



Living with the Bay

Rebuild by Design
February 28, 2017 CAC Meeting

**Living with the Bay
Citizens Advisory Committee (CAC) Meeting #4
February 28, 2017**

**Molloy College, Hagan Building, South Entrance (Kaiser Room 339)
1000 Hempstead Avenue, Rockville Centre, NY 11570**

Meeting Summary

The fourth meeting of the Living with the Bay (LWTB) Citizens Advisory Committee (CAC) meeting was held on Tuesday, February 28, 2017 at Molloy College. Forty-six (46) citizens attended the meeting including eight (8) CAC members, staff from the Governor's Office of Storm Recovery (GOSR), Tetra Tech staff, and members of the public (see the attached sign-in sheet).

Introduction

Laura Munafo, Rebuild by Design LWTB Program Manager for GOSR, delivered welcome remarks and briefly introduced the purpose of meeting – a presentation of the LWTB Resiliency Strategy development process being carried out by GOSR's contractor, Tetra Tech.

Community members were encouraged to fill-out, hand-in, or mail-in the public comment form. Public comment forms were available and distributed at the registration table as well as available on the GOSR Website at <http://stormrecovery.ny.gov/content/living-bay-comment-form>.

CAC Member Attendees

The following eight (8) CAC members were present:

- Joe Forgione, Co-Chair
- David Stern, Co-Chair
- Raymond Pagano
- Jay T. Korth
- William Faraday
- Leslie Price
- Jim Ruocco
- *Brien Weiner sitting in for Joseph Landesberg

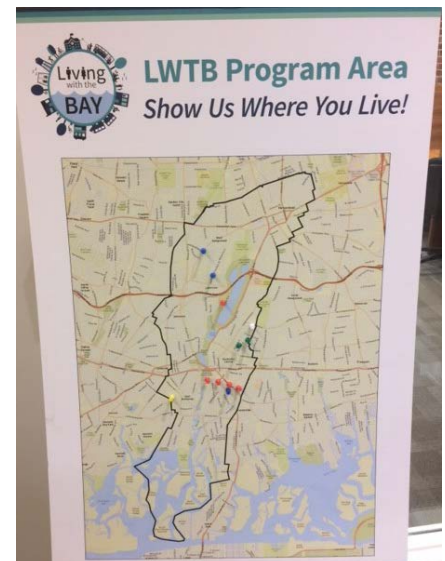


Figure 1. Geographic distribution of meeting attendees.



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(Members that were not present include: Amy Wolf, Andrew Miller, Arthur Mattson, Daniel Caracciolo, Gregory Rinn, James Loglisci, Daniel Horn, Justin Corbo, Linda Marshall, Steven Ruscio, Thomas Rozakis, *Joseph Landesberg)

Resiliency Strategy Presentation

Michael Bomar, Tetra Tech, presented a comprehensive overview of how the LWTB Resiliency Strategy is being developed. The program area is comprised of seven different jurisdictions, including the Town of Hempstead, Nassau County and the Technical Advisory Committee (TAC). The program area starts north, bordering the Village of Hempstead, expanding south to marshland and the mouth of Mill River, and bounded by the east and west by the topography for the Mill River drainage area. The program area includes approximately 10,000 acres and approximately 28,400 parcels. Over 4,000 parcels in the program area were impacted by Hurricane Sandy.

Mr. Bomar then presented a flowchart showing the three phases of Resiliency Strategy development, tasks within each phase, and how public outreach and engagement will be incorporated throughout the process.

Phase I - Project Initiation

Task A - Vision, Statement Purpose, Needs/Goals of Watershed Plan

Task B - Description/Assessment of Waterbody(ies) & Watershed Resources

Task C - Identify Stakeholders, Experts, Agencies, Programs & Laws

Phase II - Project Development

Task D - Watershed Characterization

Task E - Watershed Management, Recommendations & Alternatives

Task F - Prioritize Projects & Actions

Phase III - Resiliency Strategy

Task G - Implementation Strategy & Schedule

Task H - Tracking & Monitoring

Task I - Draft & Final

Mr. Bomar explained that the project schedule is on time and there have been no changes made to the schedule. Phase I is near completion and the project is now entering Phase II. Mr. Bomar explained that New York State Parks are at 30% completion of design in regards to Hempstead Lake State Park (HLSP). By June or July, LWTB projects should all be identified and prioritized in the project area.

Recap of Last CAC Meeting #3 – December 20, 2016

- CAC Roles & Responsibilities
- Resiliency Strategy Approach
- Goals & Objectives
- Defined Program Area
- Reviewed Regulatory Conditions



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February 28, 2017 CAC Meeting

Pending Activities Since the Last CAC Meeting

The parks tour and the CAC/Parks/SPLASH clean-up day have been postponed until spring in the hopes that warmer weather will yield a higher turnout. These activities will be announced at a later date.

Activities Since Last Meeting

- December CAC Meeting Notes
- Complete Data & Inventory
- 6 Stakeholder Meetings
- TAC January Meeting
- HUD January Update Meeting
- Drafted Problem Area Map

Presentation of Identified Problem Areas

Mr. Bomar share the LWTB Problem Area map and discussed the importance of understanding the cause of the problems these areas face.

Review of Types of Problems

The team has identified the type of problems in the program area and they are now starting to assess the causes and solutions to the problems. Mr. Bomar conducted a comprehensive description of the seven problem types:

1. Tailwater Backup
2. Inadequate Collection
3. Poor Conveyance
4. O&M of Facility Inadequate
5. Shoreline / Marshland Erosion
6. Water Quality
 - Sediment silk
 - Dissolved Solids
 - Chemicals
 - Floatables – HLSP
 - High Nutrients (habitat for invasive plants) – Smith Pond
7. Tidal Surge – Sandy type

Solutions for Problem Types

Mr. Bomar explained the importance and value of looking beyond typical solutions. The team is looking at opportunities such as green infrastructure, treating stormwater before collection and storage, and ways to restore the marsh area at the Mill River water basin.

Closing & Looking Ahead – The Next Four Months

In closing, Mr. Bomar explained that he and Tetra Tech engineers would be available for discussion and to answer any questions. The CAC members echoed Mr. Bomar's message. Also, Mr. Bomar informed community members there is a parallel effort, in addition to this effort, to work with HUD on an Action Plan Amendment Process. This effort will bring additional resources to the program area.



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CAC Comments

Mr. Bomar then opened the floor for comments from CAC members. There were none.

Public Comments

Mr. Bomar then requested comments from the public that included the following:

Comment: East Rockaway historian made a comment that this was the best prepared and well organized CAC meeting yet; she has attended three of four meetings.

Comment: CAC member reiterated the importance and availability of the Comment Form for community members to complete.

NYS Parks LWTB Projects Roundtable Discussion

Mr. Bomar introduced Jeff Olszewski, Stantec, who introduced the four design projects and design teams that displayed the enlarged project plan drawings in four separate areas of the meeting room. Each design team conducted project presentations which included a one-page design information document (see the four information documents attached) and open discussions with the community members. The presentations were all timed and allotted 15 minutes to allow the community members to circulate and participate in all four presentations.

- 1) Restoration of Dams, Gatehouse & Bridges – Lockwood, Kessler & Bartlett
- 2) Northwest & Northeast Ponds – Cashin & Associates
- 3) Greenway, Gateways and Waterfront Access – H2M Group
- 4) Environmental Education & Resiliency Center at Hempstead State Lake Park – H2M Group

Next Steps - Future Meetings

- The next CAC meeting will be held on March 28, 2017 at Knights of Columbus, Oceanside, NY.



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Agenda

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Citizens Advisory Committee Meeting #4 – February 28, 2017

Molloy College

1000 Hempstead Ave., Rockville Centre, NY 11570

- Recap Last Meeting
- Activities Since Last Meeting
- Presentation of Identified Problem Areas
- Review Types of Problems
- NYS Parks LWTB Projects Roundtable Discussion





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CITIZENS ADVISORY COMMITTEE MEETING

Molloy College

Hagan Building, Kaiser Room 339

1000 Hempstead Avenue

Rockville Centre, NY 11570

February 28, 2017 – 7:30 PM

SIGN IN SHEET

Name	Representing	Phone	Email
Shelley Brazzley	Nassau County	516 512-2244	dsbrazzley@nassau-county.ny.gov
Joe Forgione	East Rockaway	718 986-8025	joe.forgione@gmail.com
Ray Agnew	O'Sior	516 472-5306	Ray31@AOL.com
Ivana Harrington	GOSR	516 316 5634	ivana.harrington@stormr.
JEFF OLSZEWSKI	STATE/PARKS	203-541-1645	JEFF.OLSZEWSKI@STATEPARKS.COM
Bill Brown	NYSOPRHP	516 375 8380	William.Brown@Parks.ny.gov
Ryan Cook	NYSOPRHP	63	Ryan.Cook@Parks.ny.gov
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MARIAN WYPYSKI	NYS PARKS/LKB	516 938-0600	MWYPYSKI@LKBINC.COM
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Paul Donnelly	Myself	646 662 6853	pjdonnelly80@gmail.com
Natalie Wright	GOSR	212-480-5349	natalie.wright@stormrecovery.ny.gov
Brien Weiner	South Shore Audubon	516-220-7121	brien.weiner@gmail.com
Marie Taylor	West Hempstead	516 538-4338	Marie.Taylor@edwardjones.com
John Thorp	Rockville Centre	516-984-7928	
Alyson Beha	HVD	212 542 7117	alysan.c.beka@hvd.gov





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CITIZENS ADVISORY COMMITTEE MEETING

Molloy College

Hagan Building, Kaiser Room 339

1000 Hempstead Avenue

Rockville Centre, NY 11570

February 28, 2017 - 7:30 PM

SIGN IN SHEET

Name	Representing	Phone	Email
Johnny Tanzi	H2M	631-756-8000	jtanzi@h2m.com
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Jeanmaria Bullett	GOSR	(917)355-7924	
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John Scossin	RSD		iscossin@rebuildbydesign.org



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AGENDA

- Recap Last Meeting
- Activities Since Last Meeting
- Presentation of Identified Problem Areas
- Review Types of Problems
- NYS Parks LWTB Projects Roundtable Discussion



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Recap Last Meeting



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EVOLVED

Original RBD Application

- Large Area
- Broad Program
- Public Rights of Way
- Operation & Maintenance

Reality

Local
Municipal
Input

Refined
Program

Resiliency Strategy

Real
Street



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DECEMBER 20, 2016

- CAC Roles & Responsibilities
- Resiliency Strategy Approach
- Goals & Objectives
- Defined Program Area
- Reviewed Regulatory Conditions



