



**Julia Noordyk**

NOAA Great Lakes  
Coastal Storms Program  
Outreach Coordinator  
UW Sea Grant  
@NoordCoast

# **Building Resilient Communities One Code at a Time**

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Hmmm...





NOAA GREAT LAKES COASTAL STORMS PROGRAM

# Great Lakes Planning and Mitigation Needs Assessment of Coastal Storm Hazards

## Survey Summary

PREPARED BY THE UNIVERSITY OF WISCONSIN SEA GRANT INSTITUTE

JUNE 2014



The Great Lakes Coastal Storms Program seeks to provide resources to Great Lakes communities to help them plan and implement mitigation strategies to reduce the impacts of these coastal storm hazards.





# Top Hazards

1) Bluff and shoreline erosion (67%)

**2) Stormwater/agricultural runoff pollution (62%)**

**3) Stormwater/agricultural runoff sedimentation (60%)**

**4) Overflow of combined sewer and stormwater systems (57%)**

**5) Residential and commercial stormwater flooding of residential and commercial developments (55%)**

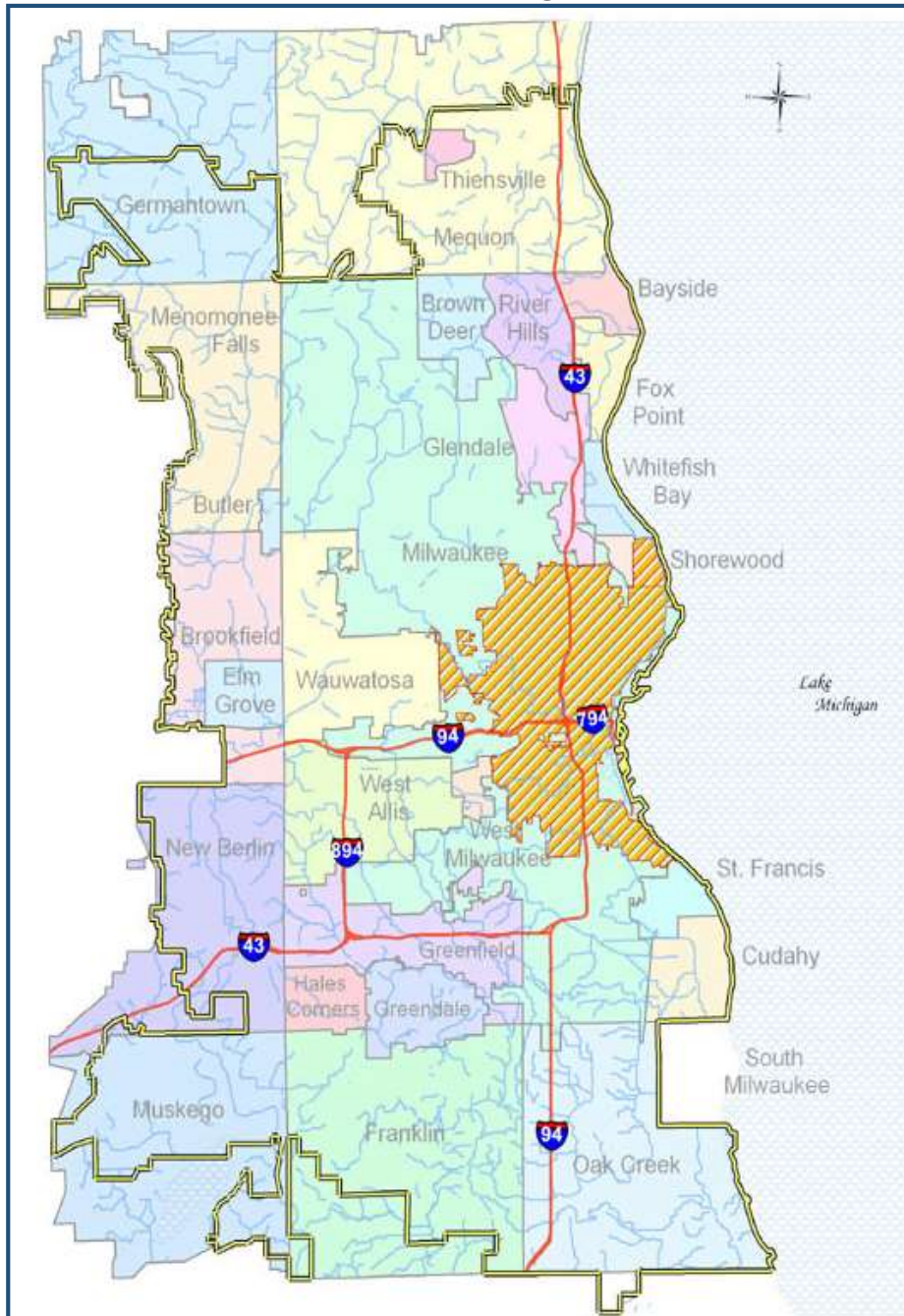


# Top Planning Needs

- 1) Updated 100/500-year flood maps (80%)
- 2) Local ordinance, zoning and building code assessment and analysis maps (79%)**
- 3) Shoreline erosion mapping and predictions (69%)
- 4) Public communication of risks and disaster response (69%)
- 5) Predictions about public health impacts (66%)



# Milwaukee Sewerage Service Area



## Advancing Green Infrastructure through Code Revision



Hallelujah!  
Hallelujah!





