Green Infrastructure and community building:

Marvin Gaye Park, Washington, DC

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TECHNION
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Green Infrastructure

An integrative approach addressing functional as well as *ecological, aesthetic and social concerns*.

But typically emphasizes **ecological** over **social benefit**
The social and cultural dimensions of infrastructure landscapes have not been fully recognized.

Historically, infrastructure was planned more holistically as a way of structuring the city.

- Infrastructure was legible and expressive.
- Natural systems provided an armature for the plan of the city.
- Infrastructure systems were planned in tandem with public space systems

Case study of Marvin Gaye Park, Washington DC along the Watts Branch stream valley- to examine the relationship of water infrastructure to the social and cultural dynamics of an urban community and as a community revitalization strategy

Synergy of biophysical and social benefits:

1. impact on community building
2. deepening local identity
3. enhancing place attachment

Legibility, expressiveness and meaning

Everyday, lived dimensions of traditional infrastructure systems

Examples of vernacular irrigation systems in an arid climate

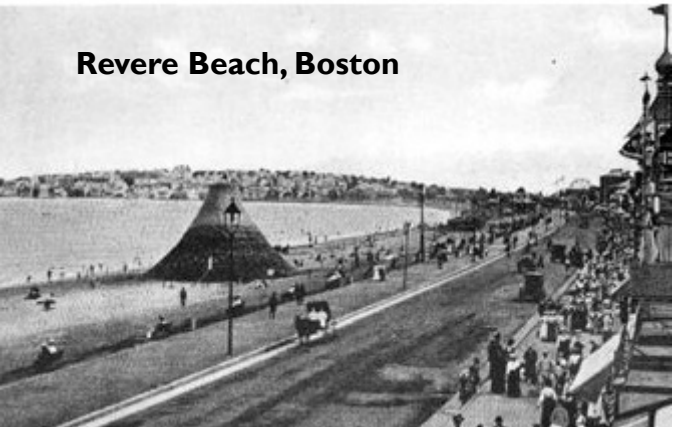
Chayat Garden, Wadi Siah, Haifa, Israel

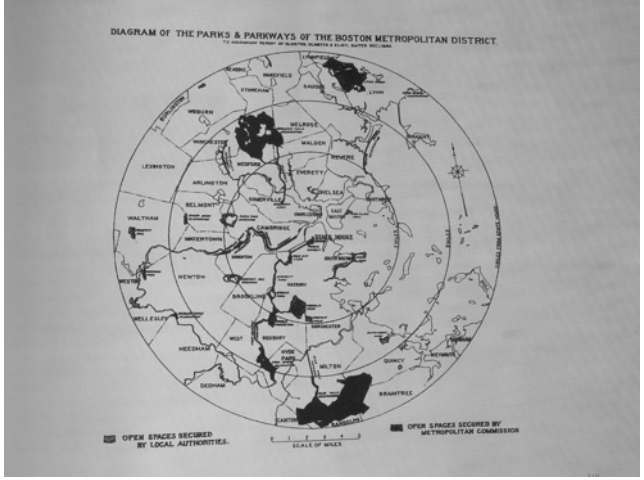
Liman, Negev Desert, Israel

Oasis garden, Sinai, Egy


Fells Station, Melrose 1893


Charles River Esplanade, Boston


Revere Beach, Boston



Parks & Parkways of the Boston Metropolitan District, Olmsted and Eliot, 1896

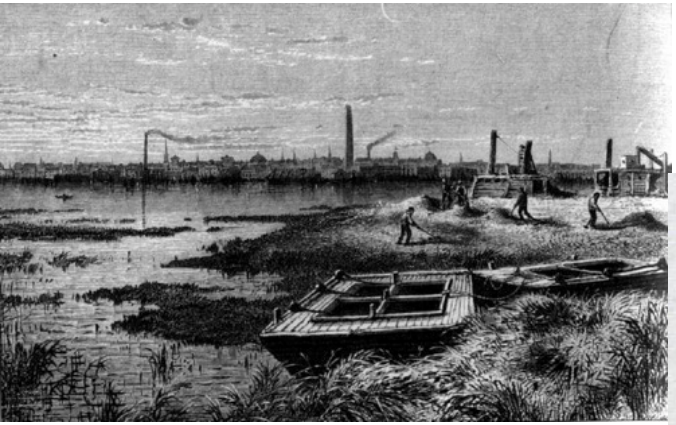

Charles Eliot

Charles Eliot and Sylvester Baxter
Metropolitan Parks System, Boston

Hydrological systems as an urban armature

Eliot and Baxter's plan for Boston- An example of park planning based on the identification and protection of regional landscape systems such as hydrology and topography, as well as scenic natural features.

Water infrastructure doubled as a recreational infrastructure for the city bringing together **engineering** and **urban design** in a cohesive approach to park planning.