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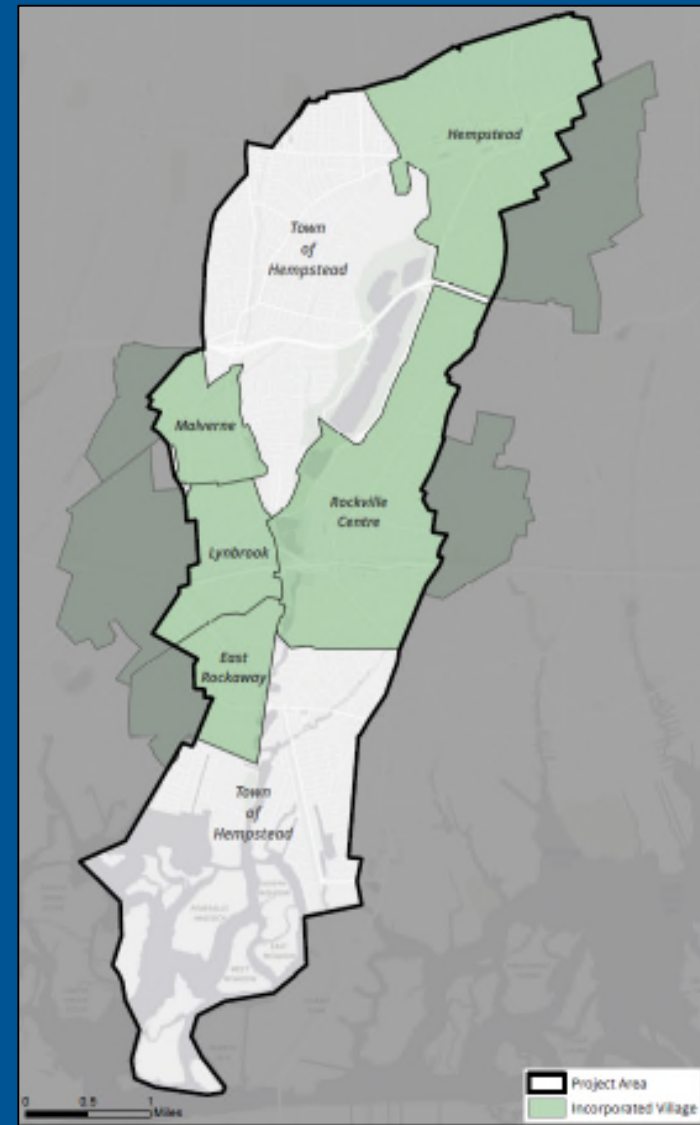
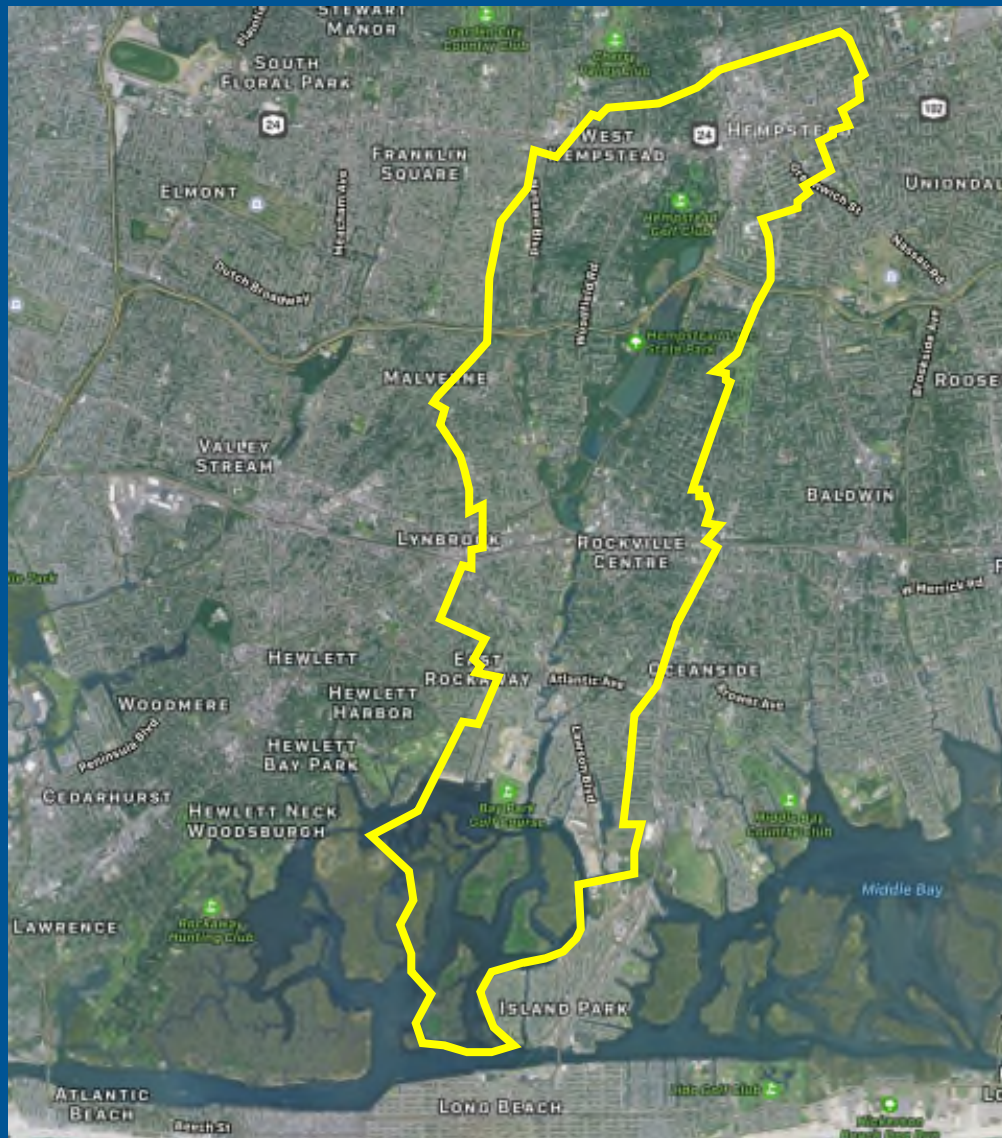


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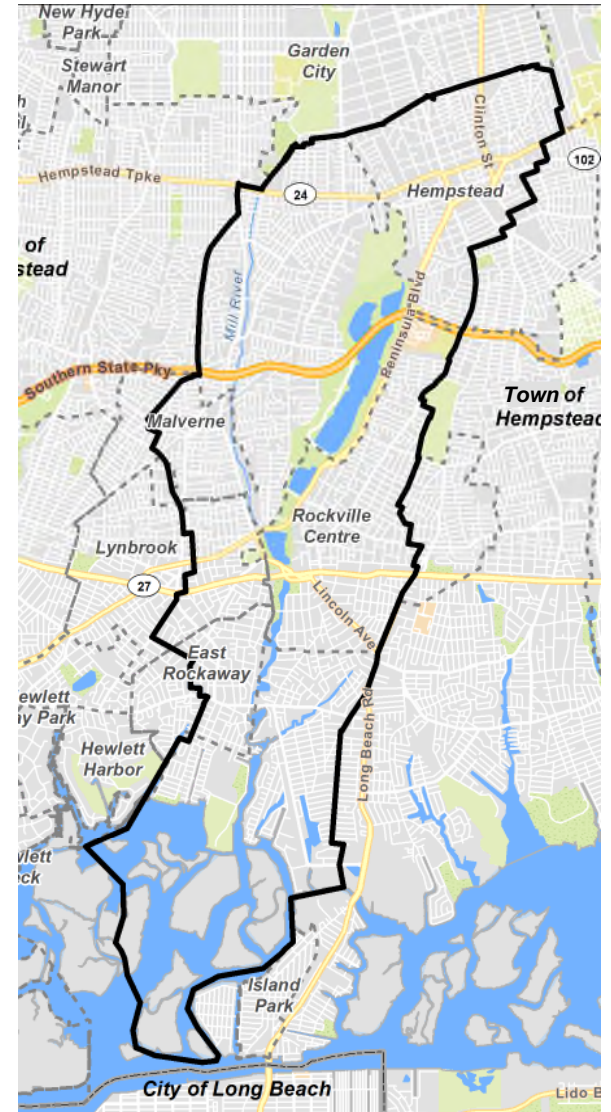
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LWTB PROGRAM AREA



LWTB PROGRAM AREA

- 10,000 Acres
- 28,400 Parcels



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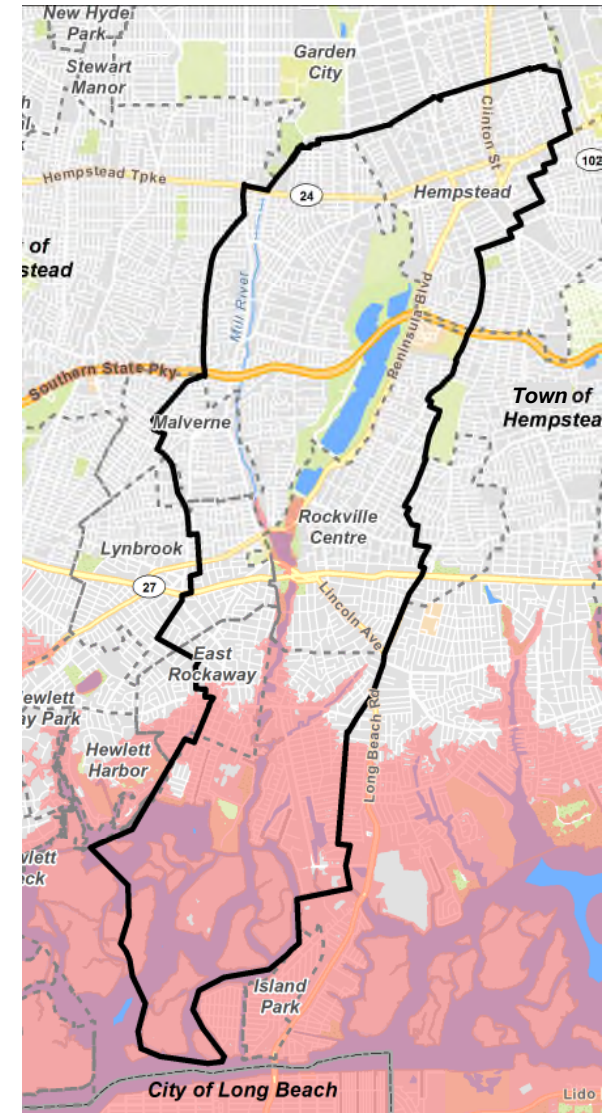


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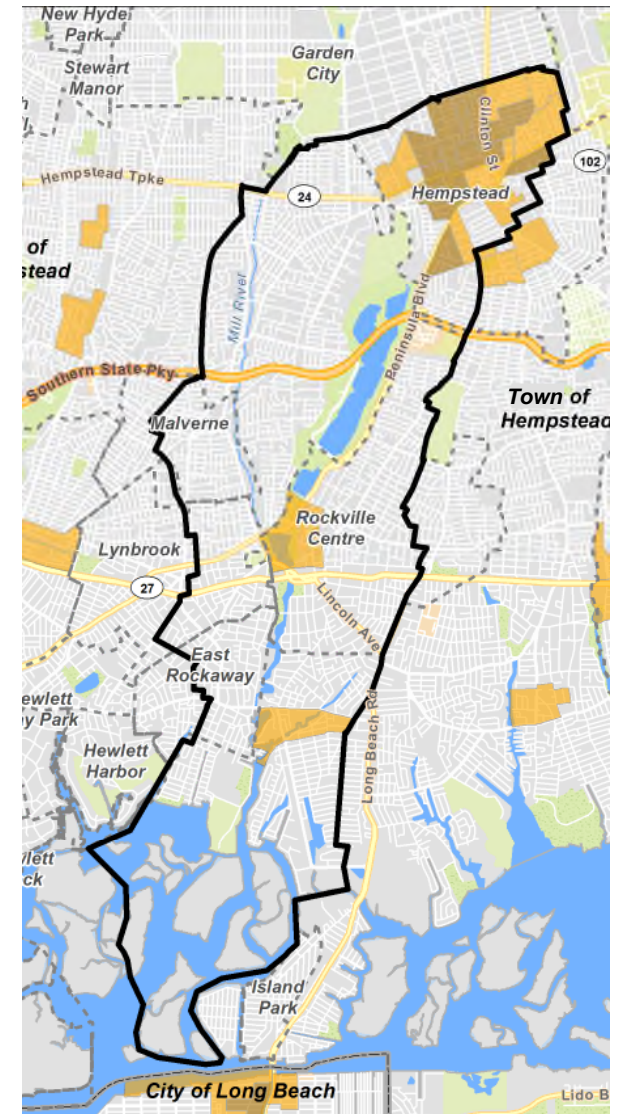
LWTB PROGRAM AREA

- 10,000 Acres
- 28,400 Parcels
- Sandy Impact:
 - 2,500 Acres
 - 4,100 Parcels (80% Residential)



LWTB PROGRAM AREA

- 10,000 Acres
- 28,400 Parcels
- Sandy Impact:
 - 2,500 Acres
 - 4,100 Parcels (80% Residential)
- Low-Moderate Income Areas



