Innovative Financing for Green Infrastructure

Tuesday, November 4th, 2014
1:00 – 2:30pm EST

Speakers:

- **Jennifer Cotting,** Research Associate, Green Infrastructure, Environmental Finance Center, University of Maryland
- **Deron Muehring**, Civil Engineer, City of Dubuque, IA
- **Lori Beary**, SRF Coordinator, Iowa Finance Authority

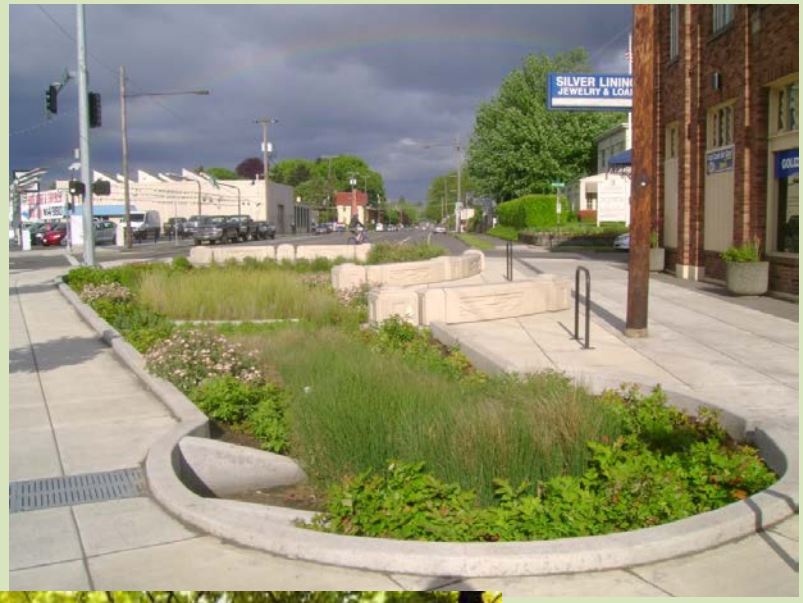
Sponsored by U.S. EPA Office of Wastewater Management

Logistics

- **To Ask a Question**: Type your question in the "Questions" box on the right side of your screen and click "Send."
- **To report technical issues/audio problems:**
  - Type your question/issue in the "Questions" box on the right side of your screen and click "Send." We will respond by posting an answer in the questions box.
  - Call **GoToWebinar** support:[1-800-263-6317], and give conference ID# 942-389-537

Webcast Agenda

- **Introduction**
- **An Overview of Green Infrastructure Financing,** Jennifer Cotting
- **The Bee Branch Watershed Flood Mitigation Project,** Deron Muehring
- **Water Resource Restoration Sponsored Projects,** Lori Beary
- **Q&A session**
- **Wrap up**



Now to our speakers!

Green Infrastructure Financing:
Innovative Ideas and Emerging Trends

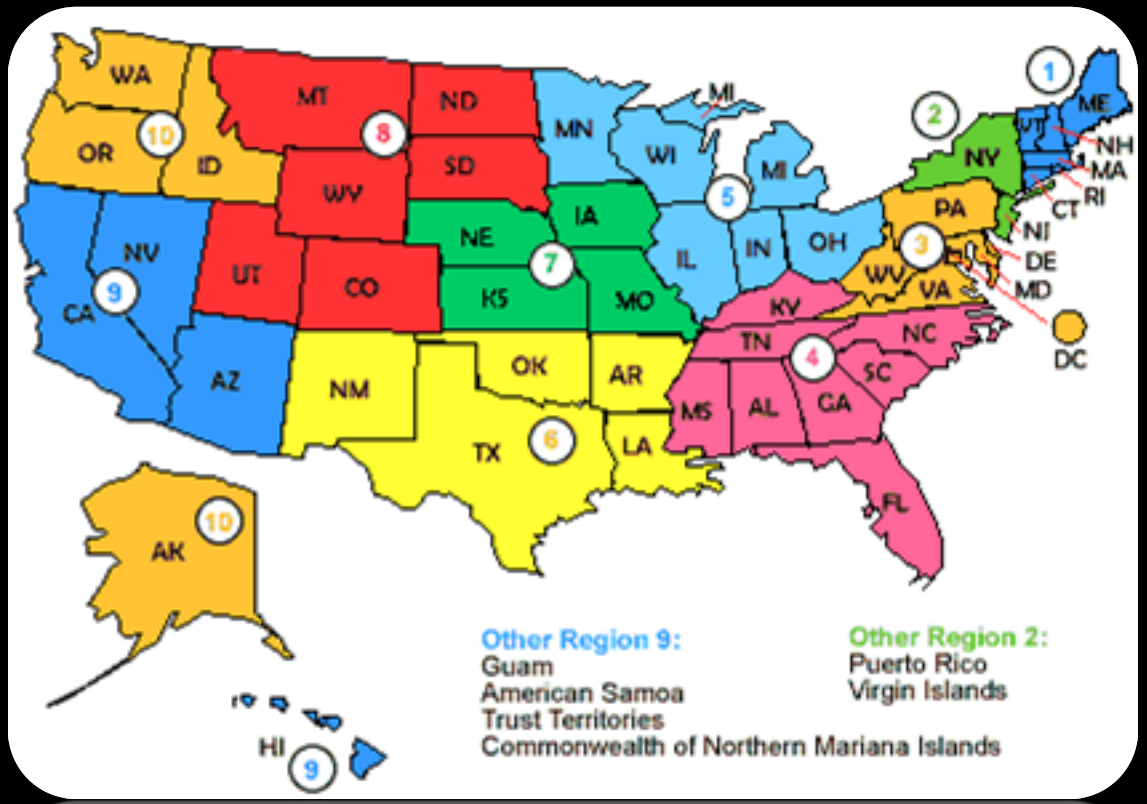
November 4, 2014

University of Maryland Environmental Finance Center
www.efc.umd.edu

The Environmental Finance Center

www.efc.umd.edu

The EFC: Who are we?



Applying a financing lens across sectors . . .

- Technical Assistance
- Stormwater
- Green Infrastructure
- Agriculture
- Air Quality
- Climate & Energy
- Sustainability
- Program & Policy Analysis

EFCN
environmental finance center network

www.efc.umd.edu

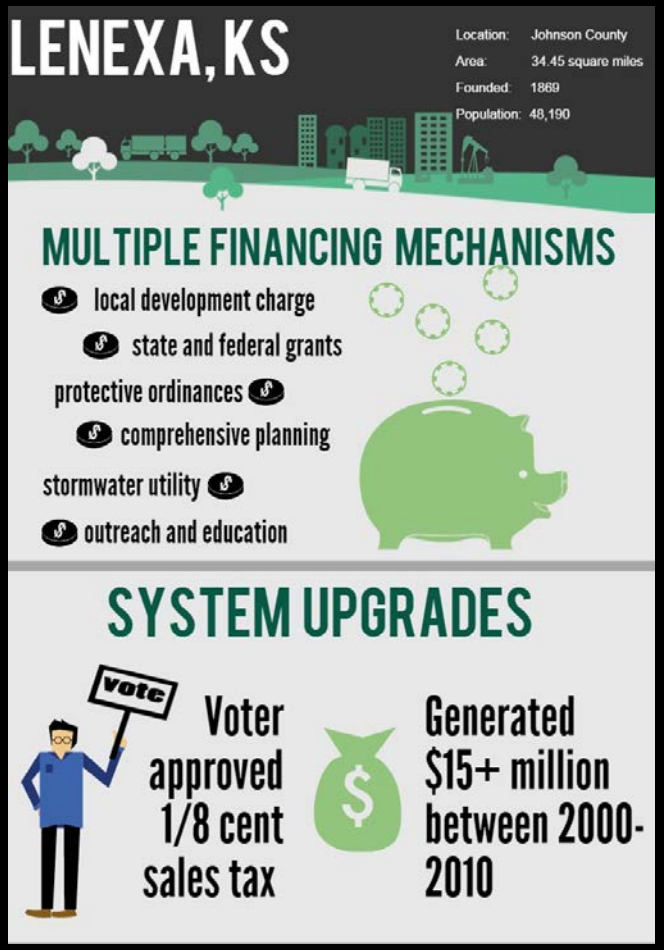
Green Infrastructure: EFC's Point of View

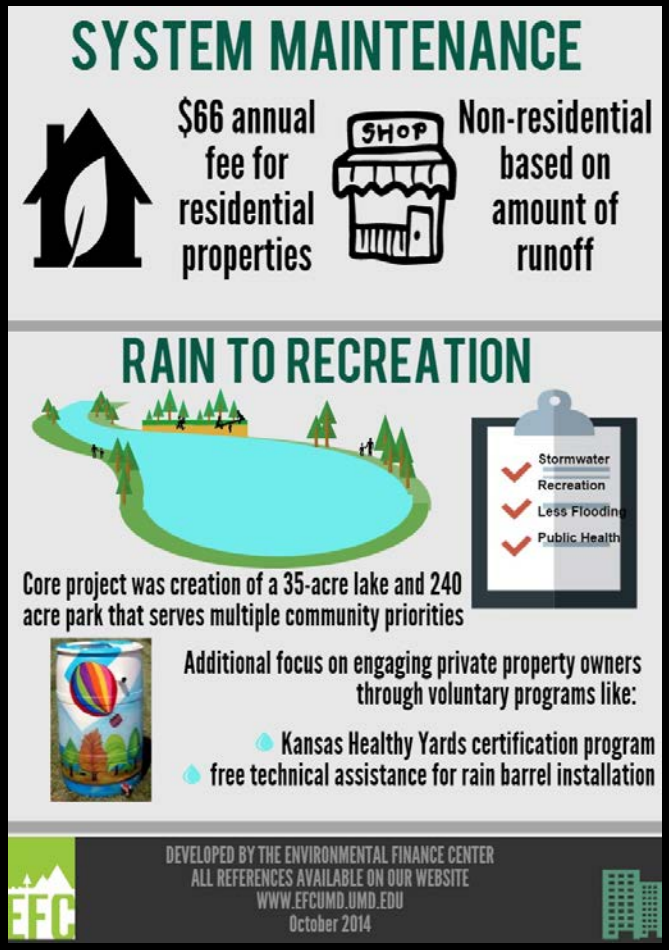
A resource management approach with the capacity to:

- Reduce implementation costs
- Deliver benefits that serve multiple community priorities
- Engage the private sector
- Spur behavior change through the marketplace
- Provide return on investment to local economies



Telling the financing story through the use of graphics





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Green Infrastructure Financing Map

Twenty communities
Diverse drivers, geography, scales, approach

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Green Infrastructure Finance: Components

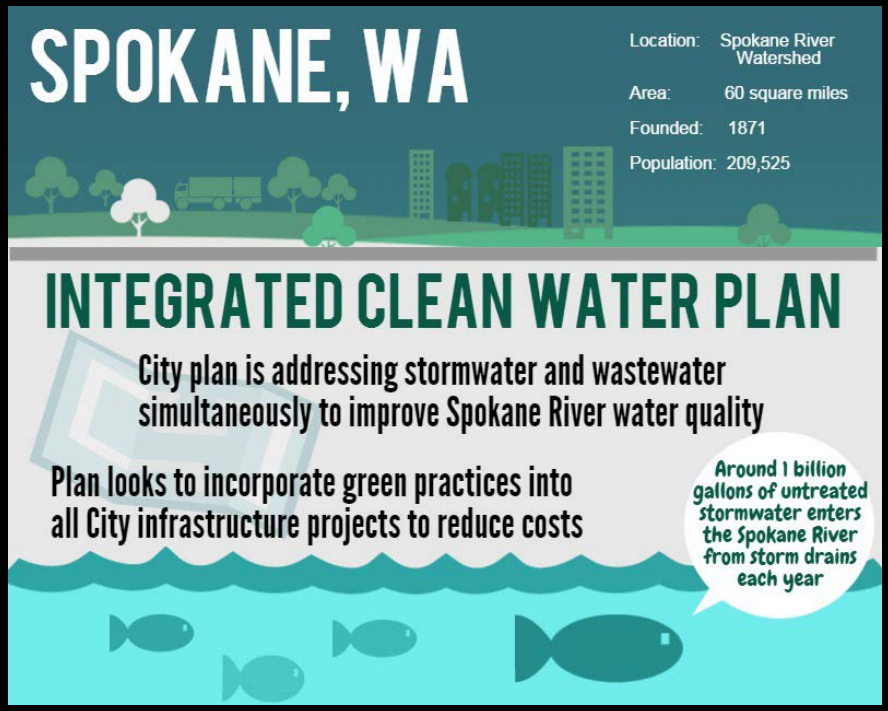
Successful green infrastructure financing tends to rely on:

- A consensus driven plan
- Strong leadership and leading by example
- Leveraging multiple financing mechanisms
- Collaboration with a network of partners
- Careful communications, messaging , and outreach
- Making the business case for green infrastructure
- Incentivizing participation from the private sector



Community Examples

Developing a Plan



Also in Pittsburgh:

- Guidance on reuse of vacant lands
- Pilot projects that help communities visualize solutions

Also in Spokane:

- Urban tree initiative
- Stormwater utility
- SRF funding

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Leadership and Setting the Example

Also in Tucson:

- Action plan for water sustainability
- LID & GI guidance manuals
- Estimating value of benefits

Also in Chicago:

- Coordination with school system and DOT
- CNT partnership engages residents and businesses