# Why are Codes and Ordinances Important?

**If the code language is not clear that green infrastructure is an acceptable or preferred approach to managing stormwater, green infrastructure will not likely be considered in development proposals, design plans or capital projects.**

# What makes this audit unique?





# Nuanced Code Ranking

GI practice clearly allowed and approved as-of-right	GI practice allowable but some ambiguity or potential conflict	GI practice allowed with discretionary approval	GI practice mentioned but w/o standards or guidance	No policy or standards adopted, but not disallowed	Limitations or prohibitive language, but could potentially be approved	GI practice prohibited or prevented by conflicting code
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# Permeable Materials

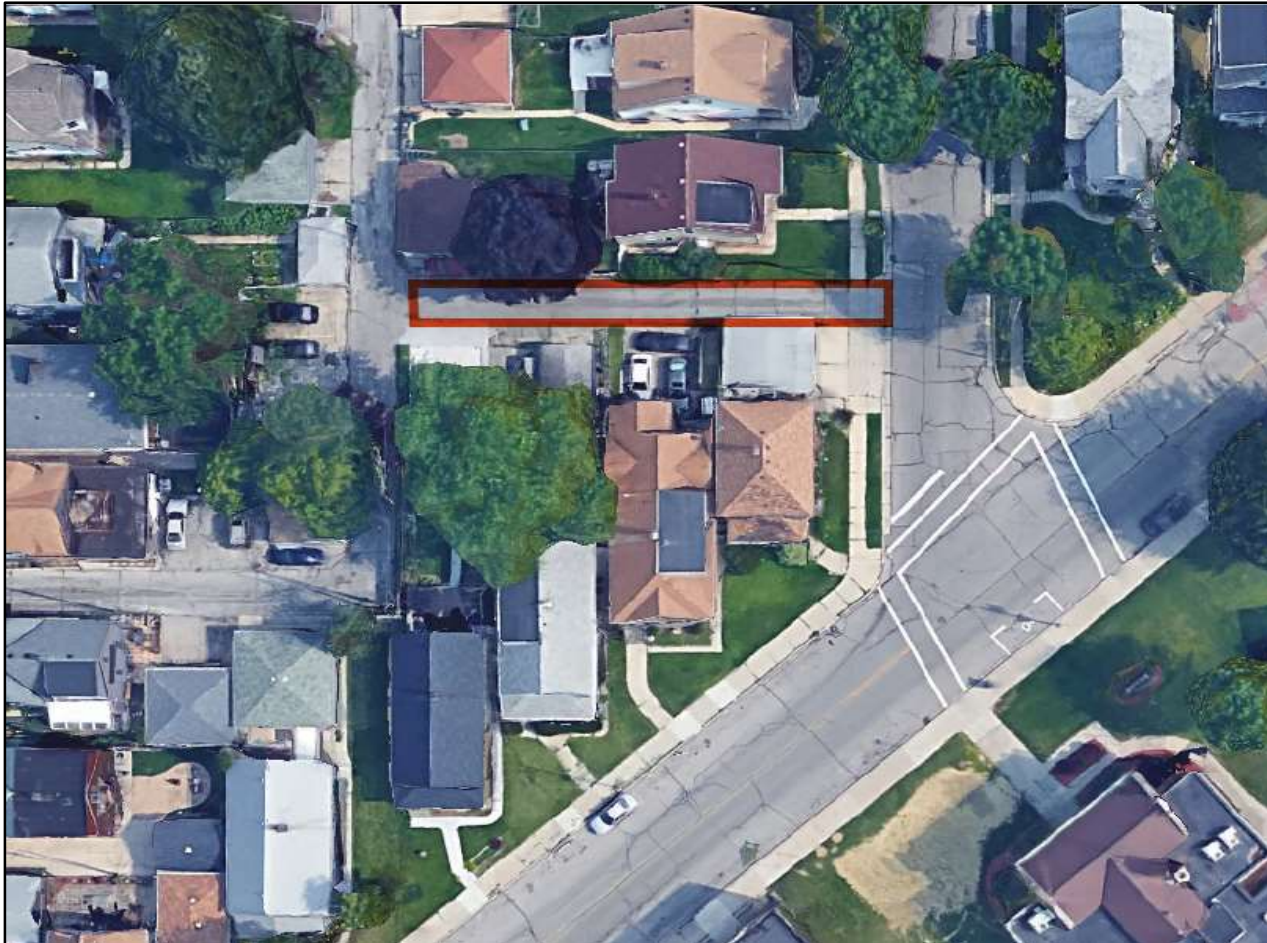
	1	2	3	4	5	6	7	8	9
May alleys be permeable or widths varied?	Blue	Orange	Blue	Blue	Red	Blue	Green	Yellow	Blue
Are parking areas allowed to be permeable?	Red	Red	Green	Orange	Red	Red	Green	Green	Red
Are loading areas allowed/encouraged to be permeable?	Orange	Orange	Blue	Red	Red	Blue	Light Blue	Orange	Red
Are sidewalks allowed/encouraged to be permeable?	Yellow	Orange	Orange	Red	Red	Red	Green	Orange	Orange
Are driveways allowed/encouraged to be permeable?	Blue	Orange	Blue	Orange	Blue	Green	Green	Yellow	Blue