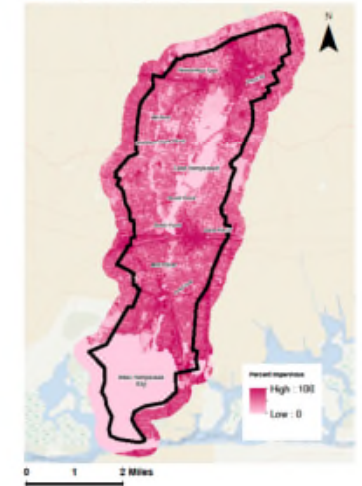
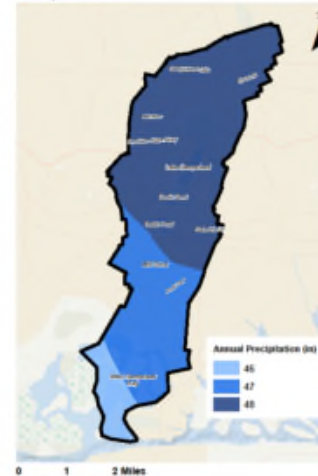
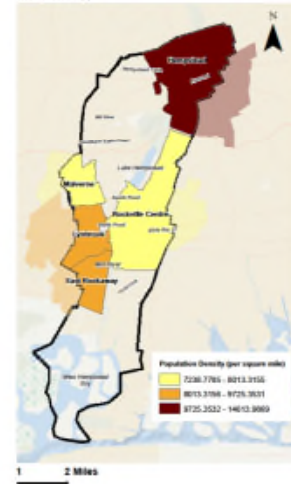
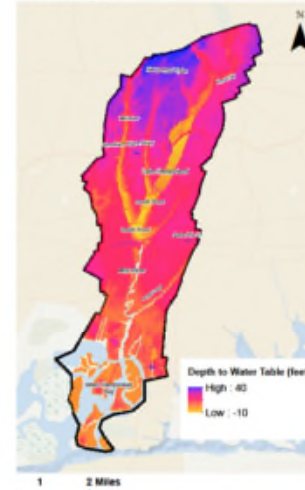
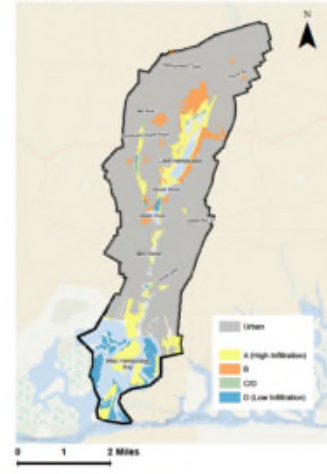
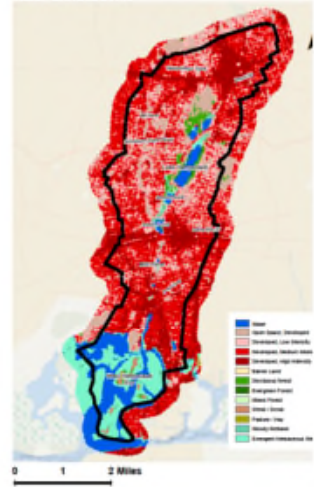
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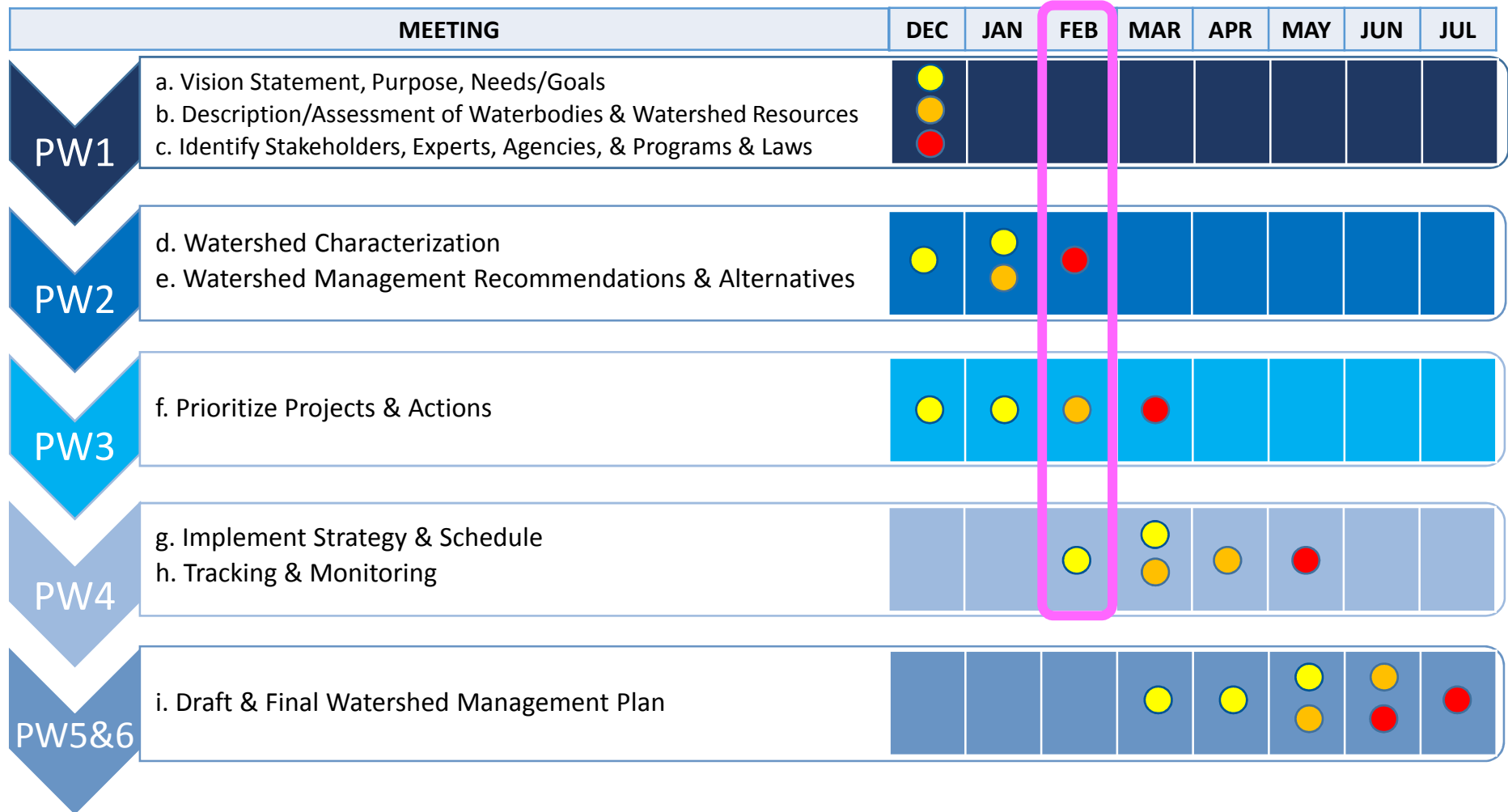
LWTB PROGRAM AREA



12/20 CAC MEETING ACTION ITEMS

- Mapping for CAC to Identify Problem  as
- Coordinating with Parks on a Tour - *pending*
- Meeting with Parks on LWTB Projects 
- Send FAQ Material to the  :
- CAC/Parks/SPLASH Clean Up Day - *pending*
- “Get the Word Out” Prior to Future CAC Meetings 
- CAC Access to Meeting Information in Advance 

RESILIENCY STRATEGY SCHEDULE



LEGEND:

● GOSR STAFF MEETING

● TAC MEETING

● CAC MEETING



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Activities Since Last Meeting



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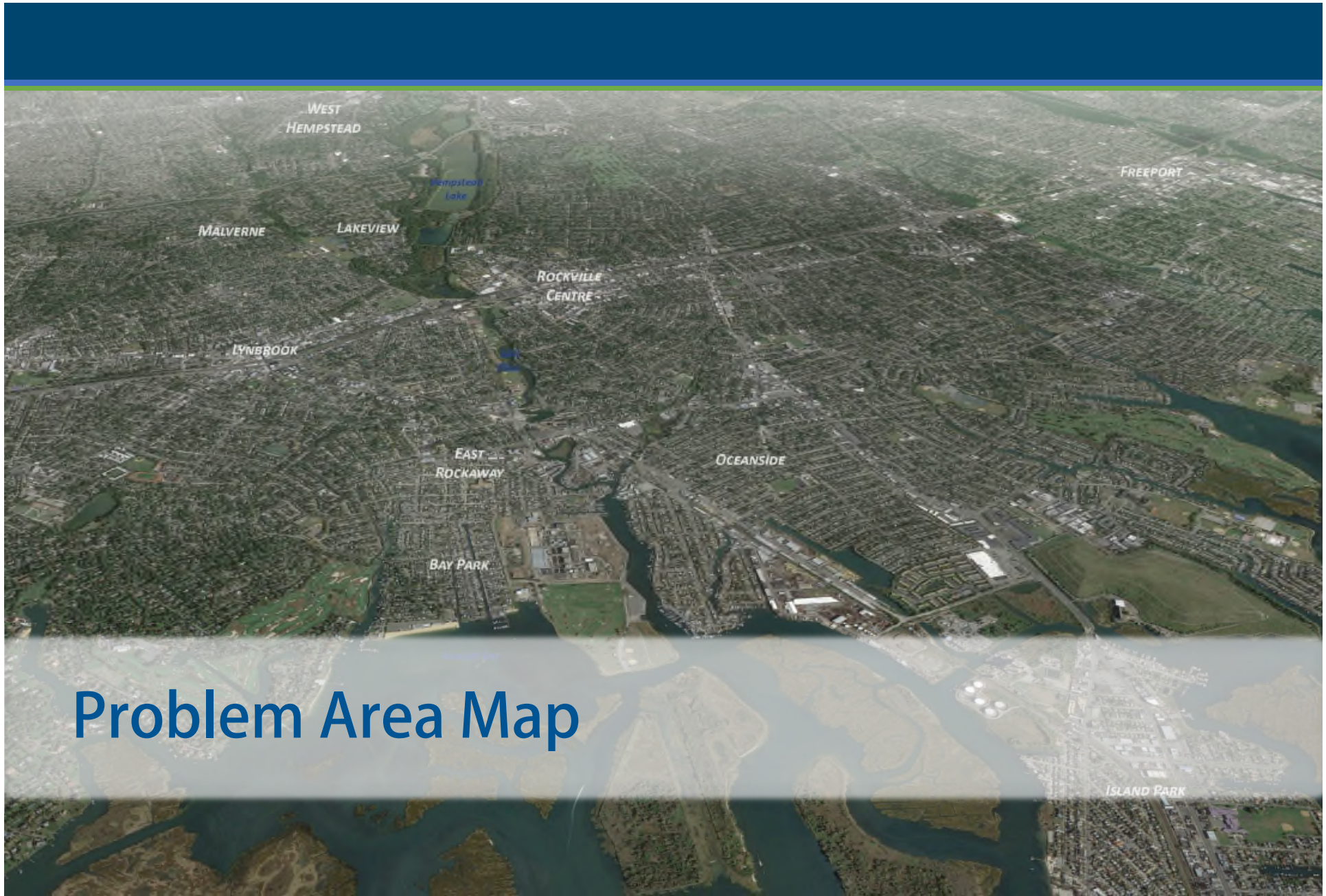


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ACTIVITIES SINCE LAST MEETING

- December CAC Meeting Notes
- Completed Data & Inventory
- 6 Stakeholder Meetings
- TAC January Meeting
- HUD January Update Meeting
- Draft Problem Area Map





Problem Area Map



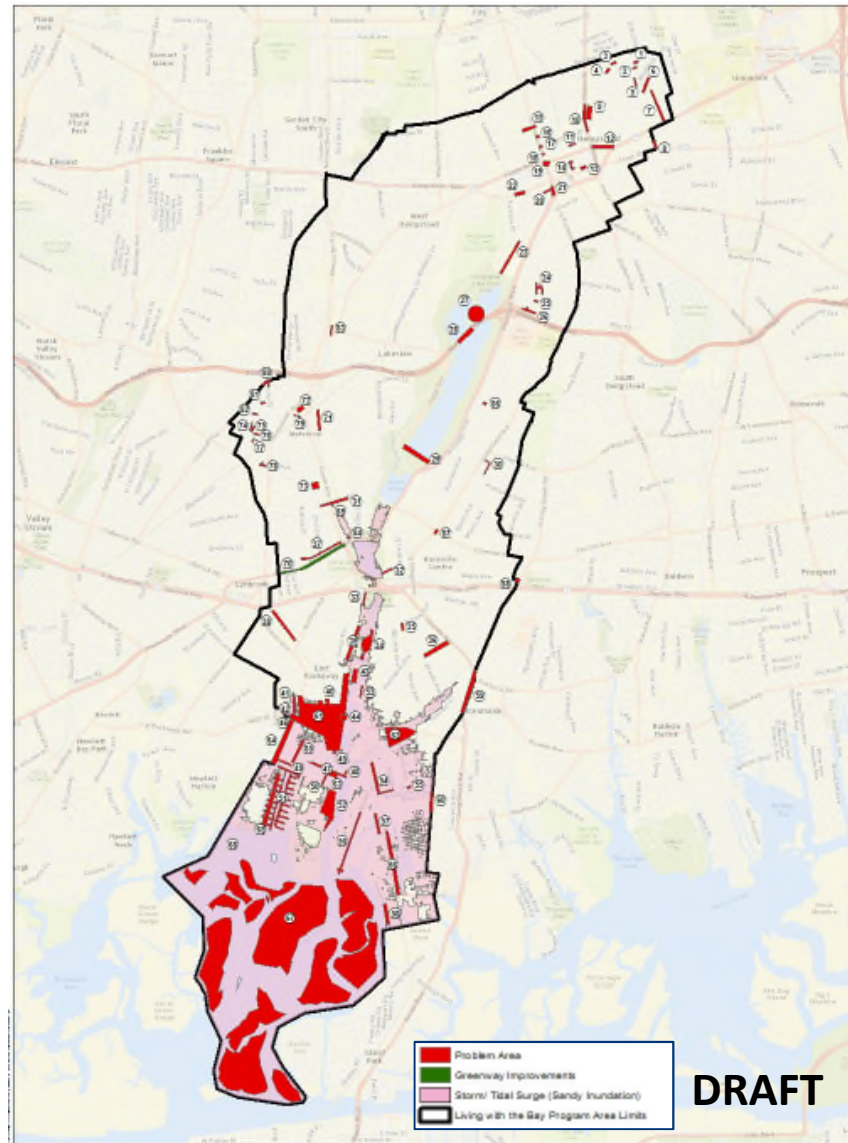
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LWTB PROBLEM AREA MAP



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Review Types of Problems



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ADDRESSING LWTB PROBLEM AREAS

- Understanding the Cause of the Problem
 - Not all Flooding is the same
 - What Flooding definition is going to be used?
 - Water Quantity vs. Water Quality
 - Role of Public Education
- Characterization and Contrast
 - Type or reason(s) for flooding may effect liability
 - Magnitude of flooding may cause liability
 - Ability for Public Access and/or Maintenance



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LWTB TYPES OF PROBLEMS



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ADDRESSING LWTB PROBLEM AREAS

Identifying & Classifying Cause

Natural Cause?
(eg. Unusual Rainfall)
or
Artificial Cause?
(Man-made Influence)

Landlocked Basin?
or
Semi-Closed?
or
Inadequate Outfall

Source:
Groundwater?
or
Surface Water?

Tailwater Backup?
or
Capacity Inadequate?

