RESTORING AN URBAN ECOSYSTEM: THE URBAN WATERS FEDERAL PARTNERSHIP-PHILADELPHIA AND THE URBAN DELAWARE RIVER

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Why Focus on Urban Water Areas?

MEA Defined Ecosystem Services as “the Benefits that People Obtain from Ecosystems (2005)
The UWFP Mission

- Break down silos between Federal agencies to improve services
- Help communities connect with – and improve – their waterways
- Boost under-served or economically distressed neighborhoods
- Engage effective community-based organizations
- Leverage existing neighborhood assets
- Collaborate with state and local government
- **Establish strong partnerships!**

The Delaware River Urban Waters master contact list now includes more than 350 individuals in some 120 organizations across all public and private sectors throughout the region.
Site Footprint: 4 cities in 3 states: Philadelphia/Camden NJ / Chester PA / Wilmington DE

Activities so far

- ‘Listening sessions’ in all 4 cities
- 1st annual Wilderness Inquiry paddling event
- Identified 5 main Communities of Practice:
  1) Water Quality & Quantity
  2) River Protection & Restoration
  3) * Climate Resilience
  4) * Brownfields Revitalization
  5) Trails, Parks & Open Space
- Launched public website
- Periodic updates to all partners (~300 contacts)

* Focus of Today’s Short Presentation
Ecosystem Service Connectivity Example

- Climate Resiliency
  - Decrease erosion and bioavailability of contaminants
  - Increase productivity and meet species requirements

- Trails, Parks and Open Space
  - Buffers for flooding/surges; carbon sequestration
  - Increase fishing and wildlife viewing; value increases

- River Restoration and protection

- Water Quality and Quantity
  - Increase productivity and meet species requirements
NOAA Coastal Flood Exposure Mapper

Produced by the NOAA Coastal Services Center

http://www.csc.noaa.gov/digitalcoast/tools/flood-exposure

The current geography includes most of the Hurricane Sandy impact area (coastal counties of Delaware, New Jersey, Pennsylvania, and New York). Expansion plans are underway for the rest of the East Coast and Gulf of Mexico.

Features

• Allows users to select a location and explore maps that show people, places, and natural resources exposed to coastal flood hazards

• Creates a collection of maps to download or share online to communicate flood exposure

• Provides guidance for using the maps to engage community members and stakeholders in conversations about potential coastal flood impacts

• Offers access to map services and tips on using them in an online mapping platform
Flood Hazards
Coastal Flood Hazard Composite
Sea Level Rise Scenarios

- 1 ft above current MHHW
- 2 ft above current MHHW
- 3 ft above current MHHW
- 4 ft above current MHHW
- 5 ft above current MHHW
- 6 ft above current MHHW

Flood Hazards

Sea Level Rise
Flood Hazard Composite

1Hazard
2Hazards
3Hazards
4Hazards
5Hazards
6Hazards

Development
High Intensity Developed
Medium Intensity Developed
Low Intensity Developed
Open Space

Infrastructure Exposure
Development
Ecosystem Exposure
Protection
Philadelphia Shorelines…

Poured Asphalt at Philly Coke Site

Failing Bulkheads at Old Phila. Piers

Unstable Shoreline at Lardners Point
Value Added Restoration Matrix
Ecosystem Service vs Shoreline Type

Shoreline Type

Ecosystem Service

Natural Coastal Ecosystems
- Shallow Subtidal
- Nonvegetated Intertidal
- Vegetated Intertidal
- Riparian
- Tributary

Management Action
- Erosion/Management Technique
  - Bulkheads
  - Revetments
  - Groins
  - Breakwaters
  - Beach Nourishment
  - Wetland Planting
  - Stocking

Provisioning
- Habitat
- Biodiversity
- Production

Regulating
- Nutrient Uptake/Cycle
- Sediment Stabilization
- Wave Attenuation
- Gas Regulation*

Cultural
- Recreation
- Aesthetic Value

*Gas regulation is carbon sequestration, carbon dioxide and oxygen production
Ecosystem Exposure

Potential Pollution Sources

Natural Areas and Open Space
- Wetlands
- Other Natural Areas and Open Space
- Beaches and Dunes

Potential Pollution Sources
- Brownfield Property
- Hazardous Waste - Large Quantity Generator
- Pesticide Producer
- Hazardous Waste – Treatment, Storage, Disposal Superfund Site
Camden:
Deteriorated water infrastructure & brownfield sites...