Are low-volume street sections allowed/encouraged to be permeable?	Red	Orange	Orange	Red	Red	Blue	Light Blue	Red	Orange
Does the use of permeable materials reduce the stormwater quantity required to be managed? If so is this a written or informal standard?	Orange	Grey	Blue	Yellow	Light Green	Yellow	Yellow	Yellow	Yellow
Is there a provision that driveways may/shall be partially permeable or drained to pervious area if exceeding a certain width/total SF?	Blue	Green	Blue	Blue	Red	Blue	Green	Blue	Blue
Is permeable surfacing allowed for parking lanes?	Orange	Orange	Orange	Red	Red	Blue	Light Green	Orange	Red
Must driveway aprons be made of impermeable surfaces?	Blue	Orange	Orange	Blue	Red	Red	Light Green	Blue	Blue
Must a sealant be used and can that provision be waived?	Blue	Orange	Orange	Blue	Red	Blue	Green	Red	Blue
Can grasscrete be used to meet public safety/fire access needs?	Light Green	Light Green	Blue	Light Green	Light Green	Light Green	Green	Light Green	Blue
Is there municipal experience with permeable material, curbless streets, or other GI measures?	Light Green	Light Green	Dark Green	Light Green	Light Green	Dark Green	Green	Light Green	Blue
Are standard specifications or performance standard adopted or referenced for permeable materials?	Red	Orange	Blue	Red	Blue	Blue	Light Green	Blue	Blue



