



New York State Water  
Resources Institute



# Green Infrastructure Case Studies from Peer Communities: Poughkeepsie and Newburgh

Emily Vail

Hudson River Estuary Program  
NYS DEC  
NYS Water Resources Institute  
at Cornell University

Ryan Palmer

Center for the Urban River at Beczak  
Sarah Lawrence College



**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**



- Hudson River Estuary Program
- Background on case studies
- Poughkeepsie projects
- Newburgh projects
- What you can do

# Hudson River Estuary Program

**Our mission: Help people enjoy, protect, and revitalize the Hudson River Estuary and its Valley**





# Hudson River Estuary Program

## Six benefits:

- Clean water
- Resilient communities
- Vital estuary ecosystem
- Estuary fish, wildlife, and their habitats
- Scenic river landscape
- Education, river access, recreation, and inspiration

## Hudson River Estuary Action Agenda 2010 - 2014

*"Helping people enjoy, protect and revitalize the Hudson River and its Valley"*



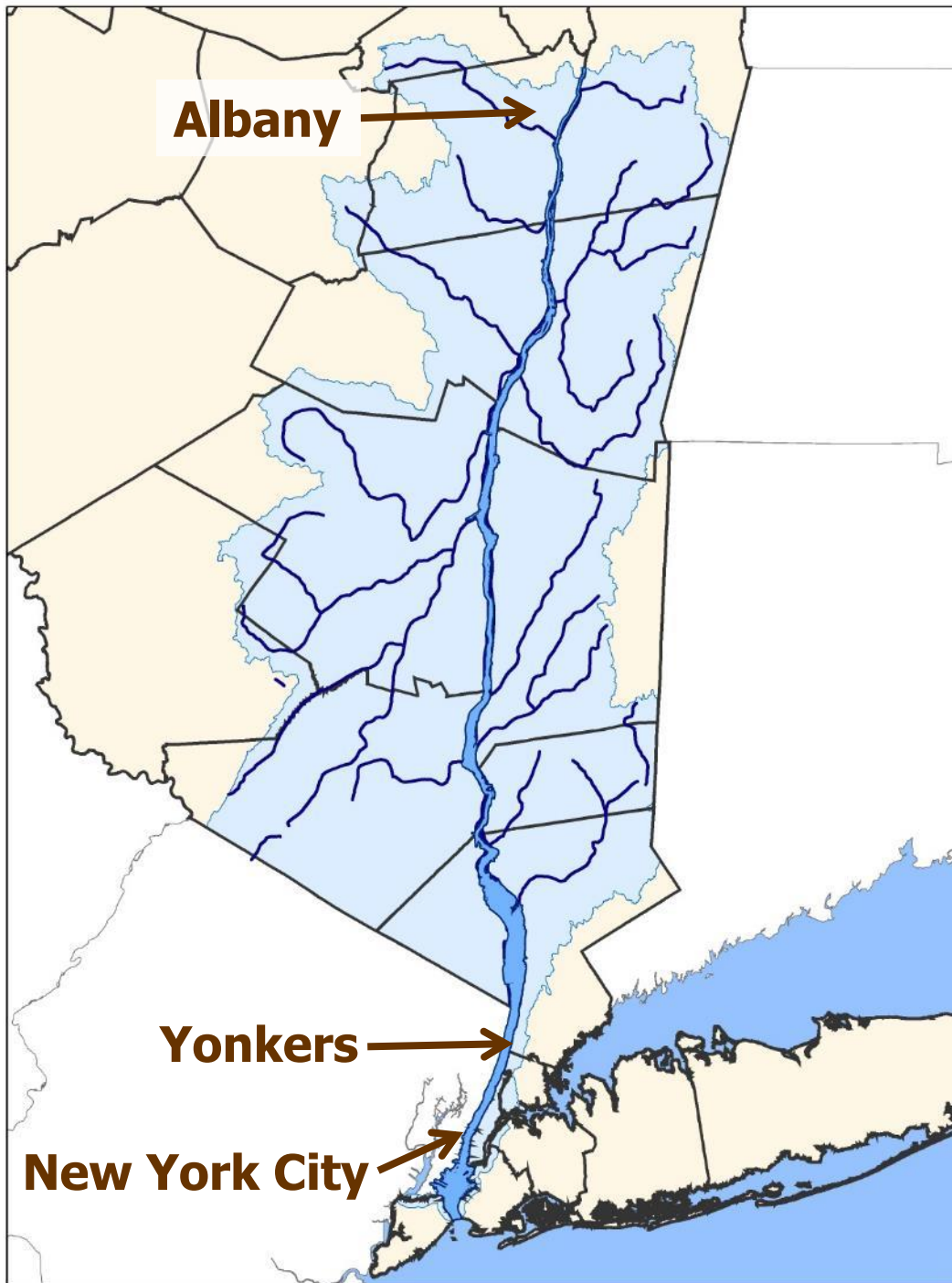
Hudson River Estuary Program  
New York State Department of Environmental Conservation

In partnership with participating federal and state agencies as well as local municipalities, non-profits, universities and businesses.



40 years of stewardship 1970-2010





**Albany**



**Yonkers**



**New York City**



# Hudson River Estuary watershed

# Creating Partnerships for GI

- Poughkeepsie:
  - Fall Kill Plan
  - GI at Underwear Factory
  - GI at Nubian Directions
- Newburgh:
  - GI planning to reduce combined sewer overflows
  - GI demo as part of fitness trail



Planting trees along the Quassaick





# Watershed Groups

Engaged local citizens



**Poughkeepsie: Fall Kill  
Watershed Committee**



**Newburgh: Quassaick  
Creek Watershed Alliance**

# Other Partners

- City Staff
  - Engineering
  - Planning/Development
- Local officials
  - City Council
  - Planning Board
  - CAC
- County agencies
- Non-profit partners
- Community organizations



Poughkeepsie's Middle Main Revitalization Block Party





# Technical Experts

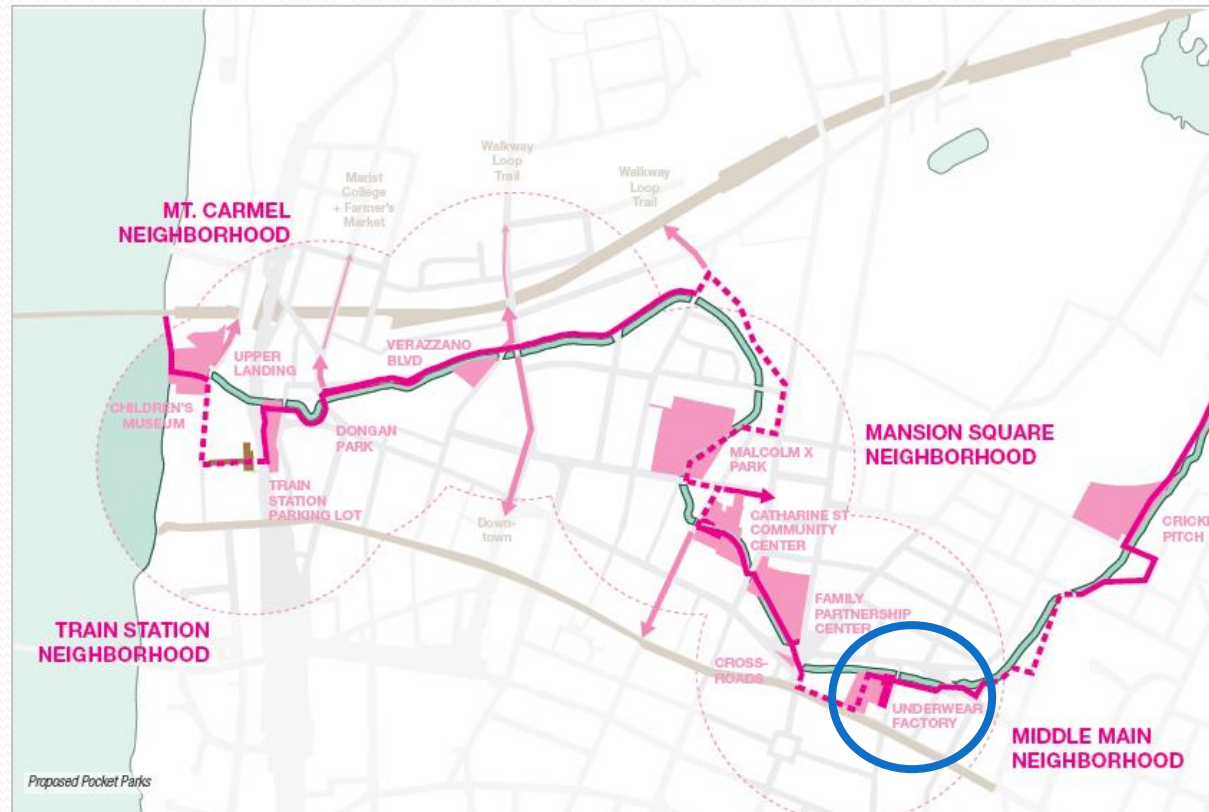
- Poughkeepsie Underwear Factory:
  - Clearwater (engaged stakeholders)
  - eDesign Dynamics (engineering)
  - Columbia University Urban Landscape Lab (landscape design)
  - LandMine studios (landscape architecture)
  - PAUSE (public art)
- Newburgh planning project:
  - Clearwater
  - eDesign Dynamics
  - Newburgh City Engineer