QUESTIONS TO BE ANSWERED
AS PROBLEMS ARE IDENTIFIED
TO GUIDE THE DEVELOPMENT
OF SOLUTIONS

Issue :
Design Related?
or
Construction?

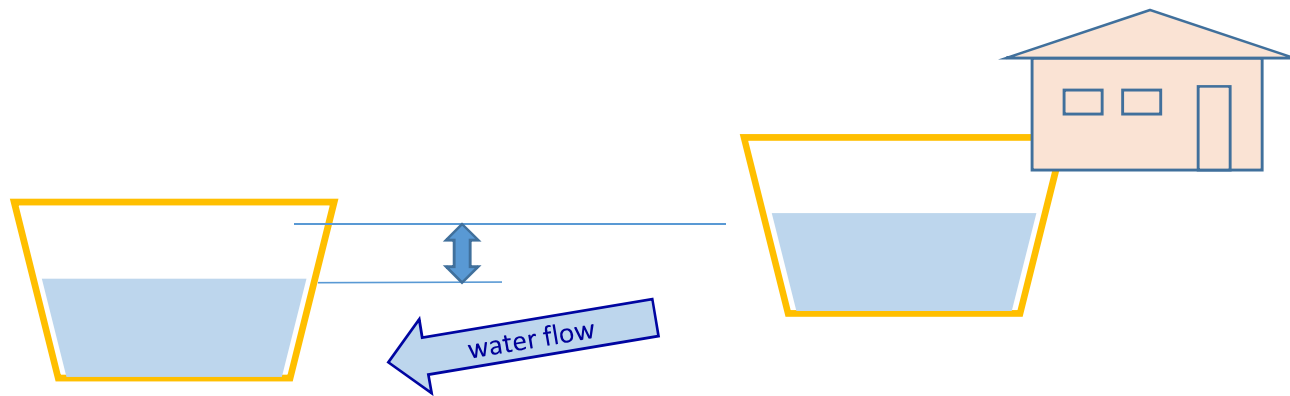
Design Flaw
or
LOS Expectation?

Issue Caused By:
R&R? or
Operation? or
Maintenance?

Structural Flooding?
or
Non (above the FFE)?

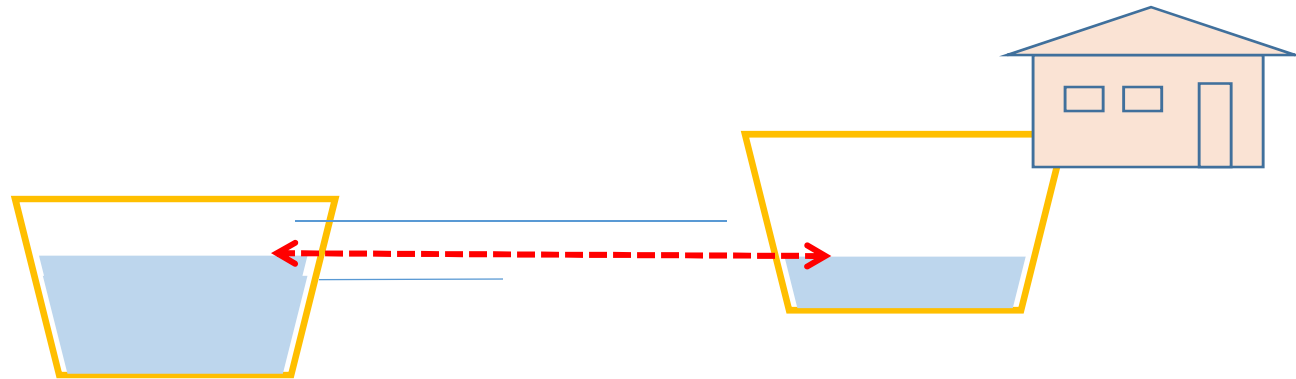
LWTB PROBLEM TYPES

Typical Tailwater Flow Conditions



LWTB PROBLEM TYPES

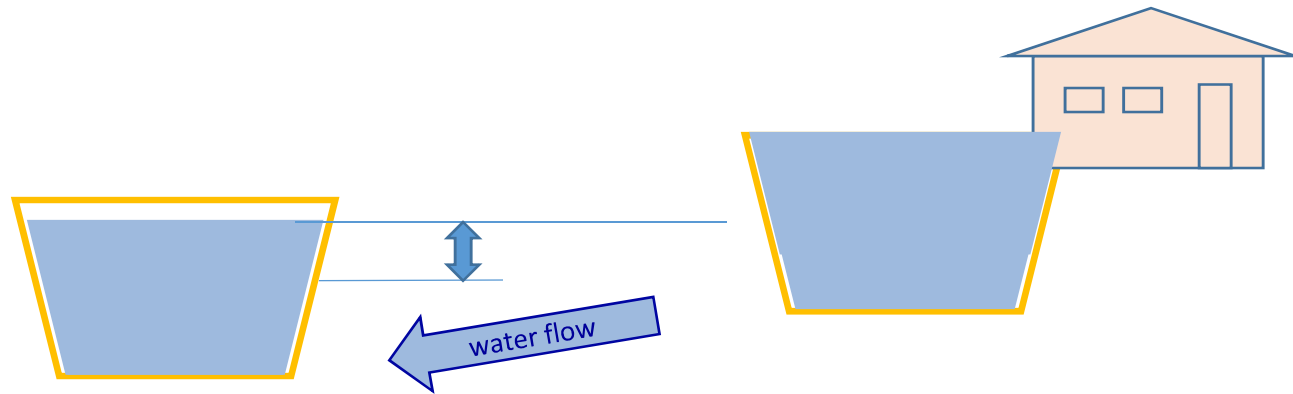
Typical Tailwater Flow Conditions



Note: Equilibrium is eventually reached (drainage outward) to rid the potential energy.

LWTB PROBLEM TYPES

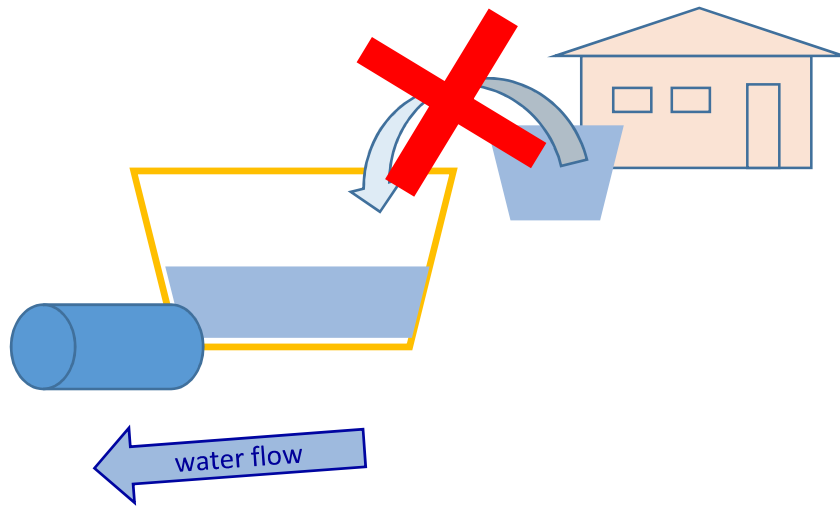
“Tailwater Backup”



Note: – When tailwater is far higher than expected (like an unusual tide event or surge event), it may backup the headwater and cause flooding even during a normally routine storm event since there is nowhere for water to go.

LWTB PROBLEM TYPES

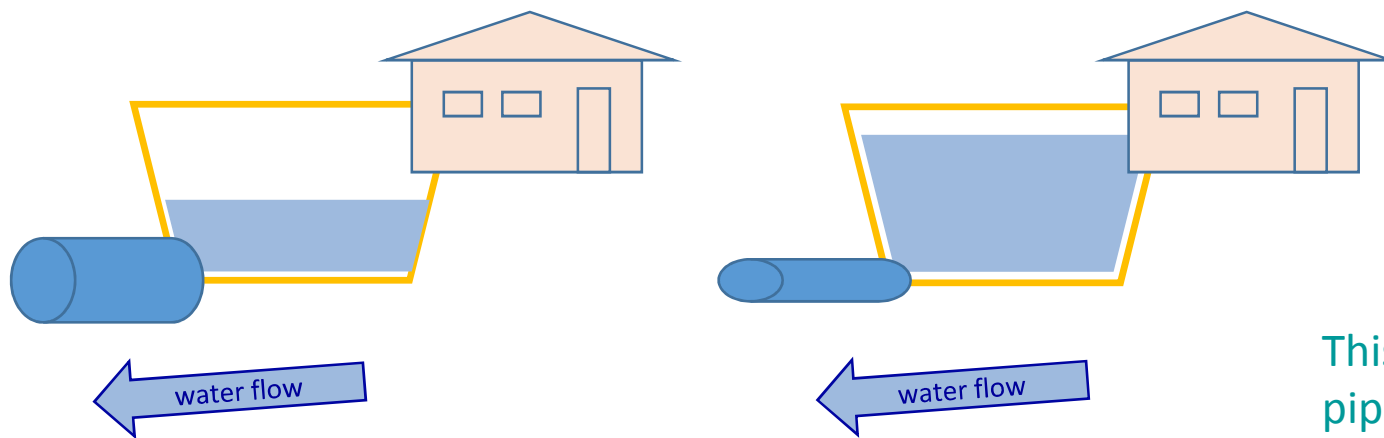
Inadequate Collection



This happens when there is no means to collect the water to get in to the pipes and/or to the downstream collection.

LWTB PROBLEM TYPES

Poor Conveyance

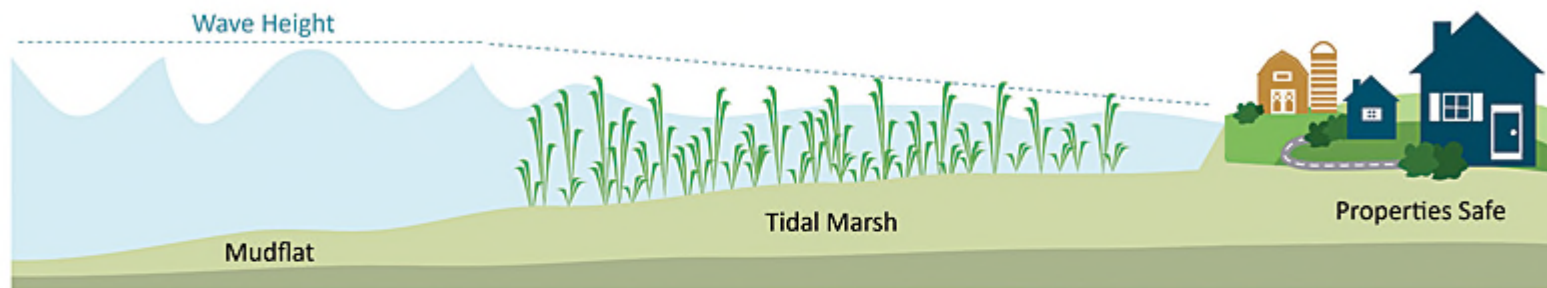


This happens when pipes or inlets are too small to keep up with water or are plugged

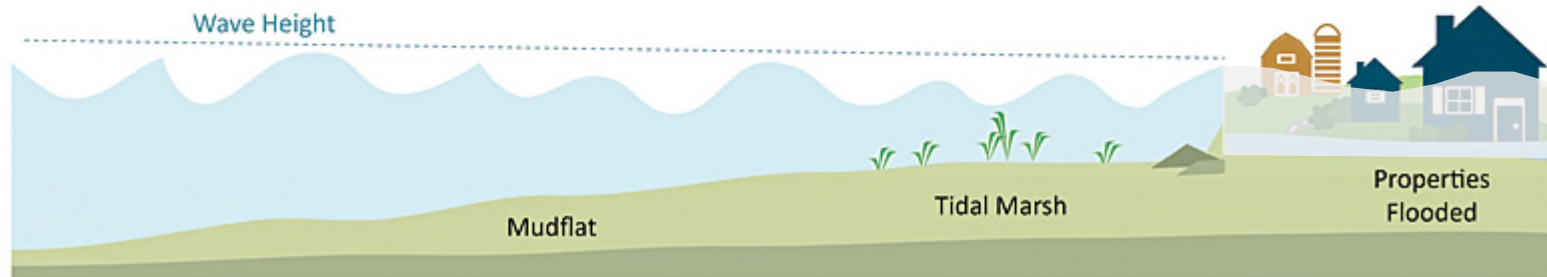
LWTB PROBLEM TYPES

Shoreline / Marshland Erosion

Wave attenuation with a healthy tidal marsh.



Wave attenuation with a degraded tidal marsh.



