New Microbial Source Tracking Markers & Rapid Testing on Grand Traverse Beaches

Sarah U'Ren

The Watershed Center

Maggie Petersen

Great Lakes Environmental Center



TWC's Beach Monitoring Program

- Started 2001 (25 years!)
- Test for *E.coli* bacteria during summer months
- Benzie, Leelanau, GT Counties
- Results weekly in EGLE BeachGuard

Elevated levels pose threat to public health and cause illness

Indicates fecal contamination is present at the beach



TWC's Beach Monitoring Program

- Added Microbial Source Tracking in 2022

- MST Markers – looking for genetic material from bacteria specific to animal hosts
  - Human
  - Cow
  - Pig
  - Canine
  - Gull

To reduce the threats to public health due to elevated bacteria levels, it is essential to know the source of bacterial contamination so proper steps can be taken to lower the inputs.











MST Results 2022-2025

- Historically focused on human, domestic, and agricultural sources
- Gull and Canine (can include fox) have been main sources found

Percent of Samples with Presence of MST Marker

	2022	2023	2024	2025
Gull	95%	89%	74%	75%
Canine	80%	13%	16%	7%
Human (*B.theta*)	30%	0%	0%	0%
Human (HF183)	n/a	3%	10%	14%
Cow	5%	0%	10%	0%
Pig	40%	3%	20%	0%
Total Samples Tested	*20*	*38*	*19*	*29*

MST Results - 2026

- Dropped Pig and Cow markers – ag sources not influencing
- Added:
  - Waterfowl (general)
  - Canada Geese
  - Racoon



Percent of Samples with Presence of MST Marker

	2026
Gull	56%
Canine	50%
Human (*B.theta*)	0%
Human (HF183)	17%
Waterfowl (general)	11%
Canada Goose	19%
Racoon	25%
Total Samples Tested	*36*

NEW!

**Human marker detected in 6 samples*

New Rapid Method Pilot Project - BactiQuick



What is BactiQuick?

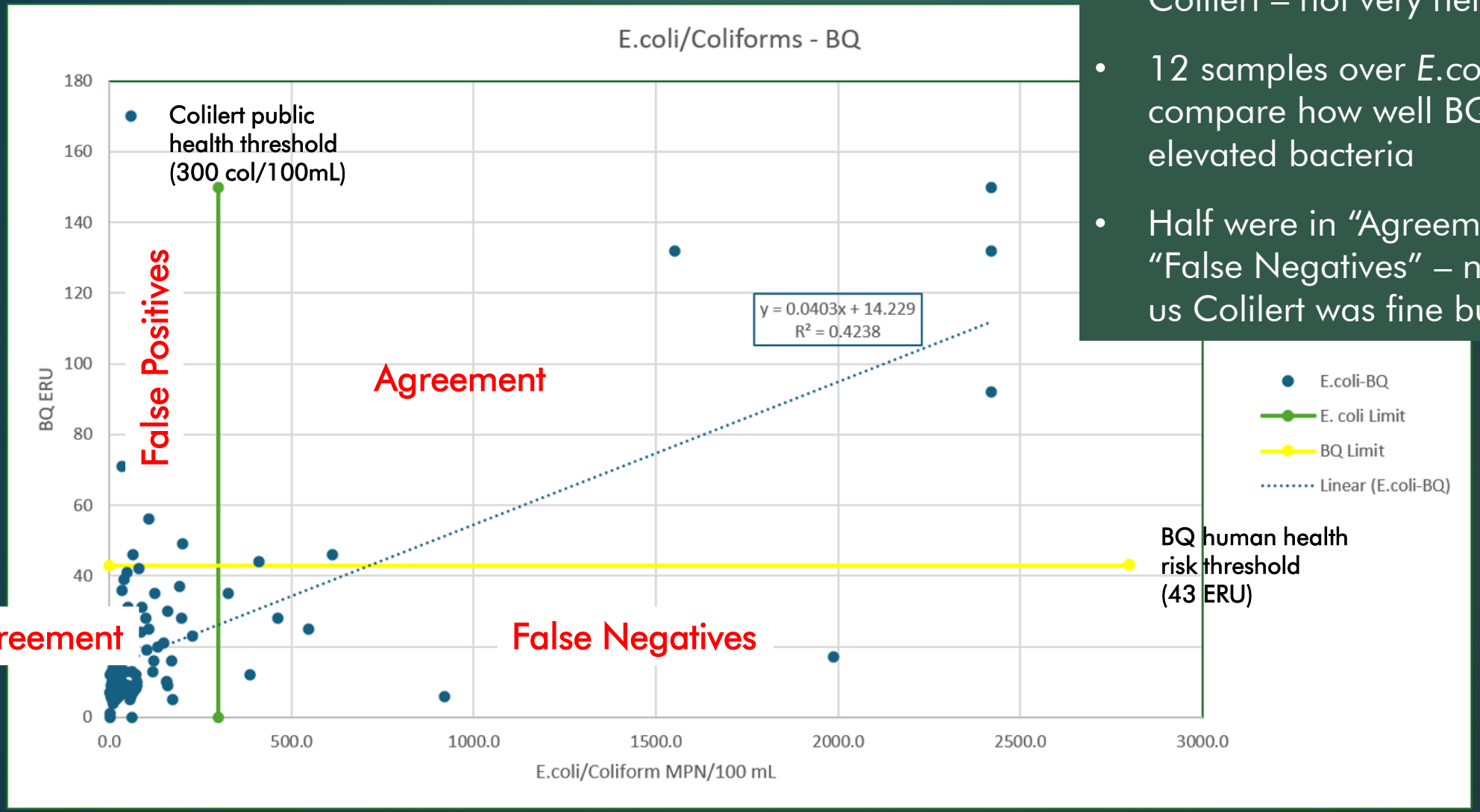
- 15-minute rapid test
- Can be done in field
- Detects **endotoxin** produced by all gram-negative bacteria (like *E. coli)*
- Doesn't give *E.coli* result, but can be used as a screening tool
- Elevated BQ would indicate beach needs to be tested for numerical *E.coli* result for potential advisory

Pilot project:

- Side by side testing of BactiQuick vs. regular beach monitoring using Colilert
- 7 Traverse City beaches
- Compare results - Did elevated BQ correlate with elevated Colilert?

New Rapid Method Pilot Project - BactiQuick

- Most samples were low BQ and low Colilert – not very helpful for comparison
- 12 samples over *E.coli* threshold to compare how well BQ can predict elevated bacteria
- Half were in "Agreement", but half were "False Negatives" – not ideal, BQ telling us Colilert was fine but it wasn't



Next Steps

Source Tracking

- ✓ Continue field validation of new markers
- ✓ Compare sanitary survey data with MST results to confirm/support source tracking
- ✓ Recommendations:
  - Continue raccoon and Canada Goose
  - Reconsider general avian

BactiQuick

- ✓ 2026 was a relatively low *E. Coli* summer, limiting the dataset
- ✓ Several MI labs also conducted these side-by-side studies
  - Working now to compare state-wide data
- ✓ Cost assessment necessary to determine utility
- ✓ May need to lower BactiQuick threshold to avoid false negatives

Thank you!

Visit GLEC at their Booth

Please feel free to reach out:

Maggie Petersen
mpetersen@glec.com
(231) 941-2230 ext. 114

www.glec.com



For More Information on TWC's Healthy Beaches Monitoring Program:

www.gtbay.org/healthy-beaches/

www.gtbay.org/healthy-beaches/bacteria-source-tracking/