Eric Rothstein from eDesign Dynamics at the Underwear Factory

# From Planning to Implementation

- Strategic sites
  - Benefit streams, the Hudson River, and the community
  - Public locations for demonstration sites
- Input from residents and experts



From the Fall Kill Plan



# Funding

- Poughkeepsie:
  - Hudson River Estuary Grant
  - NEIWPC/Hudson River Estuary Program green infrastructure grant
  - EPA Urban Waters grant
- Newburgh:
  - NEIWPC/Hudson River Estuary Program watershed resiliency grant
  - DEC Environmental Justice grant





# Poughkeepsie and Newburgh

- Why green infrastructure?
  - Tale of Two Cities:
    - Poughkeepsie Stormwater
    - Newburgh CSO
- Other Goals



October 06. 2012 2:00AM

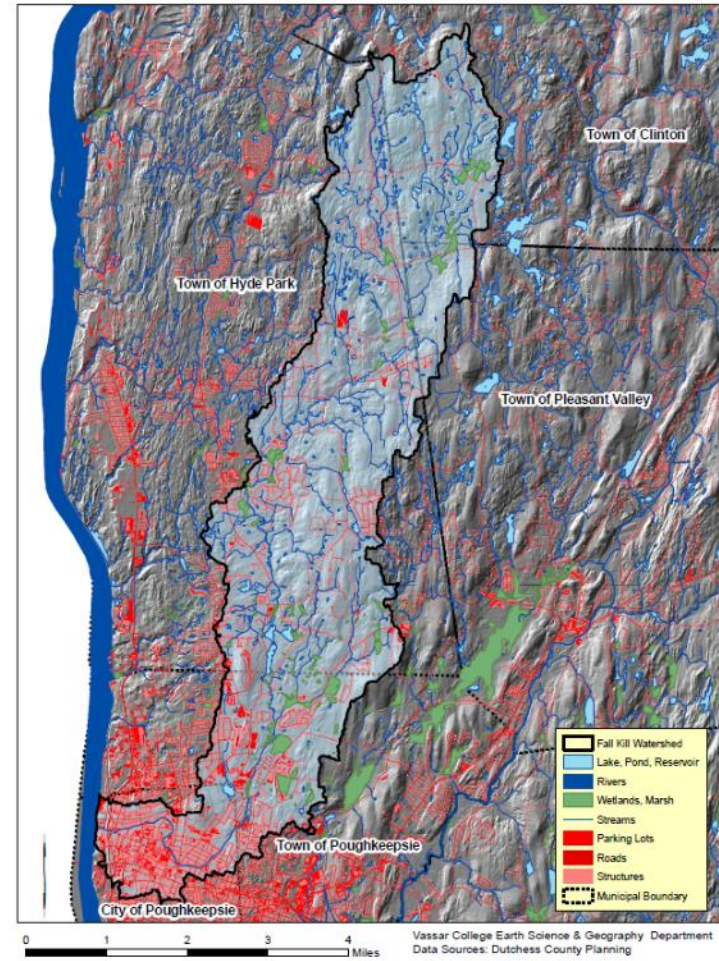
**Sewage spill prompts Newburgh state of emergency**



# Fall Kill Plan



Fall Kill Watershed





# Fall Kill Plan

Improve water quality in the Fall Kill  
Green Infrastructure to mitigate stormwater  
Riparian/Floodplain restoration

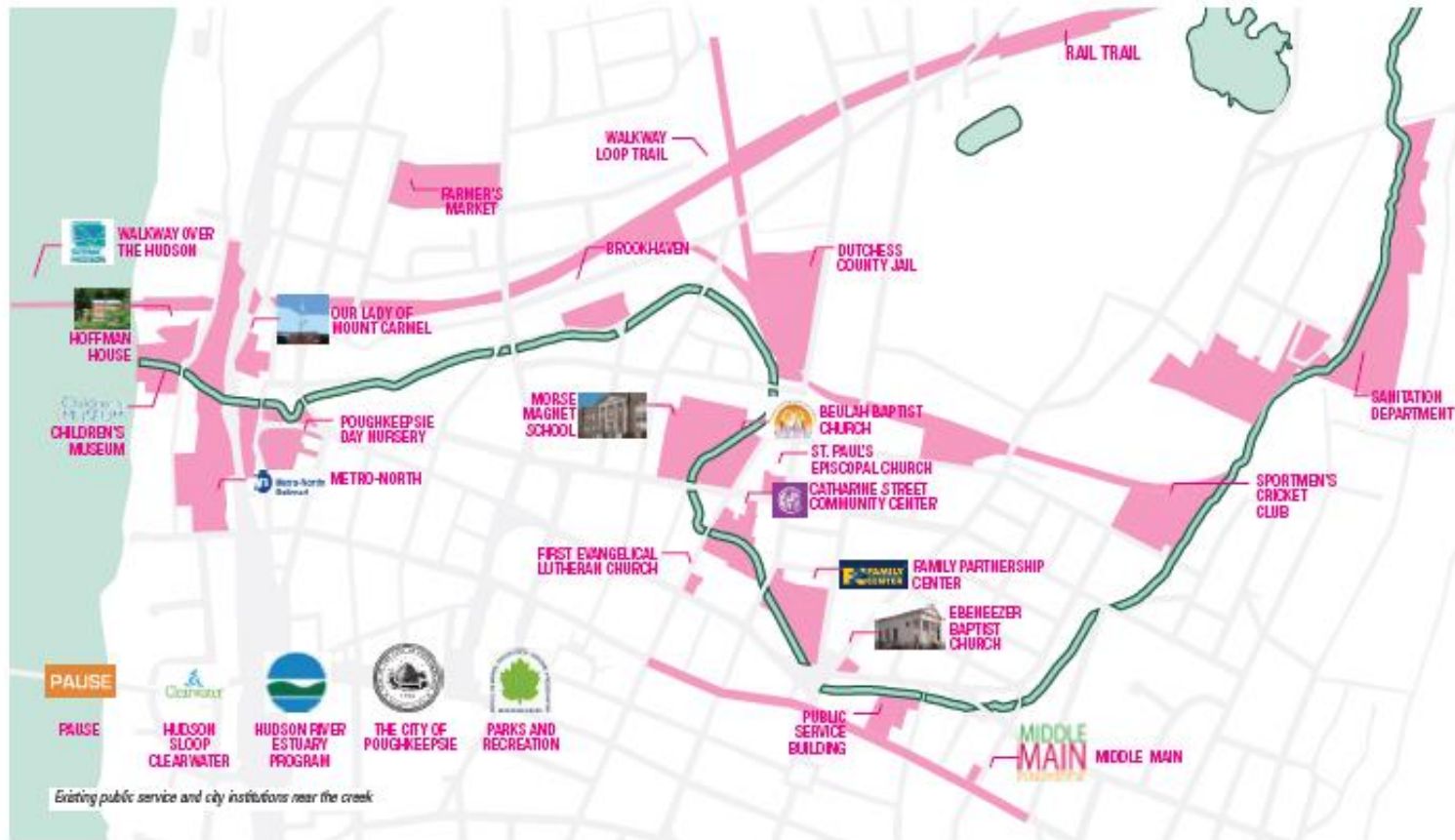
Increase community stewardship and access  
Aesthetic appeal leading to increase in ownership  
Decrease pollution from litter