Source: Esri ArcNews, "GIS Helps Integrate Coastal Hazard Risk and Sea Level Rise," 2014



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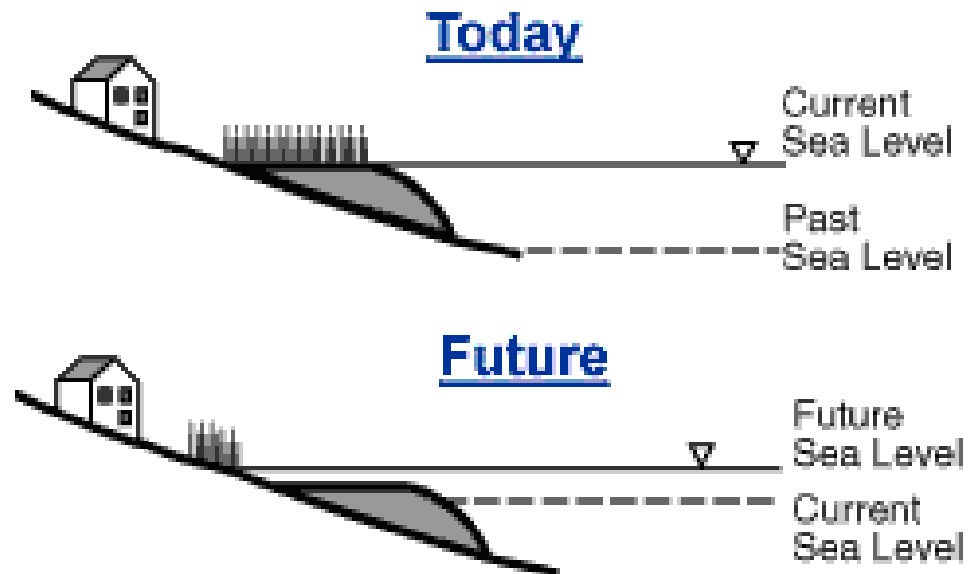
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LWTB PROBLEM TYPES

Shoreline / Marshland Erosion



LEGEND



Sedimentation and
Peat Formation



Marsh

Source: Titus, J.G. 1991. Greenhouse Effect and Coastal Wetland Policy, *Environmental Management* 15(1):39-58.



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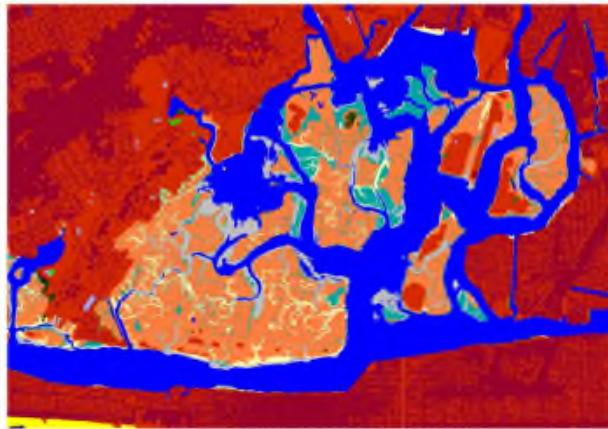
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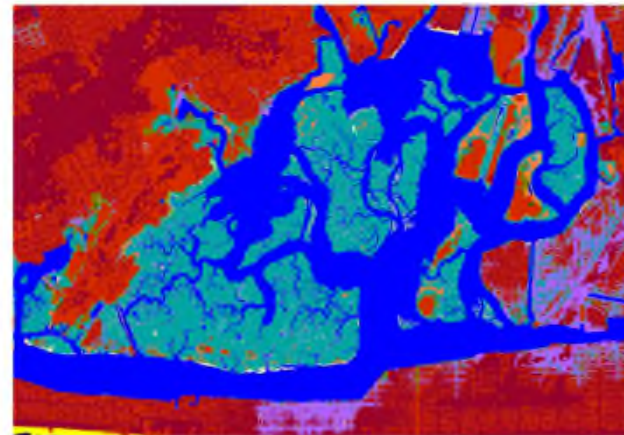
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LWTB PROBLEM TYPES

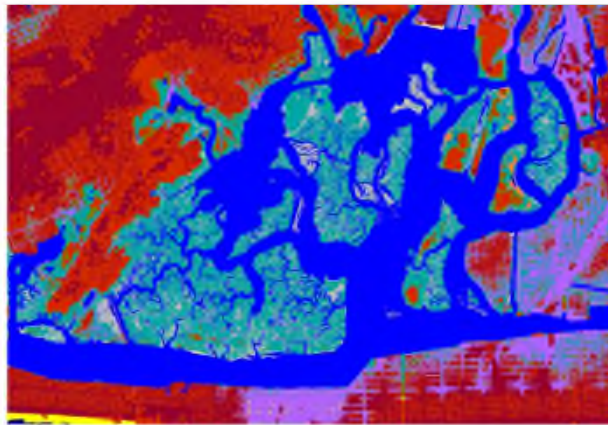
Shoreline / Marshland Erosion



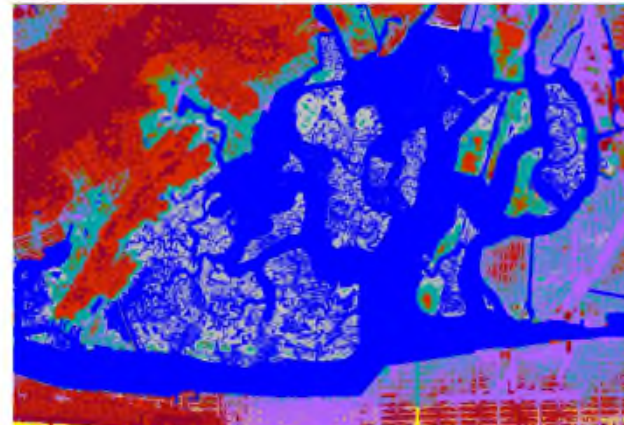
Hewlett Bay Time Zero, 2004



39 inches of SLR by 2100 (1-M scenario)



RIM Minimum in 2100 (52.3 inches of SLR)



RIM Maximum in 2100 (67.8 inches)

Source: Warren Pinnacle Group, Inc., "Application of Sea-Level Affecting Marshes Model (SLAMM) to Long Island, NY and New York City," 2014

Developed Dry Land	Open Ocean	Regularly-Flooded Marsh	Trans. Salt Marsh
Estuarine Open Water	Irreg.-Flooded Marsh	Inland Open Water	Swamp
Undeveloped Dry Land	Tidal Flat	Ocean Beach	Flooded Developed



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LWTB PROBLEM TYPES

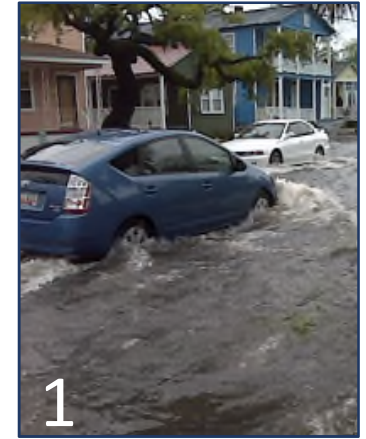
Water Quality

- Sediment & Silt
- Floatables
- Nutrients
- Dissolved Solids
- Chemicals

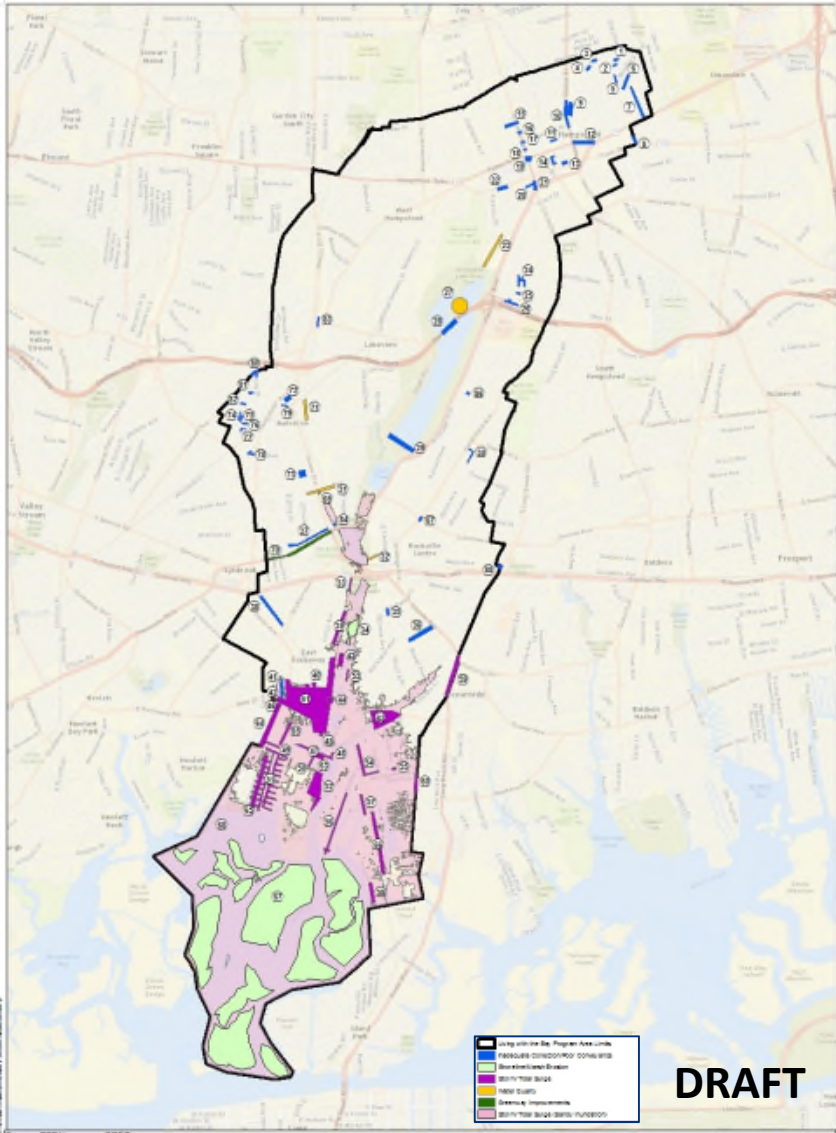


IDENTIFYING LWTB PROBLEM TYPES

1. Tailwater Backup
2. Inadequate Collection
3. Poor Conveyance
4. O&M of Facility Inadequate
5. Shoreline / Marshland Erosion
6. Water Quality
7. Tidal Surge



LWTB PROBLEM TYPE MAP



TOOLS IN THE TOOLBOX

Traditional Solutions are there...



...but we are Reimagining the Solutions



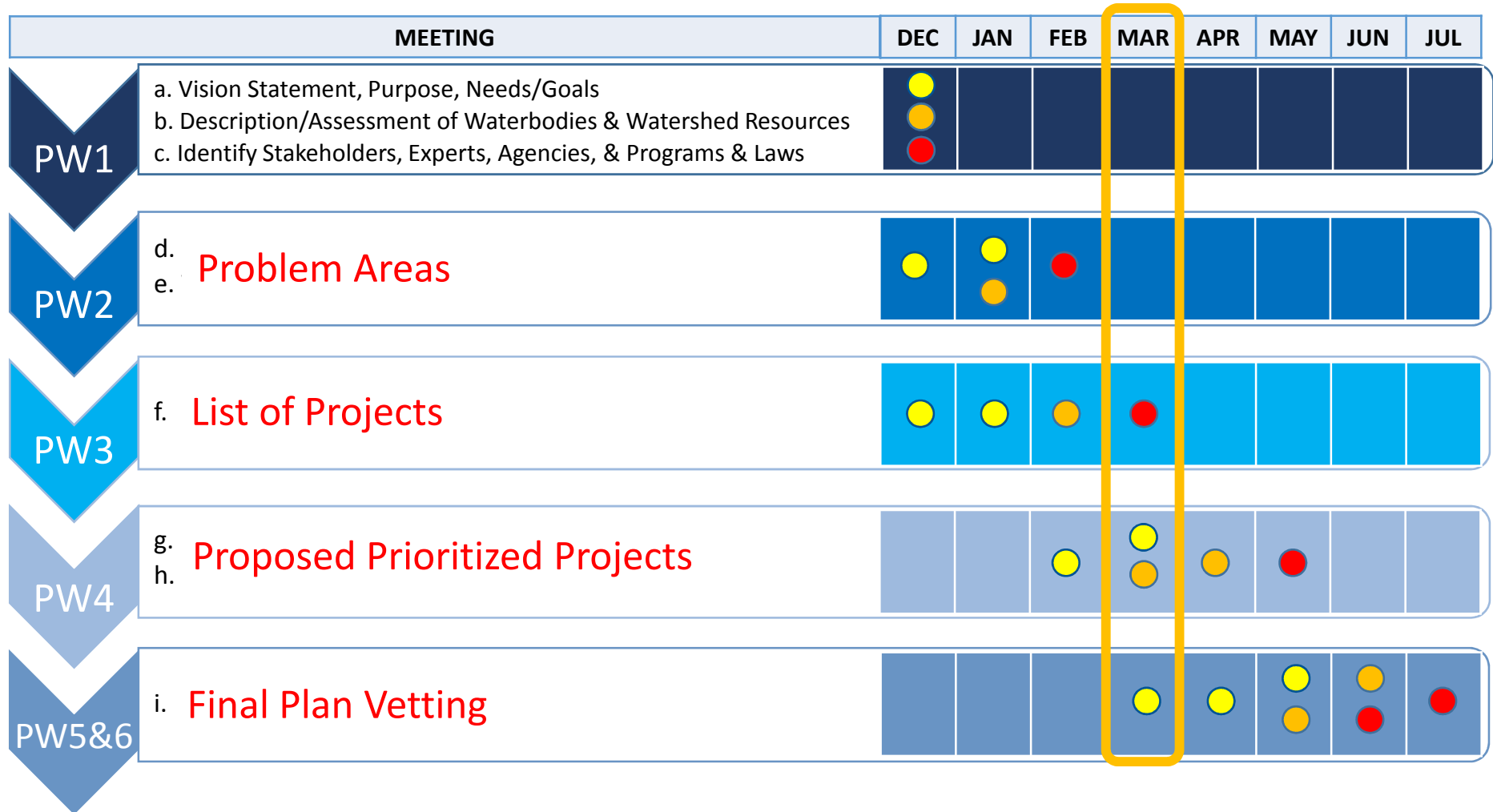
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NEXT STEPS