Leveraging Multiple Financing Mechanisms

Partnership and Collaboration

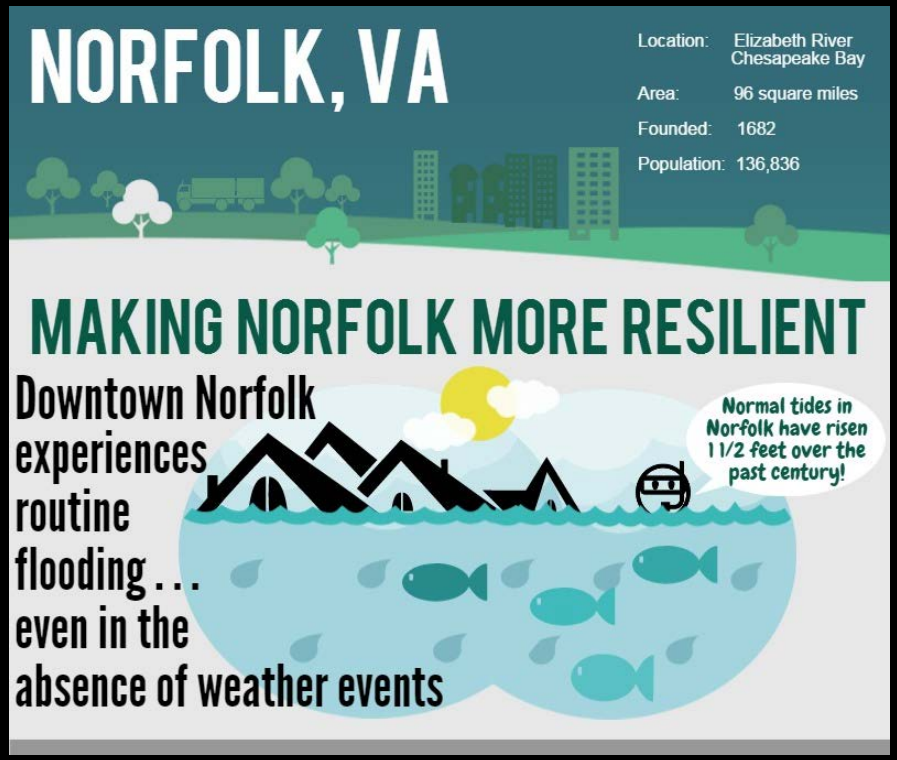
Also in Omaha:

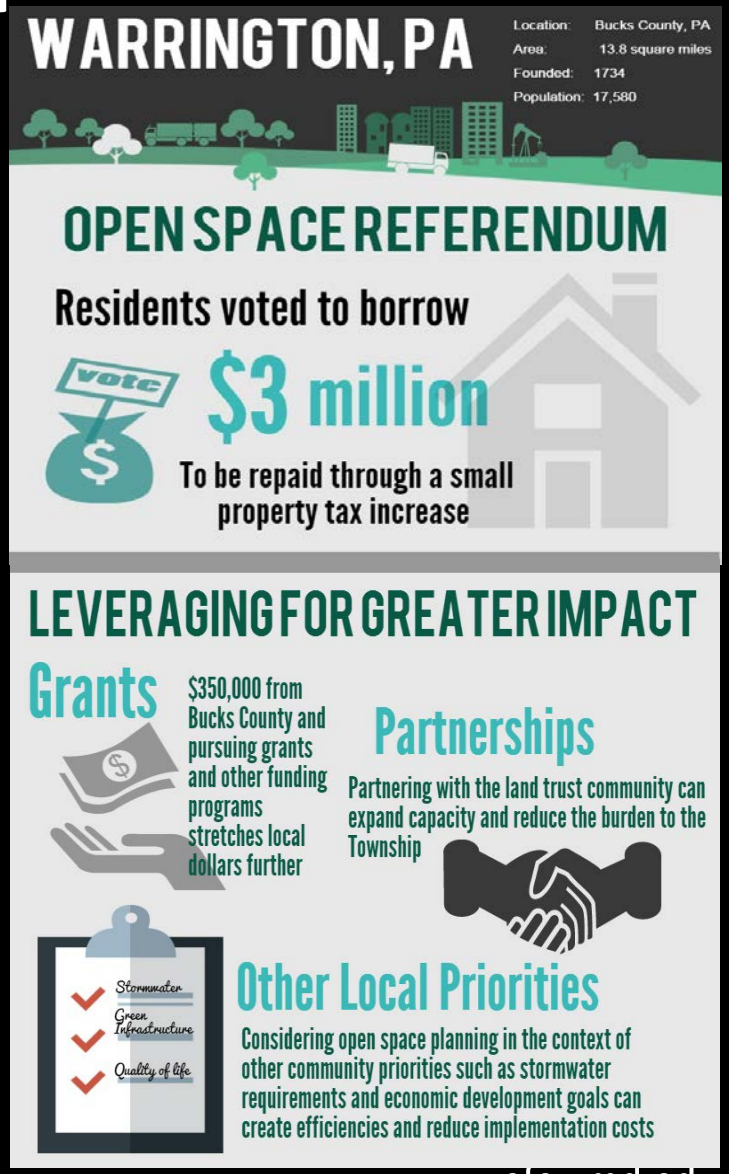
- Watershed fee
- Grants
- World O! Water
- Ordinances

Also in Puyallup:

- Planning for future growth
- Incentivizing residential BMPs

Communications and Outreach





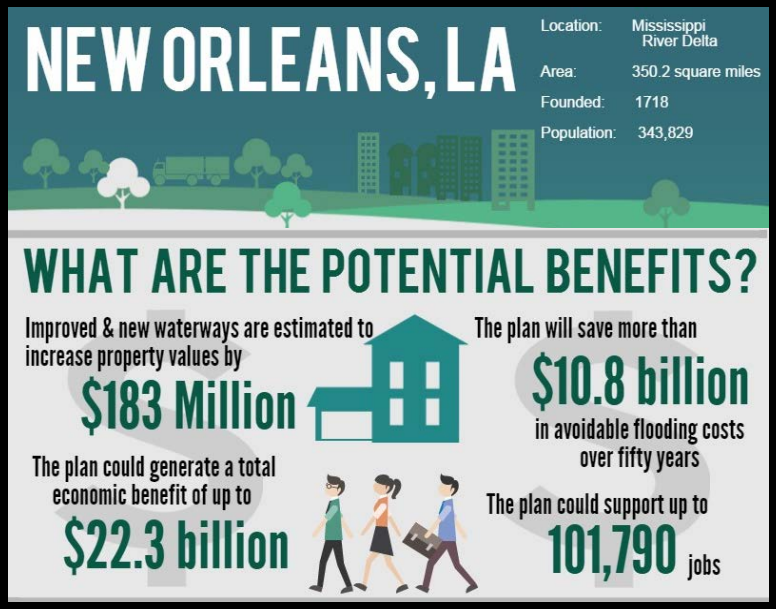
Also in Norfolk:

- Stormwater utility, regional planning, and urban tree canopy

Also in Warrington:

- Other grants, partnerships, leveraging local priorities

Making the Business Case



Engaging the Private Sector

BINGHAMTON, NY

Location: Broome County, NY
Area: 11.14 square miles
Founded: 1867
Population: 46,551

SHARING THE COST

50/50 . . . of green stormwater projects with residents and businesses

STORMWATER MANGEMENT FUND

NFWF sponsored program where the City splits the cost of GI projects with developers and landowners up to $25,000 for going above and beyond the required level stormwater management

GREEN STORMWATER AND LANDSCAPING MATCHING FUND

Local foundation sponsored program where the City provides matching funds for residents, nonprofits, and small businesses who want to install small-scale GI practices such as rain gardens, rain barrels, shade trees, and pervious paving

AURORA, IL

Location: Fox River
Area: 39.38 square miles
Founded: 1837
Population: 199,963

INCENTIVIZING INVESTMENT

River Edge Redevelopment Zone

Zoning overlay along Fox River provides state & local tax credits for locating businesses or development, creating jobs, or remediating environmental hazards in the area

RiverEdge Park

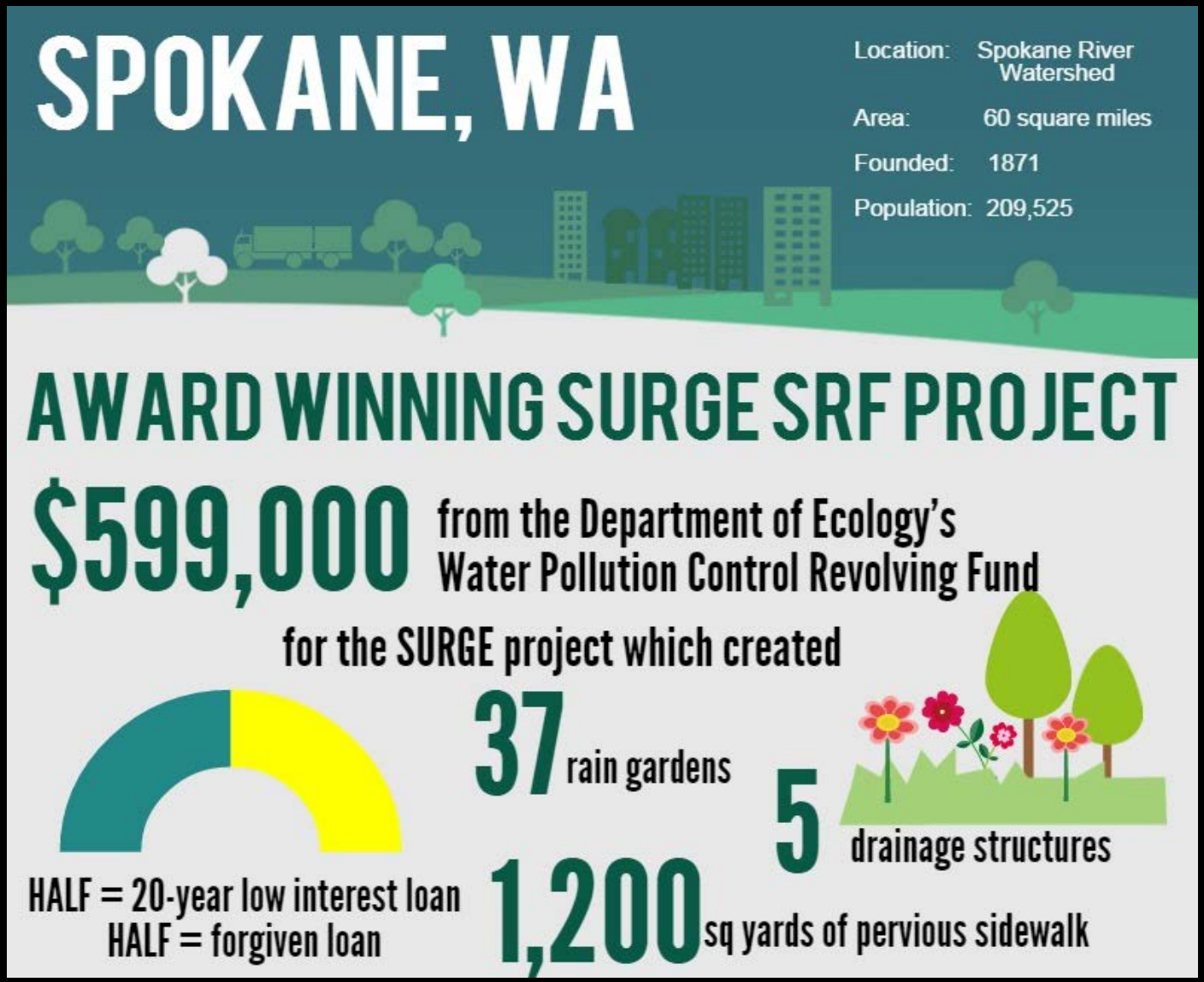
$15 million in grants leveraged

Illinois DCEO
Fox Valley Park District
County Forest Preservation District
Dunham Fund

for 30-acre, $18.5 million park at the core of the 10-year revitalization plan offering public space and natural areas for entertainment and recreation

What's Next ?