Enhance connections to existing urban  
resources  
Community centers, businesses, organizations  
Economic development opportunities

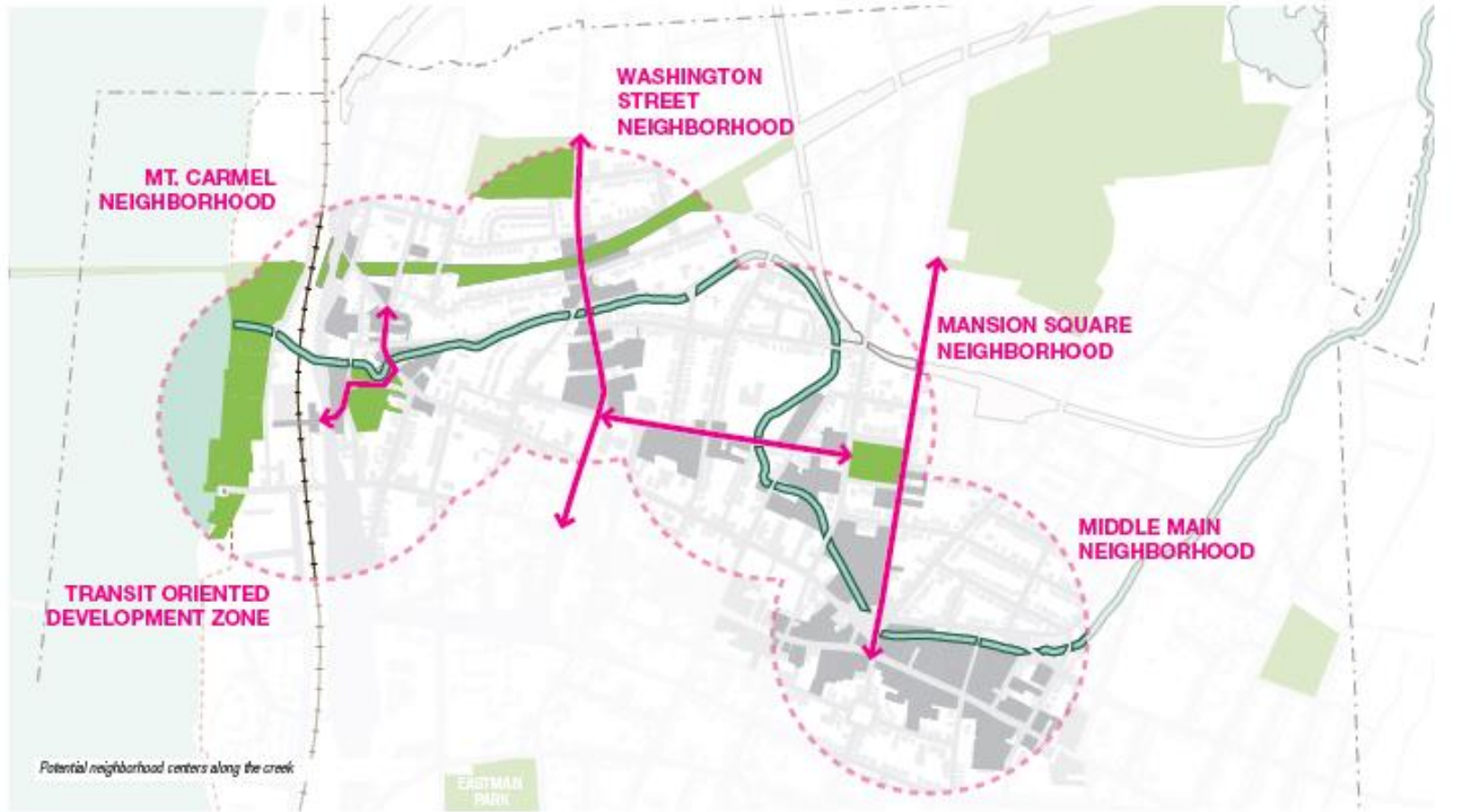




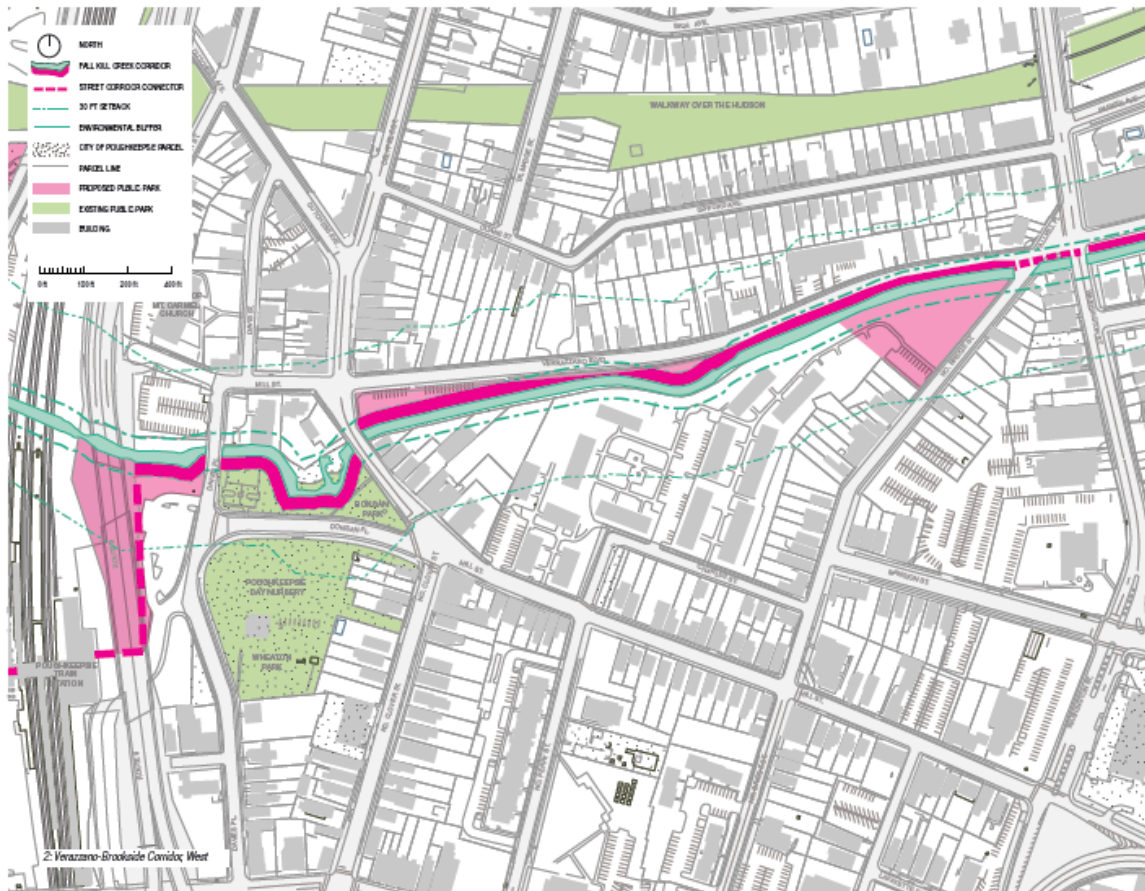
# Fall Kill Plan



# Fall Kill Plan

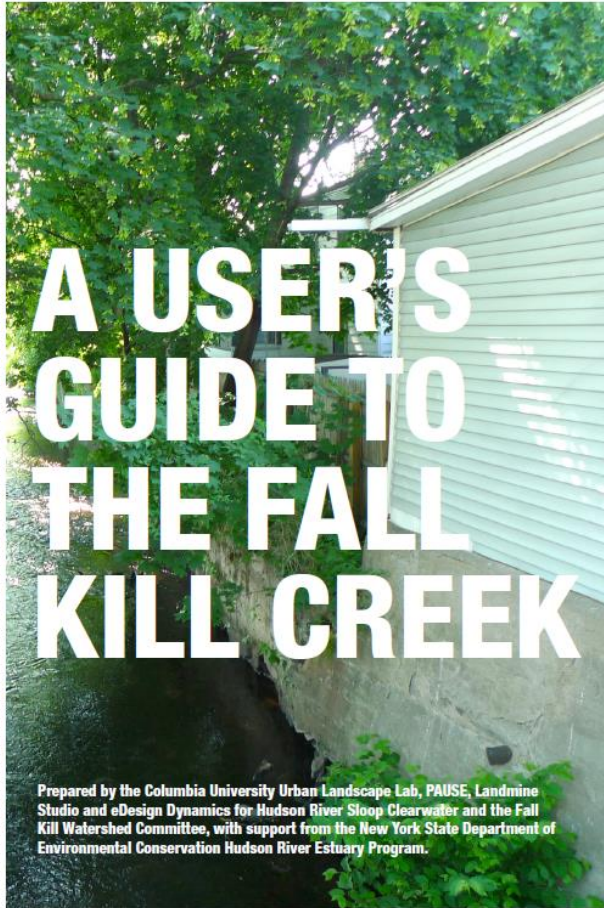


# Fall Kill Plan





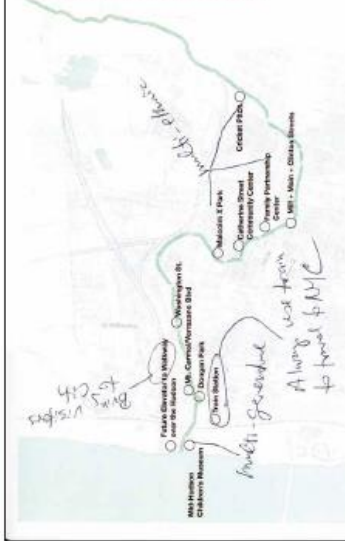
# Fall Kill Handbook



## A USER'S GUIDE TO THE FALL KILL CREEK

Prepared by the Columbia University Urban Landscape Lab, PAUSE, Landmine Studio and eDesign Dynamics for Hudson River Sloop Clearwater and the Fall Kill Watershed Committee, with support from the New York State Department of Environmental Conservation Hudson River Estuary Program.

