

Water Resilience Planning in Great Lakes Cities



Angela Larsen
Community Planning Director
alarsen@greatlakes.org



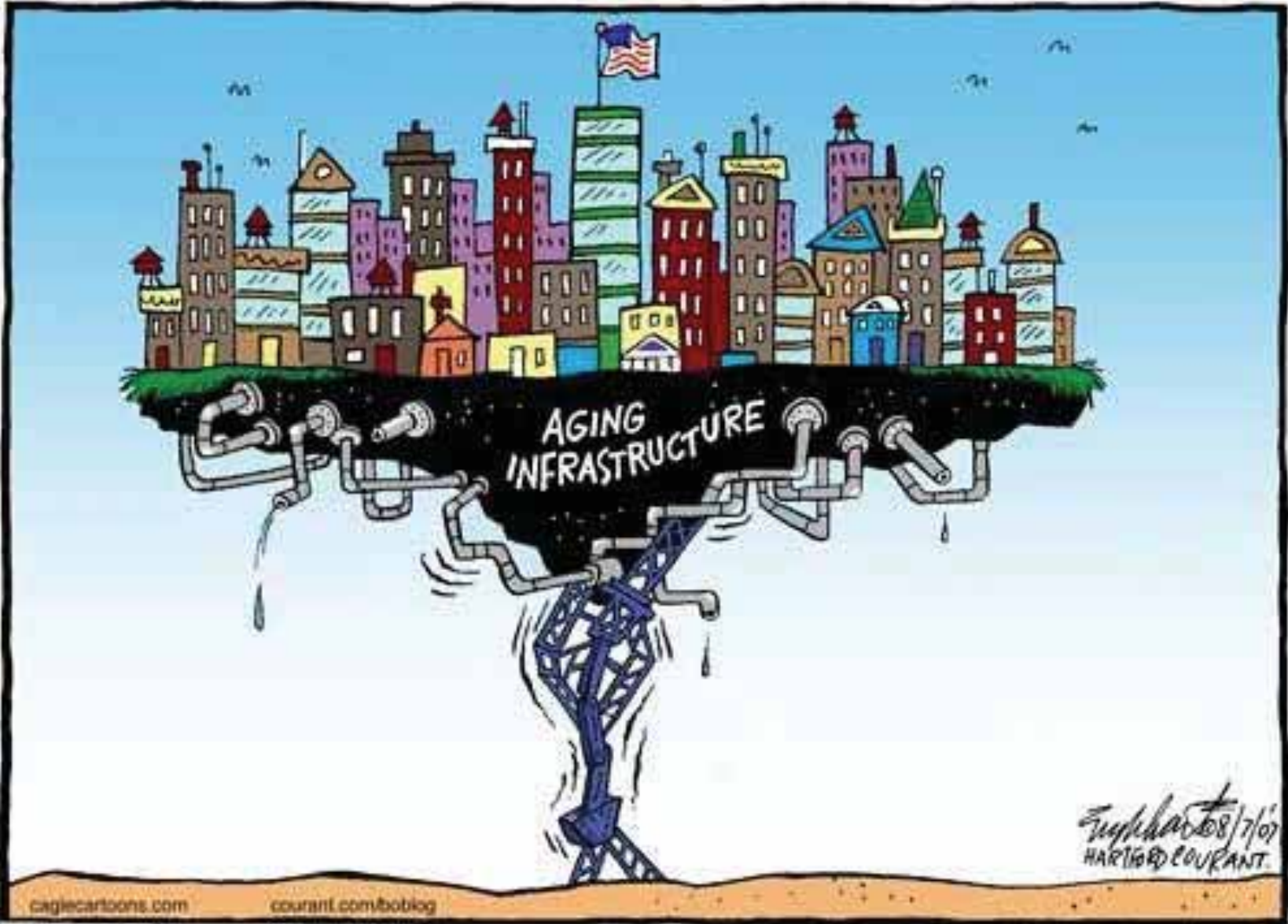
