



Rally for Barnegat Bay

Project
Update

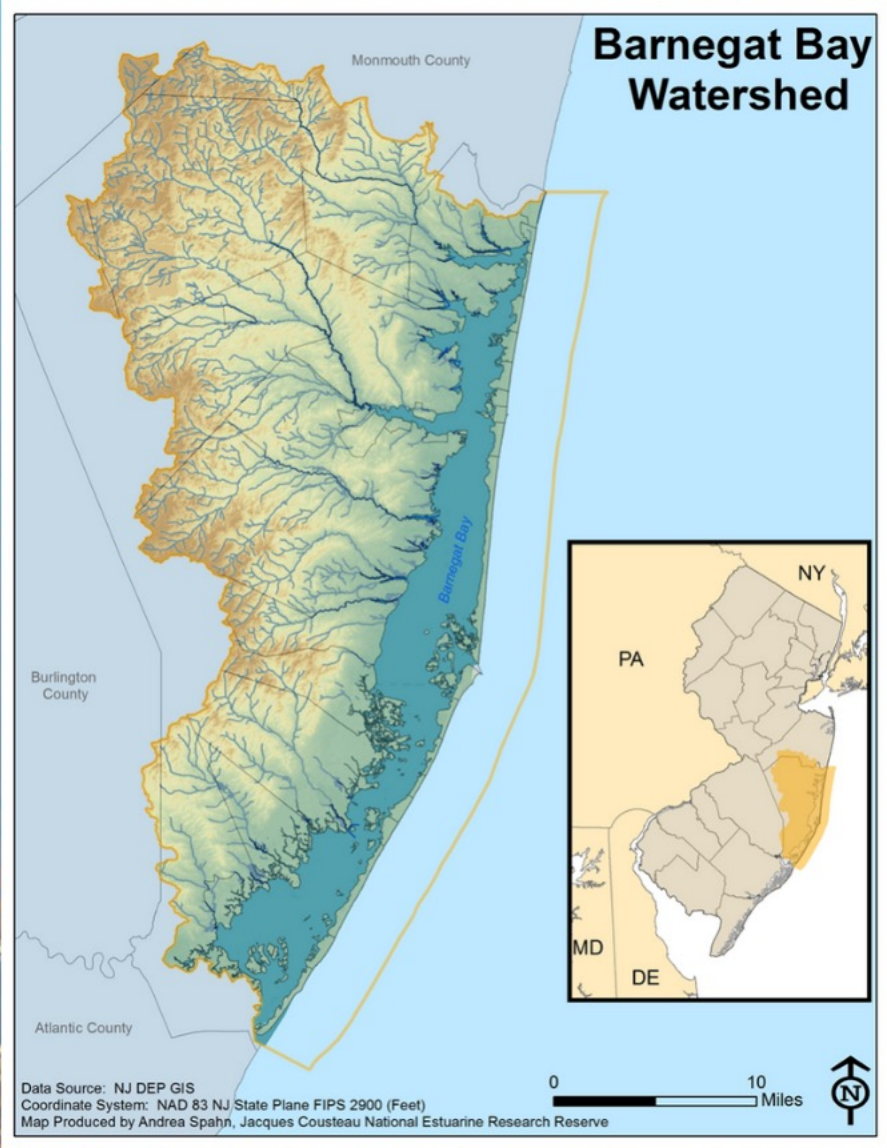


Rally for Barnegat Bay

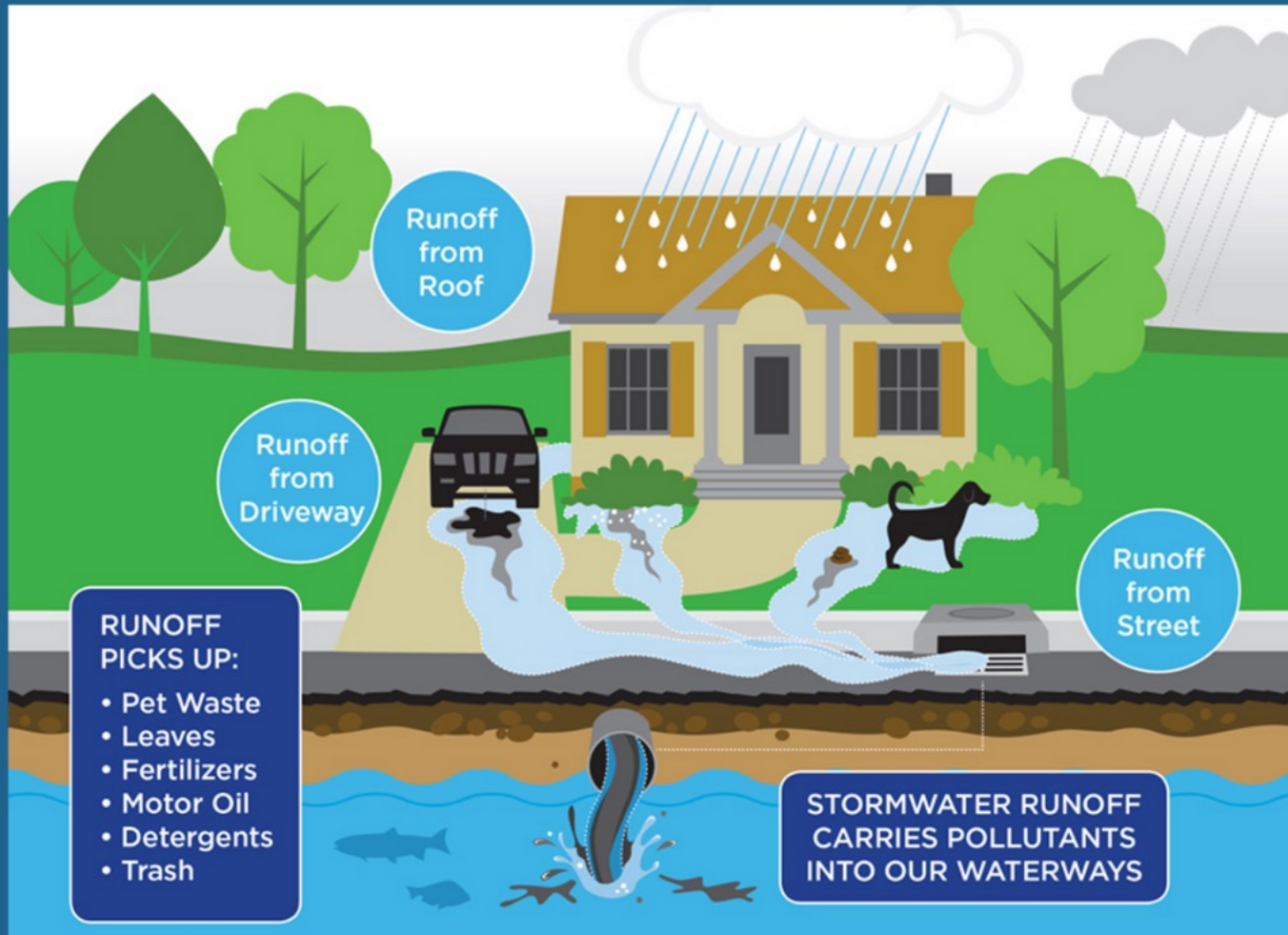


Image Source: New Jersey Yards

WATERSHED: LAND AREA THAT DRAINS INTO A COMMON BODY OF WATER

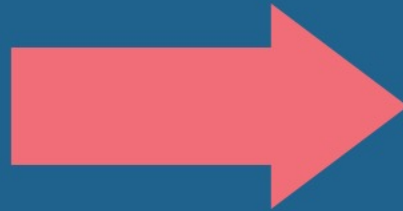


Non-point source pollution, stormwater runoff, and upstream human activities contribute to the **routine decline in water quality** in the Barnegat Bay watershed.