LEGEND:

● GOSR STAFF MEETING

● TAC MEETING

● CAC MEETING



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HUD ACTION PLAN AMENDMENT PROCESS

- Additional to the Resiliency Strategy Process and Meetings
- Moving Towards Obligation of Funds
- Event Schedule for the Spring:
 - Established Steps for Public Feedback
 - April – May Public Process
 - Public Hearing Before June
- Environmental Review Document for HLSP Projects*



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NYS Parks Projects Roundtable Discussions



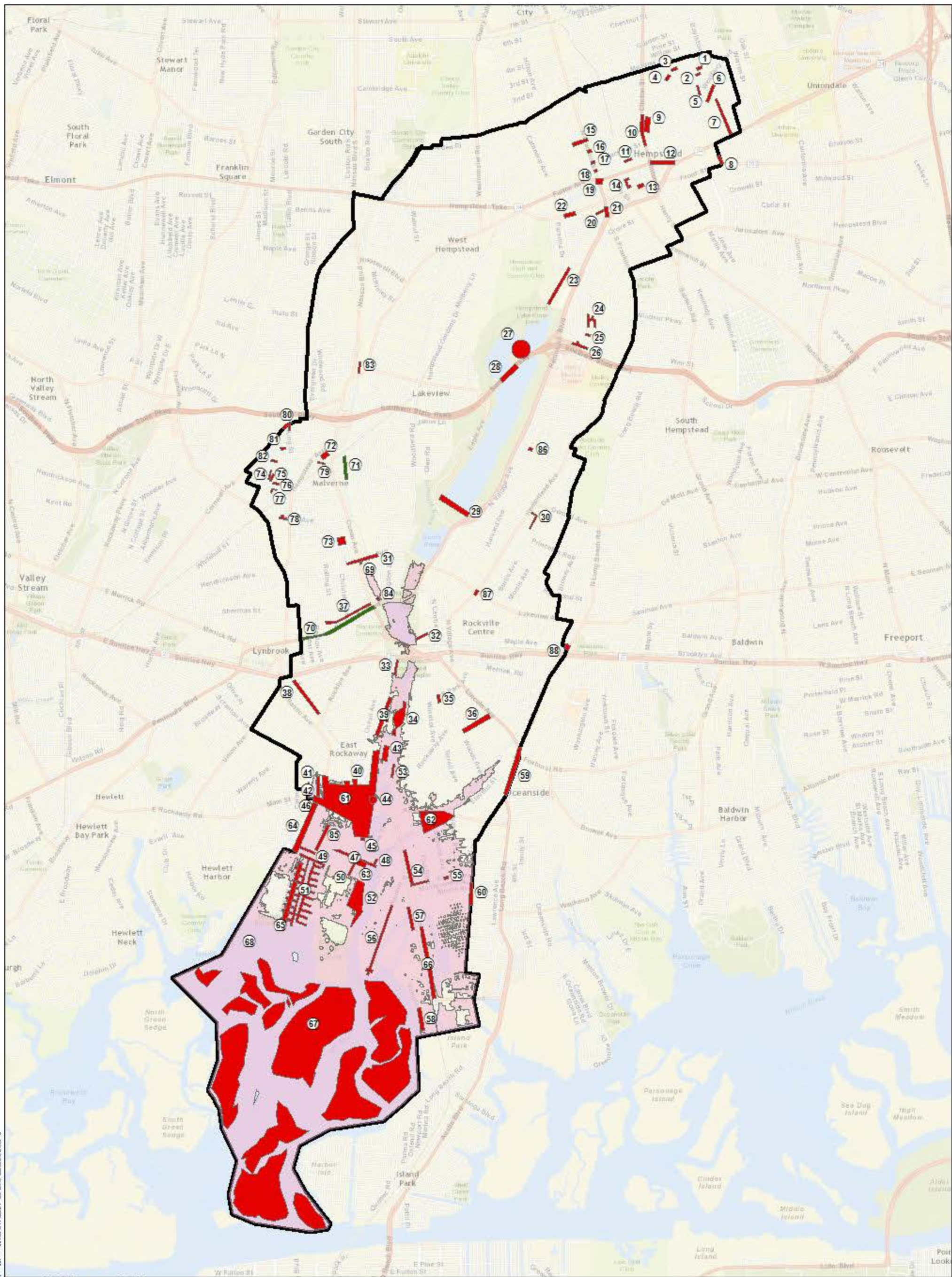
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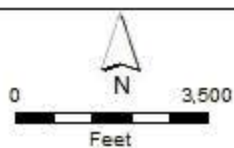
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Source: ESRI basemap; GOSR

- LEGEND**
- Living with the Bay Program Area Limits
 - Problem Area
 - Greenway Improvements
 - Storm/ Tidal Surge (Sandy Inundation)

DRAFT



GOVERNOR'S OFFICE OF STORM RECOVERY
LIVING WITH THE BAY
STORMWATER PROBLEM AREAS

EXHIBIT

Affix
postage
here

Governor's Office of Storm Recovery NYC
Attention: Antionette Lewter
25 Beaver Street, 5th Floor
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Dams, Gatehouse and Bridges

Location: The work locations for these component is located in the existing Dam located at the south end of the Northwest Pond, Hempstead Lake Dam, Gatehouse and Pipe Arch is located at the southern end of Hempstead Lake along Eagle Avenue and the South Pond Dam and Outlet Weir are located at the southernmost end South Pond and of the park.

Background/Challenges:

- Current lack of flood and water level control
- Breached NW Pond Dam
- Unrestricted flow into Hempstead lake and Mill River Watershed
- Lack of flow control through the Mill River Corridor
- Limited Dam monitoring and maintenance access
- Limited Shodack Brook connectivity
- Public safety

Proposed Interventions:

- Bringing the flow control structures (dams) into compliance with current regulatory requirements.
- Dam replacement.
- New fully operational sluice gates with operational plan.
- Design of pedestrian bridges that are part of the adjacent shared-use path system that increase access and connectivity throughout the Park.
- Historic structure restoration

Intended Effects/Improvements:

- Improve and update flood control structures
- Flow-control is key to flood protection for the overall watershed during surge events (Sandy) and rain events (Irene)
- Provide storage and attenuate peak flows
- Modeling indicates removal of existing limitations (which can cause unplanned impoundment if blocked) will enhance flows
- Water level control will enrich ecosystems and recreation
- New and enhanced access paths and bridges
- Provide emergency access & reduced response time
- Expand public access to natural ecosystems and trails
- Connect multi-use paths, trails and Greenway for greater public access to the river and waterways and view shed
- Interpretative signage about the historical nature of the Dams, educational opportunities to observe and monitor water level and flows, gate operations and overall park and watershed management

RBD principle(s):

- | | |
|--|--|
| • Coastal Environment- Cultural Resources | • Hazards – Flood Risk and Vulnerability |
| • Coastal Environment-Environmental Concerns | • Hazards – Sea Level Rise |
| • Coastal Environment- Natural Resources | • Hazards – Storm Risk |
| • Hazards-Climate Trends | • Infrastructure – Critical Infrastructure |
| | • Land Surface – Topography, and Public Health |



Greenway, Gateways and Waterfront Access

Location: The proposed greenway runs from the northern end of the parks to the southern end and weaves its way along the western side of the ponds and lakes. Gateways are located along the perimeter of the park in strategic locations. The Waterfront access can be found informally through the use of the trails system or formally in the form of docks and piers located along the western side of Hempstead Lake.

Background/Challenges:

- Access to and from the adjacent low to moderate income neighborhoods
- Limited access to waterfront (including ADA)
- Undefined or restricted gateways
- Inadequate Shodack Brook connectivity
- Current trail layout and surfacing for multiple user groups
- Limited connection from Hempstead High School

Proposed Interventions:

- New and expanded trails with educational components
- Opening view sheds through vegetation and invasive clearing
- Opening up of existing gateways to improve access and safety
- Increase the number of gateways to surrounding neighborhoods
- New multi-use greenway from north to south
- Green infrastructure as components of improvements
- Piers and kayak launches providing direct access to water

Intended Effects/Improvements:

- Increased access to improve emergency response
- New and enhanced gateways along the periphery for neighborhood access
- Additional parking for patrons
- Additional connections to multi-use path, trails and Greenway for greater public access to the river and waterways and view shed
- Piers and docks placed along the corridor will provide direct access to the waterways
- Interpretative signage throughout to educate on the park history, flora and fauna and the role the park plays in the overall resiliency
- On-water access for greater personal interaction with the water
- Expanded recreational, social and community connection opportunities in and around the park
- New trails for access to the parks various ecosystems

RBD principle(s):

- | | |
|--|--|
| • Coastal Environment- Cultural Resources | • Infrastructure – Critical Infrastructure |
| • Coastal Environment-Environmental Concerns | • Land Surface – Land Cover |
| • Coastal Environment- Natural Resources | • Land Surface – Topography, and Public Health |
| • Demographic Trends | |
| • Economic Trends | |





Northwest and Northeast Ponds

Location: The Northwest and Northeast Ponds are located in the northern portion of Hempstead Lake State Park. The ponds are separated from Hempstead lake by the Southern State Parkway.

Background/Challenges:

- Unregulated flow into Hempstead Lake and the Mill River Watershed
- Reduced water storage capacity
- Oil and pollutants in the first flush
- Limited opportunity for water filtration
- Floatables into the ponds, Hempstead Lake and downstream
- Siltation of the ponds
- Increase in water velocity due to sediment loads
- Limited access to ponds

Proposed Interventions:

- Dredging to increase water capacity
- Existing wetland restoration and new wetland creation
- Floatable catchment
- Sediment forays and “first flush” filtration
- Water velocity reduction

Intended Effects/Improvements:

- Enhanced stormwater management capabilities
- Mitigate against unrestricted flows
- Collect floatables and debris at park entrance points
- Flow control to better absorb “first flush” runoff
- Improve water filtration and ecological enhancement through wetland development
- Trap soils from runoff in sediment basins prior to entering wetlands & ponds
- Stabilize shorelines to reduce erosion and bank collapse
- Incorporate operationally sustainable design components
- Interconnect the enhancements to improve storm resiliency and ecological habitats
- Increased stormwater mitigation
- Improved water quality of storm runoff downstream
- Restoration and enhancement of ecosystems and biodiversity
- Increased opportunities for partnership development and program delivery
- Create opportunities for stormwater education

RBD principle(s):

- | | |
|--|--|
| • Coastal Environment- Cultural Resources | • Hazards – Flood Risk and Vulnerability |
| • Coastal Environment-Environmental Concerns | • Hazards – Sea Level Rise |
| • Coastal Environment- Natural Resources | • Hazards – Storm Risk |
| • Demographic Trends | • Infrastructure – Critical Infrastructure |
| • Economic Trends | • Land Surface – Land Cover |
| • Hazards-Climate Trends | • Land Surface – Topography, and Public Health |





Environmental Education and Resiliency Center

Location: The Environmental Education and Resiliency Center (The Center) is located along the western side of Hempstead Lake between Parking Field #1 and Eagle Avenue.

Background/Challenges:

- Lack of educational component within the park
- Providing an operational hub for dam controls, sluice gates and water level monitoring
- Hub for emergency response (community and infrastructure)

Proposed Interventions:

- The Center will provide flexible classroom space, wet labs and hands-on learning
- Centralize monitoring for Dam sluice gates and water levels
- Education and training center for NCPD Explorer program
- Designed as a community resource center
- Designed with high LEED Standards with a goal of net-zero energy solution

Intended Effects/Improvements:

- Emergency coordination center for state and local agencies
- Designed to be used as a coordination center to respond to and recover from emergencies and storm events
- Information center for local residents after a storm event to provide direction for access to community services
- Education and interpretative center for school and other groups as well as the neighborhood NCPD Explorer program
- Hub and gateway to the greenway
- Educational wet lab for hands-on learning for local students
- Provide education regarding the impacts of climate change
- State Parks has a transportation grant program to reimburse schools (focused specifically on Title 1 schools for field trips to the park)

RBD principle(s):

- | | |
|--|--|
| • Coastal Environment- Cultural Resources | • Hazards – Flood Risk and Vulnerability |
| • Coastal Environment-Environmental Concerns | • Hazards – Sea Level Rise |
| • Coastal Environment- Natural Resources | • Hazards – Storm Risk |
| • Demographic Trends | • Infrastructure – Critical Infrastructure |
| • Economic Trends | • Infrastructure – Housing |
| • Hazards-Climate Trends | • Land Surface – Land Cover |
| | • Land Surface – Topography, and Public Health |





Hempstead Lake State Park

New York State Parks, Recreations and Historic Preservation



FEBRUARY 2017

**LIVING WITH THE BAY – A REBUILD BY DESIGN PROJECT
NY STATE PARKS - HEMPSTEAD LAKE STATE PARK
HEMPSTEAD, NY**

COLLABORATIVE DESIGN NARRATIVE

In June of 2013, the Department of Housing and Urban Development, through the Hurricane Sandy Task Force, launched REBUILD BY DESIGN (RBD): a design competition to identify projects that promote resilience by developing regionally-scalable but locally-contextual solutions. Furthermore, RBD looked to produce designs that not only enhance regional resilience to disaster risks, but also support ongoing economic development, ecological health, and well-being of its citizens.