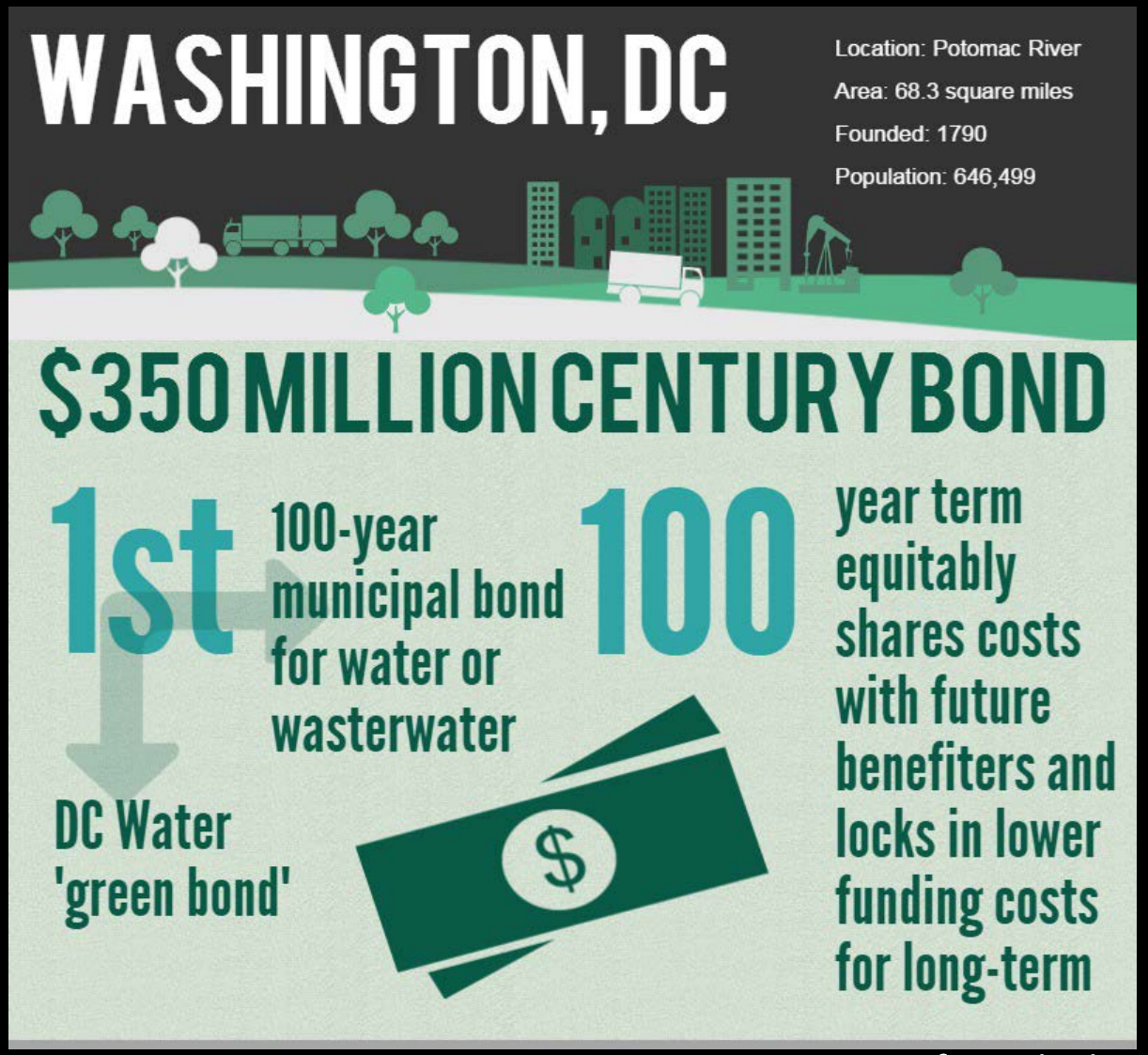
Creative Use of the SRF



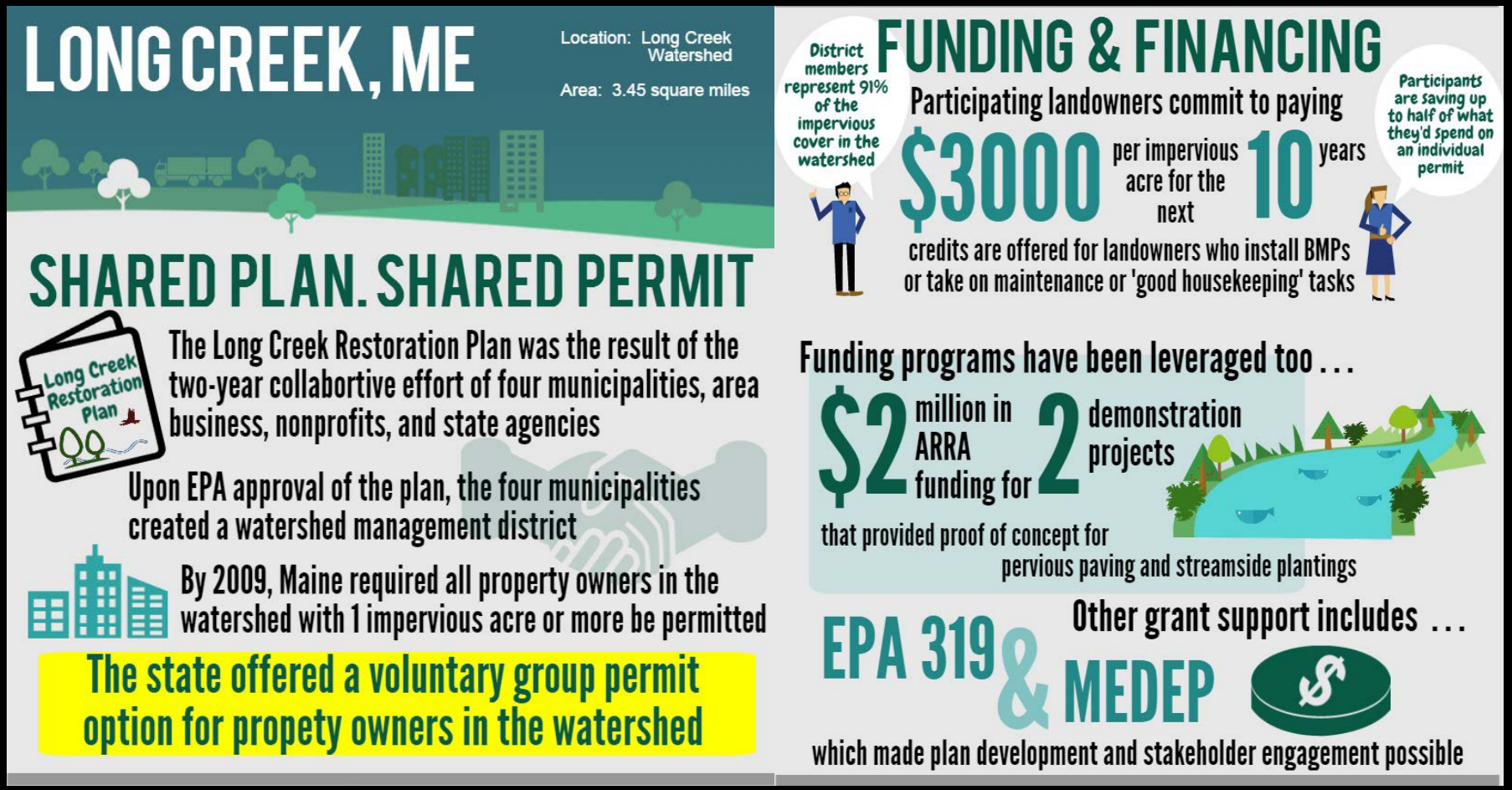
Emerging Bond Markets

Also in the District:

- Stormwater utility
- Credit trading program
- Technical support for residential BMPs



Regionalization



Summary Findings

Successful green infrastructure financing tends to rely on:

- Local ownership of the solution
- Collaboration and partnerships
- Leveraging multiple financing mechanisms
- Engaging the private sector in the solution

Emerging trends include:

- Getting creative with the State Revolving Loan Fund
- Green Bonds
- Regionalization

Contact Information

Jennifer Cotting
Research Associate – Green Infrastructure
(301) 405-5495
jcotting@umd.edu

Environmental Finance Center
University of Maryland
www.efc.umd.edu

Partnering to transform a watershed plan into a watershed reality:

the Bee Branch Watershed Flood Mitigation Project

Deron Muehring, Civil Engineer
City of Dubuque (IA)

November 4, 2014

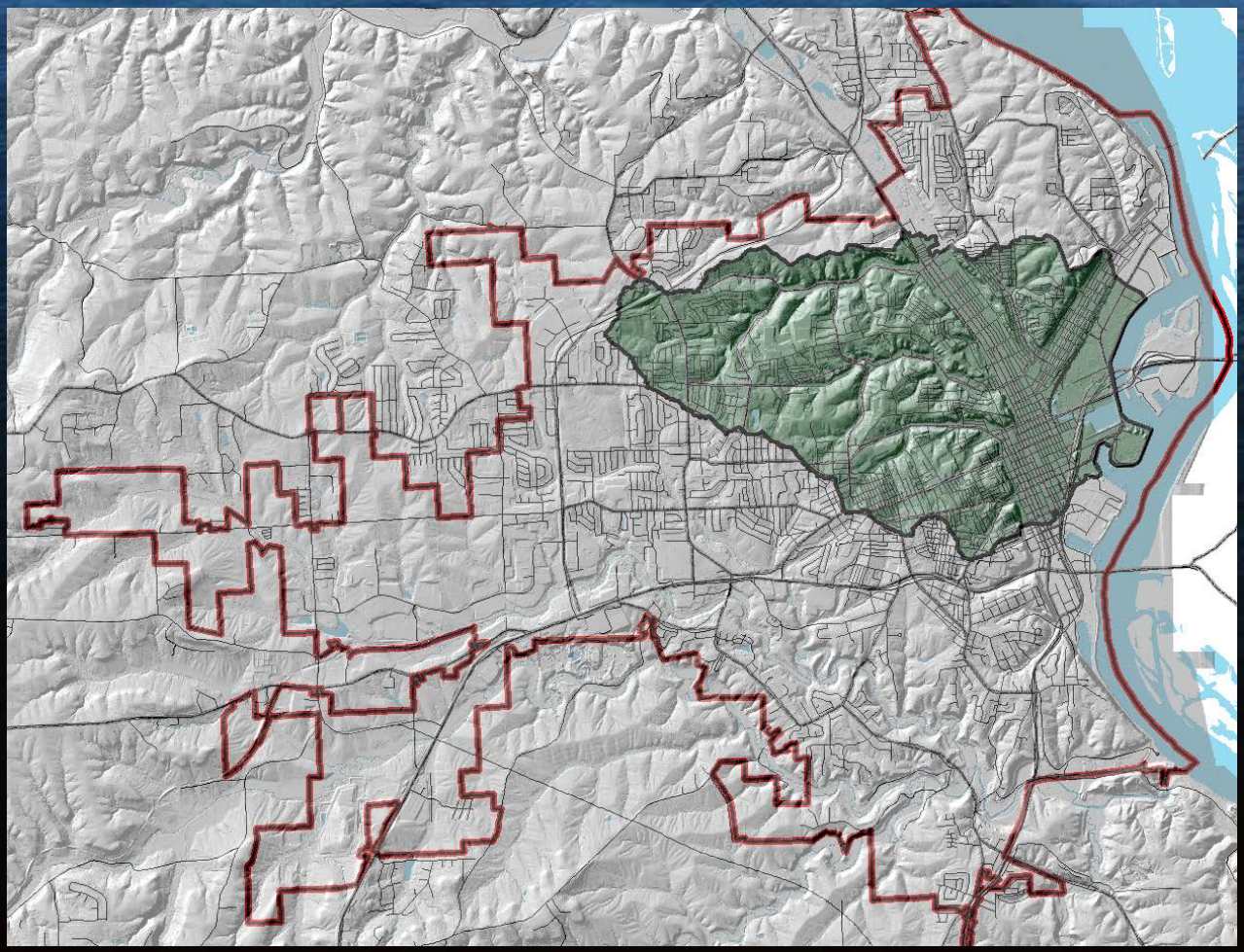
Dubuque, Iowa

THE CITY OF DUBUQUE
Masterpiece on the Mississippi

Dubuque, Iowa Watershed Address…

Mississippi Watershed

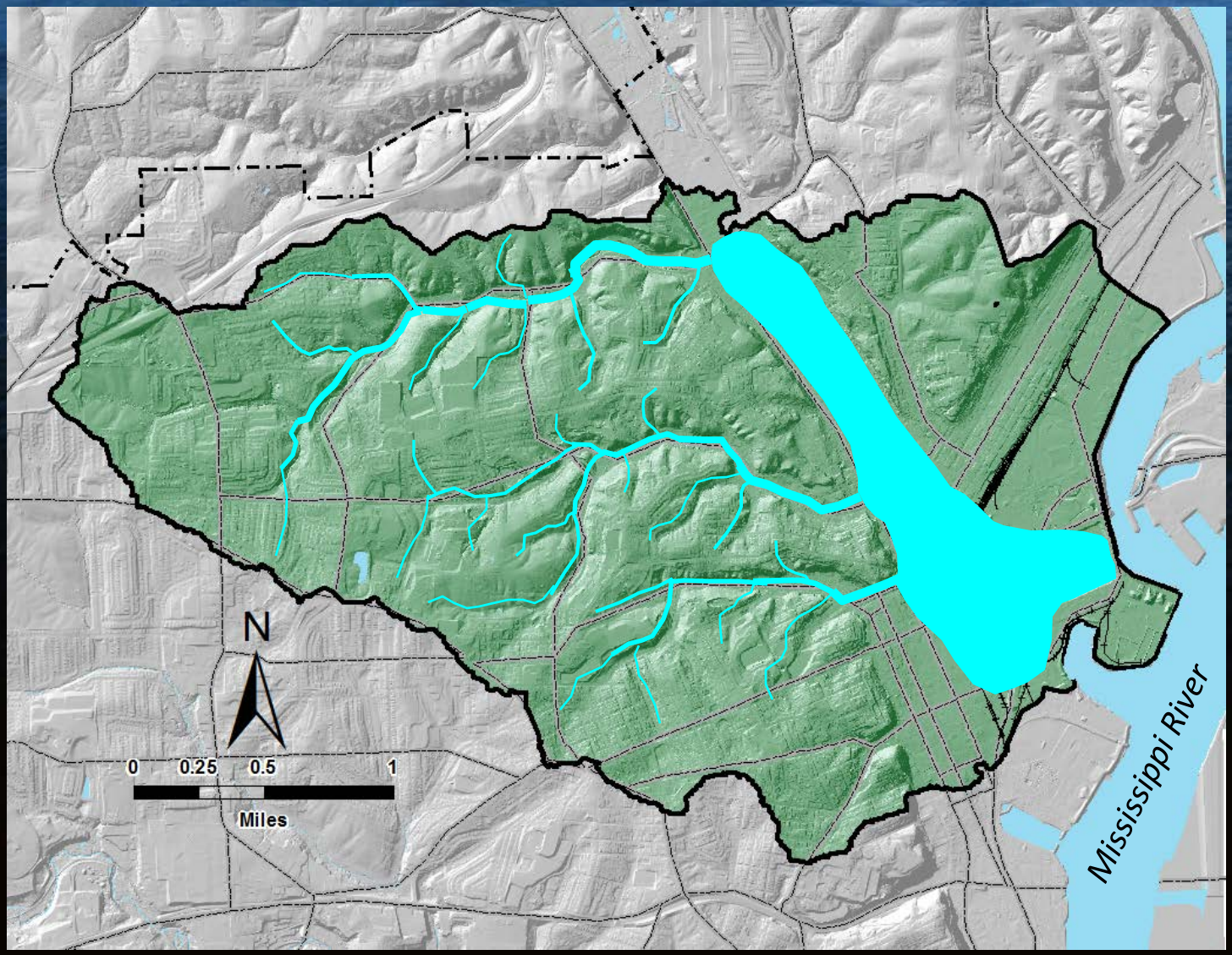
Watershed Address…



Bee Branch Watershed

Watershed Hydrology…

Watershed Hydrology…



Summary of Presidential Disaster Declarations in 1999 - 2011

Presidential Disaster Declaration: May 21, 1999	
Disaster #	1277
Reason for Declaration	Flooding, severe storms, tornadoes
Cause	