## **Code Revision:** Allow use of permeable surfacing in driveways and alleys

- (3) *Surfacing.* All driveways shall be surfaced ~~with an asphaltic or Portland cement pavement~~ in accordance with village standards and specifications so as to provide a durable and dust-free surface, and shall be so graded and drained as to dispose of all surface water. Permeable surfacing may be used upon review and approval by the village engineer.

# What's the Impact: Permeable Alleyways



**63% runoff volume reduction**

**63% total suspended solids reduction**



**Code Revision:** Encourage use of natives in lawn areas and limit total percent of site in turf grass

CODE OF ORDINANCES  
Chapter 122 – ZONING

7. Landscaping. A general description of landscaping standards, screening, and parking lot treatments. Naturalized landscaping, the use of native vegetation, preservation of existing trees and wooded area, and tree planting that will provide additional tree canopy on the site are encouraged. The use of turfgrass should be limited to those areas intended for outdoor recreation or gathering areas.

# What's the Impact:

## Substituting Native Vegetation for Turf Grass

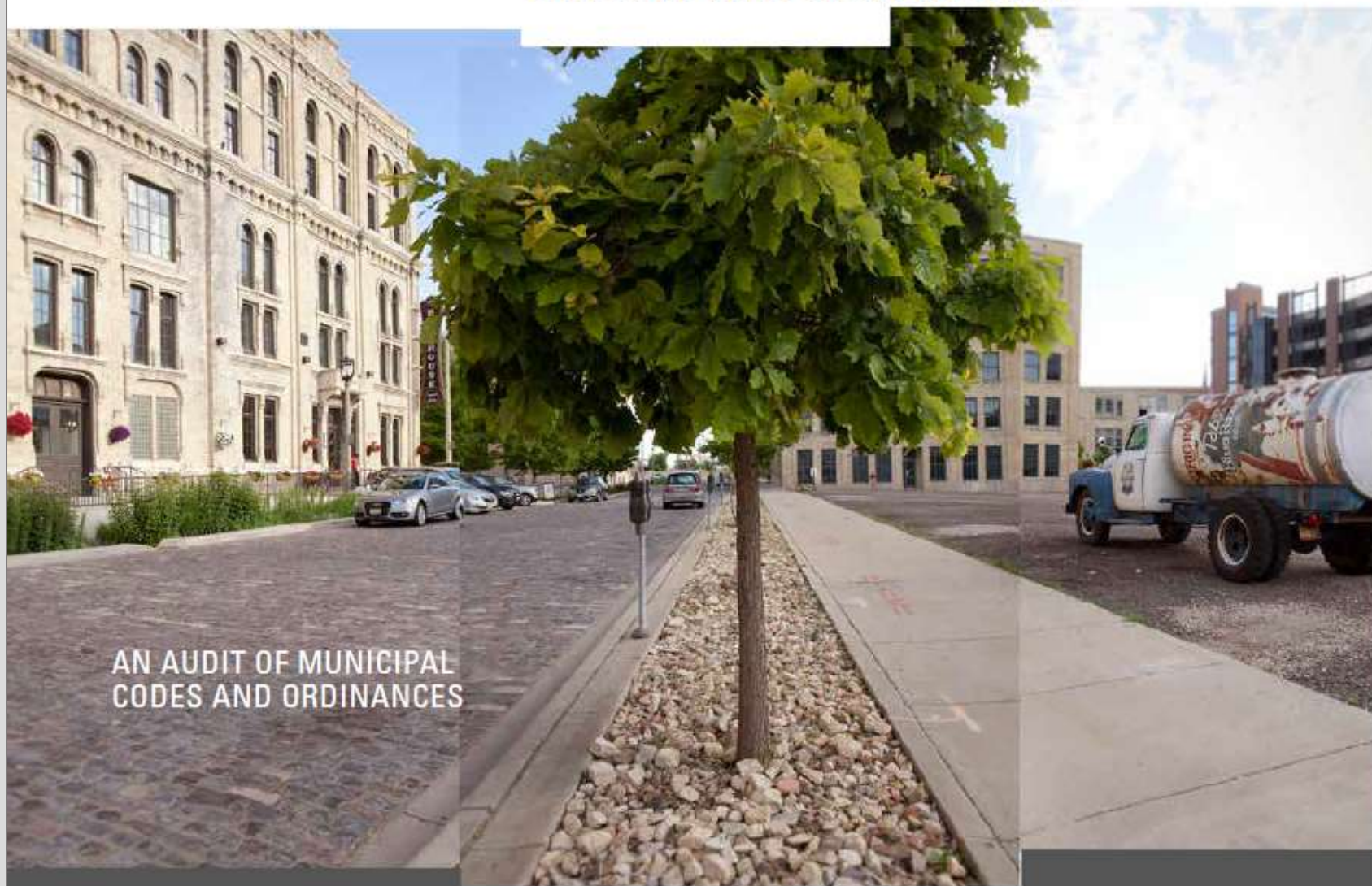


**74% runoff volume reduction**

**64% total suspended solids reduction**



# TACKLING BARRIERS TO Green Infrastructure

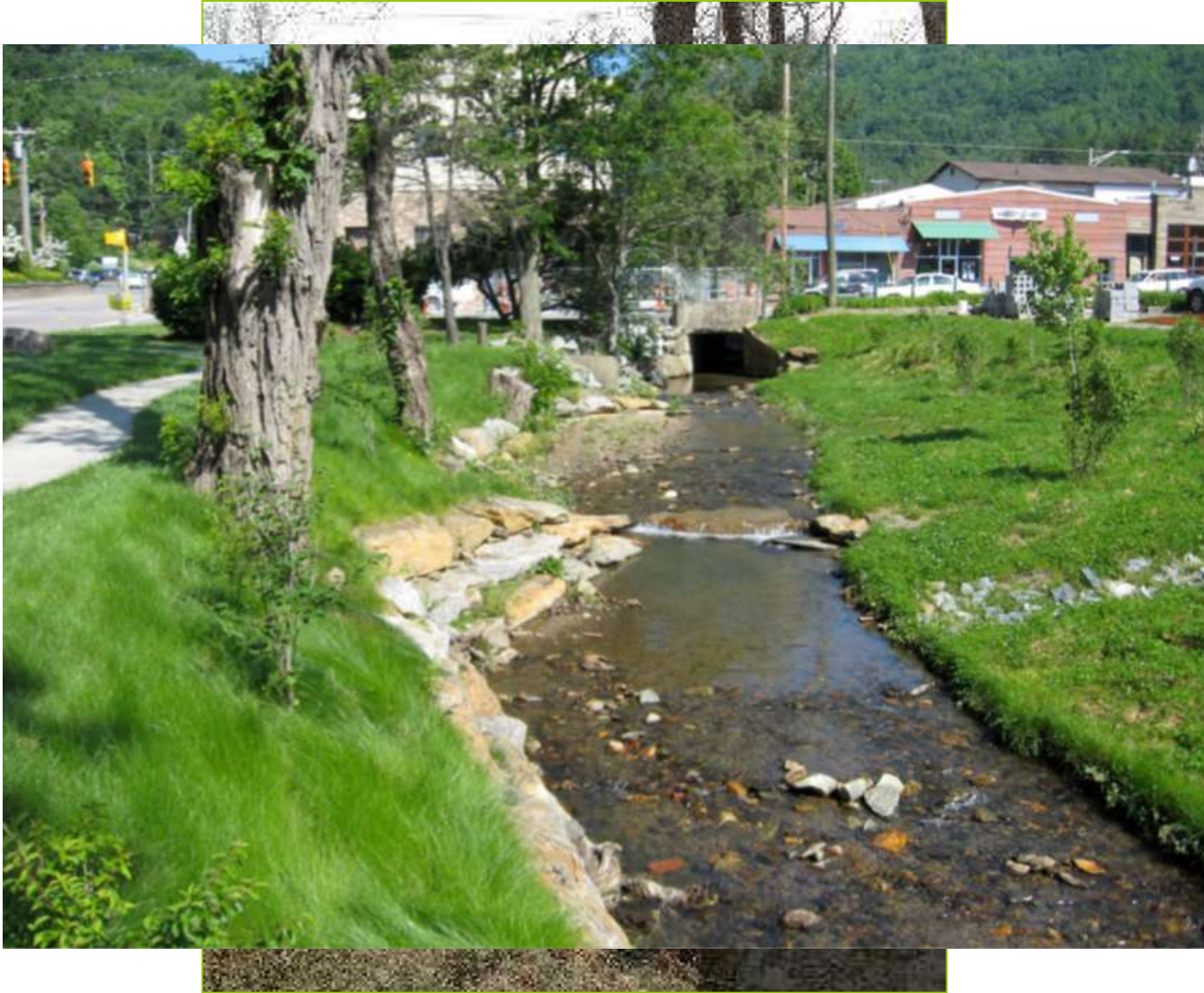


AN AUDIT OF MUNICIPAL  
CODES AND ORDINANCES

Reduce impervious surfaces and maximize vegetated/landscaped areas