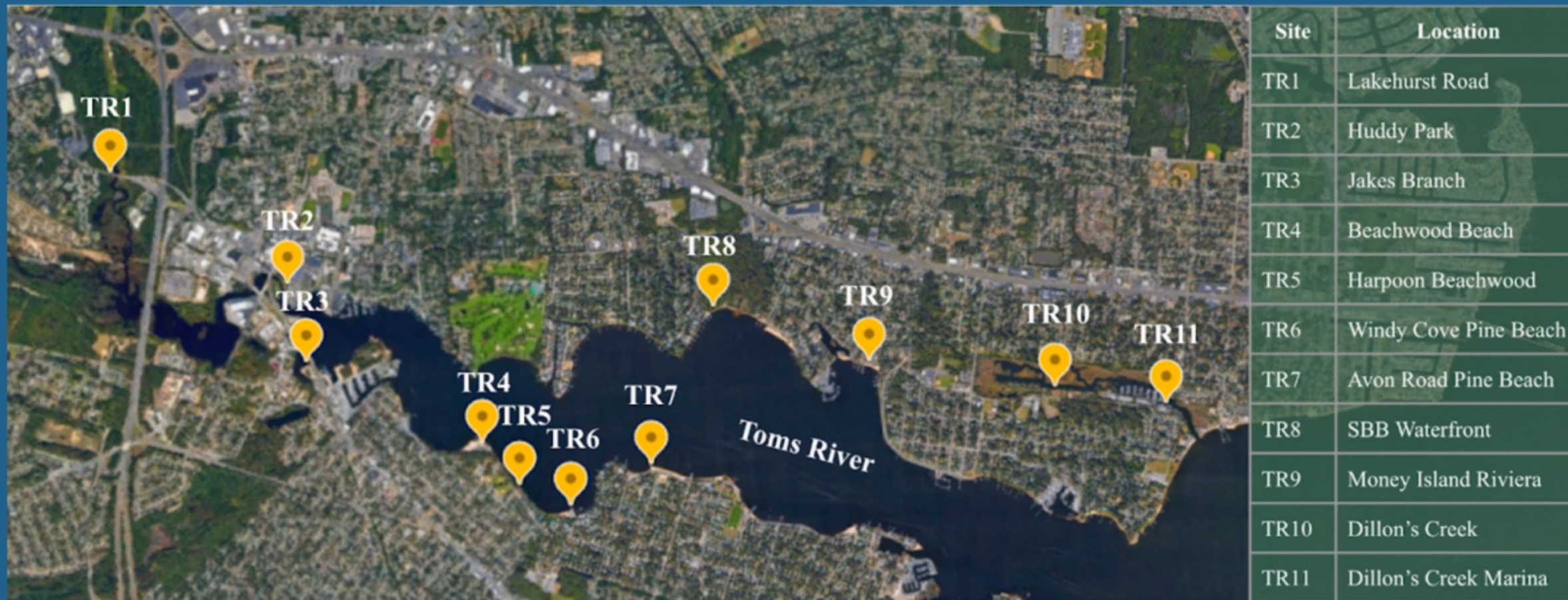
Nonpoint source pollution: diffuse contamination (or pollution) of water or air that does not originate from a single discrete source.

Many areas within the watershed that do not meet the designated use assessment. The Toms River Estuary which does not support: general aquatic life, recreation, shellfish and fish consumption. **These waters also routinely do not meet the standards for bacteria quality for recreational use.**