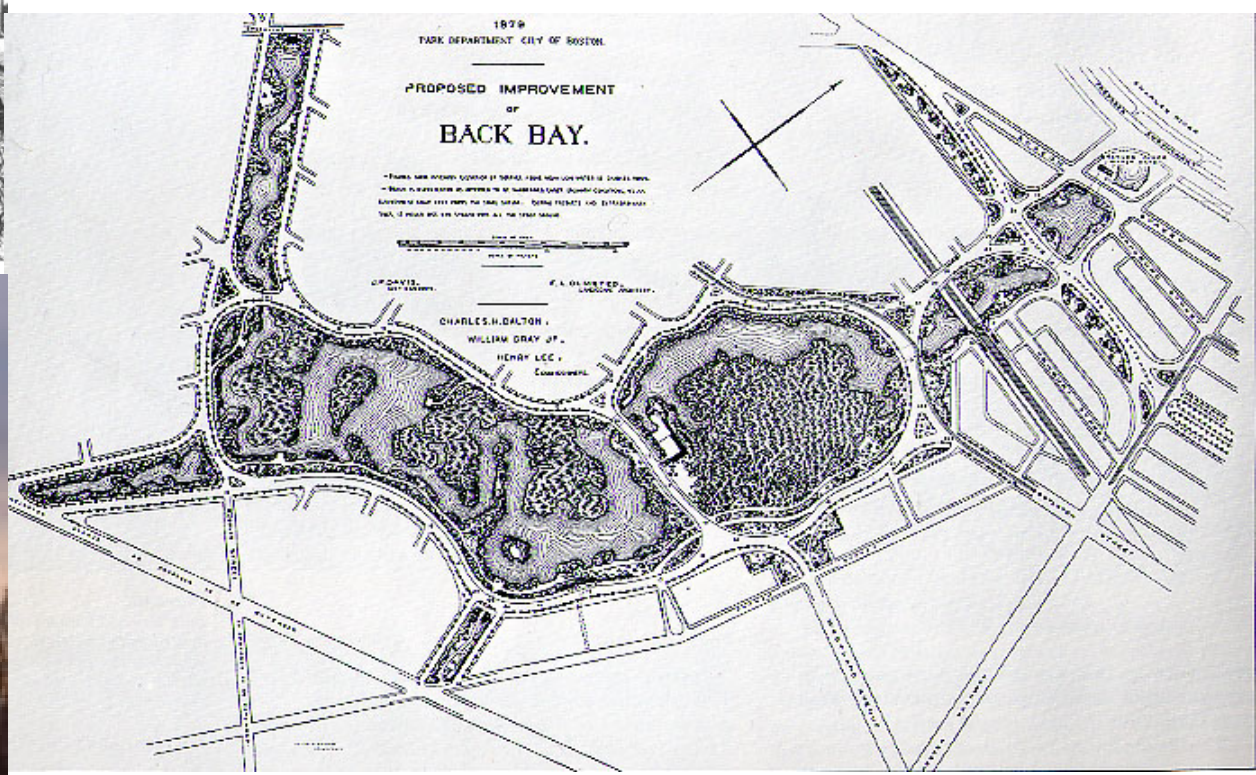
Frederick Law Olmsted

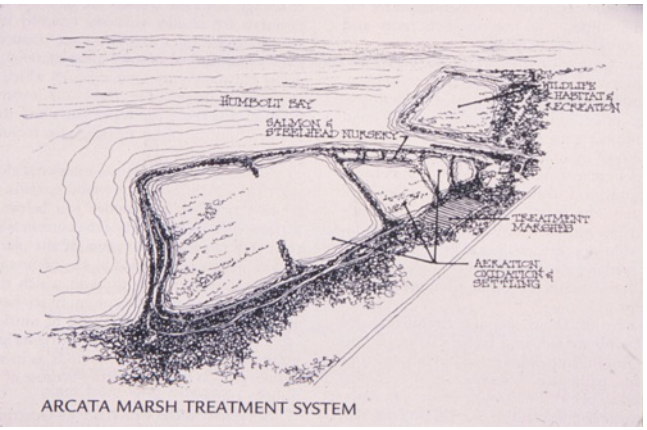
Back Bay Fens, Boston MA

Green Infrastructure principles-
19th century park planning

- Engineering solutions are site-specific and integrated into the landscape in order to preserve the city's ecological structure

- Productive use of landscape processes, rather than their depletion.





Plan: treatment ponds, salmon nursery and wildlife area

View of restored marsh

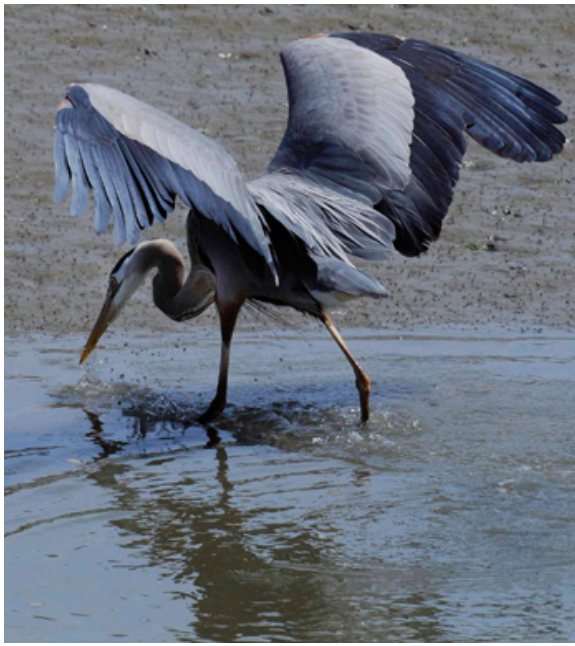
Microorganisms breakdown pollutants in wastewater

:

Arcata Marsh and Wildlife Sanctuary, Arcata CA, 1981

Green Infrastructure principles- contemporary use of landscape processes

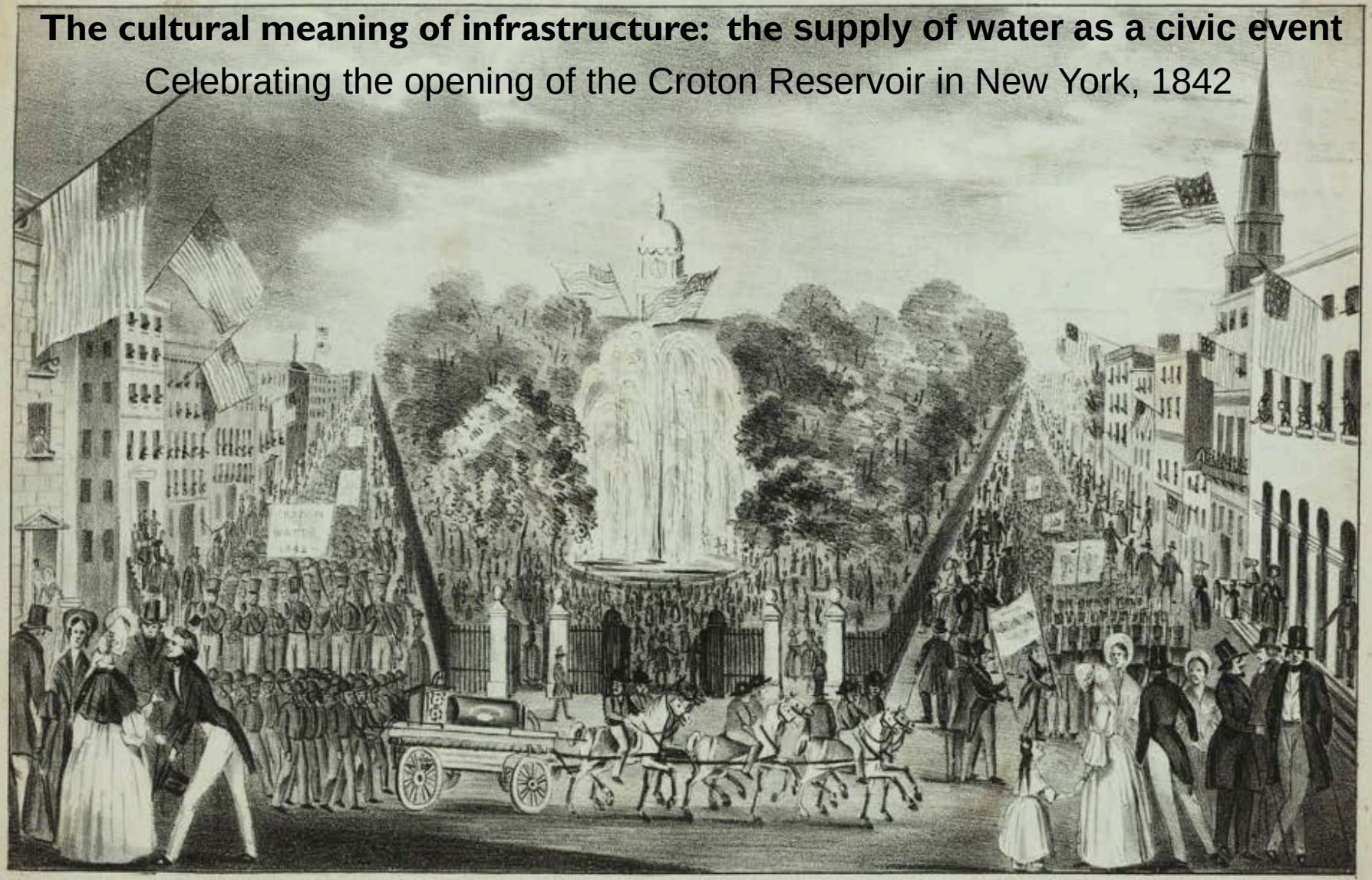
- Marsh treatment system for tertiary wastewater treatment using biological processes
- Multifunctional plannning- includes recreational open space, walking and bike trails, wildlife sanctuary, salmon aquaculture.



Great blue heron in wildlife sanctuary

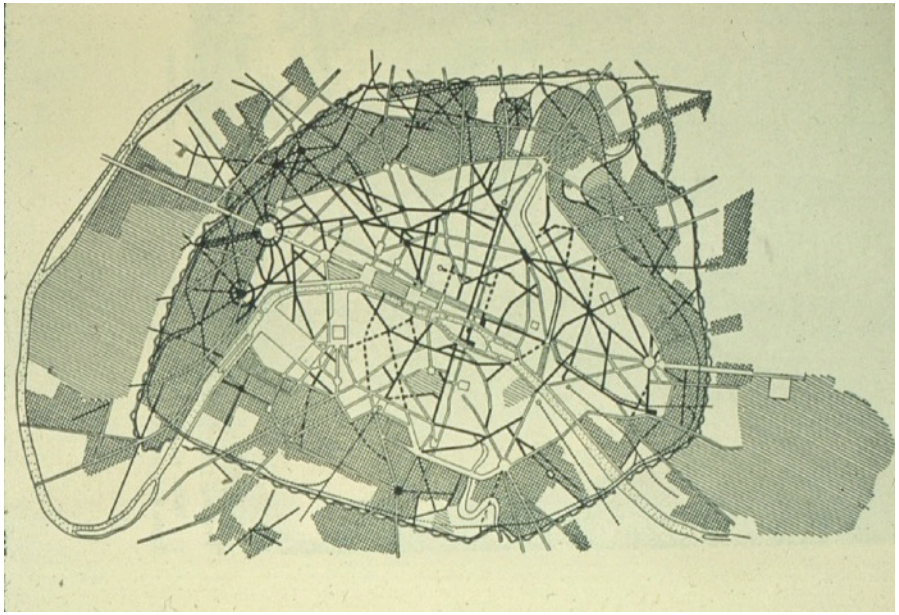
The cultural meaning of infrastructure: the supply of water as a civic event