According to the National Disaster Recovery Framework, “Resilience incorporates hazard mitigation and land use planning strategies; critical infrastructure, environmental and cultural resource protection; and sustainability practices to reconstruct the built environment, and revitalize the economic, social and natural environments.” The RBD program is focused on promoting projects that strengthen resilience throughout all aspects of the community including ecological, economic, and social elements. Ideally the built environment helps maintain the natural ecosystem which lessens vulnerability to disaster impacts while also providing collateral benefits the economy, public health, overall wellbeing and quality of life.

The RBD principles include:

- Hazards
 - Flood Risk and Vulnerability
 - Storm Risk
 - Climate Trends
 - Sea Level Rise
- Coastal Environment
 - Natural Resources
 - Environmental Concerns
 - Cultural Resources
- Infrastructure
 - Critical Infrastructure
 - Housing
- Land Surface
 - Land Cover
 - Topography
- Demographic Trends
- Economic Trends
- Public Health

The Living with the Bay Program (LWTB) was selected as one of the winning RBD proposals and was designed to increase community resilience in the Mill River Watershed area of Long Island by lessening risk of tidal and stormwater flooding, while incorporating environmental and social benefits. The LWTB goals and objectives include:

- Increase in community resilience by mitigating local risk from tidal and storm surge flooding
- Improve drainage infrastructure to alleviate local flooding problems
- Incorporate environmental and water quality improvements
- Create and improve public access to the lakes, rivers and the bay

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The work covered in this report focuses on interventions within Hempstead Lake State Park (HLSP) which is a part of the larger Living with The Bay project. As the Mill River watershed is an interconnected system, the LWTB project recognizes that both upstream and coastal interventions were required to address two of the largest vulnerabilities faced by surrounding communities: coastal surge and stormwater flooding. The interventions proposed within HLSP not only address stormwater flooding concerns, but also look to increase capacity and efficiency of the within the northern end of the system, while simultaneously introducing recreational and educational opportunities for citizens to learn about and connect with their natural environment.

Interventions within HLSP are organized into 4 main areas:

1. Dams, Gatehouse, Bridges
2. Northwest and Northeast Ponds
3. Environmental Education and Resiliency Center
4. Greenways, Gateways and Waterfront Access

Dams, Gatehouse and Bridges

Hempstead Lake State Park falls within the upper portion of the Mill River Watershed and provides key opportunities to improve flood management, enhance the natural ecosystems, provide connectivity between diverse populations, enhance safety and provide emergency response facilities, while promoting environmental education and increased usage of the Park. This section focuses on improvements to the Mill River system located within Hempstead Lake State Park and it enhances the function of the dams as a key instrument for flood mitigation. This work also includes design of pedestrian bridges that are part of the adjacent shared-use path system that increase access and connectivity throughout the Park.

Northwest Pond Dam/ Open Channels/ Bridges

The NW Pond and dam were constructed in the 1960's around the same time as a large (96" diameter) drainage pipeline was installed through Hempstead to discharge stormwater runoff from the surrounding community into the NW Pond. The dam provided attenuation of peak stormwater flows from the 96" pipe, allowed sediments to settle out of the runoff, and also prevented floatables from reaching downstream into Hempstead Lake. As a result of the dam breach, flow through the NW Pond is uncontrolled bringing sediment and floatables into Hempstead Lake. As a result of the breach, the ponds also lost their holding capacity.

As part of the dam investigations, hydrological modeling of this section of the Mill River was performed for both the existing dam breach condition and for the proposed replacement dam condition. The modeling indicated that having a dam in place at the NW Pond lessened the impacts to the larger Hempstead Lake Dam during a major

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storm event. Replacement of the NW Pond dam will maintain more water within the pond limits encouraging the growth of wetlands which in turn will provide filtering and enhanced water quality. The replacement of the dam will help attenuate peak flows from the upstream drainage collection systems allowing for better control of the overall watershed and flood mitigation. By reestablishing the depth in the pond area, the dam will allow sediment to be filtered out before reaching the downstream waters (especially after the “first flush”), thus enhancing and improving water quality downstream.

With the replacement of the dam, flows can be directed downstream of the dam through an open channel and culvert under the Southern State Parkway and into Hempstead Lake. A timber pedestrian bridge will be provided to carry a shared use path that encircles Hempstead Lake over this channel. Installation of the bridge will allow removal of existing twin 60” diameter pipes that currently limit flow through the channel (and also create the potential for an unplanned impoundment if blocked) while providing for uninterrupted access to the pedestrian pathway. Modeling indicated that the removal of the twin pipes would enhance the flow between the NW Pond and Hempstead Lake, which is an important aspect of the program goals. This pedestrian bridge will be designed to accommodate pedestrians, horses, maintenance vehicles, as well as other emergency vehicles thereby improving emergency access and response times.

Additional access will be constructed over the existing open channel located immediately upstream of the NE Pond and adjacent to Hempstead High School providing access (along with the proposed multi-use paths designed by others) to wetland areas and other portions of the Park that are currently underutilized, and difficult to access during emergencies. The crossing will be close to other wetland improvements in this area and will provide new opportunities to partner with schools and will provide students with new opportunities for environmental education and/or ecological stewardship. This bridge and (coupled with a second bridge to be located downstream over Schodack Brook) will be designed to the same standards noted above and will improve pedestrian connectivity, safety, emergency response and access while also protecting and enhancing the natural environment around it.

Hempstead Lake Dam/ Gatehouses/ Pipe Arch

The Hempstead Lake Dam, gatehouse and pipe arch were constructed in 1873. The dam’s outlet-controls (currently not functional) are housing in the gatehouse structure, that directs water flows through an attached brick pipe arch that extends from the dam into South Pond. This plan will replace all five of the sluice gates at the dam and provide new gate controls in the gatehouse. An operating plan will be developed to actively manage regular water flow in small and large storms events. The impacts of proper management will be realized both upstream on the entire Mill River corridor and down to the bay. Additional repair work will be done to the interior of the brick pipe

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arch to improve flow conditions and structural defects. We are coordinating closely with the NYSDEC to design improvements related to the outlet capacity which is effected by the upstream and downstream conditions at the NW Pond Dam, South Pond Dam, and Smith Pond. Trees and vegetation will be removed from the dam as per NYSDEC requirements to ensure the dams integrity and to allow for proper ongoing inspections as required. Removal of the vegetation will also have a positive influence on the public, but opening up spectacular views of the park, lake and of the historic dam structure, as well as providing for a safe, open, and inviting environment and interpretive opportunities of these historic structures.

Installation of new outlet gates, inspection catwalk and water level monitoring equipment at the dam gatehouse will allow for better control of flows through the dam and Park. Flow-control is key to flood protection as well as maintenance of lake levels for recreational and ecological purposes. The proposed work at Hempstead Lake Dam is intended to be completed in concert with work at the NW/NE Ponds and South Pond, but is equally as important as a stand-alone project for overall protection of the watershed.

As historic structures, the gatehouse at Hempstead Lake dam and the inlet gatehouse at South Pond will both be restored with historical accuracy. Aesthetic design will be balanced with security concerns and functionality. Interpretive signage about the history of the area will also be provided.

South Pond Dam/ Outlet Weir

Improvements to the south pond Dam combined with the other improvements will enhance the protection of the watershed. As part of the project, trees and other vegetation will be removed, and additional fill may be applied to the crest to address settlement issues and to provide for a uniform slope. These areas will be seeded with native grasses that can be mowed seasonally to facilitate required safety inspections. In addition, vandalized stonework at the historic outlet weir will be restored to ensure the integrity of the outlet structure. Tree removals will open up views of South Pond from the adjacent roadway and Parklands and provide opportunities for park users to enjoy the south pond and the park from this vantage.

In summary, the Dam work proposed throughout Hempstead Lake State Park is being progressed in accordance with NYSDEC requirements and in coordination with the overall Living with The Bay project to help improve flood management, water quality and ecological conditions throughout the Mill River Watershed. This project will enhance public safety and resiliency, provide connections to the adjacent communities, encourage usage of the natural facilities in the Park, and provide environmental education and interpretation opportunities.

Northwest and Northeast Ponds

North Ponds

The North Ponds area contains two ponds referred to as the Northeast Pond and the Northwest Pond. The ponds are fed by flow from Mill River, groundwater, and from the stormwater drainage systems that outfall into the ponds and Mill River.

Pond Restoration and Stormwater Mitigation

Over time the watershed for the North Ponds has become more impervious and the flow into the ponds is more polluted from various runoff points surrounding the park. There is significant floatables deposits, sediment load and oil residue apparent near many of the outfalls. Water sampling showed levels of pollutants in the first flush volume. The high sediment load has filled the creek channel and the high velocity of the runoff entering the Mill River channel has resulted in significant erosion of the channel that is deposited into the ponds and surrounding area. This project seeks to mitigate the pollutant levels that enter the ponds and create wetlands to filter other pollutants from the runoff to improve the water quality entering Hempstead Lake and being carried further downstream into the bay.

Impacts from Hurricane Sandy and other storm events lead to breaches when the Mill River watershed saw significant flooding, the need to address the Mill River drainage system and other flood prone areas throughout the region was identified.

The following RBD principals and goals that will be achieved by implementation of the North Ponds Restoration and Stormwater Filtering aspects of the project include:

- Coastal Environment - Cultural Resources. The North Ponds project environmental and stormwater mitigation improvements will improve public open space in a high-density urban environment and adjacent to a public high school. These improvements will result in increased access to natural areas, educational opportunities and recreational facilities. and increase access to natural areas and recreational opportunities
- Coastal Environment - Environmental Concerns. The North Ponds project environmental and stormwater mitigation improvements will reduce the spread of contamination and waste products, promote a clean urban environment through cleaner storm runoff, and remove the accumulation of debris trash and floatable waste products from the park. These improvements will result in allowing for broader use of a public park area that is currently unusable by the community.
- Coastal Environment - Natural Resources. The North Ponds project environmental and stormwater mitigation improvements will improve degraded wetlands and upland areas by the removal of sediments and trash and debris, provide additional wetlands for stormwater filtering for pollutant removal of bacteria,

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nutrients and metals, improve operation of the storm drainage system that has been altered over time to reduce the sediment and trash collections aspects. The modifications to the drainage system will result in increased visibility in the north ponds area, additional trails and improved aesthetics. These improvements will result in an improved habitat for local wildlife and improved ecosystem function by increasing pond depths and increasing wetland areas. Improvements will result in additional use space within the park which will provide increased opportunities for local business that are related to the park, contribute to the local economy and the area's quality of life, increase tourism through increased use of the park and provide additional outdoor recreation opportunities within the park.

- **Hazards – Flood Risk and Vulnerability.** The North Ponds project environmental and stormwater mitigation improvements will remove the heavy sediment and debris deposits in the North Ponds area and result in an improved system to capture debris and sediment in new components of the drainage system where they can be monitored, cleaned and removed on a regular basis. These improvements will allow for the maintaining and operating of mitigation components at the entrance to the park, reducing in the buildup of materials throughout the site, and maintaining the pond and wetland environments.
- **Hazards – Storm Risk.** The North Ponds project environmental and stormwater mitigation improvements will stabilize the channel within the park resulting in a reduction in erosion and capture of sediments that are built-up and have reduced the system capacity.
- **Land Surface – Land Cover.** The North Ponds project environmental and stormwater mitigation improvements will result in the improvement of ecological processes by filtering stormwater through wetlands. These improvements will result in the reduction of pollutant migration as runoff passes through the system and will address a portion of the runoff from a high density residential area that currently provides little treatment of the runoff from the areas surfaces.

The LWTB program identified primary goals for the Mill River watershed and identified potential projects within the North Ponds that would result in the removal of pollutants from the upper watersheds resulting in cleaner water entering Hempstead Lake and being carried through the Mill River system to the bay. The Proposed North ponds projects that address the primary goals of the LWTB project include:

- **Blueway – Create a clean and continuous water system.** The North Ponds project environmental and stormwater mitigation improvements meets this objective by including components that collect the floatables and sediments entering the parks property to be collected using methods that will allow for future removal in a cost efficient manner, constructing new filtering wetlands to remove bacteria and nutrients and dredge the ponds to increase storage times for runoff.
- **Greenway – Create a continuous route connected to neighborhoods.** The North Ponds project environmental and stormwater mitigation improvements meets this objective by including components that provide additional trails and paths that

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increase circulation through the North Ponds area and increases the ability of residents to the north of the park to access the park and the trails.