Disconnect effective impervious areas

# Restore and protect natural functions of soils and vegetation

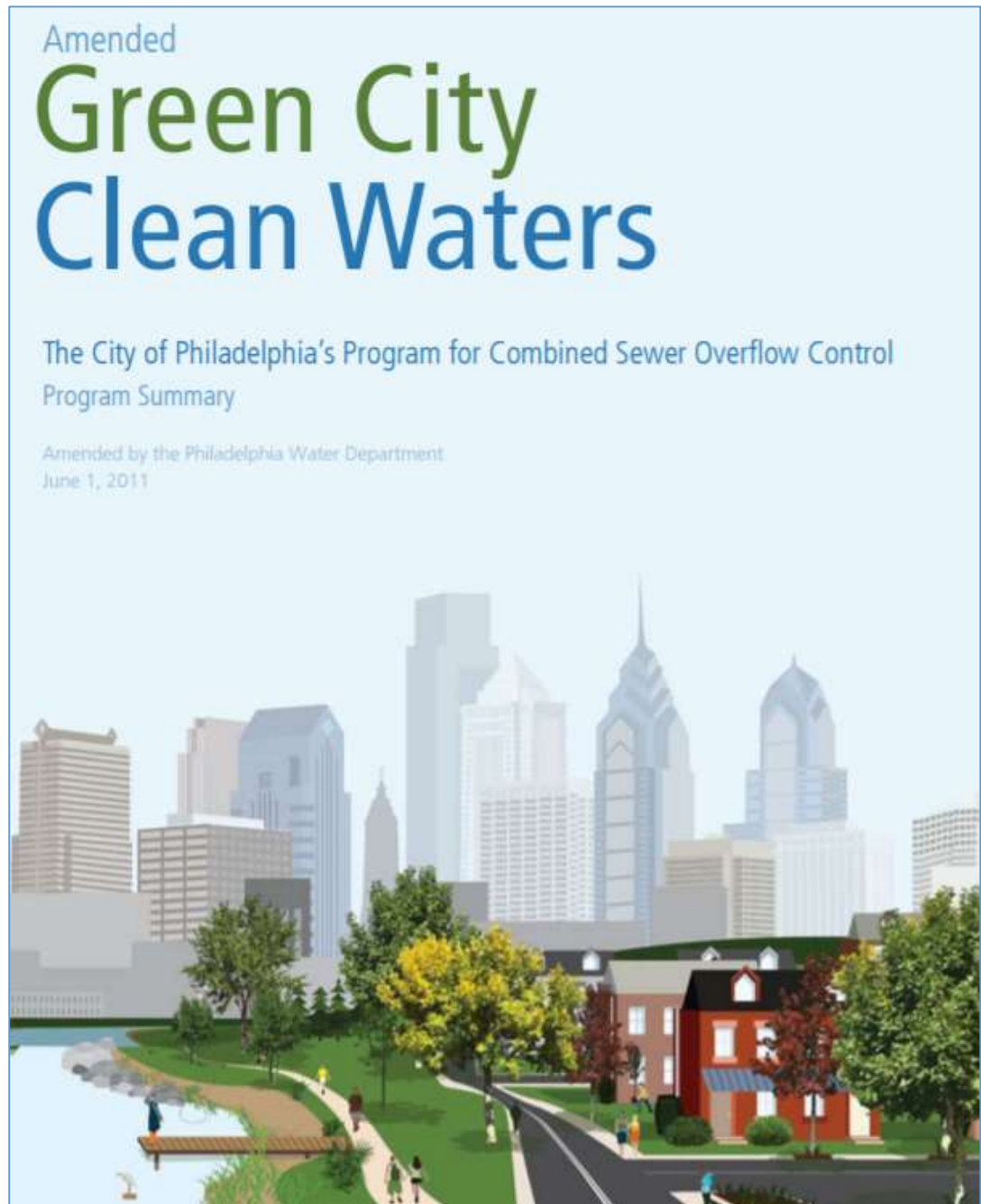




# Control pollution from specific sources



Clarify the intent and purpose of codes to encourage green infrastructure use





# **How to Audit Local Codes and Ordinances**

1. Community Scoping
2. Audit Community's Codes and Ordinances (Audit Tool)
3. Prioritize Recommendations and Develop a Strategy for Adoption

# COMMUNITY SCOPING WORKSHEET

## Community Planning

1. Has a comprehensive plan been adopted for the community?

☐ Yes ☐ No

If yes, how are the community's natural resources addressed in the comprehensive plan?

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2. Is there specific attention to the community's water resources in the comprehensive plan?

☐ Yes ☐ No

If yes, is green infrastructure implementation listed as a key element in the watershed restoration implementation plan?

☐ Yes ☐ No

3. Has your municipality taken part in the development of a watershed restoration or other similar plan?

☐ Yes ☐ No

## Natural Assets

1. Are there rivers or streams flowing through your community?

☐ Yes ☐ No

How aware are residents of these resources? \_\_\_\_\_

2. Are there private or public properties within your community that have frontage on a lake, pond or river?

☐ Yes ☐ No

3. Are there other important natural areas adjacent or within your community?