Celebrating the opening of the Croton Reservoir in New York, 1842



Comprehensive Planning

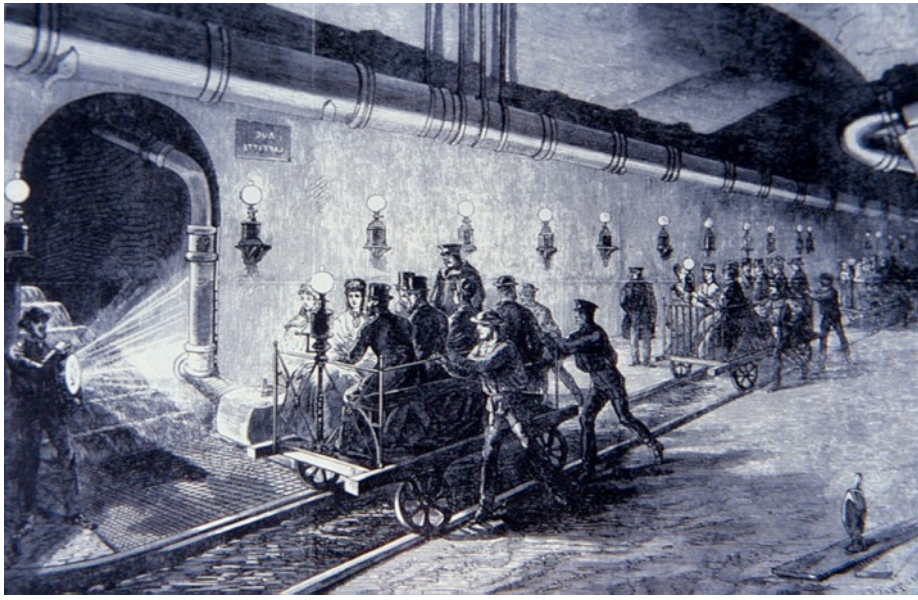
Haussman's Plan for Paris – 1853-1870



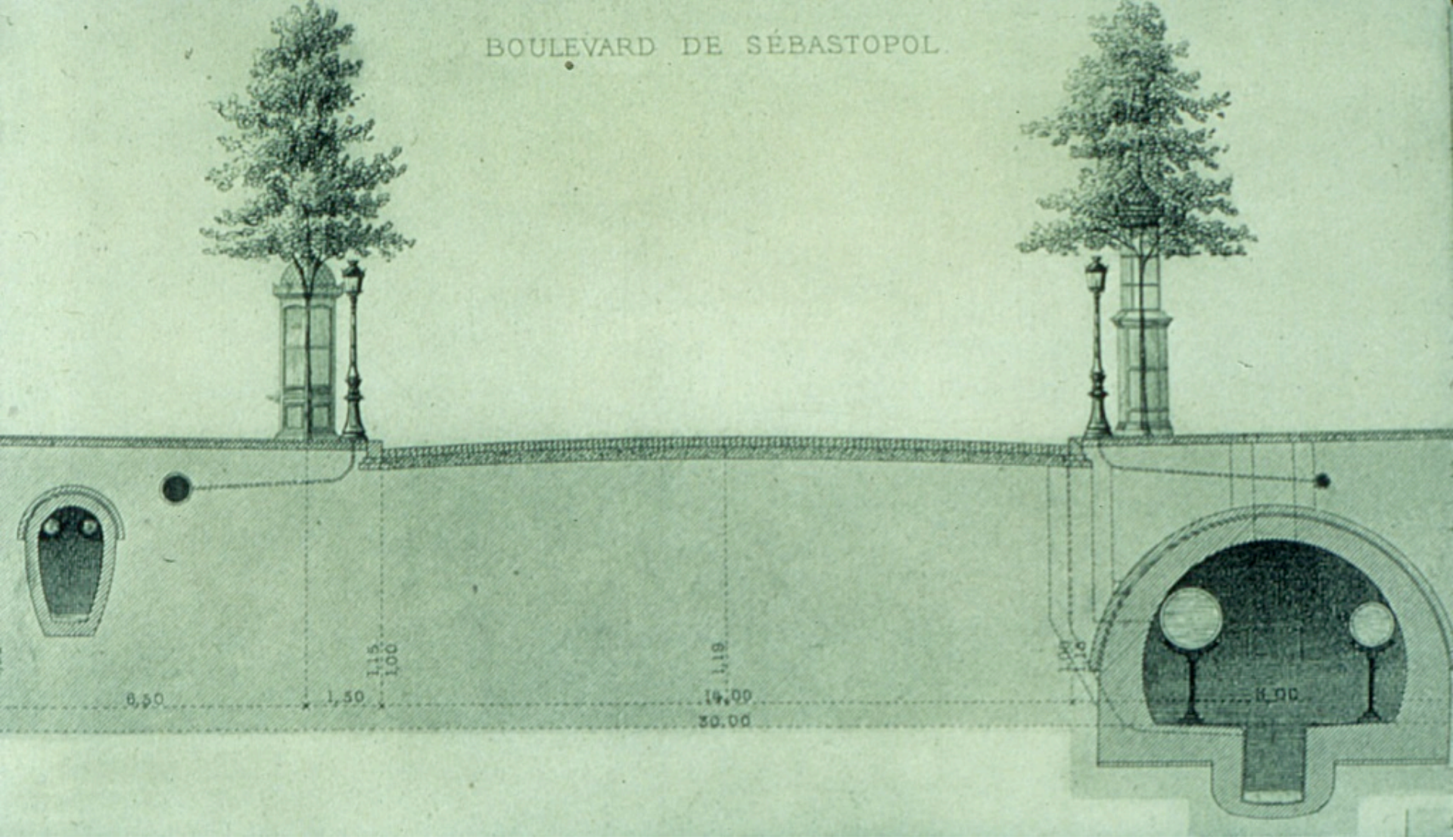
THE BOULEVARDS OF PARIS-
a comprehensive urban vision.
The boulevards combined the infrastructure for traffic and leisure promenading with a new underground system of services (sewer, gas, etc)

ABOVE The new boulevards

BELOW The new sewer system below



Taking visitors to view the new sewer system- 1870



Infrastructure and Public Space

Section through Boulevard de Sebastopol, Paris

Jean-Charles Alphand

Services below, planting and lighting above to create a new public space

In the 20th century, planning of infrastructure became increasingly technocratic and standardized.

Instead of comprehensive planning, the professions diverged and became more specialized.

The work of urban planners and designers was limited to the "visible city," while infrastructure systems were relegated to the "hidden city" of the engineers.

Image from Harry Granick, *Underneath New York*, 1947

NEW MODELS required for the design of urban infrastructure to respond to contemporary conditions of

- dispersal
- decentralization
- mobility
- flexibility

A critique of centralized, single-purpose engineering systems

GREEN INFRASTRUCTURE

An integrative approach that addresses functional as well as ecological, aesthetic and social issues

Can infrastructure be a source of social and cultural meaning?

Not as a neutral (and sometimes invisible) system, but as a visible and expressive means of highlighting the relationship between natural systems and everyday urban life?

Green infrastructure: core principles

- **decentralization**
- **site-specificity**
- **multifunctionality**

The core principles that are associated with the biophysical realm also have key implications for social sustainability: **cultural identity, social cohesion and the sense of place.**