ALLIANCE *for the*
GREAT LAKES



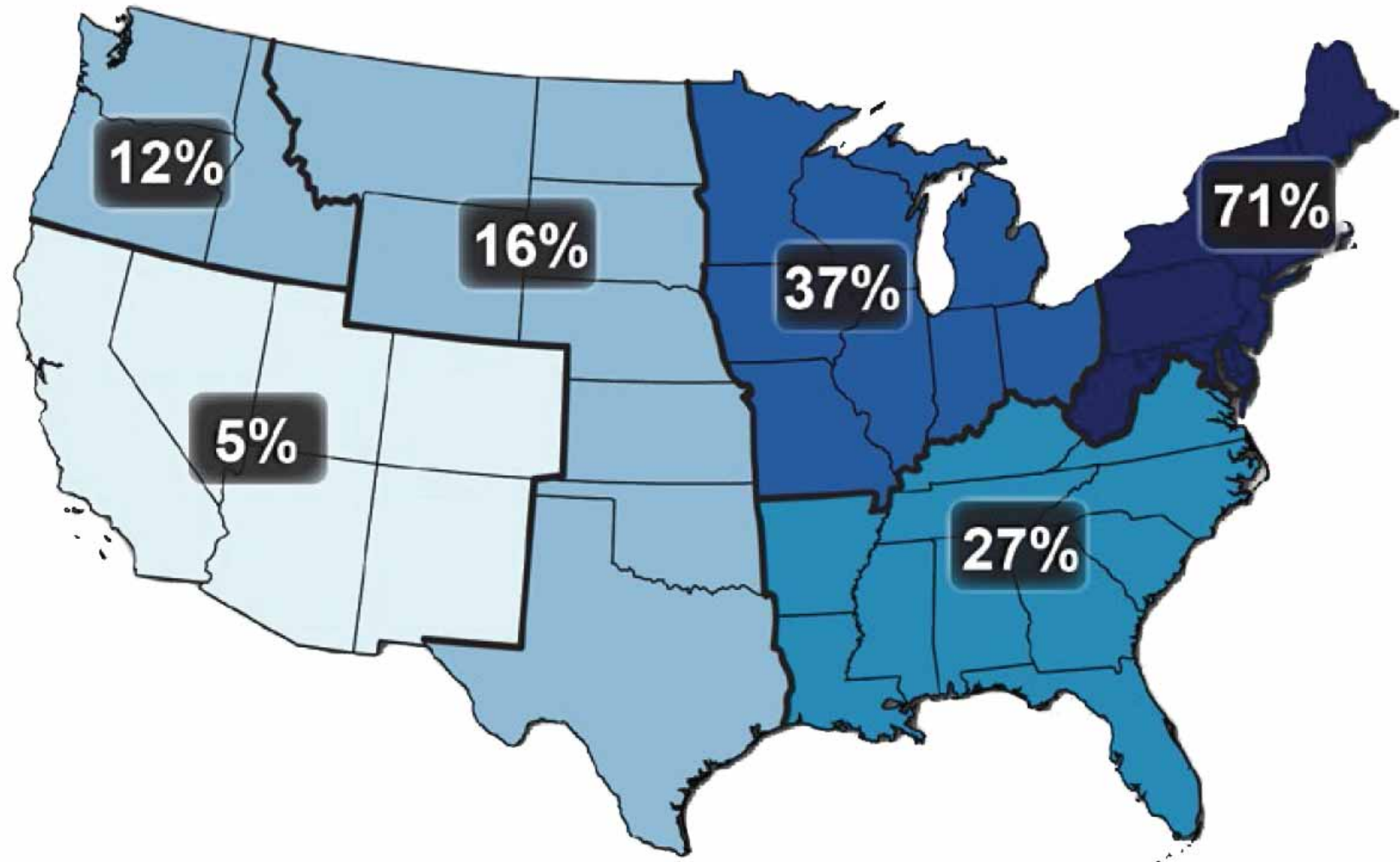








Observed Extreme Precipitation

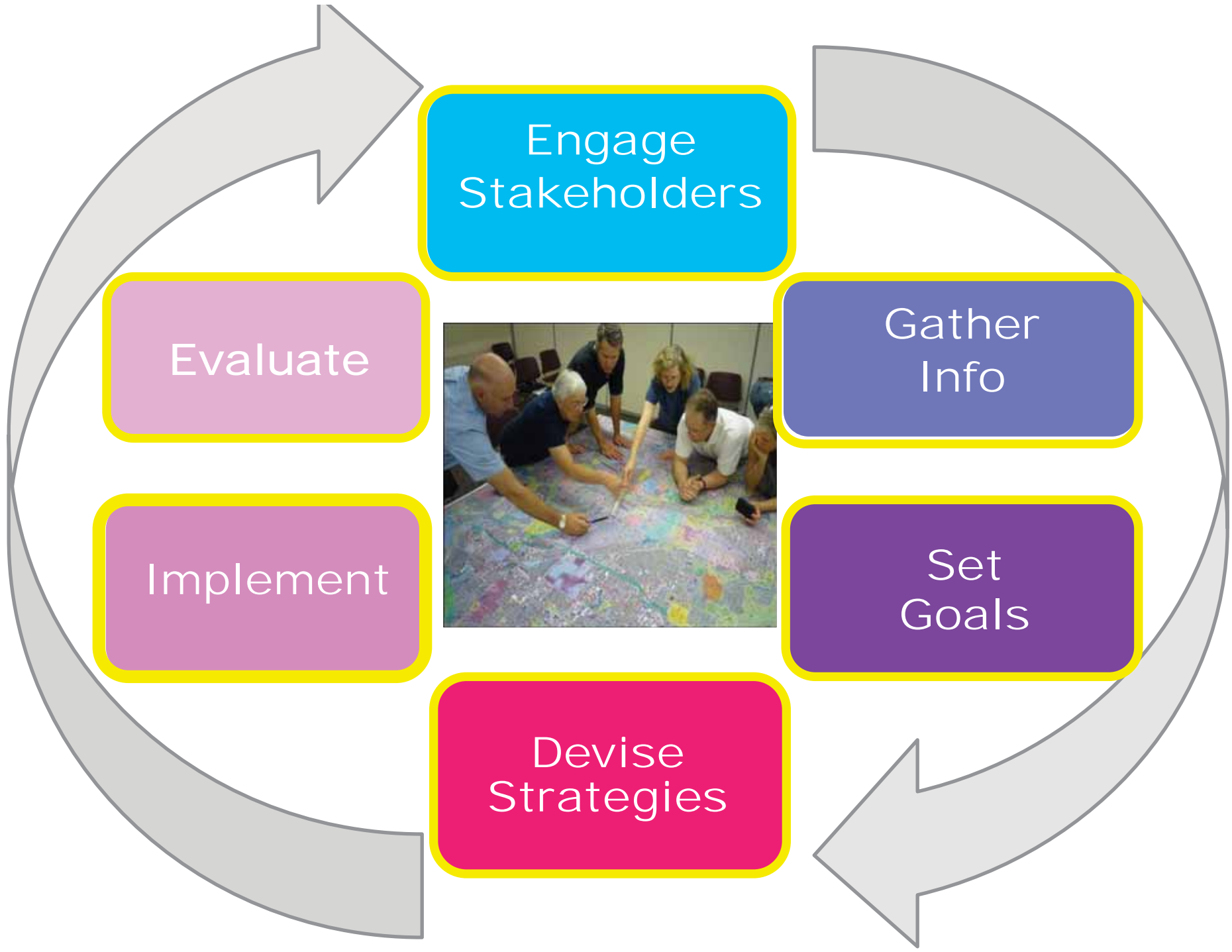


Percent changes in the amount falling in the heaviest 1% of daily precipitation events from 1958 to 2012. *Third National Climate Assessment*









