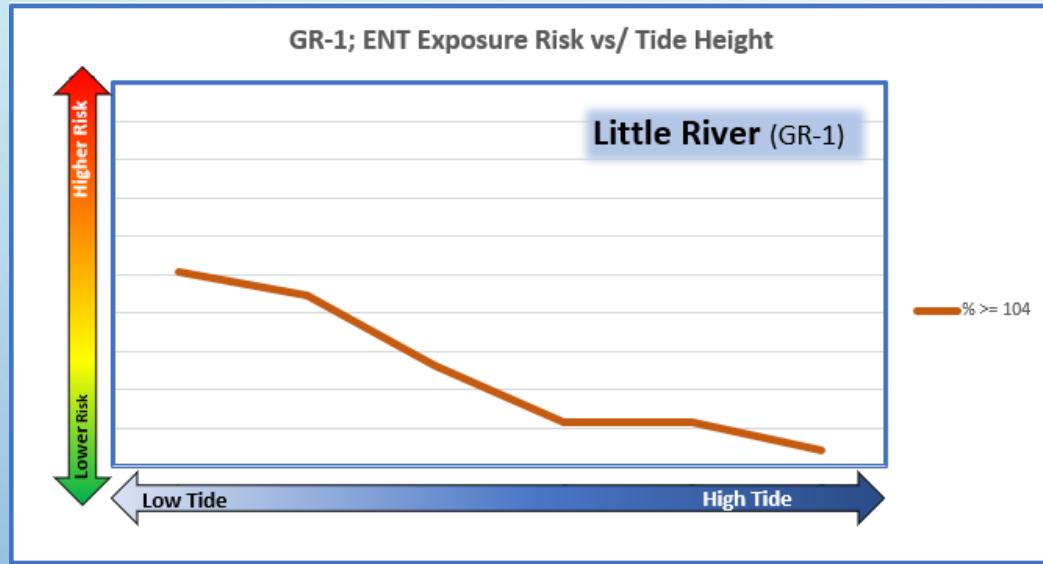
The risk of coming in contact with elevated bacteria levels increases markedly after 0.5 to 1.0 inches of rain over the past 48 hours.

Therefore, the least risk of contact is when rainfall has been less than 0.5 inches over the past 48 hours.

(The above relationship between enterococcus (ENT) exposure risk and rainfall is based on data collected at GR-1 over a 20-year period.)

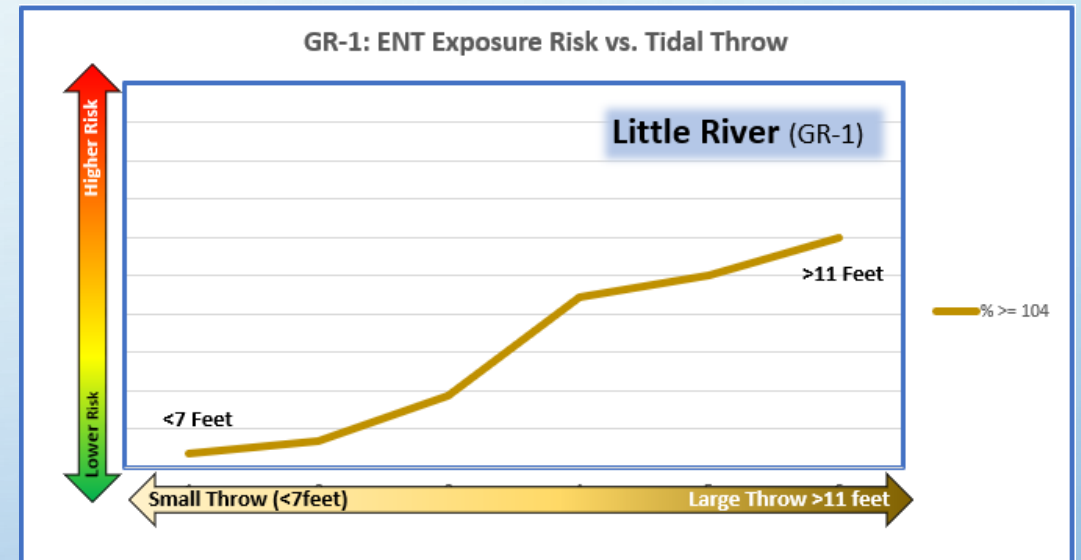
OK... THERE'S BEEN LESS THAN ½ INCH RAINFALL OVER THE PAST 48 HOURS. ANYTHING ELSE?