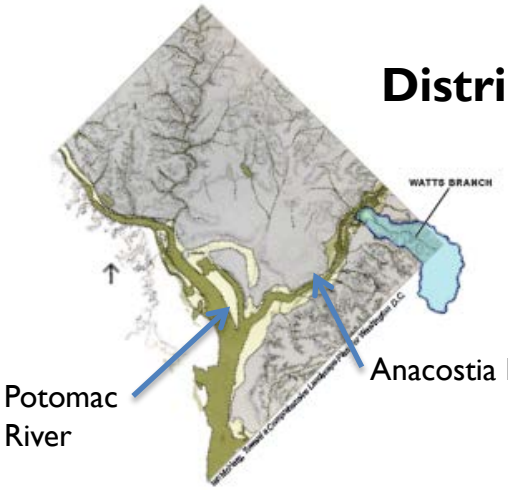
From Rosenberg 2015, forthcoming

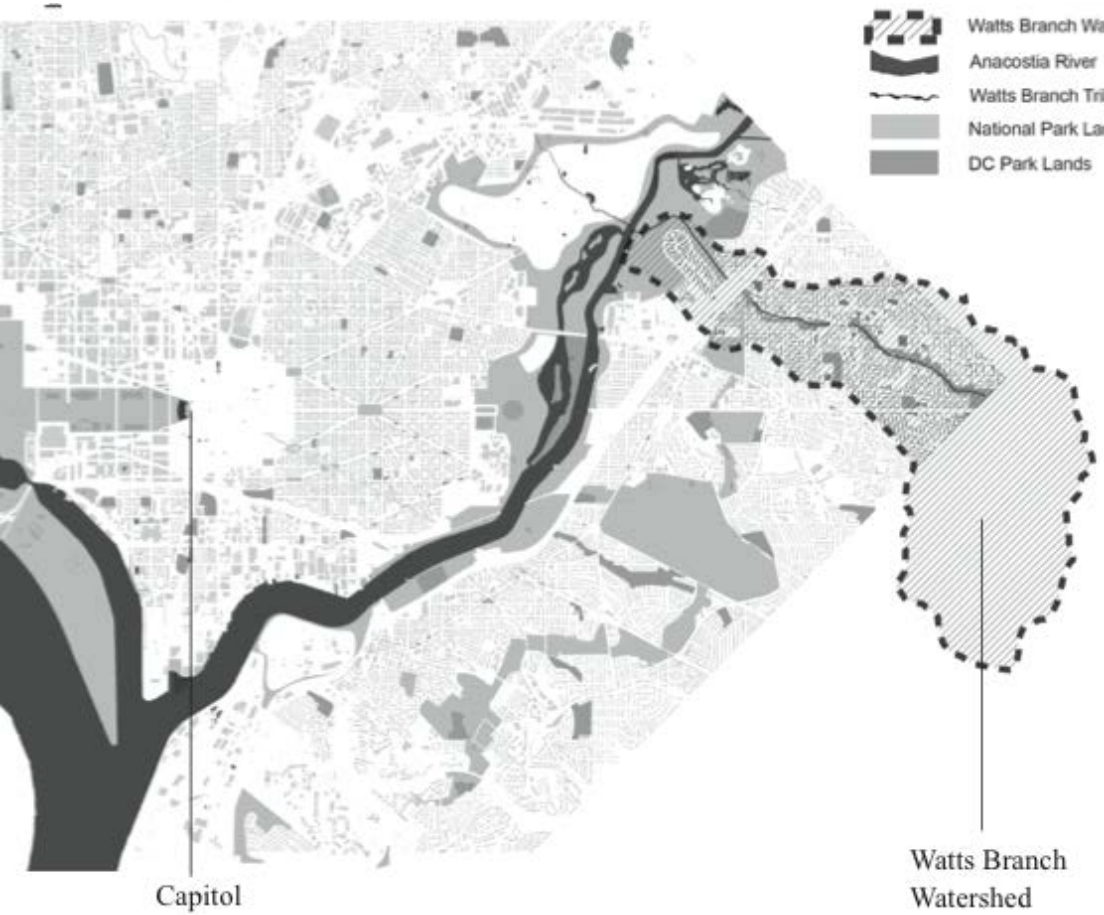
Green Infrastructure Principles	Definition	Environmental Aspects	Social and Cultural Aspects
Decentralization (McKenzie 2004; Reed 2006; Belanger 2009; Selman 2009; Belanger 2011)	Rescaling of systems to a network of multiple small-scale components	Watershed management, bio-industries, waste economies	Community based decision making; coalition- based partnerships
Landscape structure and site specificity (Horowitz 2001; Girling 2005; Low et al. 2005; Selman 2009; Musacchio 2009 Lovell and Johnston 2009)	Siting systems to protect existing ecological structure; linkages between local and regional scales	Landscape based ecological planning	Cultural place attachment; Local identity and empowerment; everyday experience of nature
Multifunctionalism (Fry 2001; Wiggering 2003; Lovell and Johnson 2009; Selman 2009; Hung 2011; Ahern 2012, Yang et al. 2013)	Synergistic relationships between uses in one space either simultaneously or successively in time for multidimensional benefits	A combination of the following services: *Supporting and biophysical* *Provisioning services* *Regulating services*	*Cultural and social services* (eg. Visual quality, beauty, human health, and recreational opportunity)

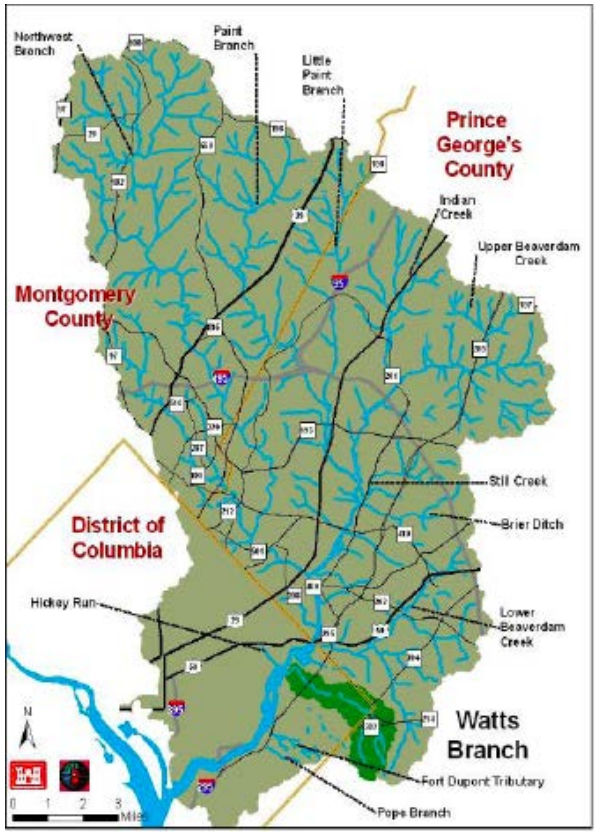
Green Infrastructure and community building:
Marvin Gaye Park, Washington, DC

Marvin Gaye Park is a 2.5 km long linear park located in a dense, low-income residential neighborhood in Northeast Washington, DC along the Watts Branch stream valley - connects more than a dozen predominantly African-American neighborhoods- named after singer Marvin Gaye who was a resident of the neighborhood.