...contribute to flooding & quality of life issues
Camden Contaminated Sites and Vacant Housing Units

Legend
- ▲ KCSL (Active)
- ○ KCSL (Closed)
- □ KCSL (Pending)

Major Roads

Vacant Housing Units per Acre
- 0.8 - 1.1
- 1.1 - 2.0
- 2.0 - 3.4
- 3.4 - 4.5
- 4.5 - 5.4
- Camden

DRAFT September 2013
Brownfield Redevelopment in Camden:

NORTH CAMDEN: EXISTING LAND USE
(41%) Brownfields
(32%) Vacant Residential
>1-mile of brownfields along riverfront

Brownfield redevelopment improves stormwater management & ecosystem services thru...
(1) **Existing sites:** impervious surfaces, buildings, foundations, and highly-compacted soils
(2) **Redevelopment:** requires removal of impervious surfaces & contaminated soils AND soil improvements and upgraded stormwater management
(3) **Urban riparian zone restoration**

EPA (2011) found that brownfield redevelopment reduced stormwater runoff by 47-62%
Opportunities

Green stormwater infrastructure + small scale brownfield sites =

A way to expand ecosystem services in communities along the Delaware River while simultaneously addressing two critical issues in our cities

- Flood reduction
- Stormwater Management
- Water quality
- Neighborhood improvements

A new methodology to help revitalize communities
Green Stormwater Infrastructure
Former American Minerals site becomes…  

PHOENIX PARK

BENEFITS:

• Connects community to waterfront
• 5.5-acre park on former brownfield site Manages >5 million gallons of stormwater/yr
• Resilient shoreline & water quality benefits

FUNDING:

$800,000 Camden County Open Space  
$2.7 million NJ Environmental Infrastructure Trust  
$655,000 (p/o) NJDEP Supplemental Environmental Project  
$19,000 NJ DEP/USEPA Living Shoreline Grant

Groundbreaking August 7, 2014
Camden Brownfield Reuse for Stormwater Mgmt.
Waterfront South Rain Gardens Park

**BEFORE:**
Abandoned contaminated gas station
~1/2 million gallons of contaminated stormwater runoff every year

**AFTER:**
Gateway/pocket park Manages/treats >1 million gallons of stormwater each year from site & streets!

**Funding Sources:**
- DEP C&E Supplemental Env’t Project (p/o $655,000)
- DEP SRP Petroleum UST Fund Grant ($122,000)
- EPA Brownfields Petroleum Ass’t Grant ($100,000)
- Rutgers 319h Watershed grant (p/o $300,000)

**Partners:**
Heart of Camden / Sacred Heart Church Center for Environmental Transformation
Camden County Municipal Utilities Auth. (CCMUA)
New Jersey Department of Env’t Protection (NJDEP)
Camden Redevelopment Agency
Camden SMART (City of Camden, Cooper’s Ferry Partnership, Rutgers University, NJ Tree Foundation, CCMUA, NJDEP)
Work across the rural-urban gradient to incorporate a watershed approach
Surface runoff for Cooper River Watershed was estimated by SWAT, which is a physically-based distributed hydrological model. The model output was joined with HRU (hydrological response unit) shapefile to create the surface runoff map.
Project Outcomes

- It’s about exploring a new approach but also developing tools
- Create a model for replication in Urban Waters partner cities
- Ecosystem Service valuation for flood reduction, SW mgmt, revitalization
- Additional phases of concept designs and green infrastructure redevelopment for a pilot group of parcels
Moving Forward

- This is an emerging project and one that will most benefit from wide collaboration and partnership within Urban Waters Federal Partnership.
- Just beginning initial phase of a potential multi-phase initiative.
- Begin incorporating needs of Urban Water partner cities to develop an effective tool to be shared.
- Collaborating With: NJ DEP, CCMUA, CRA, Cooper’s Ferry, Camden SMART, NJCF, NJIT, NOAA, USFS.
Thank You!

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