Presidential Disaster Declaration: June 19, 2002	
Disaster #	1420
Reason for Declaration	Flooding and storms
Cause	

Presidential Disaster Declaration: June 2, 2004	
Disaster #	1518
Reason for Declaration	Flooding, severe storms, tornadoes
Cause	

Presidential Disaster Declaration: May 27, 2008	
Disaster #	1763
Reason for Declaration	Flooding, severe storms, tornadoes
Cause	

Presidential Disaster Declaration: August 14, 2010	
Disaster #	1930
Reason for Declaration	Flooding, severe storms, tornadoes
Cause	

Presidential Disaster Declaration: August 30, 2011	
Disaster #	4018
Reason for Declaration	Flooding, severe storms, tornadoes
Cause of Damage	10.2 inches of rain in 12 hours

Summary of Presidential Disaster Declarations in 1999 - 2011

Since 1999, Dubuque has witnessed:

- One 10-year storm,
- One 25-year storm,
- Two 50-year storms, and
- Three 100-year storms.

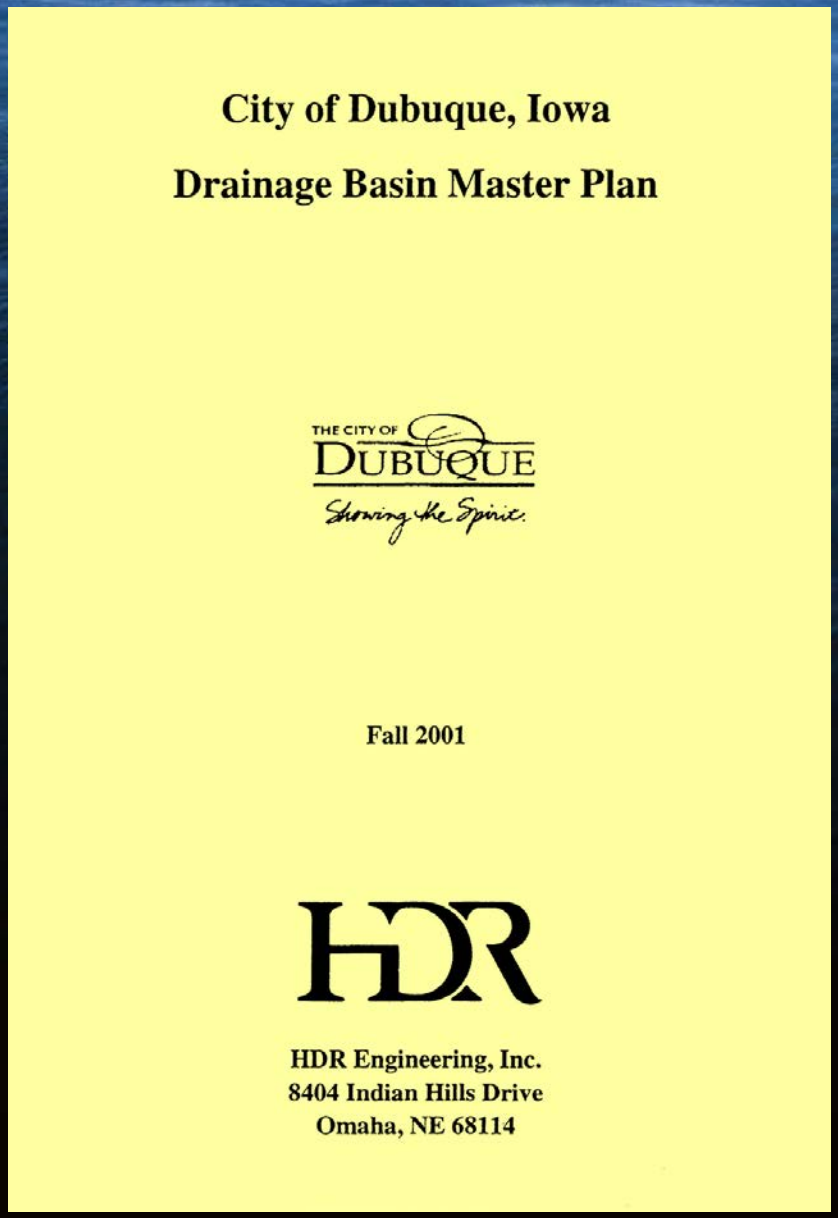
Based on historic rainfall data outlined in 1992 *Rainfall Atlas of the Midwest* (Huff and Angel)

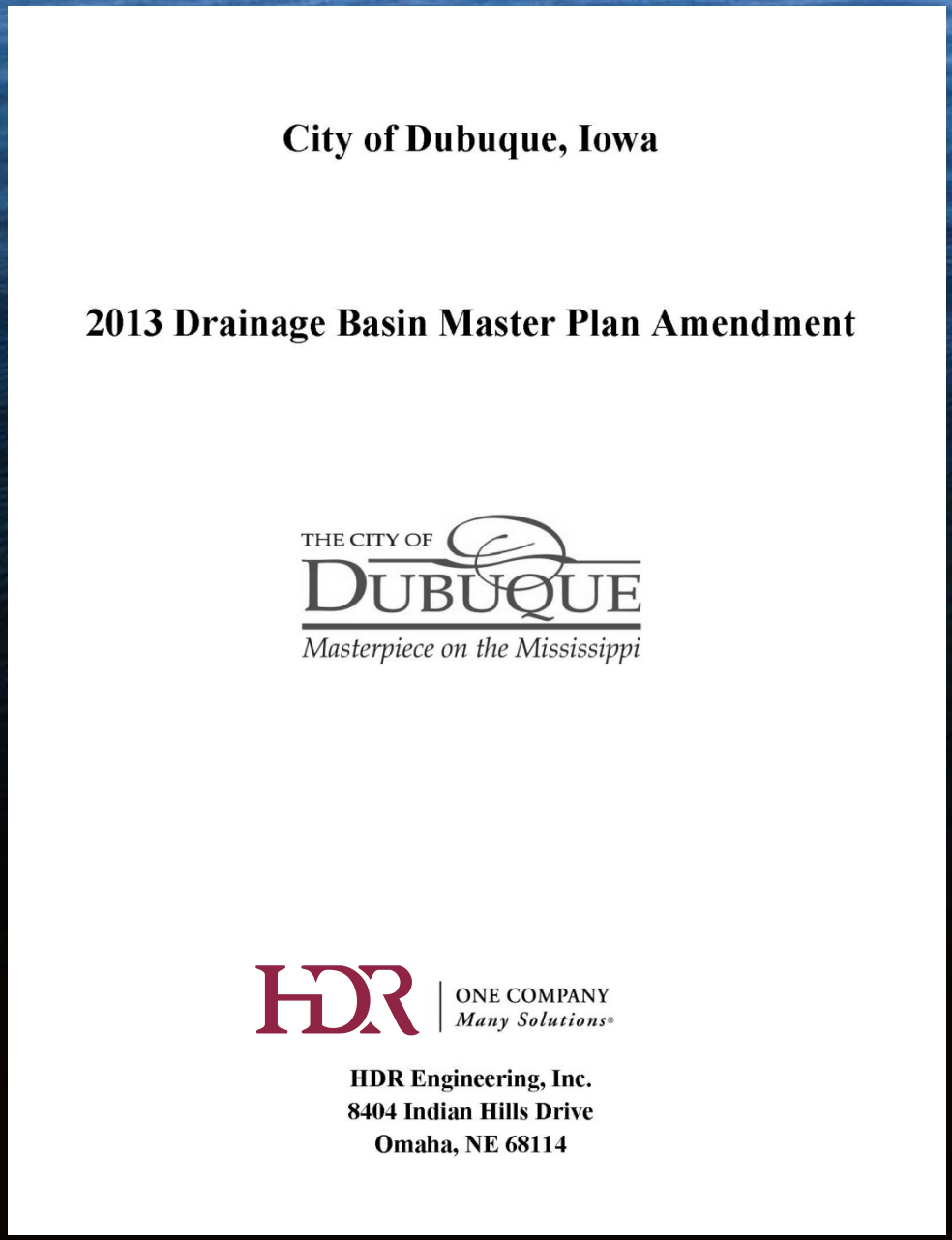
Witnessed Flooding…

Estimated damages due to the six disasters from 1999 to 2011 totals $69.8 million

Drainage Basin Master Plan

2001





Drainage Basin Master Plan

2013

How you address the issue is just as important as why…

Bee Branch Watershed Flood Mitigation Project

Bee Branch Watershed Flood Mitigation Project Phases

Phase	Description	Est. Completion	Est. Cost
1	Carter Road Detention Basin	Completed 2004	$1,076,315
2	West 32nd Street Detention Basin	Completed 2009	$4,158,589
3	Historic Millwork District	Completed 2012	$7,977,311
4	Lower Bee Branch Creek Restoration	2014	$21,274,685
5	Flood Mitigation Gate Replacement	2015	$2,099,000
6	Impervious Surface Reduction	2034	$57,420,000
7	Upper Bee Branch Creek Restoration	2016	$64,823,636
8	22nd Street Storm Sewer Improvements	2020	$3,380,000
9	Flood Mitigation Maintenance Facility	2020	$4,360,000
10	North End Storm Sewer Improvements	2019	$1,160,000
11	Water Plant Flood Protection	2020	$3,800,000
12	17th Street Storm Sewer Improvements	2020	$7,520,000
		Subtotal	**$179,049,536**

Bee Branch watershed FLOOD MITIGATION PROJECT

Bee Branch Watershed Flood Mitigation Project

The combined phases will:

- Reduce the volume of stormwater,
- Slow the rate and timing of stormwater flow through the upper watershed,
- Increase safe stormwater conveyance through the flood-prone area.

Bee Branch Watershed Flood Mitigation Project

The combined phases will:

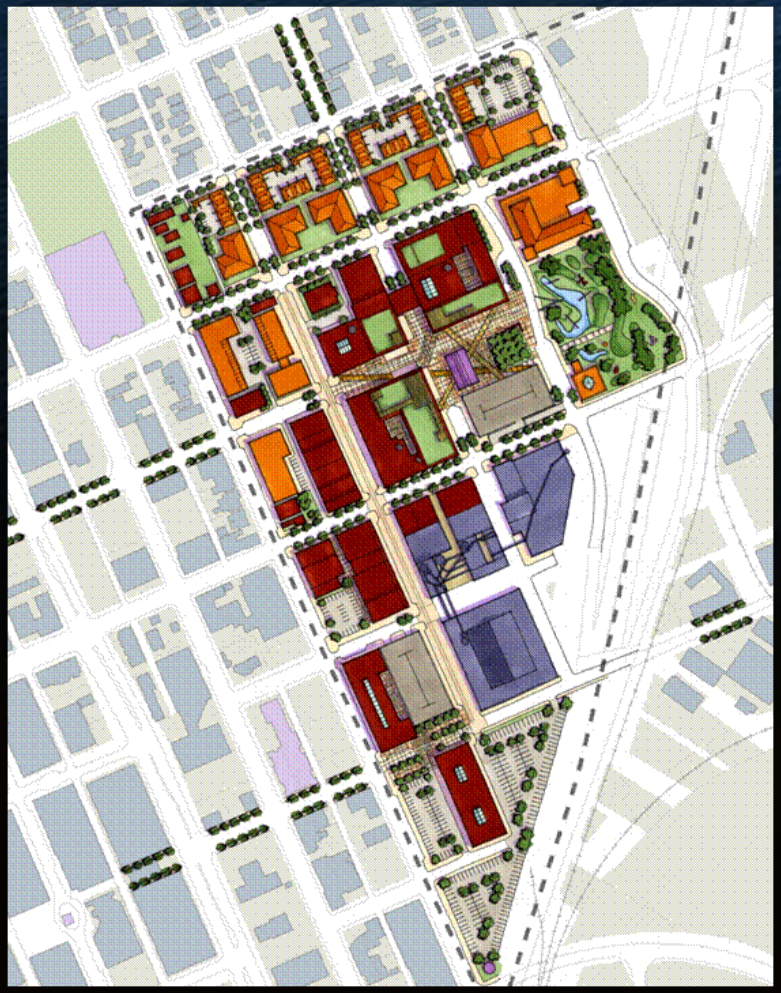
- Reduce the volume of stormwater,
- Slow the rate and timing of stormwater flow through the upper watershed,
- Increase safe stormwater discharge through the flood-prone area.