District of Columbia







Anacostia watershed
(District of Columbia and Maryland)

Watts Branch Watershed
6 square-km watershed divided between Maryland and DC

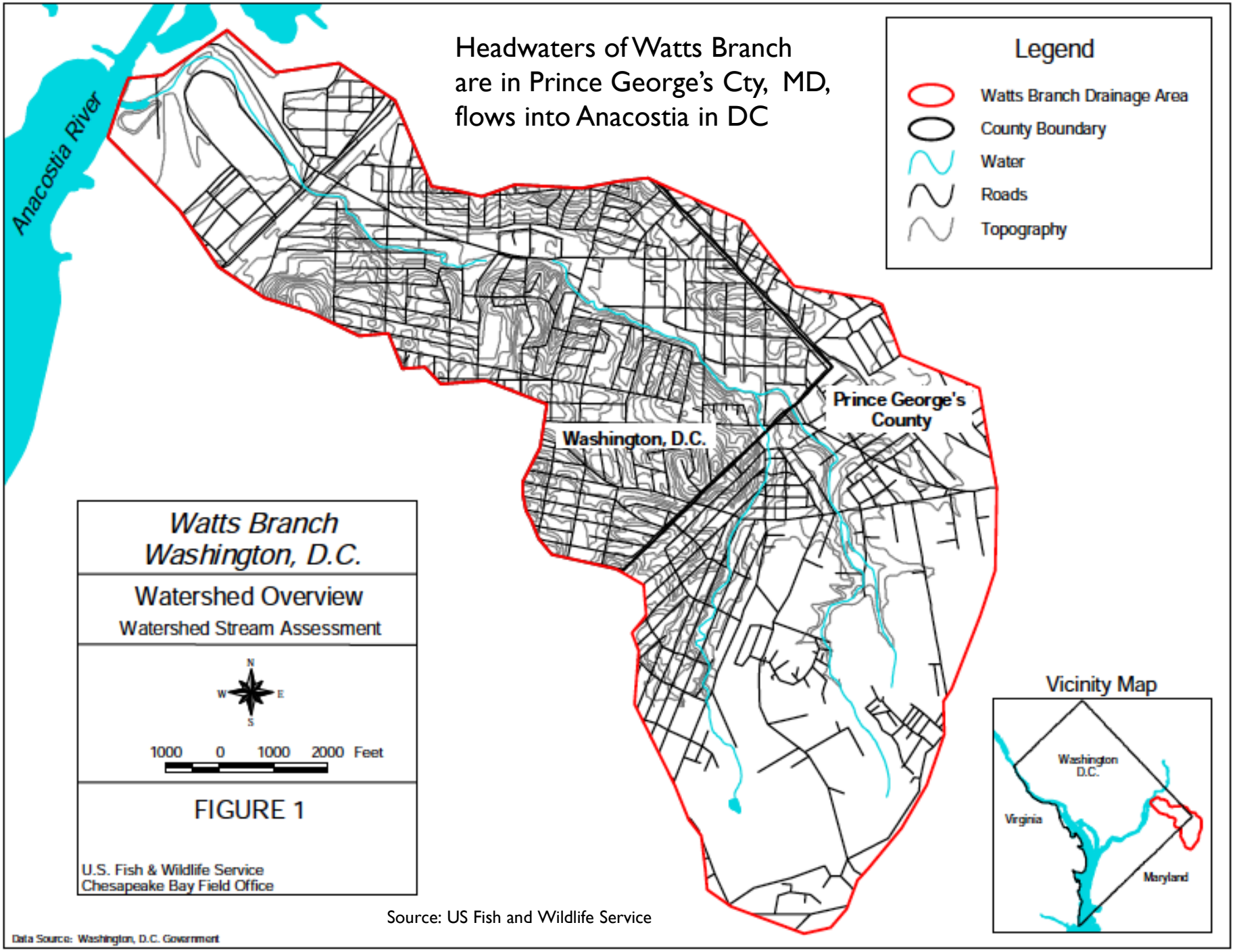

Headwaters of Watts Branch are in Prince George's Cty, MD, flows into Anacostia in DC
Anacostia River
Legend
Watts Branch Drainage Area
County Boundary
Water
Roads
Topography
Washington, D.C.
Prince George's County
Watts Branch
Washington, D.C.
Watershed Overview
Watershed Stream Assessment
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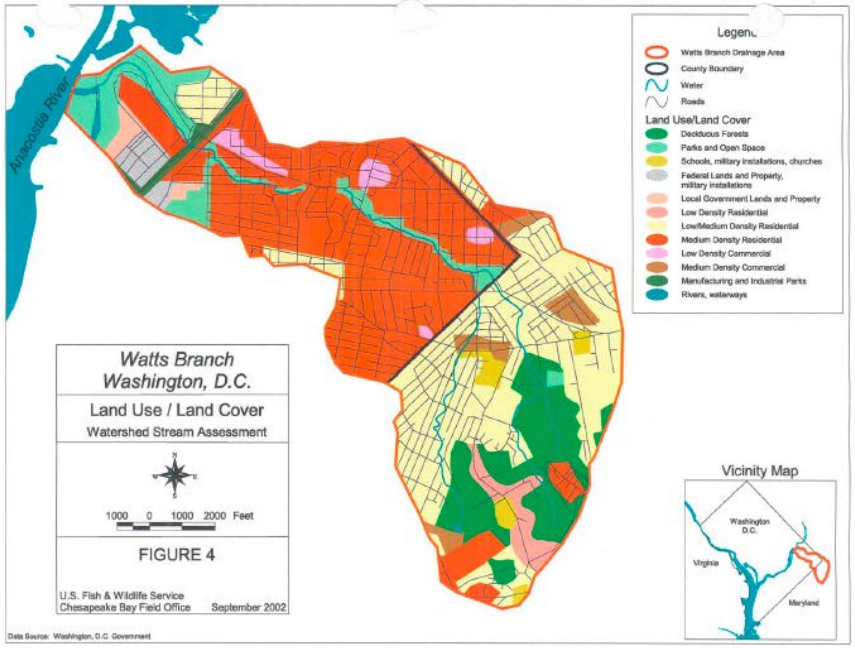
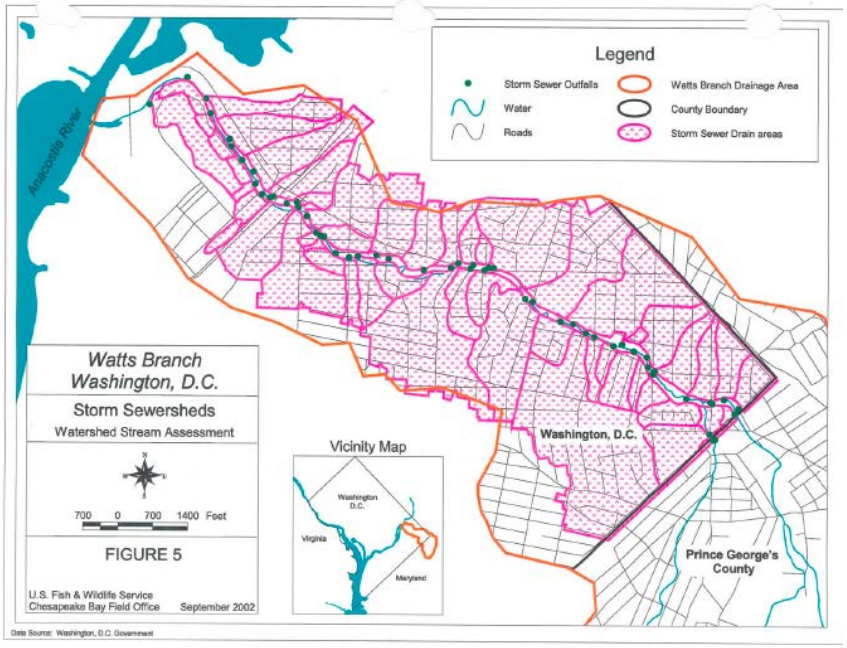
FIGURE 1
U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
Vicinity Map
Washington D.C.
Virginia
Maryland
Source: US Fish and Wildlife Service
Data Source: Washington, D.C. Government