WHICH SITES ARE IMPORTANT TO YOU? WHY?



## THE FALL KILL CREEK HANDBOOK

WHAT ACTIONS WOULD YOU SUGGEST TO FALL KILL CREEK NEIGHBORS?



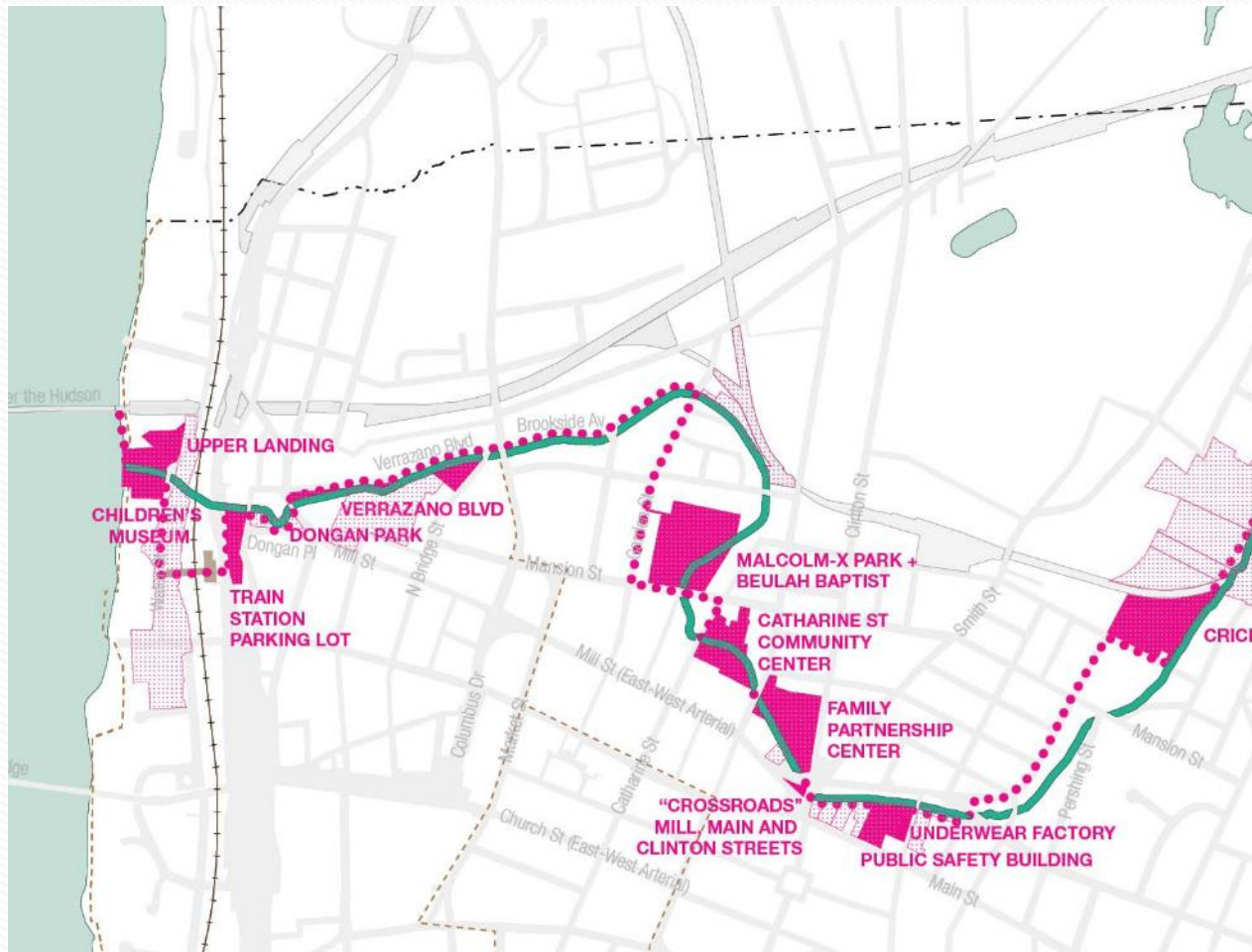
WHAT DOES THE FALL KILL MEAN TO YOU?

- ① The historical core, becoming one thread of the expanding city to include the waterfront, main street and residential neighborhoods
- ② Unused Resource — ecological, historical, economic, social
- ③ Potential — bring Nature into the city and urban consciousness

HOW CAN THESE SITES BE USED IN DIFFERENT WAYS?