Volume

Historic Millwork District
Pervious Pavement System

Historic Millwork District

Total Development Outcomes



- 732 Housing Units
- 351,000 SF commercial/ retail space
- 29 blocks of new streets
- 12 blocks of improved streets
- 3 acres of green space

Historic Millwork District

Pervious Pavement System – ***Complete Streets***

Historic Millwork District

Pervious Pavement System – ***Complete Streets***

Millwork District Street Detention/Conveyance System

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

TIGER

U.S. Department of Transportation

Green Alleys
Pervious Pavement Systems

Sometimes How you address the issue is MORE important than why…

Green Alleys
Pervious Pavement Systems

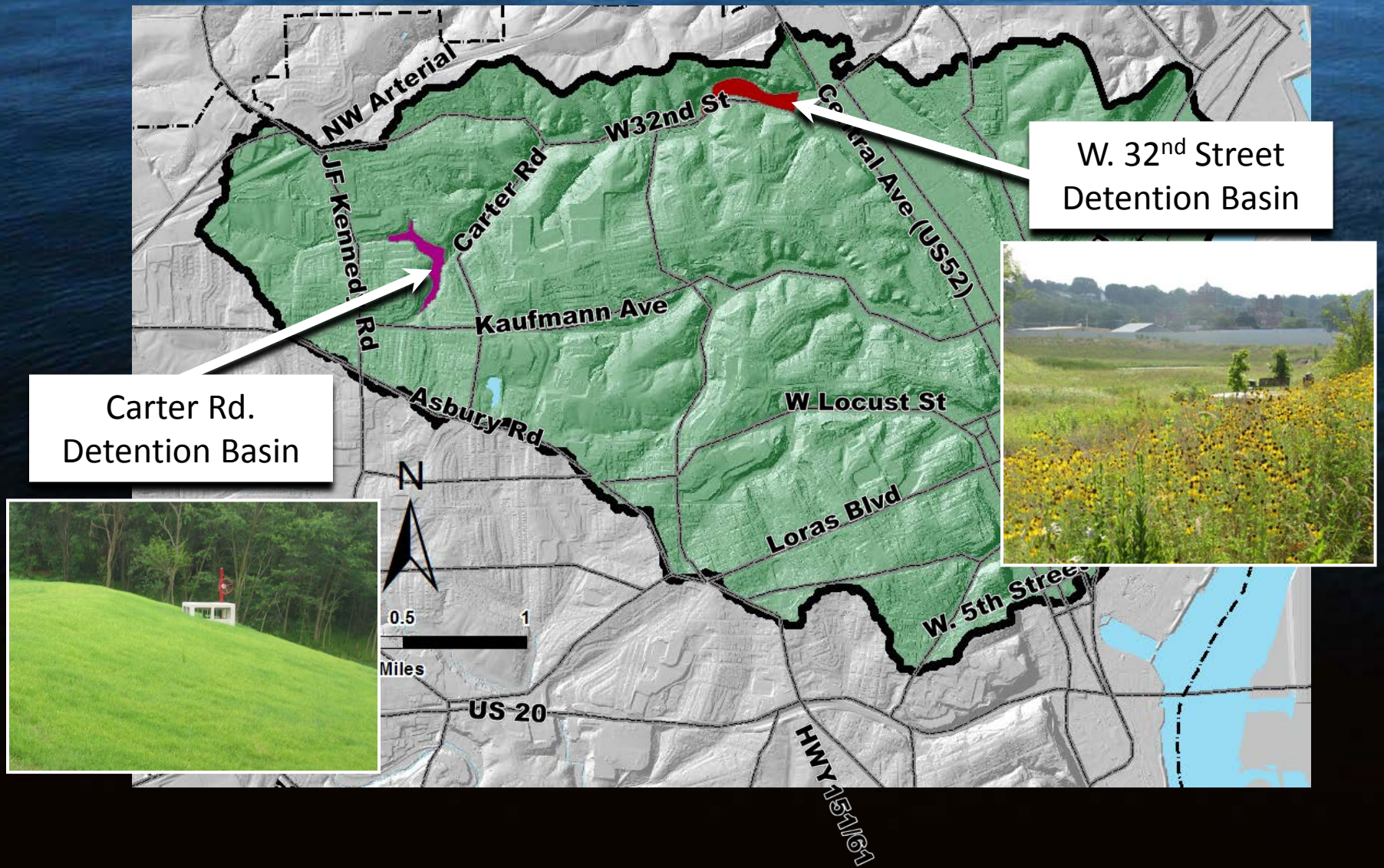
Bee Branch Watershed Flood Mitigation Project

The combined phases will:

- Reduce the volume of stormwater,
- Slow the rate and timing of stormwater flow through the upper watershed,
- Increase safe stormwater conveyance through the [illegible] area.

Rate & Timing

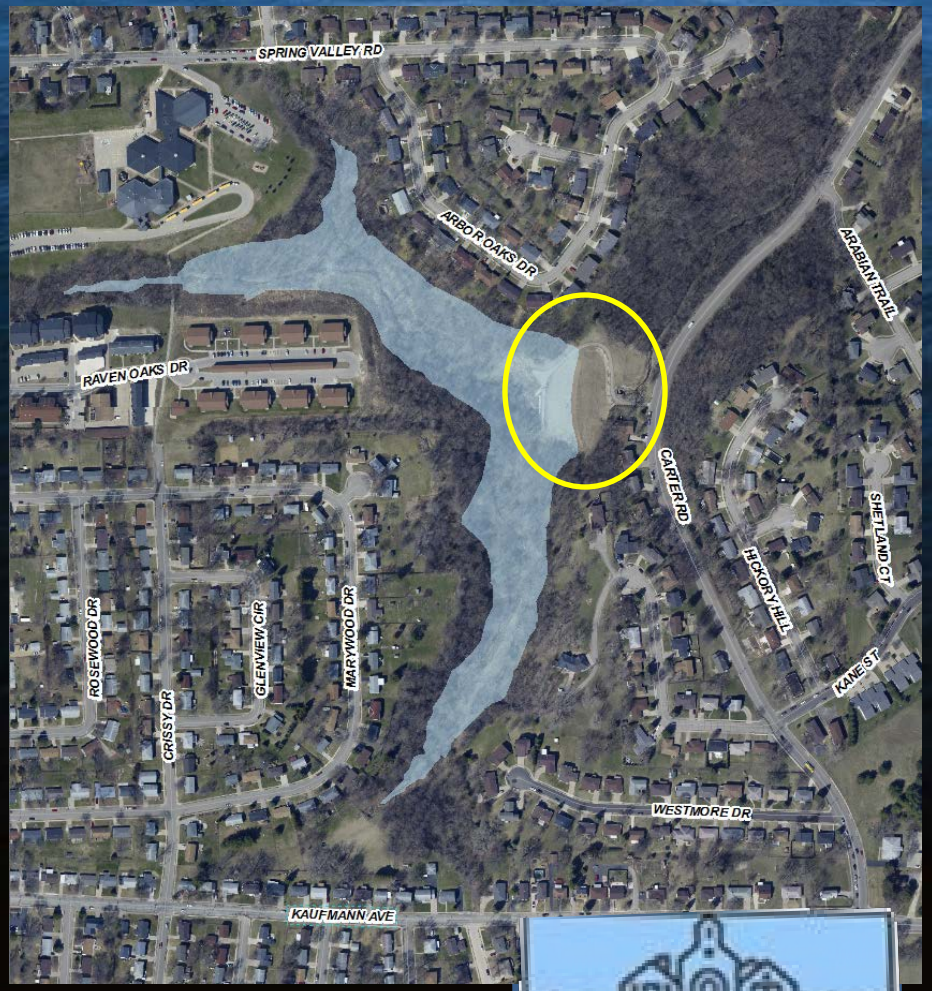
Upstream Detention



Carter Road Detention Basin

Before

After

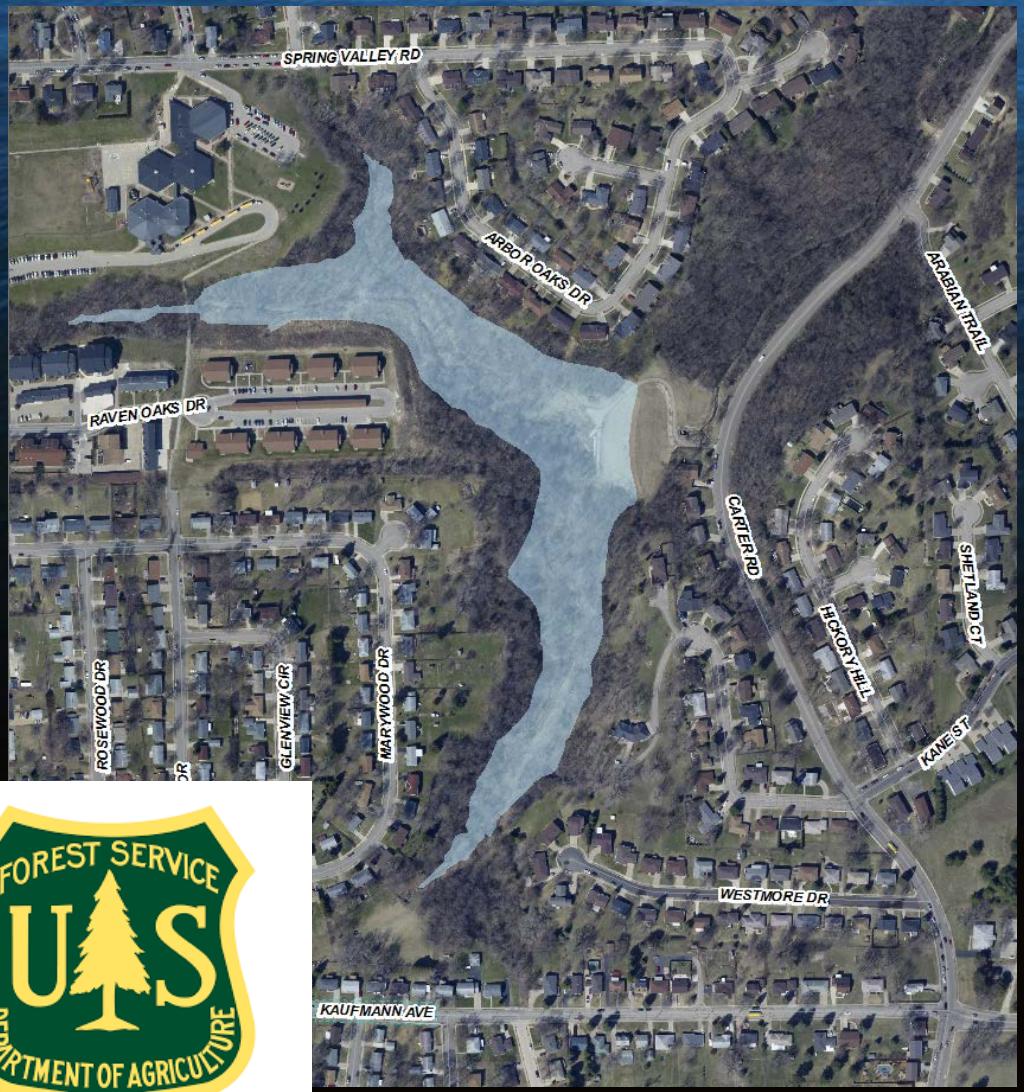


Stormwater Utility at Work

Carter Road Detention Basin

Preservation of 12 Acres of wooded, riparian landscape

Who does this interest?