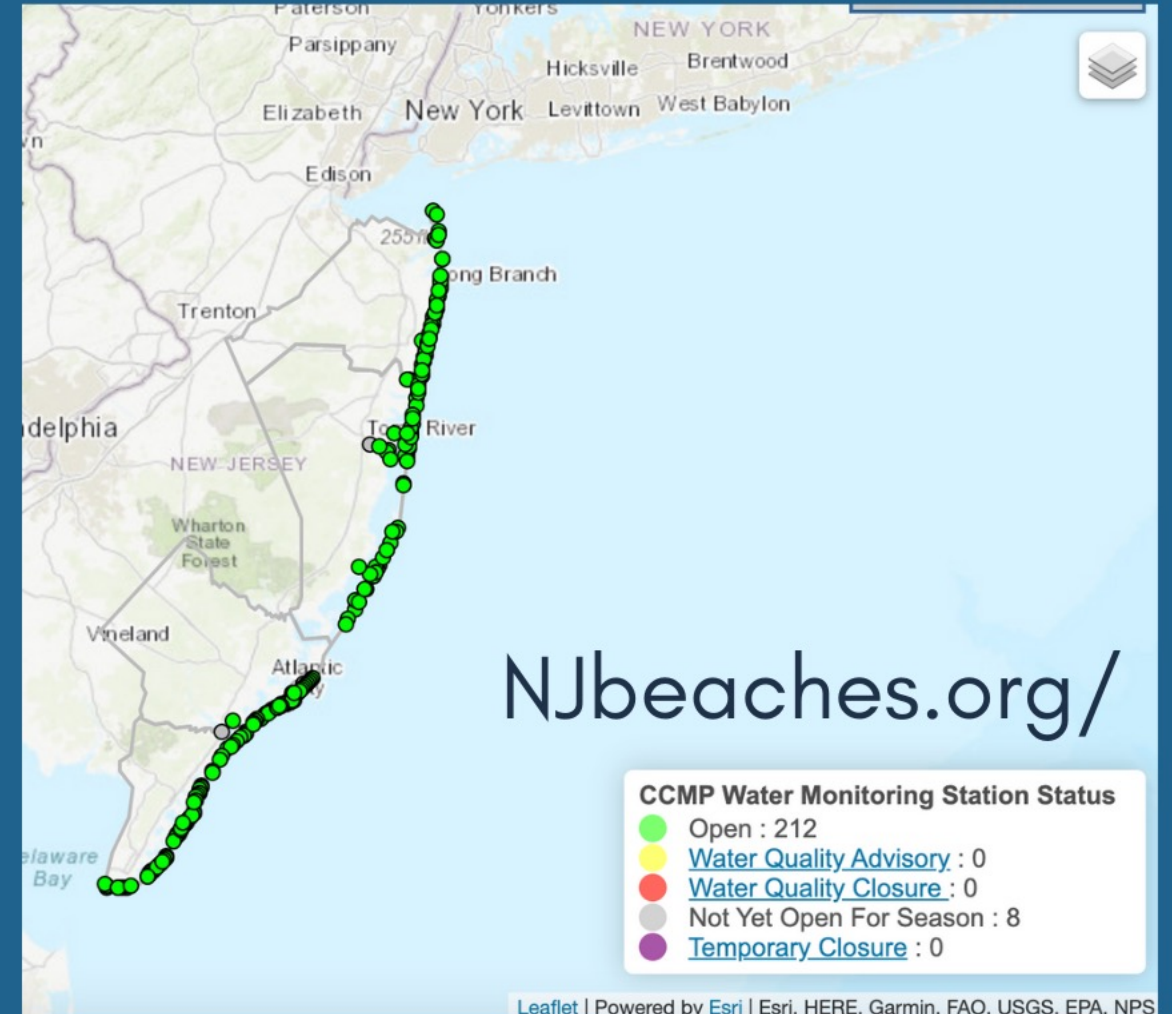


Assessment Unit Number	Assessment Unit Name	Aquatic Life - General	Recreation	Shellfish	Fish Consumption
Barnegat Bay 01	Point Pleasant Canal and Bay Head Harbor	Insufficient Data	Insufficient Data	Not Supporting	Insufficient Data
Barnegat Bay 02	Metedeconk R Estuary	Insufficient Data	Not Supporting	Not Supporting	Insufficient Data
Barnegat Bay 03	Metedeconk and Lower Tribs - Bay	Not Supporting	Fully Supporting	Not Supporting	Insufficient Data
Barnegat Bay 04	Toms R Estuary	Not Supporting	Not Supporting	Not Supporting	Not Supporting
Barnegat Bay 05	Barnegat Bay Central West	Not Supporting	Fully Supporting	Fully Supporting	Insufficient Data
Barnegat Bay 06	Barnegat Bay Central East	Insufficient Data	Fully Supporting	Fully Supporting	Insufficient Data
Barnegat Bay 07	Barnegat Bay Central Bottom	Insufficient Data	Fully Supporting	Fully Supporting	Insufficient Data
Barnegat Bay 08	Manahawkan Bay and Upper Little Egg Harbor	Not Supporting	Fully Supporting	Fully Supporting	Insufficient Data
Barnegat Bay 09	Lower Little Egg Harbor Bay	Not Supporting	Fully Supporting	Fully Supporting	Insufficient Data