# Fall Kill Plan



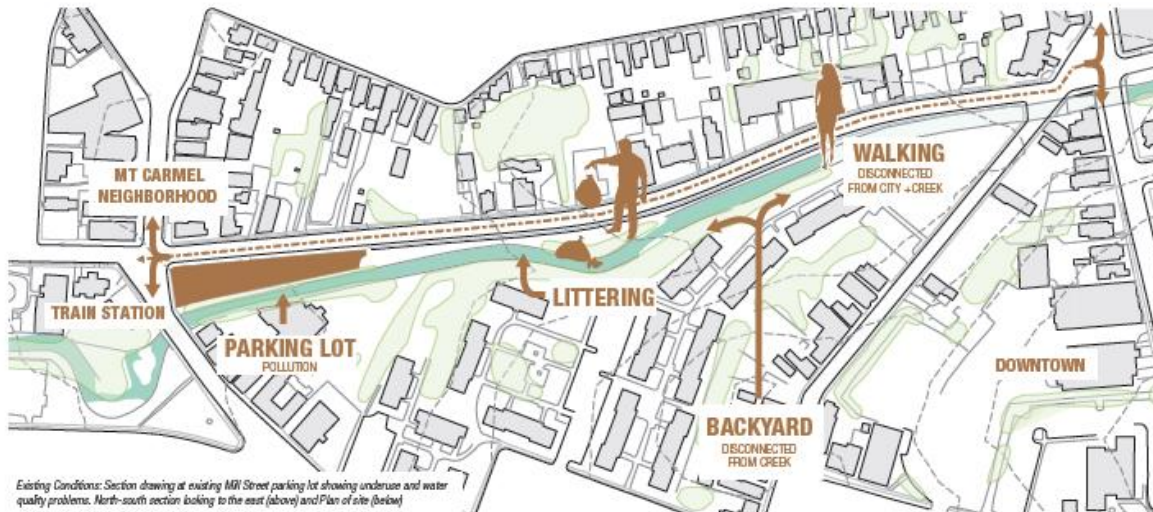
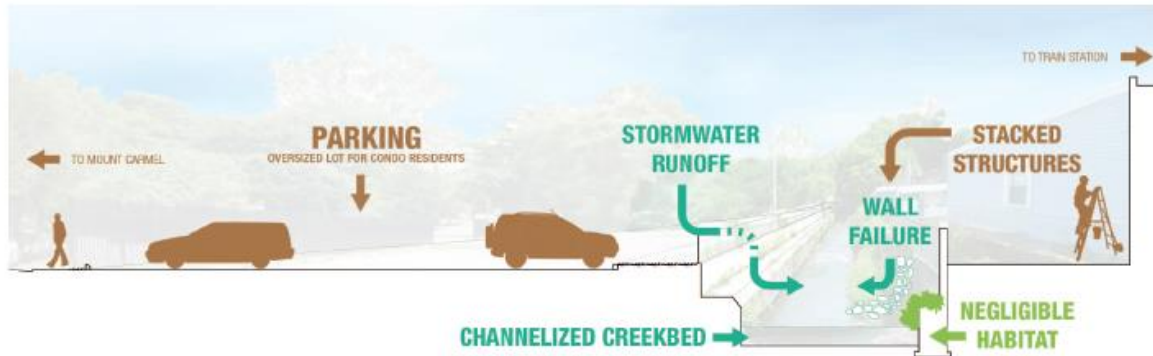


# Fall Kill Plan





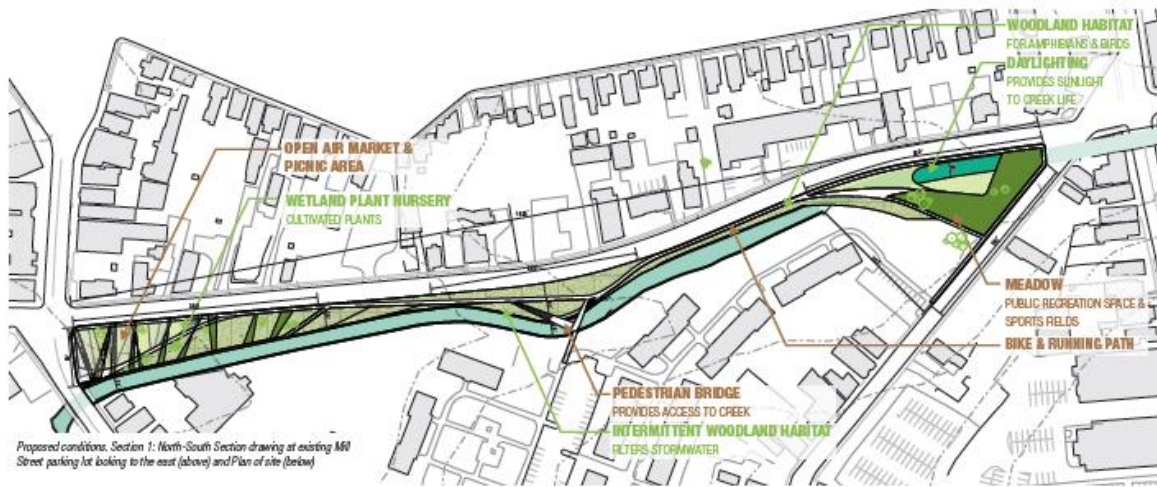
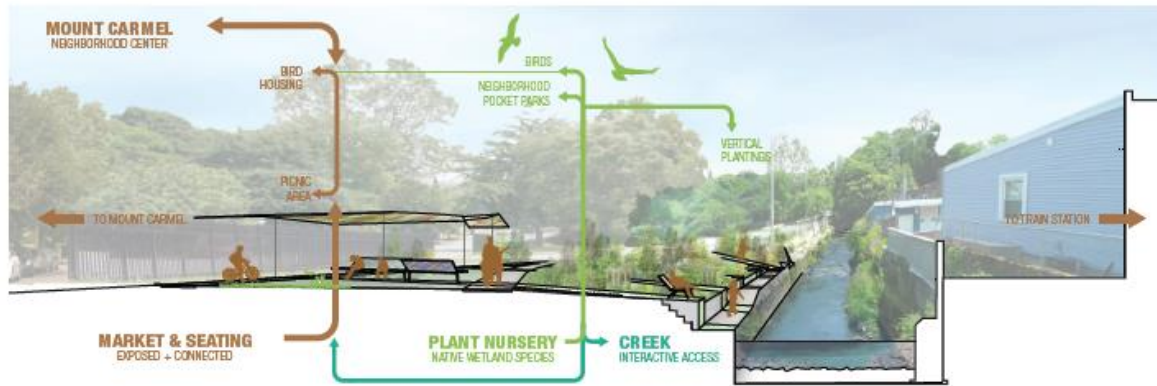
# Fall Kill Plan



Existing Conditions: Section drawing at existing Mill Street parking lot showing underuse and water quality problems. North-south section looking to the east (above) and Plan of site (below)



# Fall Kill Plan



Proposed conditions. Section 1: North-South Section drawing at existing MI Street parking lot looking to the east (above) and Plan of site (below)





# Fall Kill Plan



*several view of proposed design*



*intermittent wetland pool*





# Fall Kill Plan



# Fall Kill Plan





# Fall Kill Plan



*Proposed: View of toddler playground near wetlands. The creek and Morse School are seen beyond the wetlands.*





# Fall Kill Plan



# Fall Kill Plan



aerial view of proposed design



intermittent wetland pool





# Fall Kill Plan



Proposed: Perspective of amphitheater at night during a music event





# Underwear Factory



**OPTION A: 20 FT ROAD WITH 60 DEGREE ANGLED PARKING**

**PROS**

- 20 FT ROAD
- ANGLED PARKING
- ADEQUATE BIOSWALE

**CONS**

- LIMITED VEGETABLE GARDEN
- LIMITED GATHERING SPACE FOR EDUCATIONAL/ OUTREACH PROGRAM
- NARROW SIDEWALK ALONG LENGTH OF BUILDING
- LESS ROOM FOR NATURALIZED SLOPE