- Avoid swimming at or near low tide.



The risk of coming in contact with elevated bacteria levels increases markedly as tide approaches low. Less risk at higher tides.

- Avoid swimming during high tidal throws.

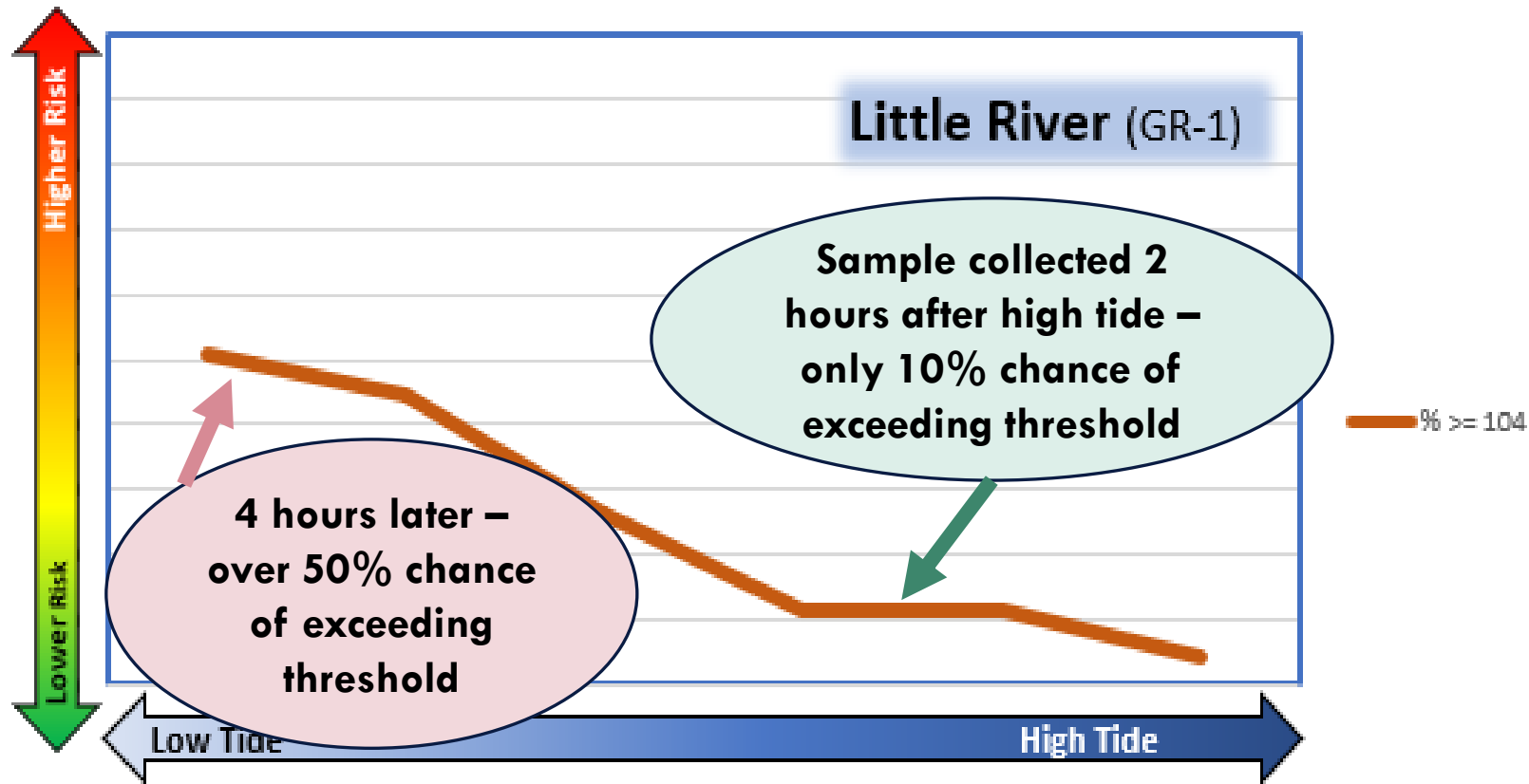


The risk increases markedly with tidal throw (difference between low and high tide) – e.g. full and new moon tides. Less throw means less risk.

(The above relationships between enterococcus (ENT) exposure risk and tide height and throw are based on data collected at GR-1 over a 20-year period.)

WHY ARE THE RIVERS UNDER A PERMANENT WARNING OF BACTERIA RISK?