☐ Yes ☐ No

If yes, how are those natural areas incorporated into the community's culture, such as for events?

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Natural  
Assets?



Hazards?



# Community Identity and Character?





Green  
Infrastructure  
Usage?



# Acceptance?



## Step 2: Audit Community's Codes and Ordinances



# Audit Topics

- ✓ARCHITECTURAL DESIGN STANDARDS
- ✓COASTAL COMMUNITIES
- ✓COMMUNITY OUTREACH AND EDUCATION
- ✓CONSTRUCTION AND POST-CONSTRUCTION MANAGEMENT
- ✓LANDSCAPING
- ✓PARKING
- ✓PERMEABLE MATERIALS
- ✓POLLUTANT REDUCTION THROUGH SITE PLAN REVIEW
- ✓POST-CONSTRUCTION STORMWATER STANDARDS AND LONG-TERM MAINTENANCE
- ✓PUBLIC WORKS STANDARDS
- ✓PURPOSE STATEMENTS AND COMMUNITY PLANS
- ✓SANITARY AND STORM SEWER DISCONNECTIONS
- ✓STORMWATER MANAGEMENT STANDARDS
- ✓SUBDIVISIONS AND NEW “GREENFIELD” DEVELOPMENT
- ✓ZONING



Juli Beth Hinds,  
Orion Planning &  
Design

A+	Practice is enabled and described specifically; clearly allowed and approved as-of-right
A	Practice is specifically allowable/ as-of-right approval, but some ambiguity or potential conflict
A-	Practice is enabled or encouraged, with discretionary approval
B	Practice is mentioned but without standards or guidance for use
C	No policy or standards adopted, but not disallowed
D	Limitations or prohibitive language in the code, but could potentially be approved
F	Practice prohibited by code language, or an active conflict would prevent approval