Municipal Roundtable of River Towns: Toms River, South Toms River, Ocean Gate, Island Heights, Pine Beach, and Beachwood



Beach Closure Data

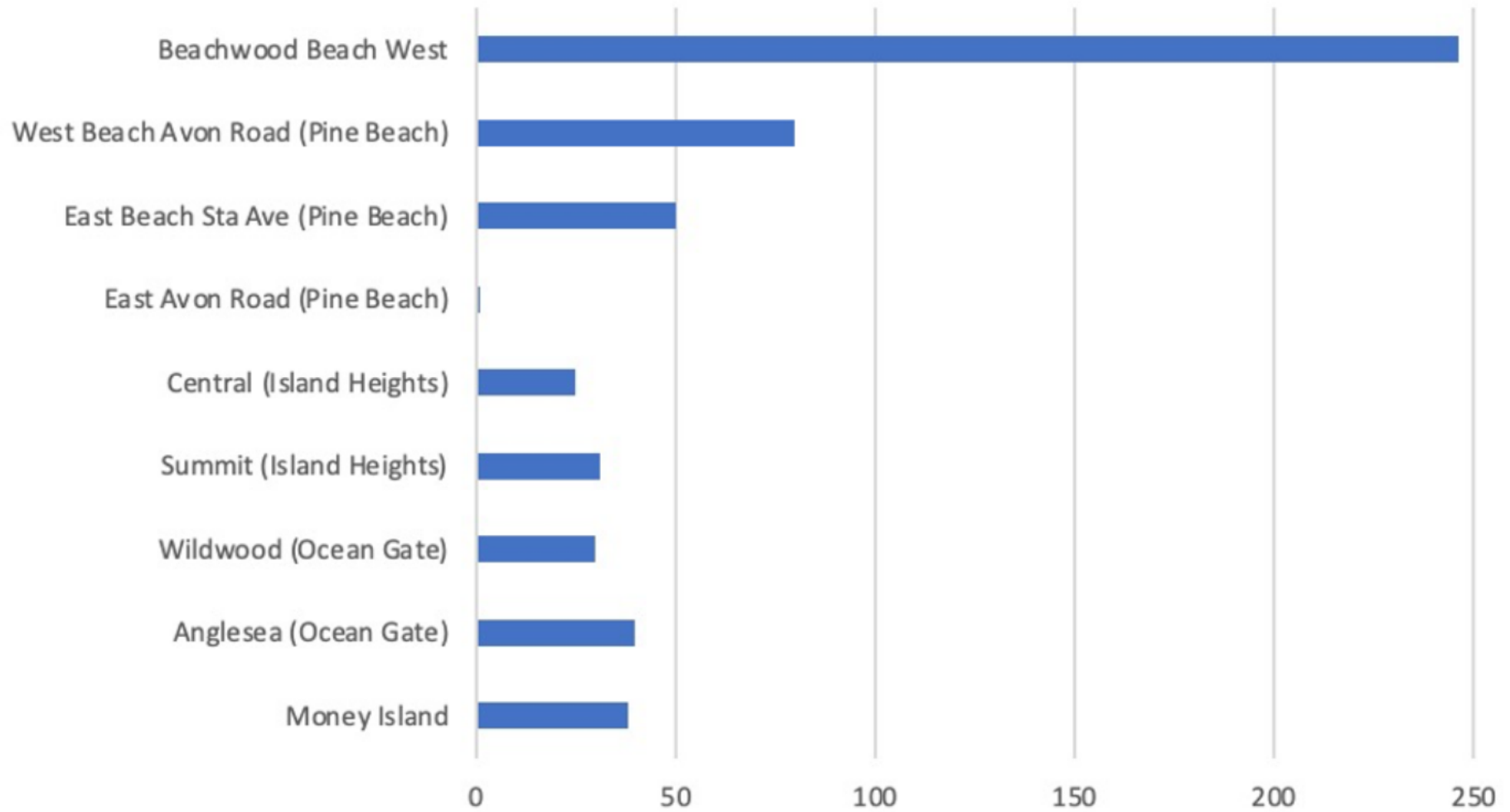


Weekly updates with NJDEP data on COA social media

Instagram: @CleanOceanAction

Facebook: www.facebook.com/CleanOceanAction Twitter: www.twitter.com/CleanOcean

Exceedances summary 2005-2020



OBJECTIVE ONE: ESTABLISHING THE FRAMEWORK FOR SUCCESS

Timeline: November 2020–ongoing

Outcomes:

- Compiled summary report on water quality in the Toms River
- Established strategy for source trackdown investigation
- Submitted Quality Assurance Project Plan (QAPP) to NJDEP for approval
- Engaged municipal leaders and established Municipal Round Table
- Public outreach and engagement



OBJECTIVE TWO: TRACK DOWN SOURCES OF SANITARY SEWAGE

Timeline: August 2021-ongoing

Tasks and Anticipated Outcomes:

- Engage screening methods, canine field investigations, and analytical verification to identify potential sources of human sanitary sewage
- Results shared in December 2021
 - Outcome: Prioritized list of “hot spot” areas for further investigation and monitoring



We are here!



Conduct monitoring of hot spots for fecal indicator bacteria and water quality conditions

- Conducted by COA, MATES, and trained citizen scientists
- Outcome: Better understanding of variables influencing bacteria levels at hot spot areas

Collaborate with municipalities to investigate infrastructure in hot spot areas

- Funding available: \$60,000 total; \$10,000 for each town
- Outcome: Causes of sanitary sewage sources identified