Source: US Fish and Wildlife Service



Watts Branch Land Use Cover



Watts Branch Sewersheds

The park was planned in the 1920s as a flood-control measure.
Instead of burying Watts Branch in a closed storm sewer system, the open flow of the stream was maintained and floodplain was cleared and protected, creating a linear park along the stream. This multifunctional approach to urban flood control maintained the stream and protected the floodplain for the combined purposes of flood control and public recreational use. The preservation of the local hydrologic pattern has allowed the stream to remain a distinctive urban feature and source of neighborhood identity.

With the loss of Federal funding in 1972 the park began a long period of decline.

By the 1990s it served as an illegal dumping ground and a haven for violent crime and drugs.

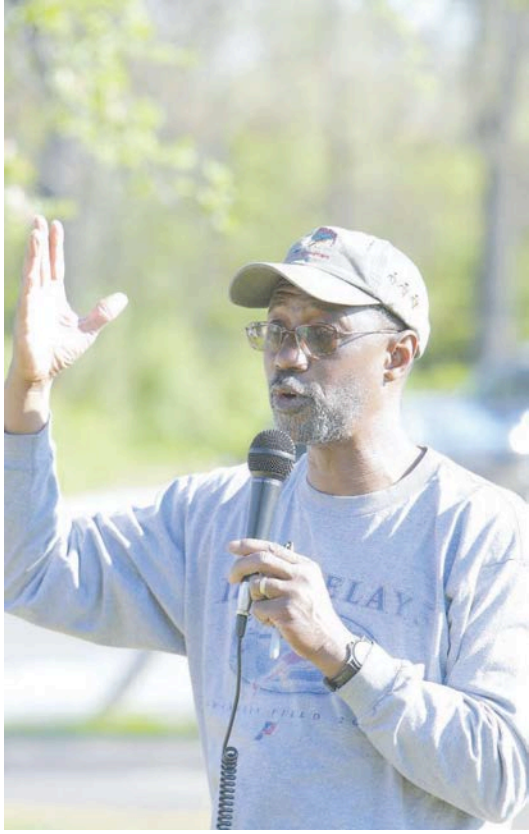
In 2001 the NGO *Washington Parks and People* (WPP) began a grassroots community development process.

Source: EDAW/ AECOM

Two major initiatives transformed the park:

Stream restoration of Upper Watts Branch (by a partnership of state and federal agencies)

Community revitalization process of the neighborhoods surrounding park, headed by *Washington Parks and People* (WPP)



Dennis Chestnut ,
community organizer

U.S. Fish and Wildlife Service

Stream Restoration

Due to intense urbanization, increased volumes of stormwater runoff had severely eroded its stream banks and caused high levels of suspended sediment (TSS).

Approximately 1500 tons of sediment were being deposited into the Anacostia watershed each year.

Deeply incised stream channel with almost vertical banks disconnected stream from its natural floodplain.

Poor water quality and loss of habitat due to litter and leakage from the sanitary sewers