Total Impervious Area = 20360SF  
 Target Vol = 20360 x 1.1/12 = 1866 CF  
 Area of depression required = 1866/1 ft detention = 1866 SF



BIOSWALE WITH 3:1 SLOPE ON BOTH SIDES AND 3' OFFSET FROM THE PARKING LOTS ON EITHER SIDES



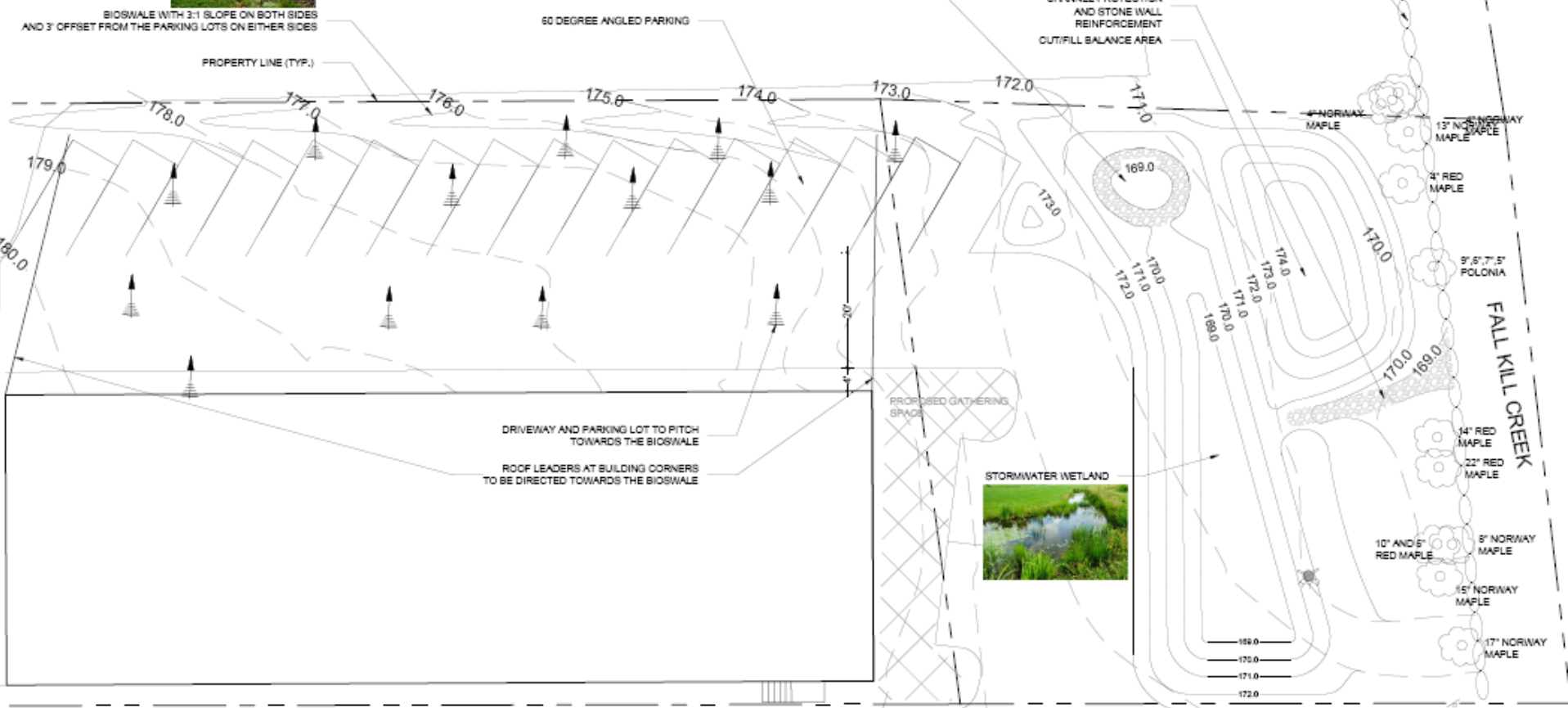
OVERFLOW SWALE WITH CHANNEL PROTECTION AND STONE WALL REINFORCEMENT  
 OUTFILL BALANCE AREA

EXISTING STONE WALL

WETLAND FOREBAY

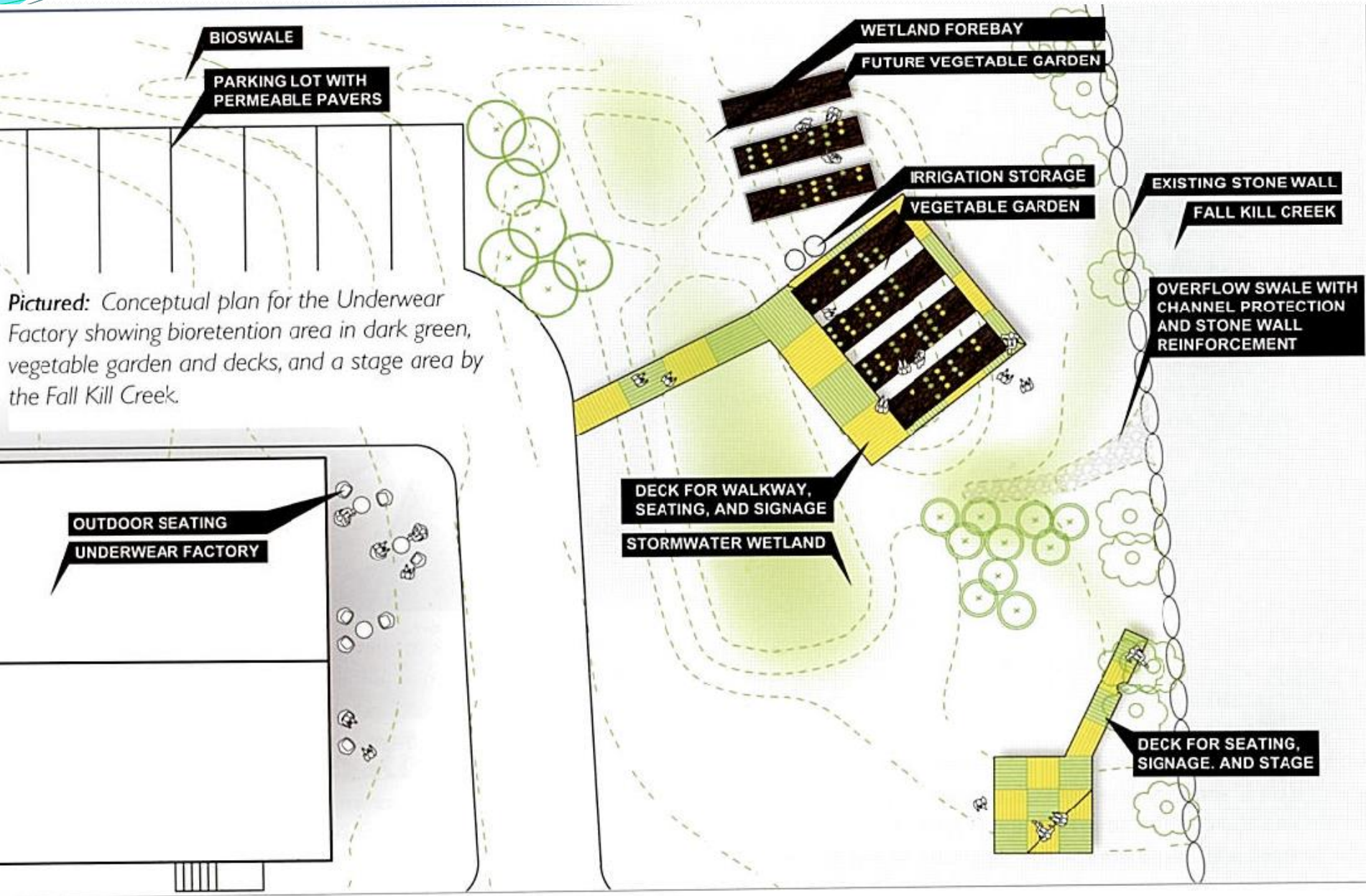
60 DEGREE ANGLED PARKING

PROPERTY LINE (TYP.)