OBJECTIVE THREE: ELIMINATION OF SANITARY SEWAGE SOURCES THROUGH MINI-GRANTS

Timeline: January 2022–ongoing

Tasks and Anticipated Outcomes

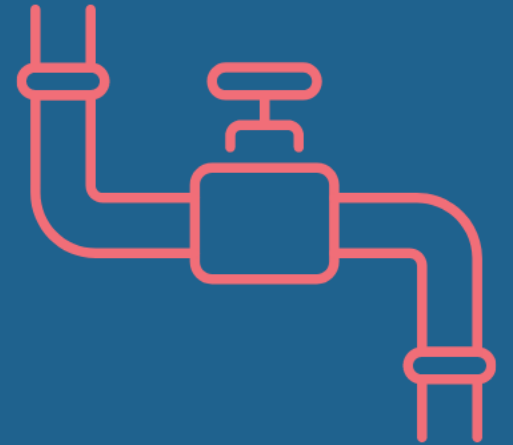
- Provide mini-grants to municipalities for elimination of sanitary sewage sources
- Process for application will be established, including criteria and reporting
- Funding available: \$180,000 total; \$30,000 for each town
- Outcome: Sanitary sewage sources eliminated

Once fixes are completed, confirm elimination of sources with water quality monitoring

- **Outcome:** Water quality results show reductions in bacteria levels as a result of fixes

Prepare a detailed report on the activities and findings of the project

- **Outcome:** Report submitted to NJDEP; citizen-friendly public document produced and shared



Student Grant Program Data



Project Rally: Water Quality Analysis of the Toms River

Luis Arias, Rory Hogan, Julia Keiser & Lana Van Note



Introduction

- The Toms River is a 7.86 km² river that is mainly estuarine, marine deepwater and riverine wetland habitat (USGS, US FWS, 2021).
- These wetland habitats provide ecosystem services such as habitat for wildlife, flood protection, natural water quality improvement and local recreation opportunities and therefore, it is crucial to protect it (US EPA).
- The Toms River has suffered from pollution such as Ciba-Geigy chemical dumping and beach closures from high levels of fecal coliform (US EPA, Petenko, 2018).
- This SBB study, in coalition with MATES, COA and NJDEP, aims to find and fix current pathogen sources to protect the Toms River and surrounding waterways.