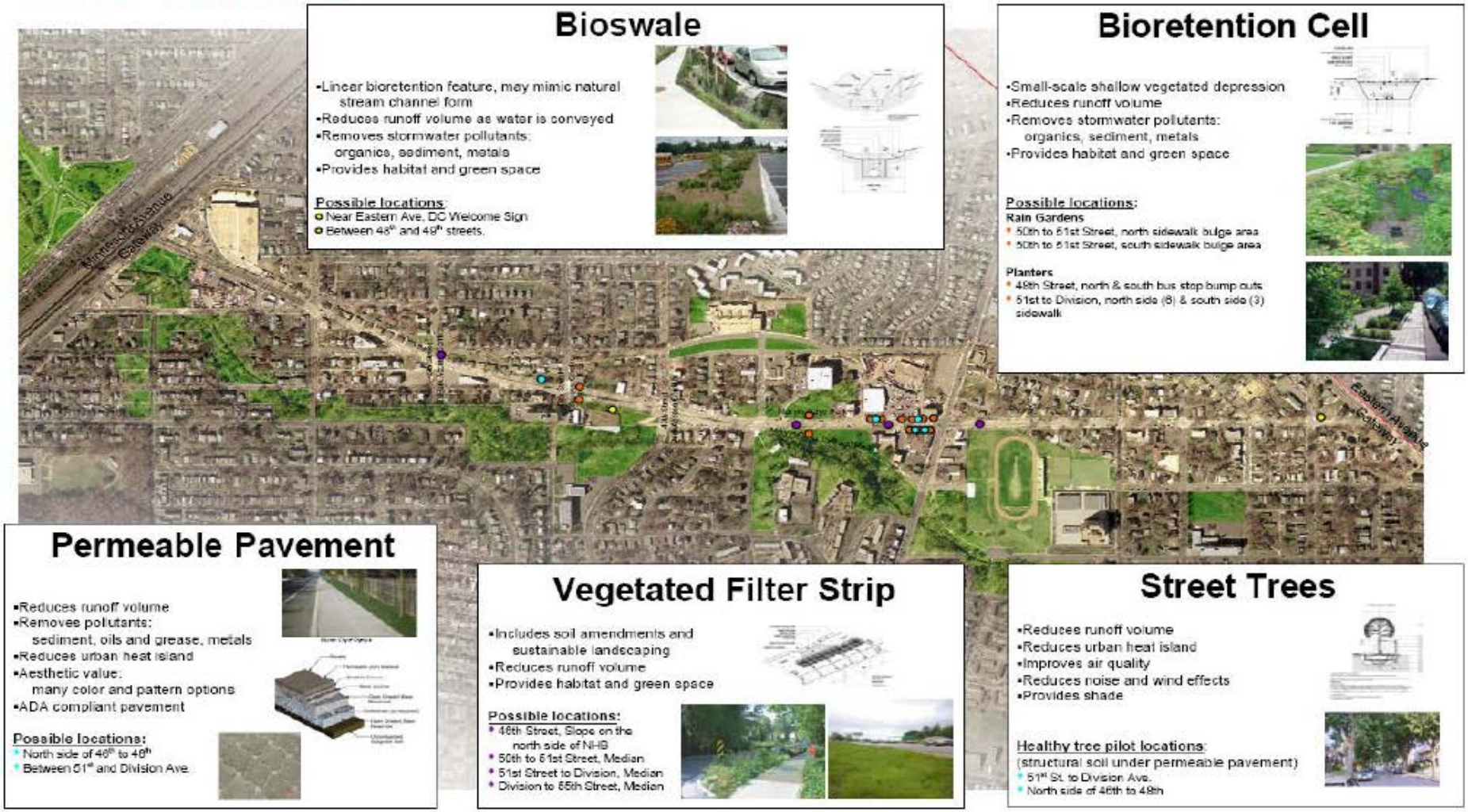
District Department of Environment (DDOE).

The stream banks were regraded to reconnect the stream to its flood plain and reduce the energy of storm flows by allowing the flows to spread over a larger area

Pools and riffles added within the stream channel, banks planted with native grasses, shrubs, and trees to establish a forested area on both sides of the channel.

Bird and aquatic habitat quality have been improved and sediment flowing into the Anacostia has been lowered

LID Toolbox



UPLAND STRATEGY TO COMPLEMENT STREAM RESTORATION:

"Green Streets" Program (DDOT) funds stormwater retrofits along Nanny Helen Borroughs Avenue

Source: *District Department of Transportation, Washington, D.C*

Decentralized, low impact development (LID) stormwater retrofits along Nanny Helen Burroughs Avenue

3.4 hectare drainage area--SWMM Modeling shows LID reduces runoff by 12%

Source: *District Department of Transportation, Washington, D.C*

Watts Branch Reductions in relation to DC's TSS TMDL

	TN reduction (lbs/yr)	TP reduction (lb/yr)	TSS reduction (lb/yr) 2.55lb/lf	%age of *TSS TMDL* goal	TSS reduction 3.58lb/lf *	%age of TSS TMDL *
Stream restoration (20K ln ft)	400	70	51,000	32.86%	71,600	46.13%
Reductions from comprehensive school retrofits (listed in WIP)	73.5	11.68	5,328	3.43%		
Reductions realized from additional SW retrofits in (roadways, parking lots listed in WIP)	134.4	18.64	10,063	6.48%		
Reductions realized from tree planting	134.1	21.8	5,532.1	3.56%		
Reductions realized from RS Homes (75 RB, 50 RG, 75 ST, 10 PP, 50 BS)	21.3	3.0	850.1	0.55%		
Total reductions from all programs/practices	763.3	111.4	72,773 lbs/yr (36.39 Tons/yr)	46.88%		60.15 %
Reduction needed to meet TMDL	No TMDL	No TMDL	155,200 lbs/yr 77.6 Tons/yr (61.2 SR + 16.4 SW)	100%		
Shortfall to meeting TMDL			82,427lbs/yr (41.21 Tons/yr)	53.12%		39.85 %

District Department of Environment (DDOE).

Community volunteers removing trash from the stream.

Cooking class in the park to teach healthy nutrition and counter childhood obesity.

Washington Parks and People

COMMUNITY ORGANIZING

(Washington Parks and People)

Began in 2001 with a large-scale grassroots clean-up effort. Over a period of five years, 24,000 volunteers removed 3000 tires, 14,000 hypodermic needles, 55,000 bags of garbage and towed 95 abandoned cars and trucks.

They cleared trails, removed thousands of exotic invasive plants, and planted 2000 native trees and shrubs

New activities and community programming were introduced to activate the park and drive out illegal uses, such as opening a farm stand in an active heroin dealing area, run by middle and high school students who worked in the nearby youth garden

Social sustainability: *combines the design of the physical realm with design of the social world including infrastructure to support social and cultural life.*

Watts branch stream provided **social and cultural infrastructure:**

- Place attachment - component of local identity
- empowers local groups to claim their histories
- sense of community identity and belonging
- local history – residents had "the stream in their bones" – stories/memories of the stream in everyday life

In 2006 the park was renamed after Motown singer Marvin Gaye, who grew up in one of the public housing projects in the neighborhood.

He began his career performing at the local Crystal Lounge which was converted into a new community park headquarters.

Motown singer Marvin Gaye

DC Green Corps trainees planting a small wetland channel (Sept 2011)

One year later - September 2012

Washington Parks and People

Economic strategy:

physical infrastructure leveraged as a productive economic base by generating employment programs, such as DC Green Corps a job-training program for members of the community in the areas of urban and community forestry and forest-based ecosystem and watershed restoration.


DC Green Corps in Marvin Gaye Park
ALLPROWEST.com


DC Green Corps in Marvin Gaye Park

Community programs: nutrition to combat obesity and "food desert" effect

urban agriculture and farmers markets

Marvin Gaye Park:

DECENTRALIZED

Planned as a flood control system - a neighborhood scaled component of a larger watershed strategy

SITE SPECIFIC

Stream provides neighborhood identity and place attachment/everyday experience of nature

MULTIFUNCTIONAL

Flood control/ open space/ economic base for employment programs/ food production/ forestry/ new public-private coalitions/entrepreneurship