NORTH CHERRY STREET





**BIOSWALE**

**PARKING LOT WITH PERMEABLE PAVERS**

**WETLAND FOREBAY**

**FUTURE VEGETABLE GARDEN**

**IRRIGATION STORAGE**

**VEGETABLE GARDEN**

**EXISTING STONE WALL**

**FALL KILL CREEK**

**OVERFLOW SWALE WITH CHANNEL PROTECTION AND STONE WALL REINFORCEMENT**

**DECK FOR WALKWAY, SEATING, AND SIGNAGE**

**STORMWATER WETLAND**

**OUTDOOR SEATING UNDERWEAR FACTORY**

**DECK FOR SEATING, SIGNAGE, AND STAGE**

*Pictured: Conceptual plan for the Underwear Factory showing bioretention area in dark green, vegetable garden and decks, and a stage area by the Fall Kill Creek.*



# Underwear Factory



Before



After (11/15/13)





# Underwear Factory



Before



After (6/26/14)





# Underwear Factory





# Nubian Directions

- Workforce Development Agency
  - GED, Youthbuild, Computer Skills, Resume and Interview
- Green Building Training
- Poughkeepsie Beautification



# Nubian Directions





# Nubian Directions

<http://www.poughkeepsiejournal.com/videos/tech/science/environment/2014/10/21/17665701/>



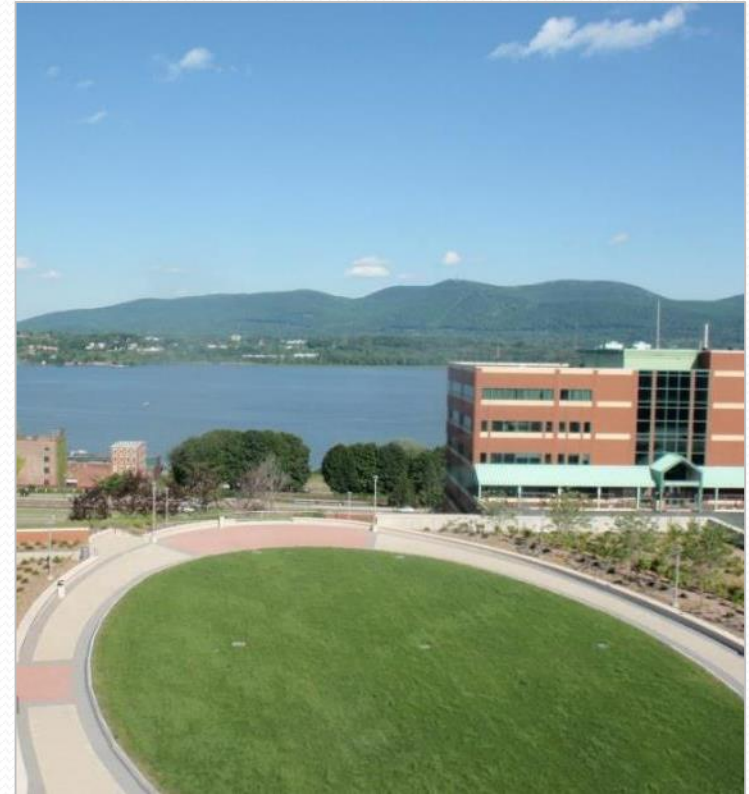
# Newburgh GI Plan

Improve water quality in the  
Quassaick Creek and Hudson River  
Green Infrastructure to mitigate CSOs

Reduce cost of gray infrastructure  
Strategic implementation to save money  
and integrate with LTCP