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DNR

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

W. 32nd Street Detention Basin

Before

After

W. 32nd Street Detention Basin

- Preservation/ enhancement of 6.2 acres of riparian landscape
- Creation of an additional 10.5 acres of riparian landscape

Bee Branch Watershed Flood Mitigation Project

The combined phases will:

- Reduce the volume of stormwater,
- Slow the rate and timing of stormwater flow through the upper watershed,

Conveyance

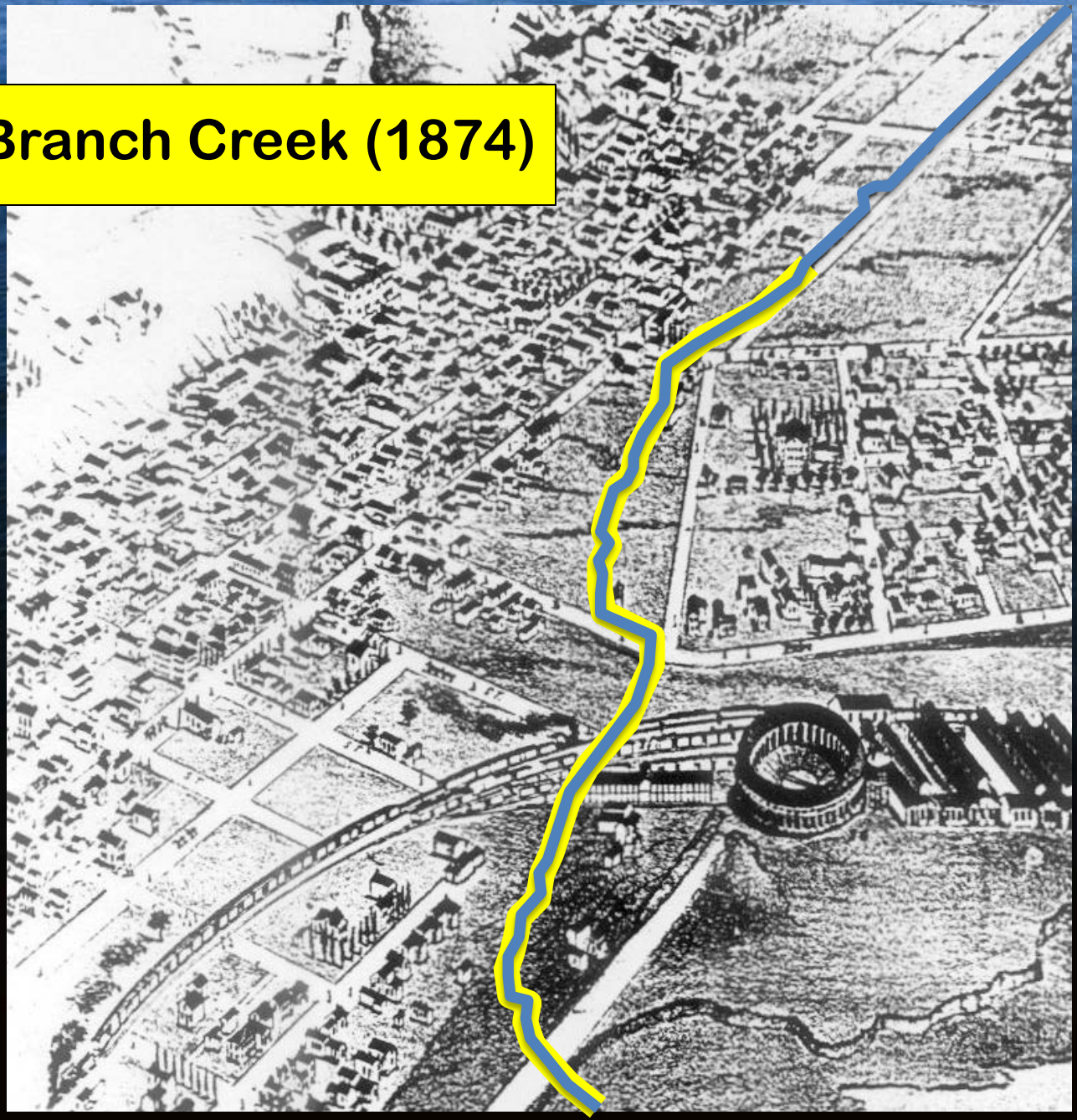
- Increase safe stormwater conveyance through the flood-prone area.

Bee Branch Sewer (1910)

Who does this interest?

American
Concrete Pipe
Association

Bee Branch Creek (1874)



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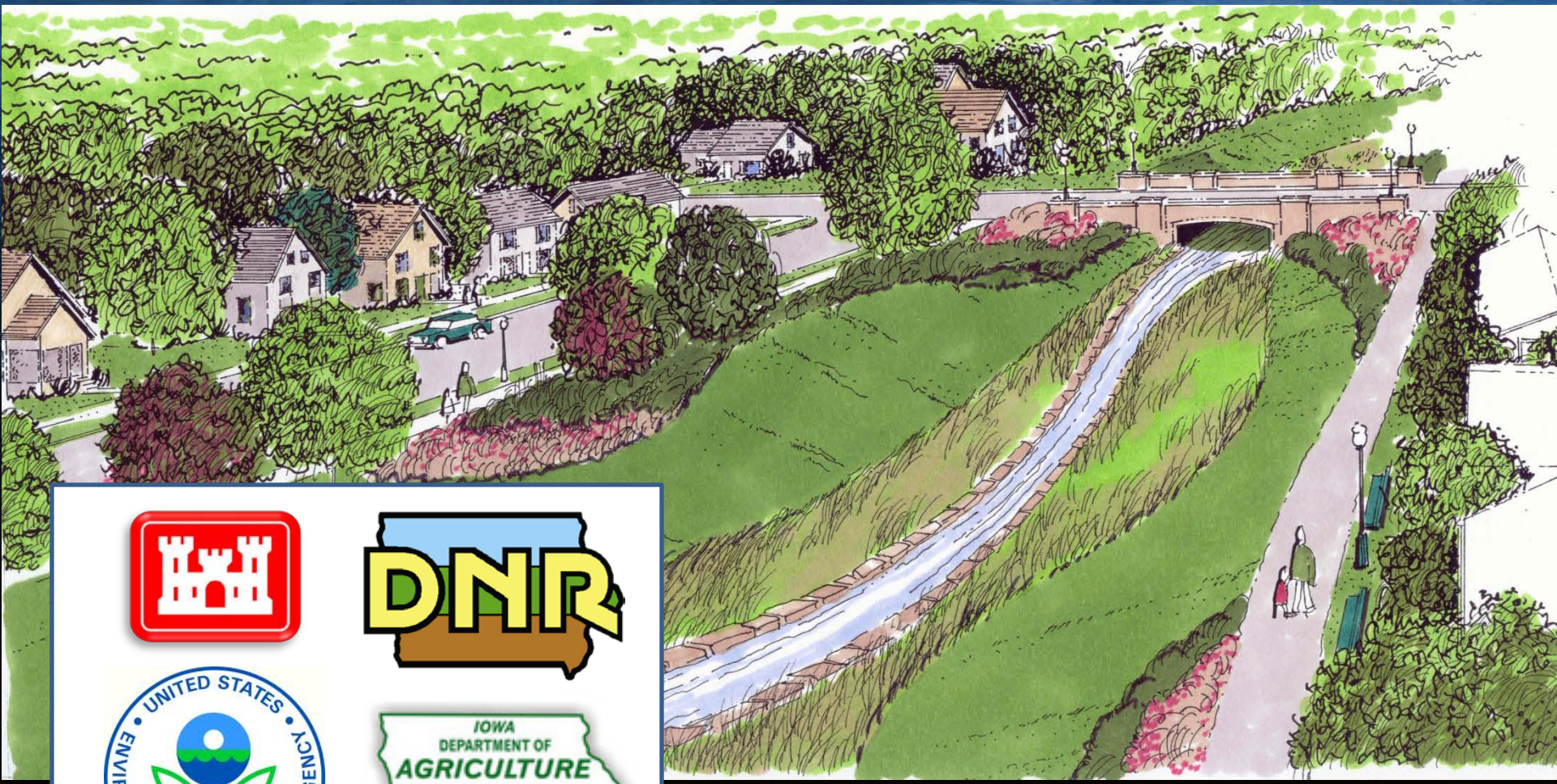
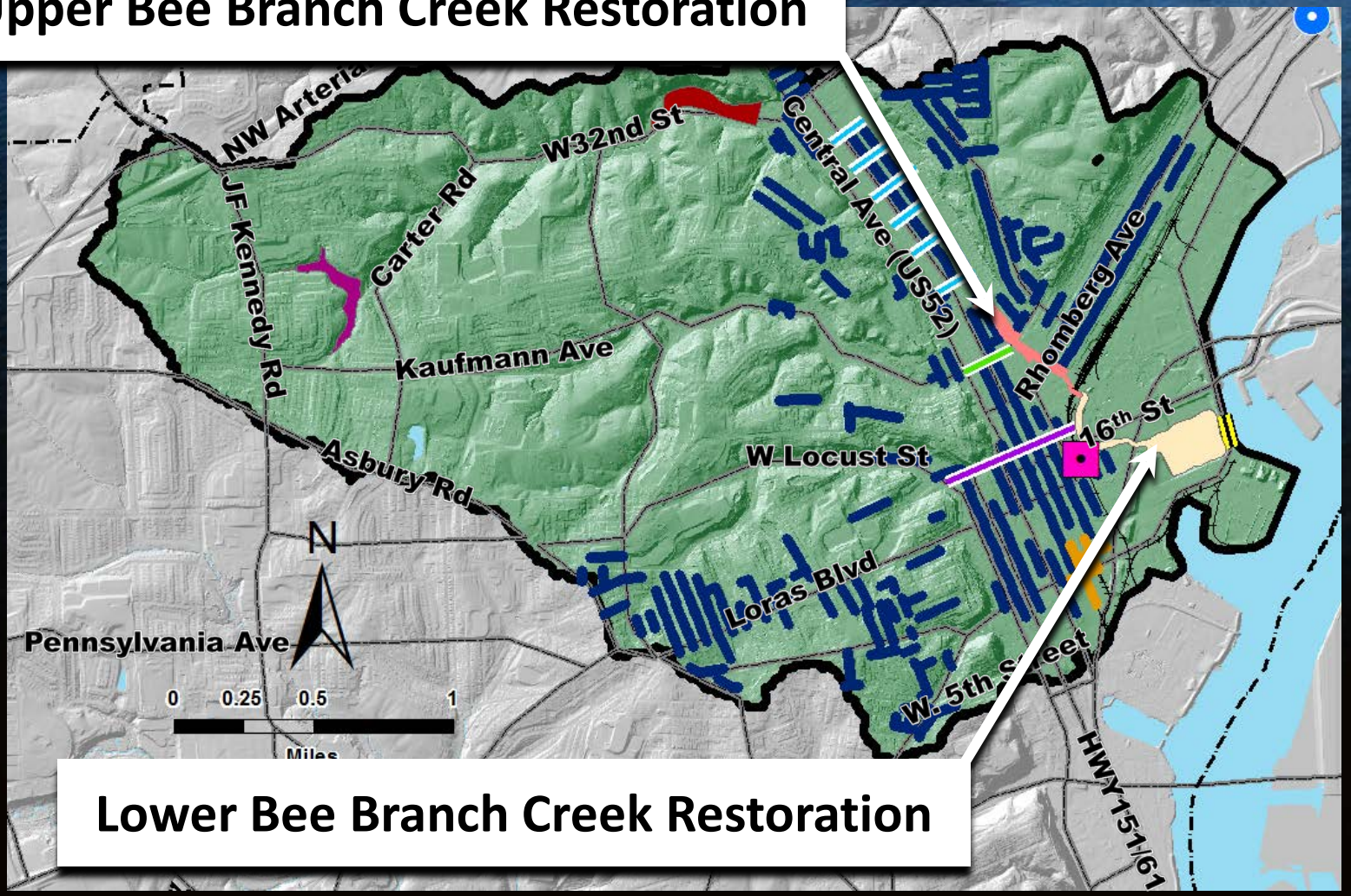


Bee Branch Creek Restoration



Lower Bee Branch Creek Restoration

Looking east from Sycamore Street

Lower Bee Branch Creek Restoration

Who does this interest?

After

Looking east from Sycamore Street

Biodiversity and Habitat Creation

June 2014 fish count:

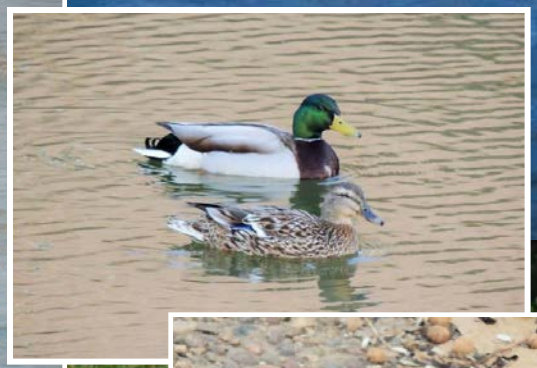
15 fish species from **7** families!

Who does this interest?

Biodiversity and Habitat Creation

Who does this interest?

Biodiversity and Habitat Creation

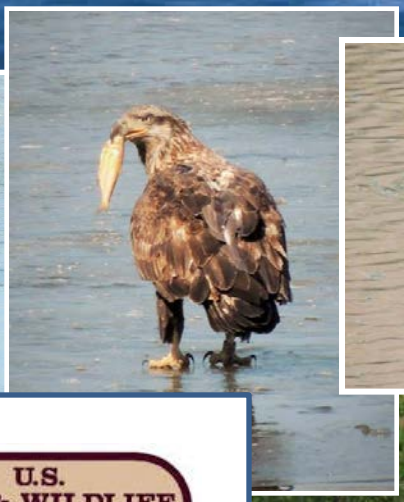


45 bird species

Who does this interest?

Biodiversity and Habitat Creation






UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DNR

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

Who does this interest?

Lower Bee Branch Creek Restoration

Looking northwest from 15th Street

Lower Bee Branch Creek Restoration

Did you know that the corners of square pegs can be rounded?