Table 1: Site abbreviations and locations of the study (Figure 1) along the Toms River.

Site	Location
TR1	Lakehurst Road Winding River Overpass, Toms River
TR2	Hudly Park, Toms River
TR3	Jake's Branch, Route 9, South Toms River
TR4	Beachwood Beach
TR5	Harpoon Street, Beachwood
TR6	Windy Cove Park, Pine Beach
TR7	Avon Road Waterfront, Pine Beach
TR8	Save Barnegat Bay, Cedar Road, Toms River
TR9	Riviera, Money Island, Toms River
TR10	Dillon's Creek, Island Heights
TR11	Dillon's Creek Marina, Island Heights

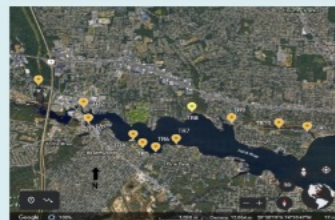


Figure 1: Map of sites TR1-TR11, starting from the west side of Route 9 to Island Heights (east).



Figure 2: Image of sampling site TR4, Beachwood Beach, NJ.

Objective

Collect and analyze water quality data at eleven sites located along the mouth of the Toms River in an effort to identify and remediate pathogen sources that harm the Toms River and subsequent waterways.

Methods

Study Sites:

- Sampling occurred at eleven sites on the Toms River in 6 different towns (Figure 1). Sampling took place between June 7 and July 27, 2021 on Mondays and Tuesdays between 7:30 A.M. and 9:00 A.M. Sites were labelled TR1-11 from the west side of Route 9 to Island Heights on the east side (Table 1).

Field Protocol:

- A YSI 556 handheld meter was used at each location to record physical parameters. Water bottles and WhirlPak sample bags were used to collect water using a sterilized sampling pole. All samples were transported in a cooler with ice packs to maintain approximately 4 degrees C.

Laboratory Protocol:

- Turbidity and chlorophyll were measured using an Aquafloor handheld meter. pH was measured using an Oakton pH 5 meter. Total Suspended Solids (TSS) was measured using quantitative filter paper through a vacuum filter method.
- Bacterial testing was conducted using the Coliscan Easylog and Enterolert methods.

Statistical Analysis:

- One-factor ANOVA tests were conducted for tidal cycles, wind, and July 5 results. Pearson correlation coefficients were calculated for chlorophyll and TSS values in relation to Coliscan results.

Results

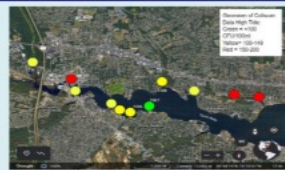


Figure 3: Heat map of Coliscan geometric means by sample site. Legend indicates ranges of CFU/100ml, and color representation.

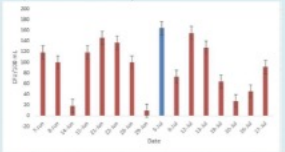


Figure 4: Column chart displaying mean daily Coliscan values (CFU/100ml) for July 5, 2021 is highlighted in blue.

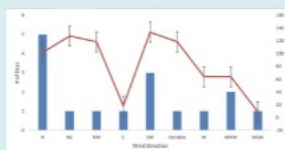


Figure 5: Plot showing number of days (blue) and mean Coliscan value (red) by prevailing wind direction. NW winds have the highest frequency and SW winds have the highest average Coliscan values.

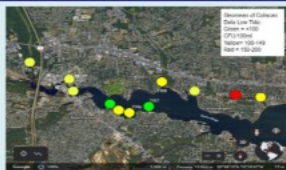


Figure 6: Heat map of Coliscan geometric means by sample site. Legend indicates ranges of CFU/100ml, and color representation.