- Social Connectivity – Develop projects that are linked to the community. The North Ponds project environmental and stormwater mitigation improvements meets this objective by including components allowing park user greater access to the area, the ability to view the improvements, and offer opportunities for education on the importance of the water system and the filtering components of the natural environment.

The North Ponds project environmental and stormwater mitigation improvements will address the following North Ponds objectives of the LWTB project including:

- Purifying – Improve the water quality of the runoff that enters surface waters and to support ecosystem restoration.
- Buffering - Increase buffering capacity of the precipitation runoff and slow down the surface drainage rate through increased filtering.
- Ecological Biotope – Create diverse habitats and restore the environmental characteristics and quality of the area.
- Attractive Landscape - Provide improvements that increase the aesthetic of the place.

Environmental Education and Resiliency Center

As the importance of global climate change increasingly impacts people around the world, it is more and more important to prepare everyday citizens and develop effective response strategies to more common extreme weather conditions. Education is an impactful way to increase community engagement and the ability of a community to prepare for, react and respond to extreme weather events. The Environmental Education and Resiliency Center (The Center) and Greenway at Hempstead Lake State Park will be a new and unique hands on learning center about storm resiliency, environmental management and will provide education opportunities for the immediate community as well as the region regarding the principals of Rebuild By Design, the Mill River Corridor and the impacts of climate change and how the natural ecosystem plays a critical role in the environmental resiliency of the surrounding area. The greenway and trails will provide a physical connection linking the ecological network and the communities along the Mill River Corridor.

The Center is being designed to act as a “coordination center” during times of emergency, if necessary, and can be used for the following purposes:

- “Command Post” for local disaster response coordination either for agency staff or other agencies such as the NYS Park Police. The existing parking area (field 1) is also utilized by PSE&G for emergency response staging of equipment in advance of severe weather events. The Center will provide a location for PSE&G staff to coordinate equipment staging, enhancing their emergency response to

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restore critical utilities and thereby help to promote economic resiliency in the community and region.

- The Center may also serve as an information center if needed, for local residents after an emergency. Parking is available in field 2 or access via the greenway that provides connection points to the surrounding neighborhoods and communities. The building will include a full building load emergency generator to provide resiliency and continued functionality during power outages.

On a daily basis, the trails and greenway will be open to the public for recreational use (walking, jogging, biking, horseback riding, bird watching, etc.) providing connection points to the surrounding neighborhoods and an economical way for people to exercise, increasing health and well-being of its users, with attention to developing physical environmental connections to nearby underserved communities. The trails and greenway will also provide access to the ponds and lake for other types of recreation such as fishing and kayaking. The Center will provide a central focal point and core for the park with connections to the greenway, providing educational and community spaces connected to an overlook deck with views of Hempstead Lake, a point where permits and services can be administered, and park information explaining the critical messages of climate change impacts, community resiliency processes, environmental preservation, and local relevance. The Center will also provide essential facilities to help with building partnerships with local school districts to utilize the education space and wet lab for hands-on learning and activities, engaging young minds through activities that reflect their local surroundings and fosters stewardship. The Center will be focused primarily around the importance of parks and wetlands, specifically during extreme weather conditions. There will also be information about the Mill River Corridor system as a whole, local wildlife and history of the area.

Additionally, Hempstead Lake State Park has adopted the National Park Service's "Every-Kid-in-a Park" program which provides free entry for 4th grade students and their families to the park. The program encourages children at a critical development age to learn and explore about the importance of local and national parks and waters. Hempstead Lake State Park also participates in larger State Parks program that provides grants to Title 1 schools to reimburse them for bussing costs for field trips to State Park facilities.

The Center is also being designed to include space to provide for additional partnerships for organizations such as the Nassau County Law Enforcement Explorer Program that will use the Center for training space to promote and deliver their programs within the park. This volunteer program provides an opportunity for at risk young adults and many from low to moderate income areas to receive basic law enforcement training and to learn about career opportunities within law enforcement. In addition to training and education, volunteers participate in community service events throughout the year to encourage volunteerism and build stronger communities. The space necessary for this program also will serve as a center

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for local community outreach by the police, educating and positively engaging young people with officers through mentoring and education; further strengthening the connection to the community.

The Center building itself will be designed to reduce environmental demands, both in initial cost and lifecycle cost in a responsible fashion. Aside from the obvious benefits of lower operating costs of an environmentally conscious building, the building will be used to educate users about sustainable building practices and construction. The building will be designed with the following key features:

- Robust and sustainable exterior envelope optimized to suit local climate demands.
- Awareness of solar impacts (i.e. siting) and control (i.e. glazing) to reduce heating and cooling loads.
- LED lighting with occupancy sensing and daylight harvesting to reduce electrical usage.
- Photovoltaic roof panels to offset electricity energy usage.
- High-efficiency, low/no water plumbing fixtures.

The Environmental Education and Resiliency Center and Greenway will connect the adjacent neighborhoods and communities with the natural environment and promote environmental awareness, ecological and public health as well as promote the overall wellbeing and quality of life of the region by providing opportunities for recreation, education, interpretation and improved community relations related to preparedness for future storms as well as the environmental, social and economic resiliency and emergency services.

Greenway, Gateways and Waterfront Access

Hempstead Lake along the old Mill River corridor is a key component in the strategy needed to improve the water quality, decrease stormwater flooding, while incorporating environmental co-benefits such as water quality improvements, ecological restoration, and aquifer recharge, community and social, resiliency, education, recreation (Greenway Corridor) and quality of life.

The park enhancements and improvements will include new amenities; pedestrian lake interaction and accessibility; a new education and visitors to welcome the community and to educate the people on the history of the place and the important role it plays in the economy, health, and safety of the community; Schodack Brook Bridge crossing to allow users to now be able to traverse the entire park from north to south; bridle trail improvements; a new 50 car space area for regional commuters to park and enjoy the park and the Mill River Corridor; enhanced bird watching opportunities, through a newly designed and developed wetland that will also improve the water quality and storm water events; interpretive and educational signage; connectivity to the high

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school, as well as gateways that will allow the public easy pedestrian access to and from all surrounding neighborhoods.

Gateways

The gateways will provide a direct, pedestrian access from the adjoining neighborhoods, a significant portion of which are low to moderate income communities into the Mill River Corridor and HSLP, where currently there are none. The gateways will open access into the neighborhoods providing more opportunities for adjoining neighbors to freely access the park. These gateways will also provide a sense of security within the park, by opening up views, providing additional access points for pedestrians as well as emergency vehicles.

Greenway

The greenway provides a unique opportunity to connect the public to an ecologically significant watershed corridor allows the public to walk the corridor and learn along the way about the river system through educational signage. Some of the positive impacts and results include:

- Environmental Benefits - Reduces environmental impacts- Ped access and Bikes, no cars mean, no fossil fuels mined, no air pollutants are generated, less maintenance is needed on roads,
- Improved Public Health (Collateral Benefit) - breathe cleaner air; walking and exercise improves the immune system and circulation, which means less lost workdays, increased productivity and less money spent on healthcare costs.
- Experience - People experience and learn about *nature through direct contact* and interpretative signage
- physiologically improvements - nature relaxes the body and reduce toxins
- improves the immune system - Walking through the corridor
- Mental health - improves with connecting with nature through exercise, experience, site, and sounds

Piers/Kayak Launch

Floating piers and kayak launches will allow the public to have direct access to the middle of the River Corridor. The Piers allow the user to be placed directly over the water to experience and see and feel the place. Kayak launch gives the public one more layer of interaction by allowing the use to float on top of the water and be physically connected. In addition to the piers and launches, docks will be included for the local community use for fishing, education piers, bird watching areas for locals (Audubon).

Greenway Parking Lot



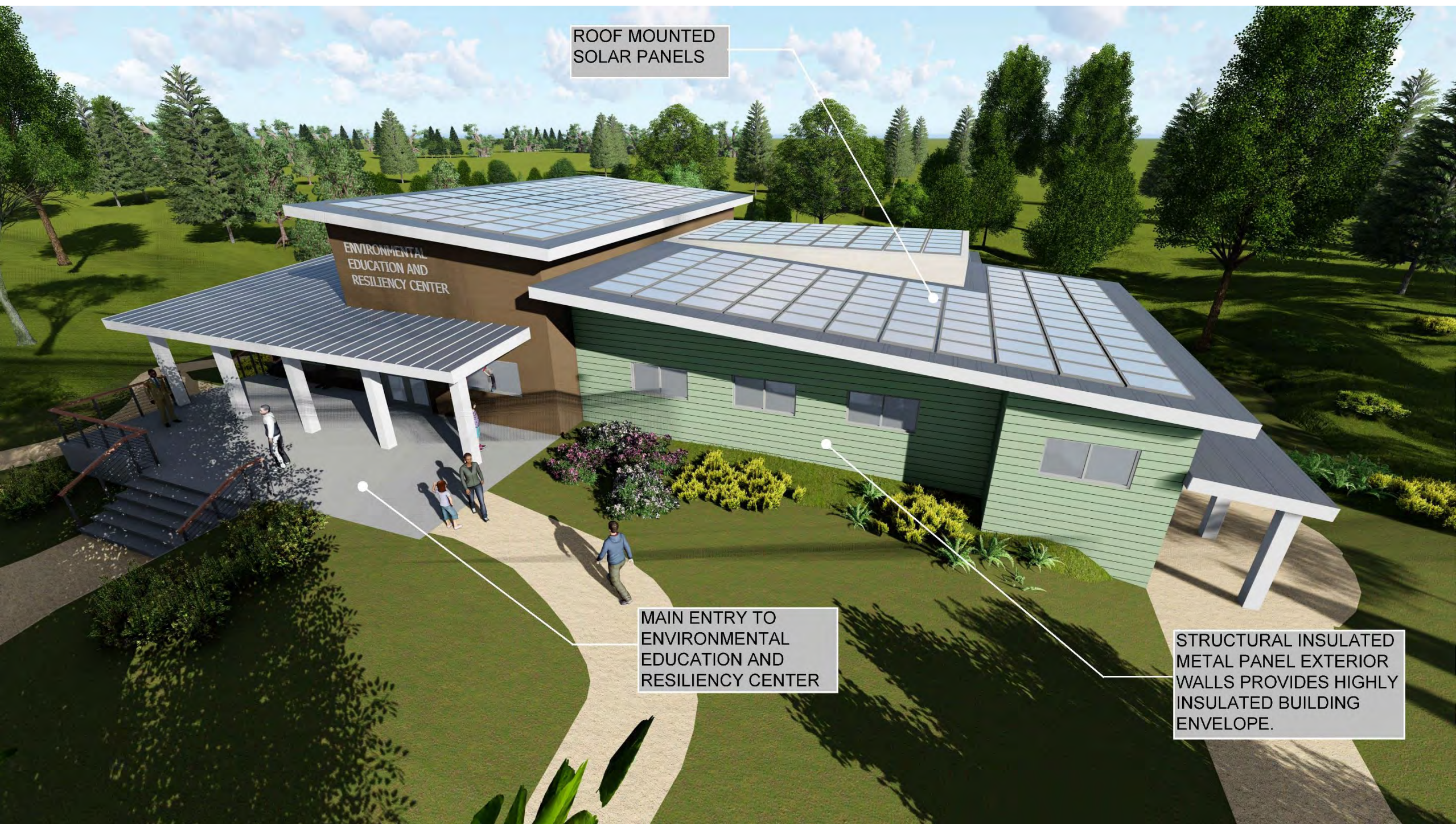
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Upgrades to the parking lot will provide visitors, both locally and from the larger region additional parking so they can access the greenway and the existing and proposed park amenities. Resulting from the Greenway Trail, environmental interpretation and programming as well as other future community enhancement programs that will be developed will be a multi-purpose Environmental Education and Resiliency Center, the park anticipates an increase in visitation which necessitates this improvement. In addition, the entrances to the parking lot will also have direct access to/from the Long Island Railroad local stations and access from other public transportation.



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INFORMATION
DISPLAY AREA

MAIN ENTRY TO
ENVIRONMENTAL
EDUCATION AND
RESILIENCY CENTER

CONNECTION PATHWAYS
TO GREENWAY AND TRAILS



Hempstead Lake State Park

New York State Parks, Recreations and Historic Preservation



ROOF CANOPIES AND
OVERHANGS CONTROL
SOLAR EXPOSURE AND
CREATE SHADED EXTERIOR
AREAS

CONNECTION PATHWAYS
TO GREENWAY AND TRAILS

OVERLOOKING DECK WITH
DIRECT ACCESS FROM
ENVIRONMENTAL
EDUCATION SPACE



Hempstead Lake State Park

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ROOF MOUNTED
SOLAR PANELS

HEMPSTEAD LAKE STATE PARK

ROOF CANOPIES AND
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SOLAR EXPOSURE AND
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ENTRY VESTIBULE

INFORMATION AREA

EXHIBITS

3D WETLANDS SECTIONAL
WALL DISPLAY