

**Southern Barnegat Bay Watershed Restoration Plan
Stakeholder Advisory Committee
Meeting 4**

Friday, December 2, 2022
1 – 2:30 pm

Meeting Notes

Attendees:

Project Team	
Lisa Auermuller	Jacques Cousteau Reserve
Amanda Archer	Jacques Cousteau Reserve
Rick Lathrop	Rutgers University
Subhasis Giri	Rutgers University
Kate Douthat	Rutgers University
Zhiming Zhang	Stevens Institute of Technology
Dibyendu Sarkar	Stevens Institute of Technology
Zeyuan Qiu	NJIT
Wenkong Feng	NJIT

Advisory Committee	
Kristin Adams	NRCS/OCSCD
Brittany Moore	Ocean County Soil Conservation District
Allison Iannaccone	Stafford Township
Matthew von der Hayden	Stafford Township
Ceili Pestalozzi	Barnegat Bay Partnership
Jim Vasslides	Barnegat Bay Partnership
Karen Argenti	Save Barnegat Bay
Graceanne Taylor	Save Barnegat Bay
Jim Ardoin	Pinelands Regional High School
Lisa Avichal	NJ Office of Planning Advocacy
Lynette Lurig	NJDEP
Helen Pang	NJDEP Water Monitoring and Standards
Cynthia Coritz	Bass River State Forest
Steve Yergeau	Rutgers Ocean County Extension
Virginia Rettig	US Fish and Wildlife/ EBF NWR
Steven Simone	Pinelands Commission
Tim Gleason	Ocean County Planning
Roger Budd	Barnegat Township
Louis Fisher	Barnegat Township/Waretown

1:00 Welcome, Introductions and Overview

This project focuses on Southern Barnegat Bay-Little Egg Harbor Tributaries comprising of seven sub-basins. A consequence of watershed urbanization: Barnegat Bay has been identified as a highly eutrophic estuary with nonpoint source pollution being a major source of nutrient enrichment. Therefore, the decline in ecological health of the Barnegat Bay can be attributed to high nutrient loading. NJDEP has identified nitrogen and sediment as the primary pollutants of concern in the Bay. The focus of this project is to enhance the integrity of the watersheds that drain to Southern Barnegat Bay - Little Egg Harbor.

Timeline of the project: we are somewhere in the middle of Year 2 where we are in the beginning stages of developing the Watershed Restoration Plan. The project goal is to develop a watershed restoration plan that will detail the management measures needed to achieve the necessary reduction in sediment and nutrients (N and P) to attain water quality.

1:15 Update on Water Quality Enhancement Projects

- **Culvert Retrofitting at Pinelands High school**

Phosphorus has been detected in the basin and bog higher than NJ surface water standards. Team designed a biofilter media that was installed at the bottom of the stormwater basin and engaged students in the installation and water monitoring. Water samples were taken during 2 rain events with data showing - ½ of the phosphorus was removed by the media.

- **Ocean Acres Bioswale**

Needed to know the runoff of the area when designing the bioswale: 75-80 sq feet of basin area is needed to accommodate the runoff amount. Drain time of the runoff was calculate at 62 hours. The soil of the bioswale would be amended with organic compost (Biochar was tested). Without amendments, soil only filtered out about 20% of the phosphorus. Bioswale design has an addition of pocket rain gardens too with green engineered mulch.

- **Stafford Township Community Center Rain Gardens**

Soil samples have been collected and team is looking for funding sources for the project. Also, developing a bioswale along the parking lot lines to alleviate ponding in the lot.

- **Rain Barrel Workshops**

A total of 74 rain barrels were taken home this year in Southern Barnegat Bay Watershed based on the workshops. These workshops also help municipalities with public education credits in the MS4 permits. 2023 workshop may be available – contact Graceanne Taylor at Save Barnegat Bay.

Discussion:

For the benefit of our discussion, I would like to address the use of biochar in bioretention basins. My understanding is that biochar has the capacity to elevate pH levels in soil, groundwater, and surface water. This may be counterproductive in the Pinelands Area, where the local ecosystem requires low pH levels. Perhaps an alternative can be implemented?

- **Use of Biochar – depends on the source materials. Started with a biochar with a high pH to start with. The pH of the mix was 6.7 or 6.8 before it started.**

I have read that the commercial manufacture of biochar can produce greenhouse gases--another potential area of concern regarding counterproductive effects.

Removal efficacy for the filter media?

- **It will depend on the collection of samples based on data points. In the lab it seems like it will “last forever”. In these lower phosphorus systems, we hope that they will last for a very long time.**

Has there been any design for rain garden plantings?