# Landscaping

Audit Question	Type of Barrier	Tips	Grade
Is the use of deep-rooted or native plants, plants with habitat value, or edibles allowed or encouraged in the landscaping standards?	Landscape standards  Design guidelines	Explicitly listing desired types of landscaping in the regulations tells site planners up front that the community encourages these types of plantings.	A





## Step 3: Prioritize Recommendations

# Development pressures?





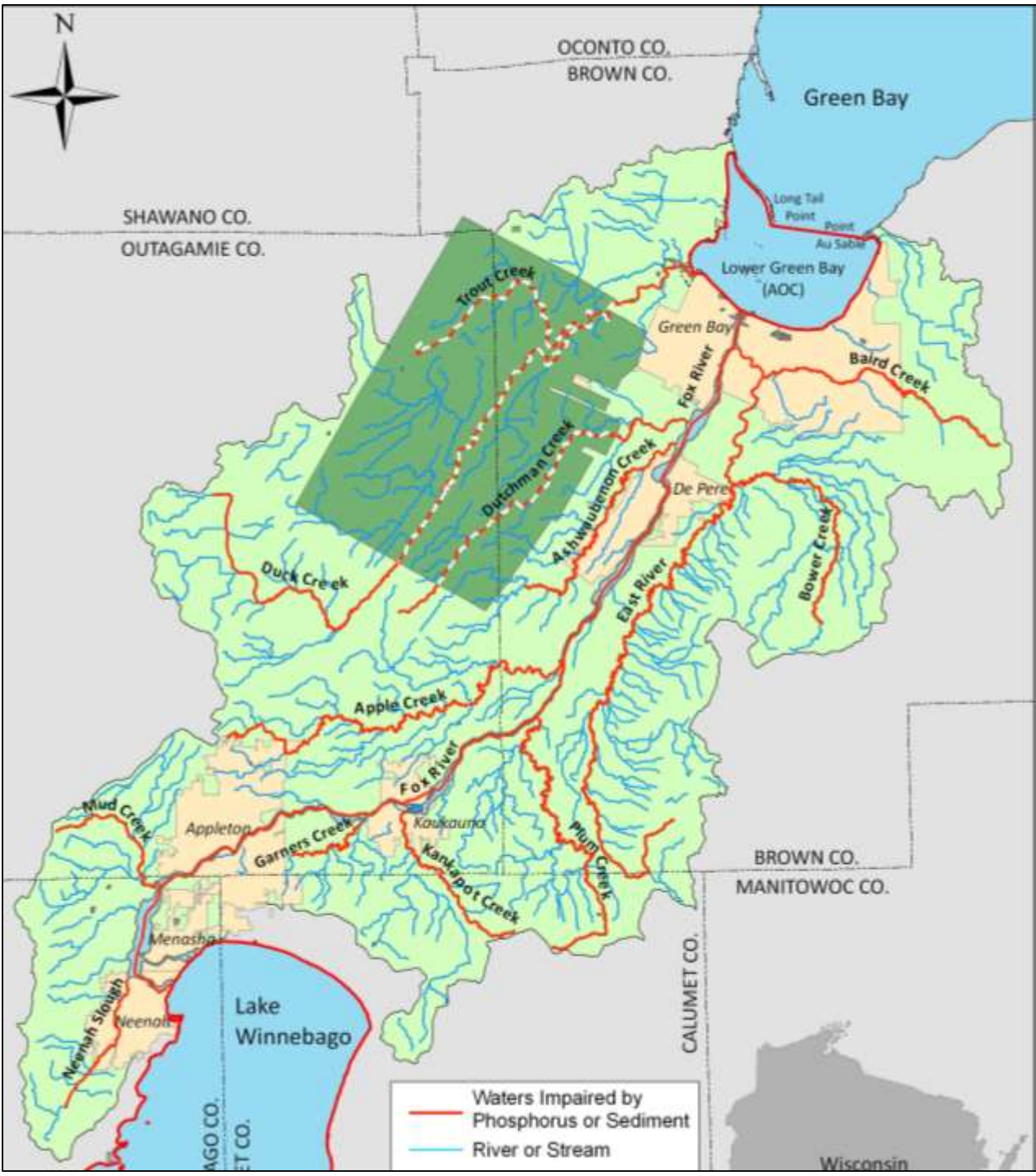


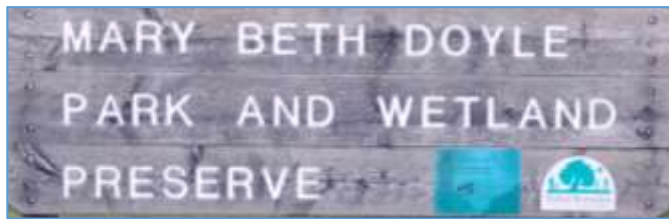
No Near-term Development or Redevelopment?