Improve habitat and urban green  
space

Aligns with Quassaick Creek Watershed  
Management Plan

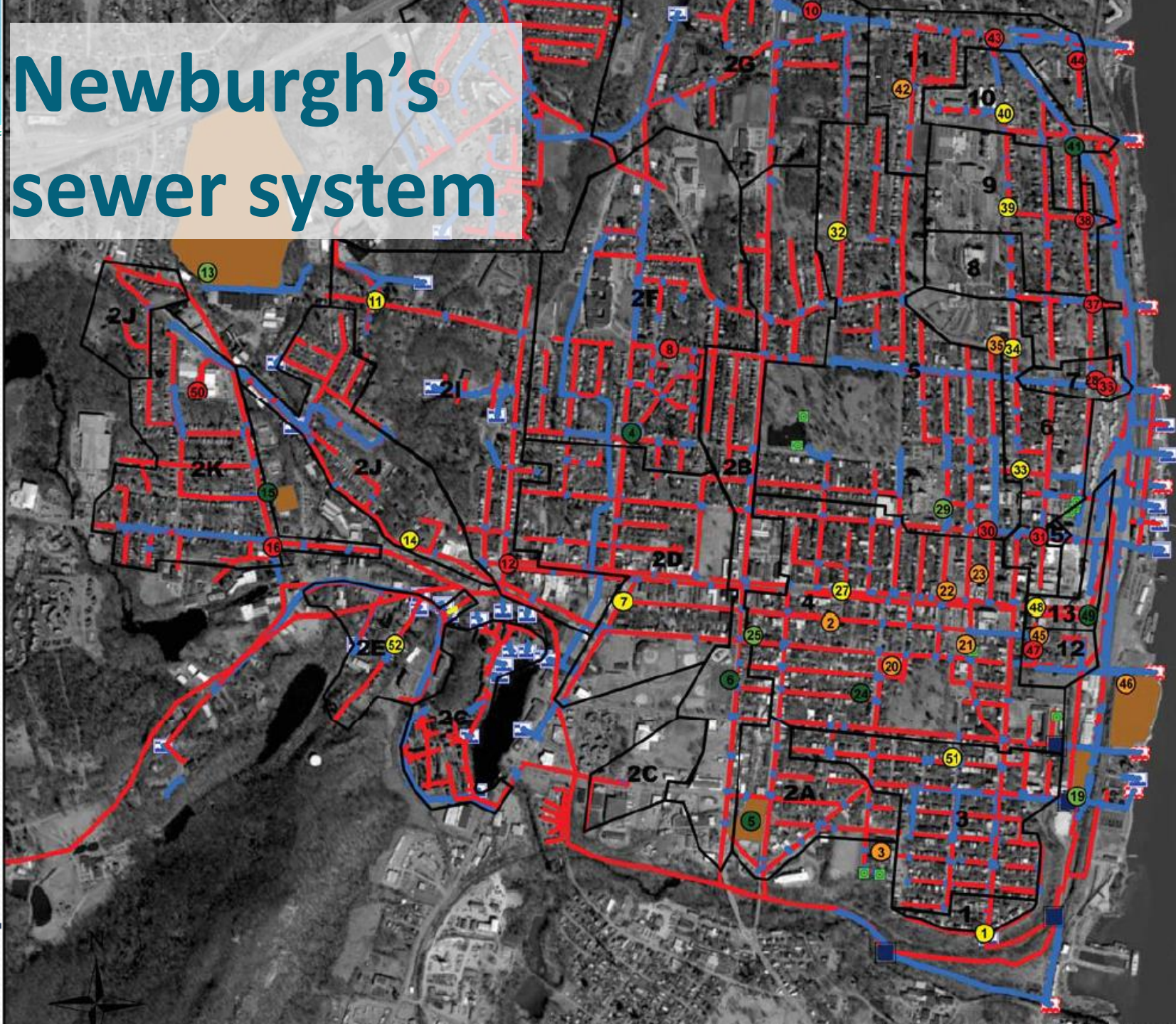


Green roof at SUNY  
Orange - Newburgh



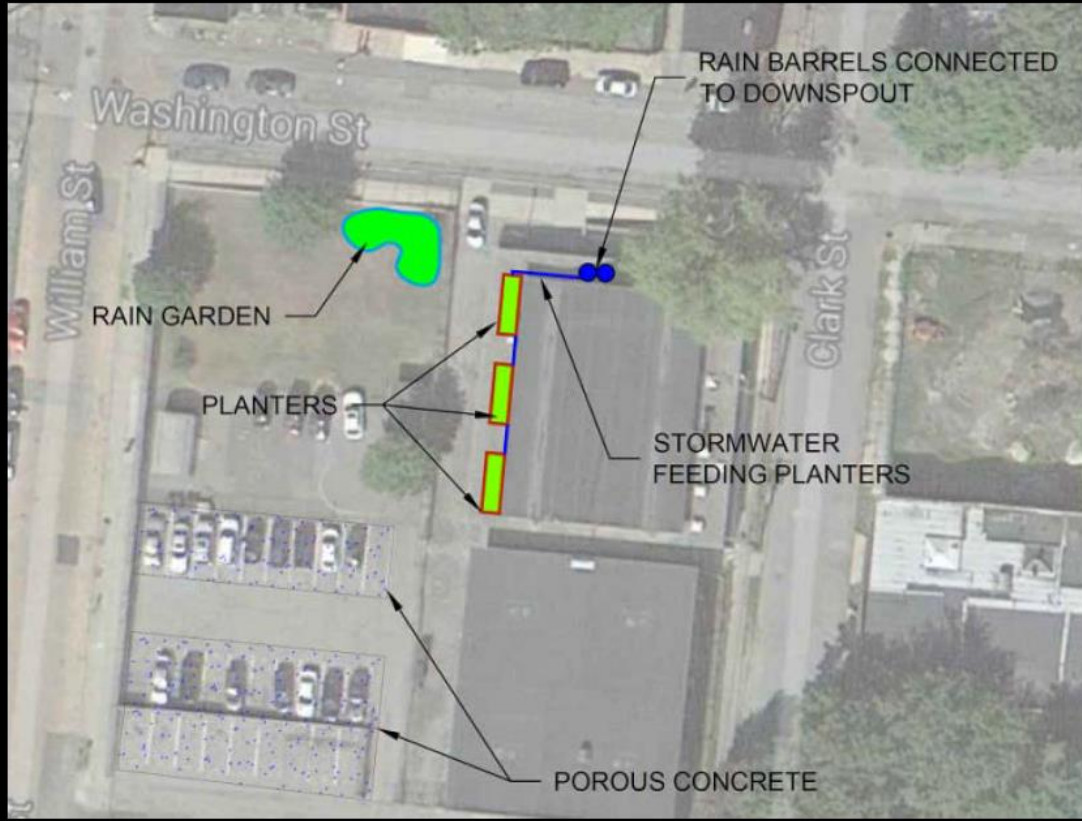


# Newburgh's sewer system



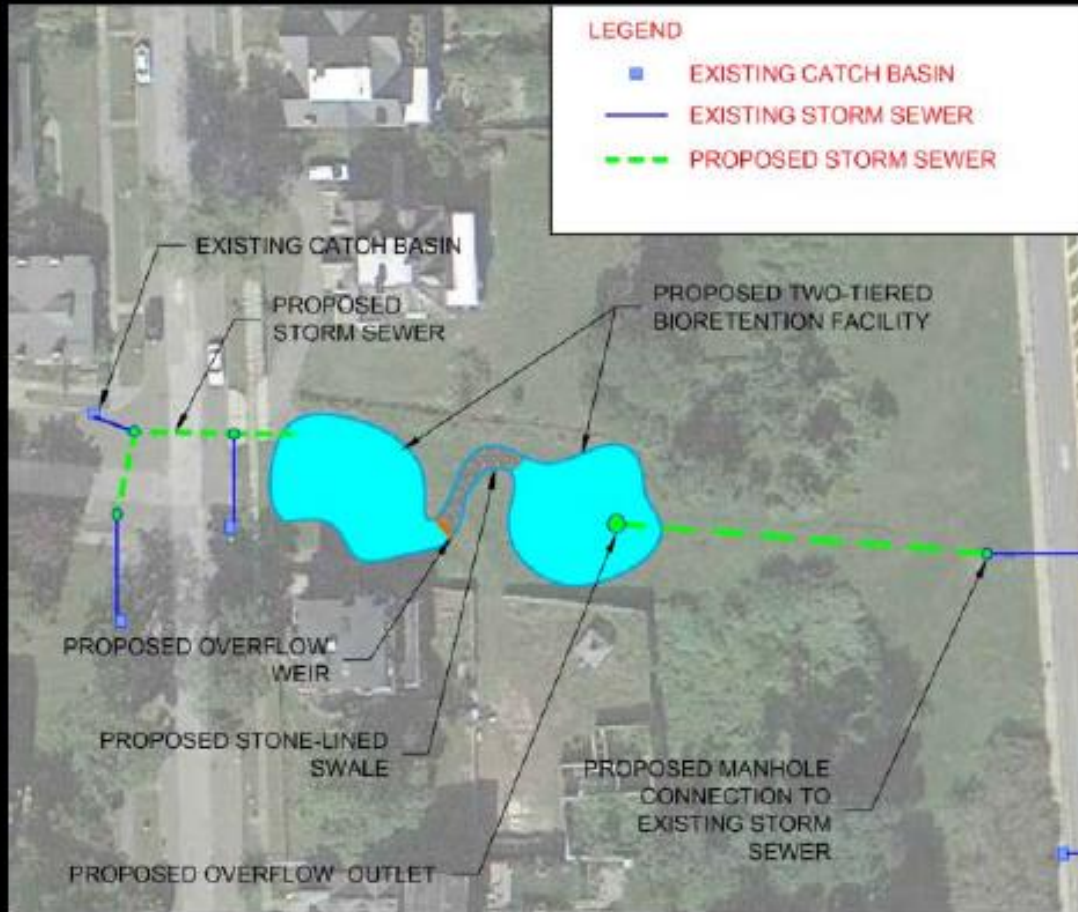


# GI On Public Property: Washington Street School





# Strategic Separation: Montgomery & Clinton



# Muchattoes Lake Fitness Trail

- Fitness trail around Muchattoes Lake
- Green infrastructure demonstration at the Newburgh Armory Unity Center
- Habitat and access improvements
- Education/research programs with students
- Waterfront corridor planning
- DEC Environmental Justice grant





# Muchattoes Lake Fitness Trail



Drawing by  
Peter Smith

# Partnerships in Newburgh

- GI Planning:
  - eDesign Dynamics
  - Clearwater
  - Quassaick Creek Watershed Alliance
  - City of Newburgh
- Muchattoes Lake Fitness Trail:
  - Quassaick Creek Watershed Alliance
  - City of Newburgh
  - Clearwater
  - Newburgh Armory Unity Center
  - Orange County Planning Department
  - Newburgh Community Land Grant
    - And many other local partners!





# What can you do?

- Identify engaged citizens, community groups, city officials/staff, non-profit partners, agencies, technical experts
- Goals for green infrastructure (reduce flooding, improve water quality, reduce CSOs, beautify neighborhoods, reduce heat impacts, improve habitat, etc.)
- Strategic locations that provide multiple benefits
- Learn more about green infrastructure, what others have done
- The Hudson River Estuary Program provides technical assistance, outreach, grants for planning/implementation



# Thank You!

## Contact information:

- Emily Vail
- Watershed Outreach Specialist
- Hudson River Estuary Program, NYS DEC
- [emily.vail@dec.ny.gov](mailto:emily.vail@dec.ny.gov)
- (845) 256-3145
- Ryan Palmer
- Director
- Center for the Urban River at Beczak, Sarah Lawrence College
- [rpalmer@sarahlawrence.edu](mailto:rpalmer@sarahlawrence.edu)
- (914) 377 - 1900 x15