Looking northwest from 15th Street

Lower Bee Branch Creek Restoration

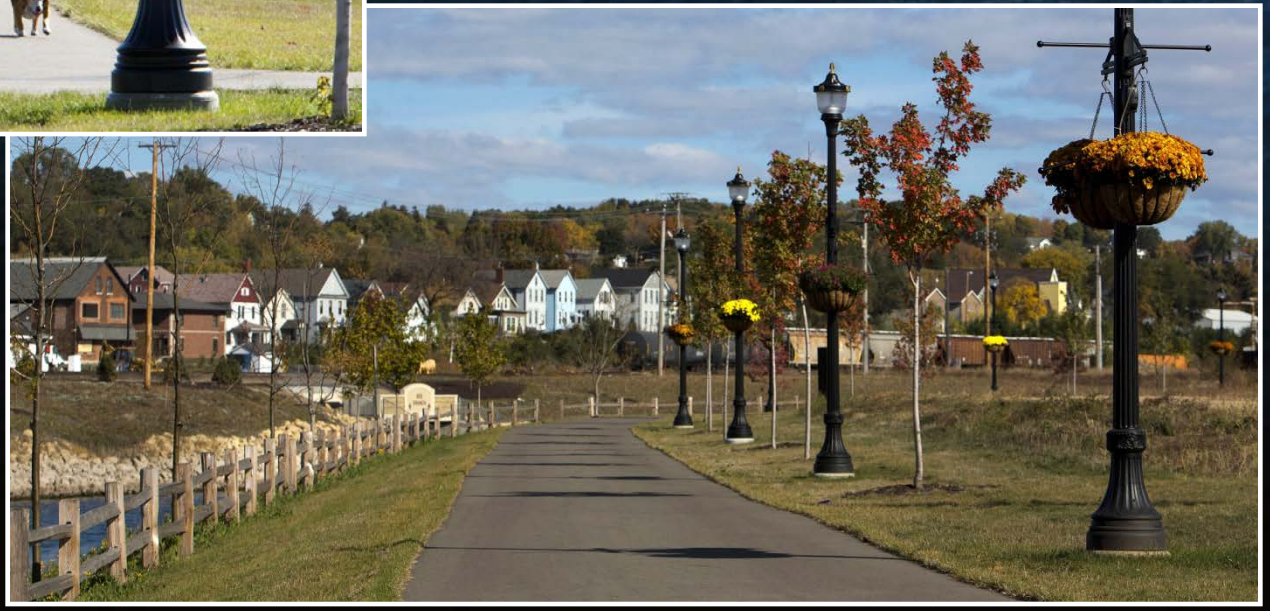
VISION IOWA

ENHANCED BRIDGES

Recreation & Transportation Alternatives

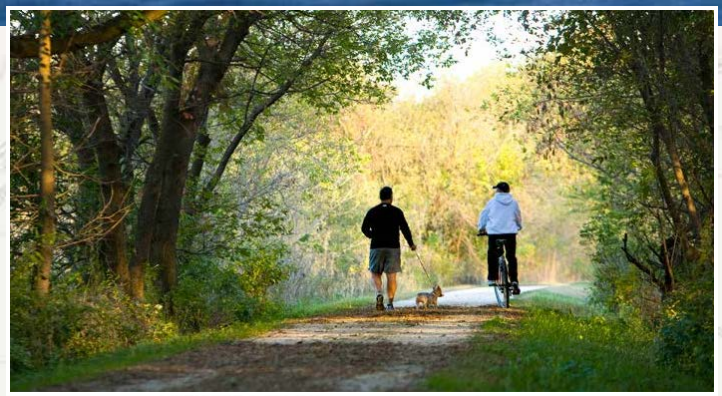
U.S. Department of Transportation
Federal Highway Administration

Iowa Department of Transportation



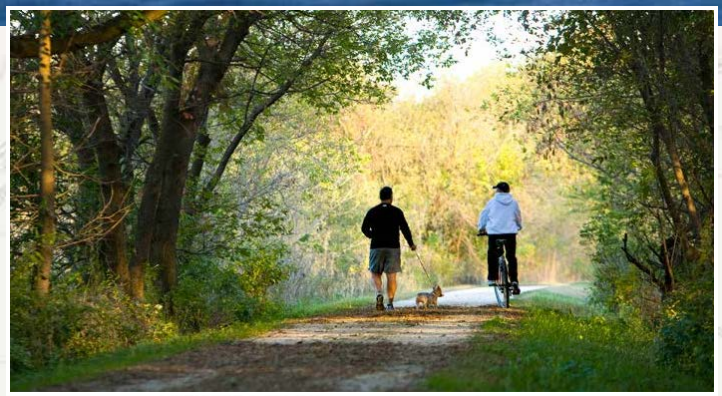
Who does this interest?

Recreation, Tourism, & Transportation Alternatives



Who does this interest?

Recreation, Tourism, & Transportation Alternatives



U.S. Department of Transportation
Federal Highway Administration

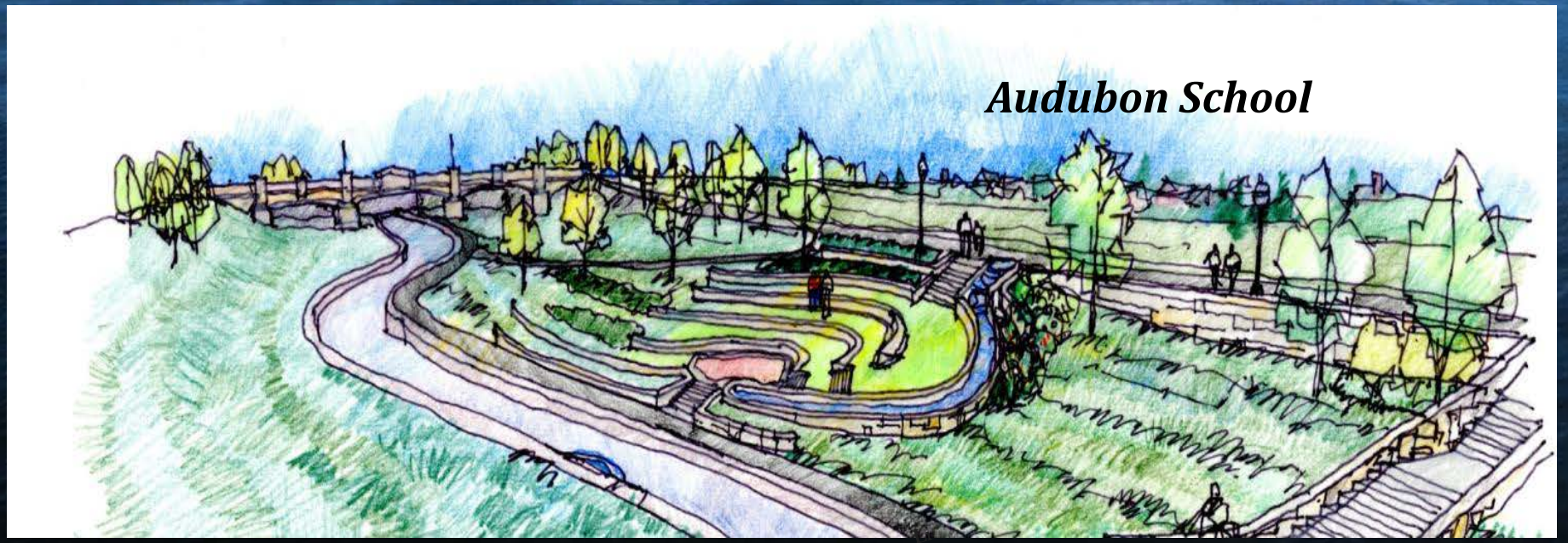
Iowa Department of Transportation

THE COUNTY OF DUBUQUE

VISION IOWA

Who does this interest?

Connecting with Nature



Dubuque Community Schools

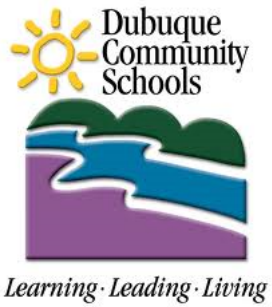
Learning · Leading · Living

Outdoor Classroom / Amphitheater

Project Funding

U.S. EPA Clean Water SRF	$39,604,257
U.S. EPA Clean Water SRF Sponsorship Program	$9,416,795
U.S. EDA Disaster Relief Grant	$1,227,138
U.S. DOT TIGER Grant	$5,600,000
State I-Jobs II Grant	$3,965,500
State RECAT Grant	$2,250,000
U.S. DOT National Scenic Byways Grant	$1,000,000
State Recreational Trail Grant	$100,000
Dubuque Metropolitan Area Transportation Study	$640,000
General Obligation Bonds	$48,227,604
Private Donations	$165,244
Sale of Assets and Land	$336,358
Stormwater Utility Fees	$14,394,096
State Flood Mitigation Sales Tax Increment	$98,494,178
Table adjustment for SRF loan repayment	$(24,491,634)
Total Project Funding	**$200,929,536**

Project Partners



WAHLERT FOUNDATION

North End Neighborhood Association

Project Partners

Always room for more…

THE CITY OF DUBUQUE
Masterpiece on the Mississippi

Partnering to transform a watershed plan into a watershed reality:

the Bee Branch Watershed Flood Mitigation Project

Bee Branch watershed
FLOOD MITIGATION PROJECT

Deron Muehring, Civil Engineer
City of Dubuque (IA)
dmuehrin@cityofdubuque.org

www.cityofdubuque.org/beebranch

facebook.com/beebranchdbq

twitter.com/beebranchdbq

Water Resource Restoration Sponsored Projects

SRF
STATE
REVOLVING FUND

INVESTING IN IOWA'S WATER
www.iowasrf.com

SRF Background

- In Iowa, the SRF Program is jointly administered by Iowa Department of Natural Resources (DNR) and Iowa Finance Authority (IFA)
- Primary source of funding for municipal water and wastewater infrastructure projects

SRF STATE REVOLVING FUND

1989 - 2002

LOW-INTEREST LOANS FOR

Water and wastewater infrastructure only

SRF STATE REVOLVING FUND

INVESTING IN IOWA'S WATER
www.iowasrf.com

2003 - Present

Nonpoint Source

- Loans
- Linked Deposits
- Loan Participations
- Green Projects / Loan Forgiveness
- Sponsored Projects

SRF STATE REVOLVING FUND

INVESTING IN IOWA'S WATER
www.iowasrf.com

SRF for Nonpoint

Loans to farmers, livestock producers, cities, watershed organizations, rural homeowners, landfills and others to protect or restore water quality

$178 million since 2003

SRF STATE REVOLVING FUND

INVESTING IN IOWA'S WATER
www.iowasrf.com

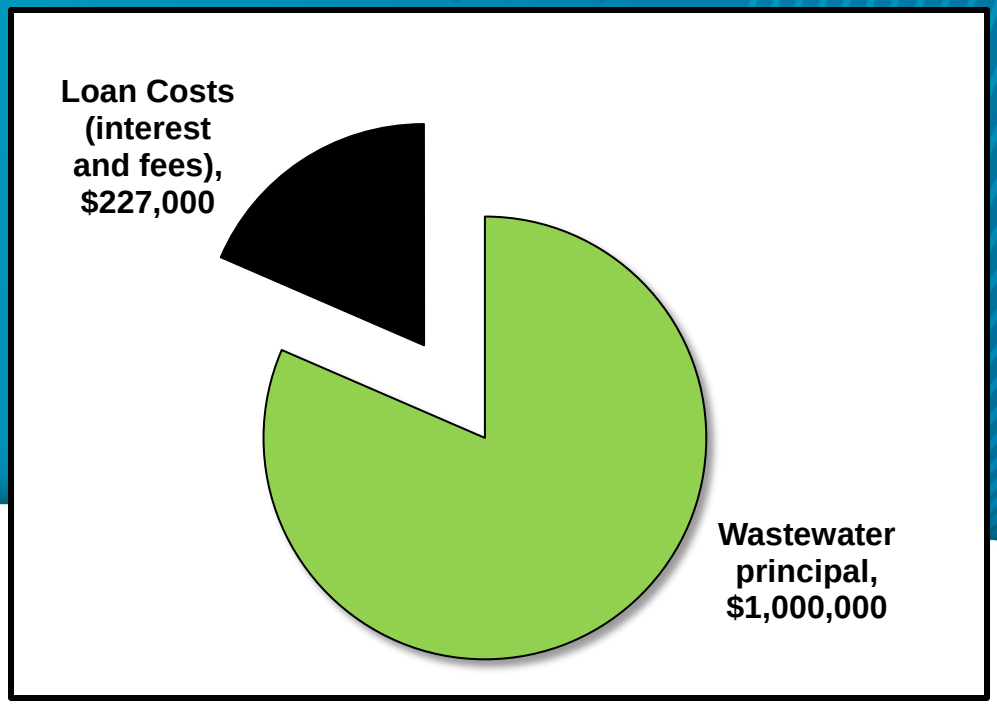
WRR Sponsored Projects

- Created by Ohio EPA
- Iowa first explored doing sponsored projects back in 2005
- Changes had to be made to the Iowa Code
  - sewer revenues could only be used for the utility
- Two types of projects:
  - Non-point project within city
  - City partners with a third party for project in watershed

SRF STATE REVOLVING FUND

Typical CWSRF Loan

- City borrows **$1,000,000** for sewer project
- City makes annual principal and interest payments on loan for 20 years
- With interest and fees, the city repays **$1,227,000** over the life of loan