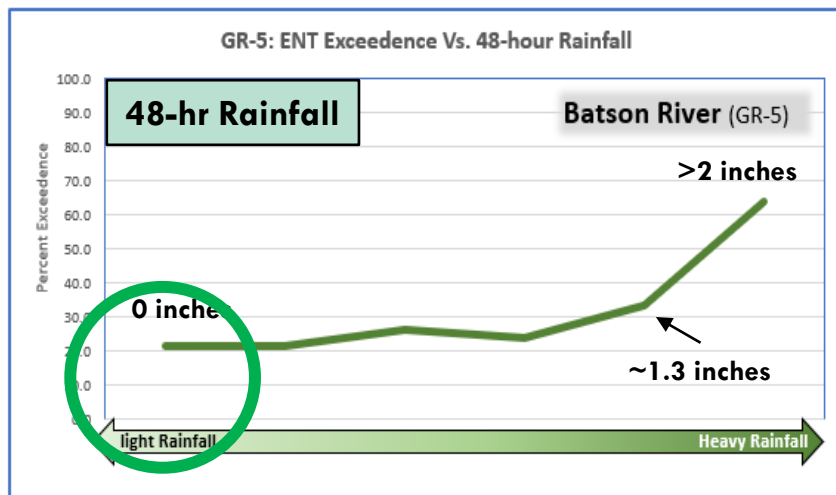
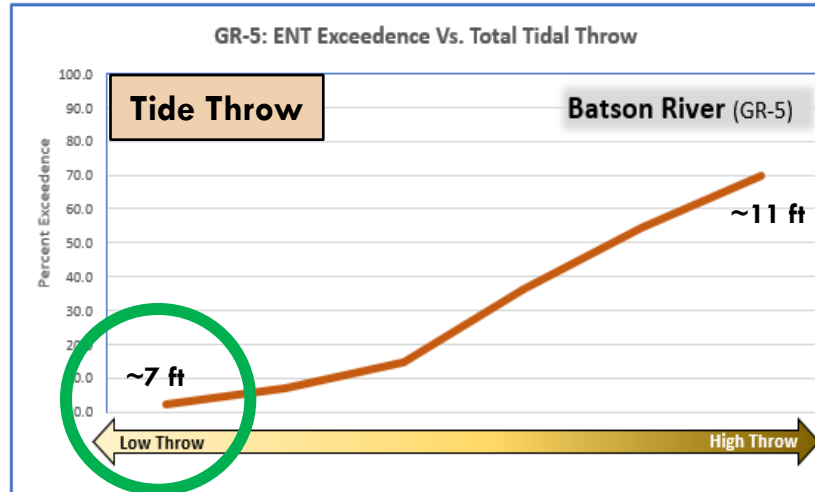
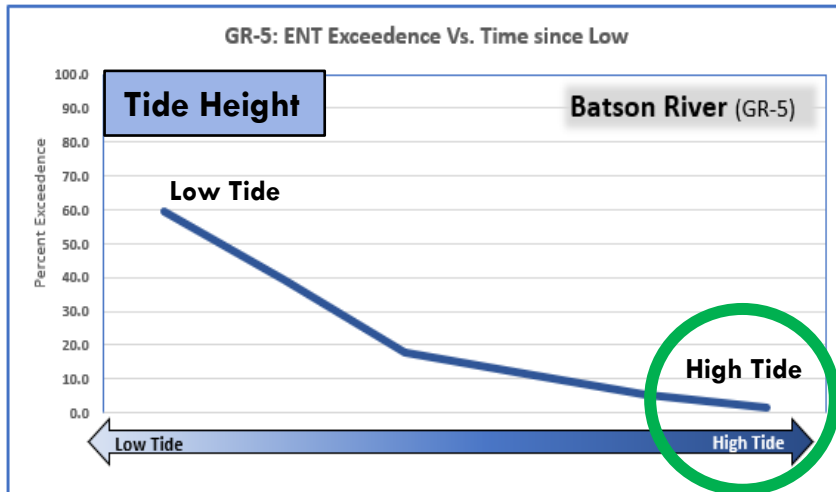
GR-1; ENT Exposure Risk vs/ Tide Height



(The above relationship between enterococcus (ENT) exposure risk and tide height is based on data collected at GR-1 over a 20-year period.)