- **Working with RU landscape Architecture program to help with design and plantings based on the architecture group.**

1:35 Southern Barnegat Bay Watershed Spotlight

Sharing a spotlight on Pinelands Regional High School Honors Ecology Class and teacher Jim Ardoin. Giffordstown Bog in Little Egg Harbor has been a topic of conversation in past meetings, and it is also tied in with our Pinelands Media filter project. The bogs have given students an authentic science experience, over 60 students signed up for the class focusing on discovery, stewardship, and communication. Students want to be scientists but don't know what science is. This course helps them explore that career and classes were also instituted at Southern Regional High and maybe in Barnegat. So far students are helping take water samples for the culvert media filter project anytime there is 0.5 or more inches of rain and worked with NJ Watershed Ambassadors to do a benthic macroinvertebrate study. Follow their work on 'From the Barrens to the Bay' website and Follow the Flow podcast on Spotify. <https://sites.google.com/prsdnj.org/prhshonorsecology/home?pli=1>

1:45 Riparian Zone Assessment, Hydrological Sensitive Areas, and Buildout Analysis Update

Land Use

Looked at land use changes from 1986 – 2015 with conversions from upland forest to wetlands. These areas are decreasing and urban areas increasing. The annualized rate of land use change – urban rate peaked during 2007.

Riparian Buffer Zone Assessment

More than 500 acres of new urban lands are increasing in the coastal forest areas and wetlands. Looking at altered land use in individual basins, Mill Creek and Tuckerton Creek are the highest. This assessment identified areas for potential restoration sites.

Hydrologic Sensitive Areas

Using a topographic wetness index: If an area is having a high index number, it has a potential for runoff. For defining a topographic wetness index threshold (10.5, 11, 11.5 and 12) overlaid HSAs with 100 year floodplain to get the "HIT rate". Locations of these areas will provide suitable locations for placement of green infrastructure. Decided to use TWI of 11 because it includes 50% of the FEMA floodplain.

Build Out analysis

For this analysis the team identified what is presently vacant and potentially developable. To estimate the intensity of future development the team looked for lots that could be subdivided for additional housing units and impervious cover. The timing is not estimated; development has continued at a slower rate since the peak in 2007. Currently, there are over 500 acres of vacant and development land and if developed, it would bring urban land up to 4%. West of the parkway, parcels may be in very low density due to pinelands regulations, etc. Results were generated by municipality.

- SWAT watershed Modeling – run off modeling
 - Baseline existing conditions and then under future conditions with build out
 - Looking for scenarios with future climate change and scenario changes

Discussion:

- Climate change scenarios? Any municipal regulations and policies
 - Do you plan to connect to the coastal flood with SLR and storm surge scenarios?
 - We have not currently but we could.
 - Enhanced precipitation?
- Matt von der Hayden – Need to include climate change in updates to municipal master plans
 - <https://nj.gov/dep/climatechange/resilience-strategy.html>
 - <https://nj.gov/infobank/eo/056murphy/pdf/EO-89.pdf>
 - Also, resiliency projects related to climate change, especially in the coastal wetlands
- Steve Simone - Since Dr. Lathrop mentioned the Pinelands Area, the Land Capability Map is a good guide to land development potential, especially west of the Parkway.
<https://www.nj.gov/pinelands/home/maps/maps/documents/archD.pdf>
- Jim V – Riparian Zone analysis - Barren zones identified – what land uses are you including? Barren for them has proven to be mostly sand mines and other used areas.
 - We are trying to focus on more agricultural lands
 - Lots of barren lands cannot be restored and are potential urban land
 - Good opportunity for collaborative projects with municipality and private landowners, and USGS and USDA programs.

- Kristin Adams - *I work for the OC Soil District and am a partner with NRCS, if there is any support I can provide, or discussions for future collaborations please let me know. I can be reached at kadams@soildistrict.org or kristin.adams@usda.gov*

2:00 Assist Municipalities w/ Elements for Watershed Management Plans – Community Rating System Requirement

Talked about how the team can provide assistance to municipalities with elements for watershed management plans that they might be working on or even want to pursue.

Discussion:

Stafford – can be drafted within a few days just missing future rain data. Drafts of plans reviewed via ISO. The loss of the ABFE credits is really a hit on the program. There were conversations with state climate extension person – future precipitation. Used the coastal vulnerability assessment and Natural resource inventory as resources to the plan. NJIT doing a bunch of work with Stafford as well for hydrological flooding building.

The goal is to provide a template for some of the other municipalities to use for the Watershed Management Plan CRS activity.

Next steps

- SWAT analysis for pollutant loading
- Pollutant loading coefficients for remaining basins
- Prioritization for watershed Conservation Measures
- Updates to the website and the reports including story maps

Discussion

- Team is always interested in water quality enhancement project nominations
- Expect mid-winter to get folks back together again