SRF STATE REVOLVING FUND

INVESTING IN IOWA'S WATER
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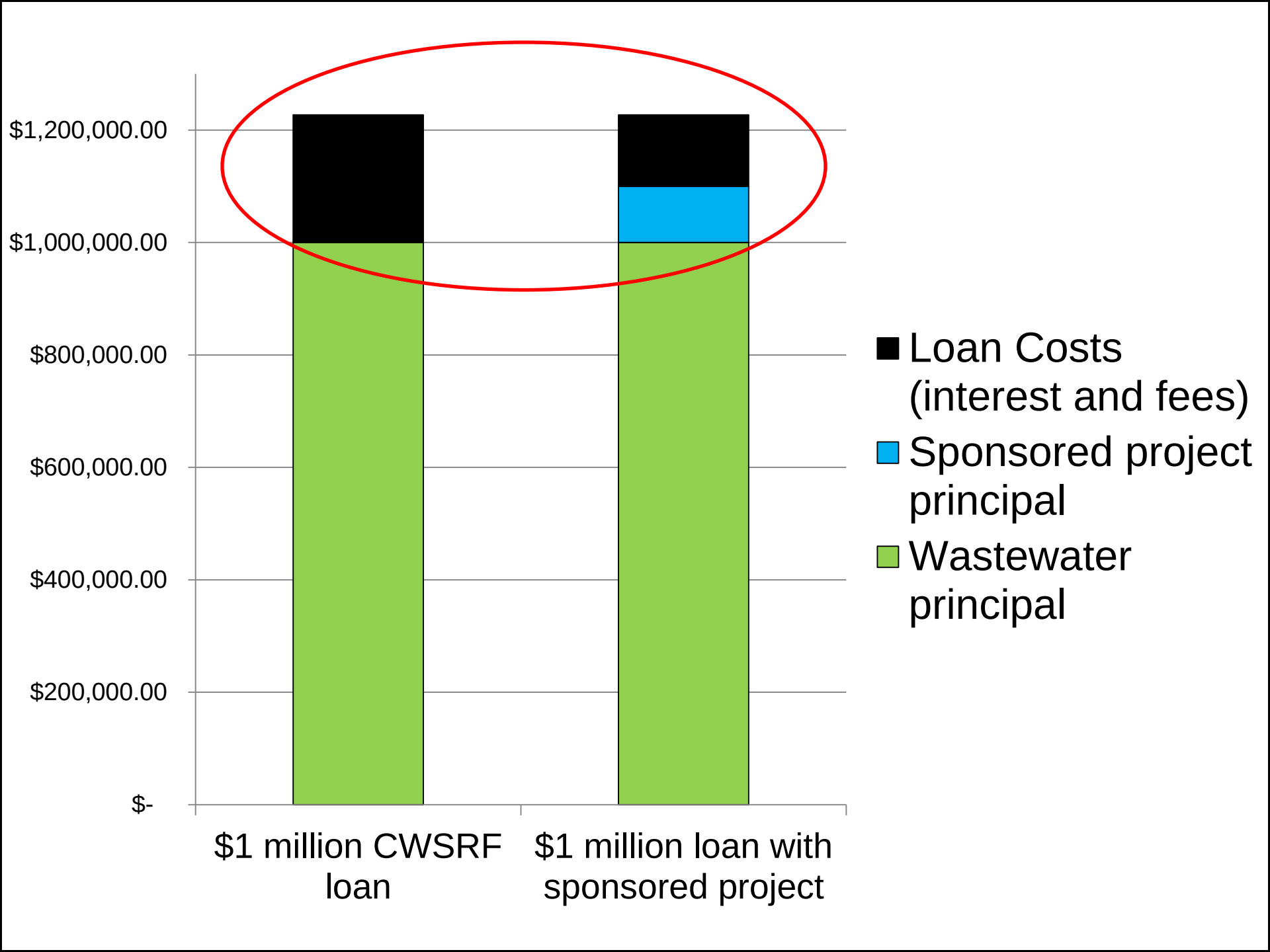
$1,200,000.00
$1,000,000.00
$800,000.00
$600,000.00
$400,000.00
$200,000.00
$-
$1 million CWSRF loan
$1 million loan with sponsored project
Loan Costs (interest and fees)
Sponsored project principal
Wastewater principal

Sponsored Project Funds

- Current interest rate is 1.75%
- Up to 1% of interest can be used for non-point source project (interest rate will not go below .75%)
- Approximately $100,000 per $1,000,000 borrowed

SRF STATE REVOLVING FUND

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CWSRF Loan with Sponsored Project

- City applies for both traditional wastewater project and non-point sponsored project
- City borrows **$1,000,000** to pay for sewer system upgrades PLUS amount equivalent to up to1% of interest (about **$100,000**) for a total of **$1,100,000**
- There is only one loan
- City makes annual principal and interest payment for 20 years. The interest rate is reduced on the loan so the amount repaid by the city is **$1,227,000**

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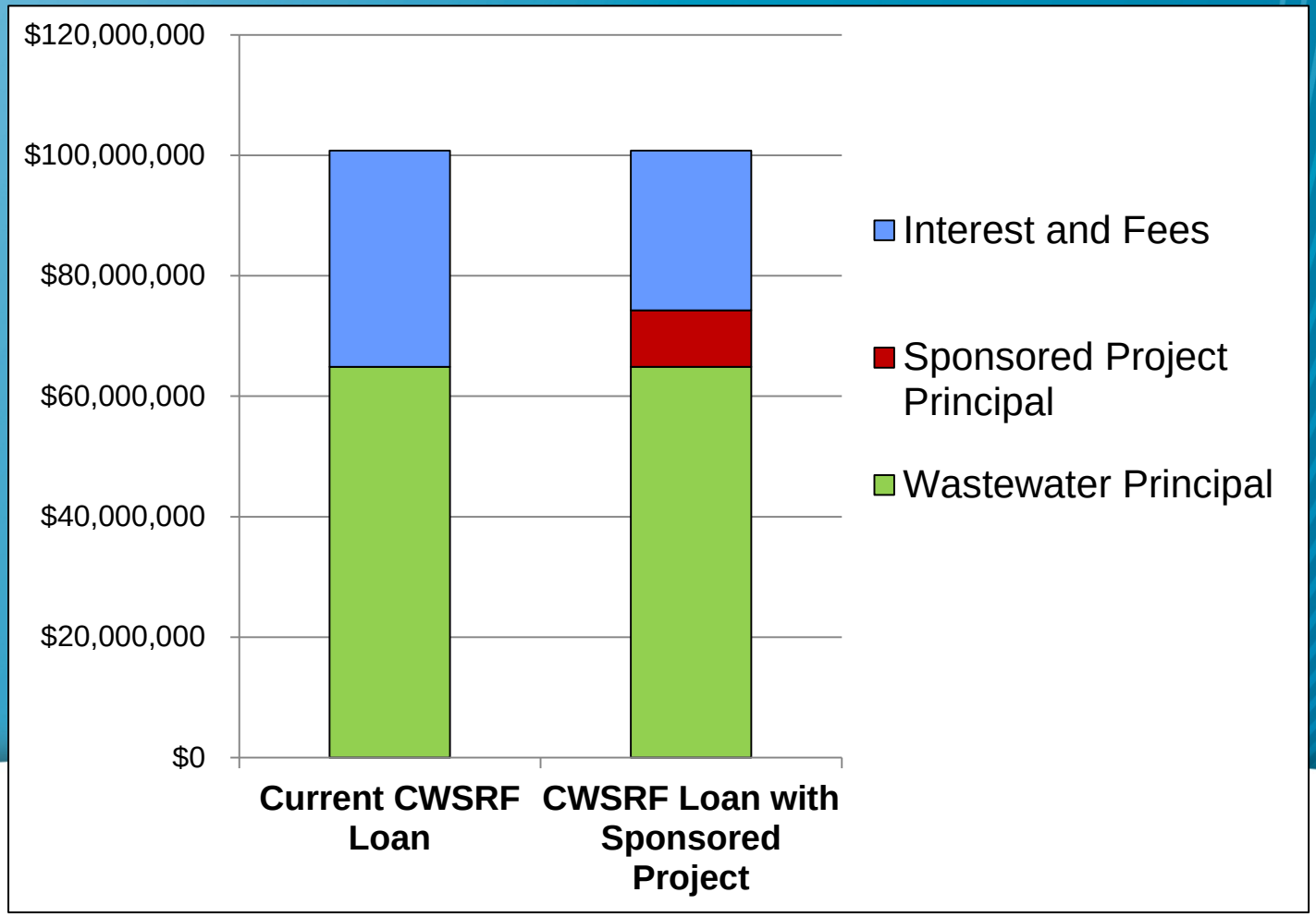
Dubuque Pilot Project



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FY 2014 Projects

23 projects for $13M in NPS projects

Project**s** included:

- Permeable paving
- Grassed waterways
- Constructed wetlands
- Stream bank stabilization
- Conservation buffers
- Rain gardens/bioswales
- Restoration of riparian buffer and flood plain

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FY 2015 Applications

- Applications are now taken twice a year
  - March and September
- $10 million allocated for FY15 projects

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Application Requirements

The project must improve water quality in the watershed in which the publicly owned wastewater utility is located.

- Applicants must have a watershed plan
- Applicants must include a water quality organization in project development, planning and design
  - Soil and Water Conservation Districts
  - local watershed organizations
  - County Conservation Boards

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Pre Application Consultation

This consultation is conducted by conference call and covers:

- Applicant eligibility based on status of CWSRF infrastructure loan
- Water resource proposed for protection or restoration
- Status of watershed assessment
- Project partners, including required participation of a conservation organization
- Eligibility of potential practices
- Approximate project schedule and budget

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Watershed Plan

- Identification of impacted water body and its watershed
- Assessment of water quality issues
- Project goals and objectives
- Evaluation of alternatives
- Description of practices to be implemented
- Expected water quality outcomes
- Proposed project schedule and milestones
- Proposed evaluation measures and procedures

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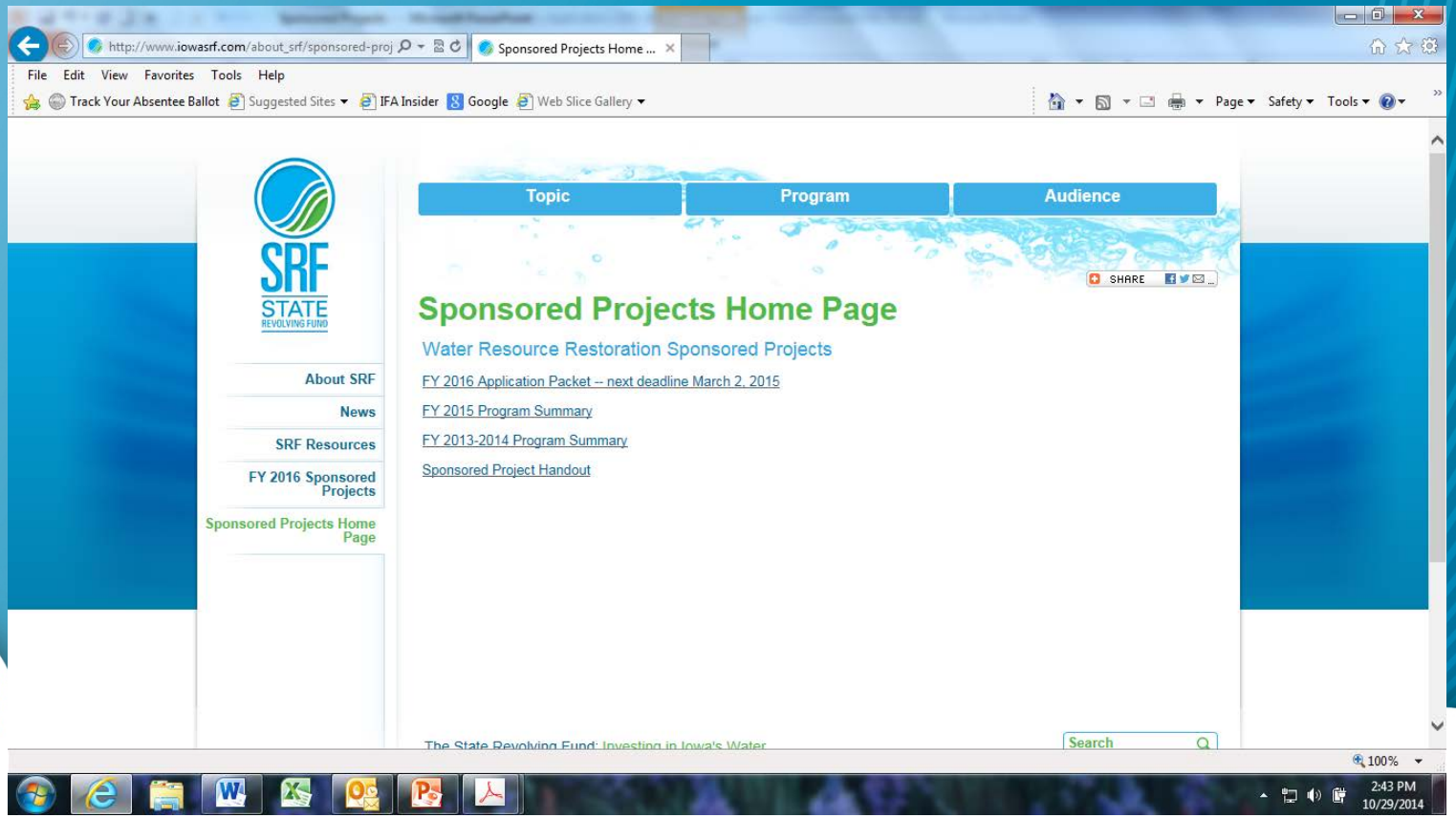
For More Information

www.IowaSRF.com

www.iowasrf.com/about_srf/sponsored-projects-home-page/



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Contact Information:

Patti Cale-Finnegan
Iowa Department of Natural Resources
515-725-0498
Patti.cale-finnegan@dnr.iowa.gov

Lori Beary
Iowa Finance Authority
515-725-4965
Lori.beary@iowa.gov

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Speaker Contacts

Jennifer Cotting, Environmental Finance Center, University of Maryland
jcotting@umd.edu | 301-405-5495

Deron L. Muehring, City of Dubuque, IA
dmuehrin@cityofdubuque.org | 563-589-4276

Lori Beary, Iowa Finance Authority
lori.beary@iowa.gov | 515.725.4965

For questions about EPA's Green Infrastructure Webcast Series:

Emily Ashton, ORISE Fellow, U.S. EPA Office of Wastewater Management
Ashton.emily@epa.gov | (202) 564-3324

Eva Birk, ORISE Fellow, U.S. EPA Office of Wastewater Management
Birk.eva@epa.gov | (202) 564-3164