Figure 6: Two sampling dates received rainfall within 24 hours prior to sampling, indicated by dark blue highlight.

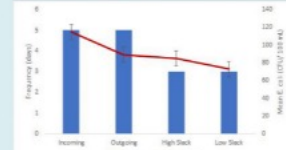


Figure 8: No significant difference was found among the mean E. coli values for all sampling sites of varying tidal phases (p > 0.05, p = 0.5458).

Discussion

- TR10 and TR11 had highest geometric mean for Coliscan data (Figure 11).
- 6 of 11 sites exceed safe E. coli standard of 200 CFU/100ml during sampling period.
- Sites TR2, TR10, and TR11 exceeded safe limits most frequently.
- Tides and the July 5 holiday have no statistically significant impact on Coliscan values (Figures 5 and 8)
- Coliscan values tend to increase directly after a rainfall event as a result of run-off (Figure 6).
- Wind shows no statistically significant impact on Coliscan, which is not expected (Smith et al., 1999) (Figure 7).
- Chlorophyll & TSS are weakly correlated with Coliscan results, which is not expected (Ansa et al., 2011; Irvine et al., 2002).



Figure 9: Test result from Enterolert test. A cell is considered positive for E. coli if a blue glow is produced under a blacklight.

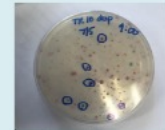


Figure 10: Test result from a TR10 sample on July 5, 2021 using the Coliscan Easylog method. Blue color indicates E. coli (circled above).

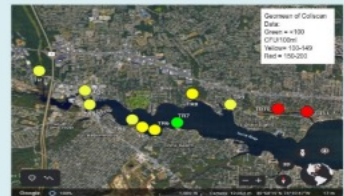


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Acknowledgements

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References

Abad, R. L., Laflamme, R. L., Smith, J. A., & Smith, J. L. (2015). The use of a novel method to assess the impact of a coastal aquifer on a coastal aquifer. *Estuarine, Coastal and Shelf Science*, 153, 1-11.

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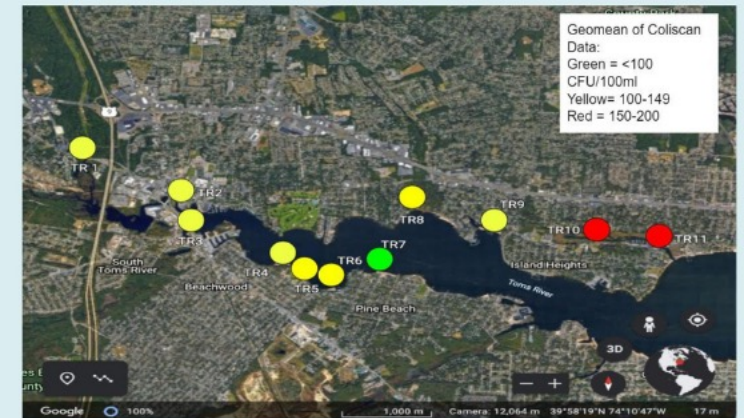


Figure 11: Heat map of Coliscan geometric means by sample site. Legend indicates ranges of CFU/100mL and color representation.

Student Grant Program





*Empowering the next
generation of
scientists since 2007*

Community Science Water Sampling



Team of local volunteers looking to help out and learn more about water quality in their communities

Next training: June 28th @ 1-3PM

Contact:
Programs@CleanOceanAction.org

Calling all adventurers! We are attempting to break a world record of most canoes/kayaks in a parade.

Register at
RaceForum.com/PaddleForTheBay

PADDLE FOR THE BAY

When: Saturday August 20th - 8:00 AM
(Rain or Shine)

Where : Pine Beach, NJ - Start is at Avon Avenue Beach
(You need not launch here, but must paddle to this beach for boat number and wristbands)

How Much: \$10.00 registration fee per boat





This project is funded by a Non-point Source (NPS) Water Quality Restoration and Federal 319(h) grant awarded by the New Jersey Department of Environmental Protection to address pathogen pollution in the Barnegat Bay Watershed.