Stormwater Permits?

Pollution limits?  
(e.g, TMDLs)

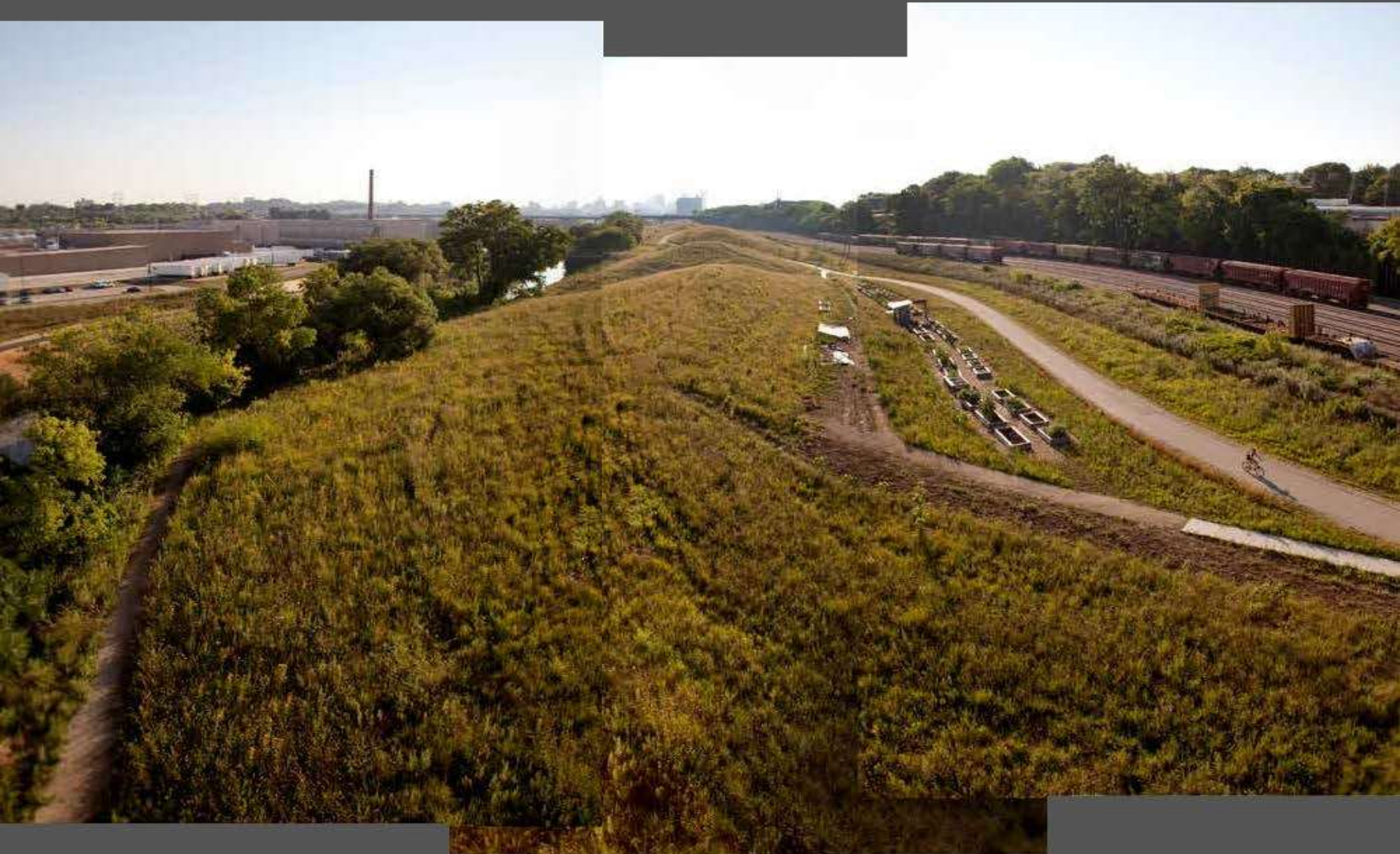




Flooding or CSO issues?



# What are your community's goals?



Menomonee Valley Redevelopment and Community Park, Milwaukee



# Thank You!



NOAA Great Lakes Coastal Storms Program  
**FOSTERING COMMUNITY RESILIENCE TO COASTAL STORMS**

# Questions?



@NoordCoast



**Julia Noordyk**

NOAA Great Lakes Coastal Storms Program Outreach Coordinator  
University of Wisconsin Sea Grant Institute

[noordykj@uwgb.edu](mailto:noordykj@uwgb.edu)

[www.seagrant.wisc.edu/greeninfrastructure](http://www.seagrant.wisc.edu/greeninfrastructure)