- Due to logistical restrictions, water quality samples are always collected in the early AM. Therefore, the tide height during sampling is always changing.
- A false sense of security can occur because...
 - A sample collected 2 hours after high tide has only a 10% chance of exceeding the EPA threshold for enterococcus.
 - However, 4 hours later, at low tide, the exposure risk at the same location is over 50%.

LEAST POTENTIAL FOR CONTACT WITH FLAG BACTERIA AT GRB

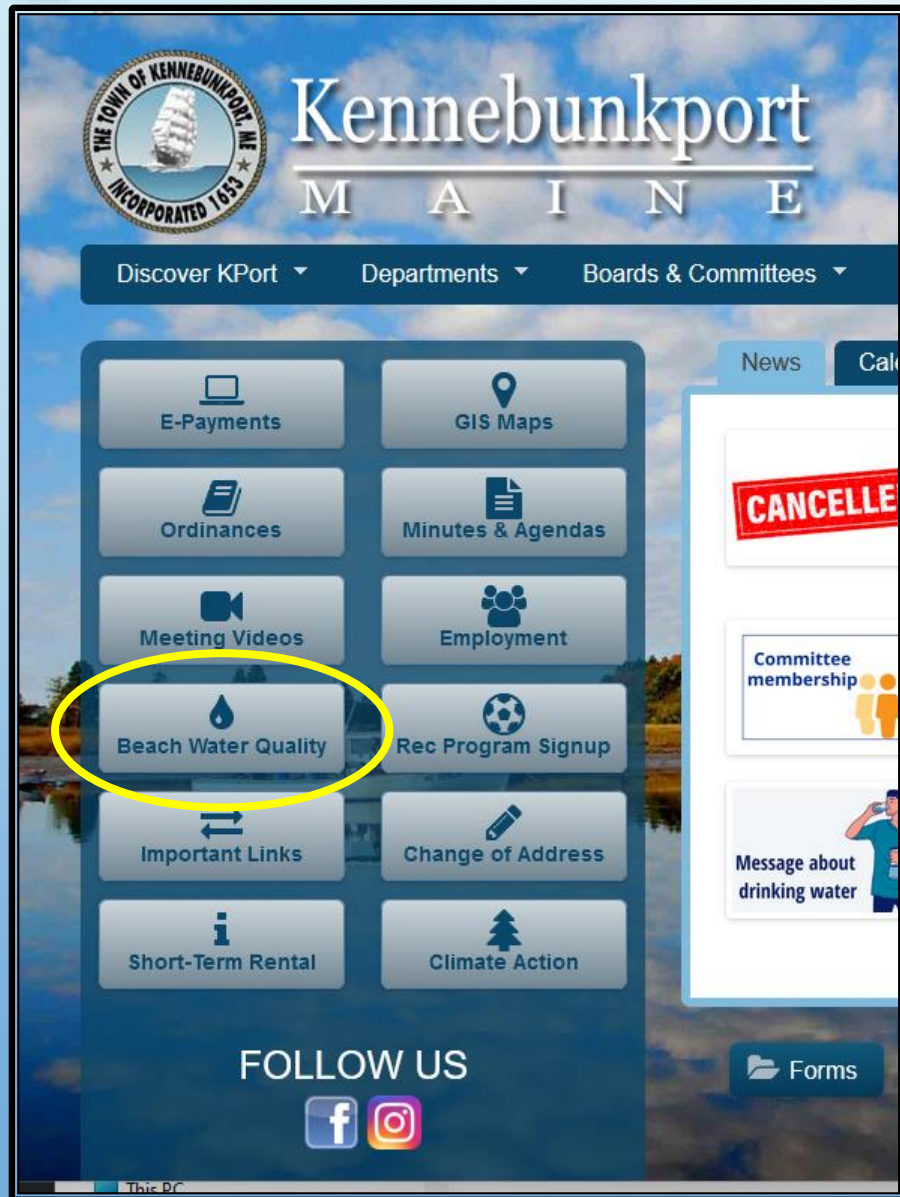


Both Tide and Rain
Tightly Control Bacteria
Concentrations – least
chance for exposure to
elevated bacteria loads
indicated by green circles

The potential for contact with Flag Bacteria within the rivers decreases with:

- Higher tide depths,
- Smaller tidal throws (difference between low and high tide depths), and
- Less than 0.5 inches of rain in the past 48 hours.

GRB WATER QUALITY INFORMATION



- Water Quality information is hyperlinked directly from the home page.
- Both the Maine Beach and Tidal River results and processes are clearly linked on the Water Quality page.