Engage Stakeholders

Gather Info

Set Goals

Devise Strategies

Implement

Evaluate





THE GREAT LAKES

superior



michigan



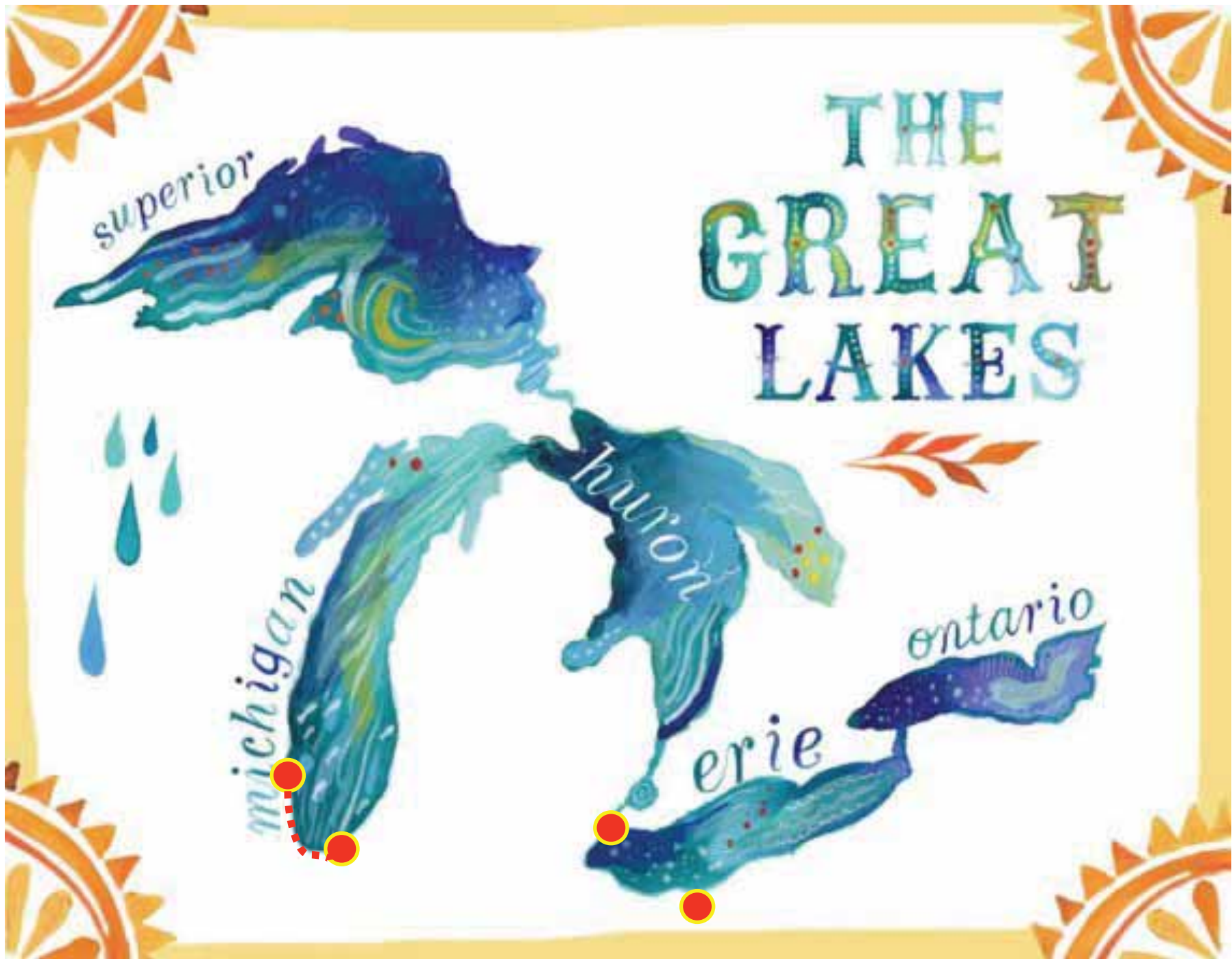
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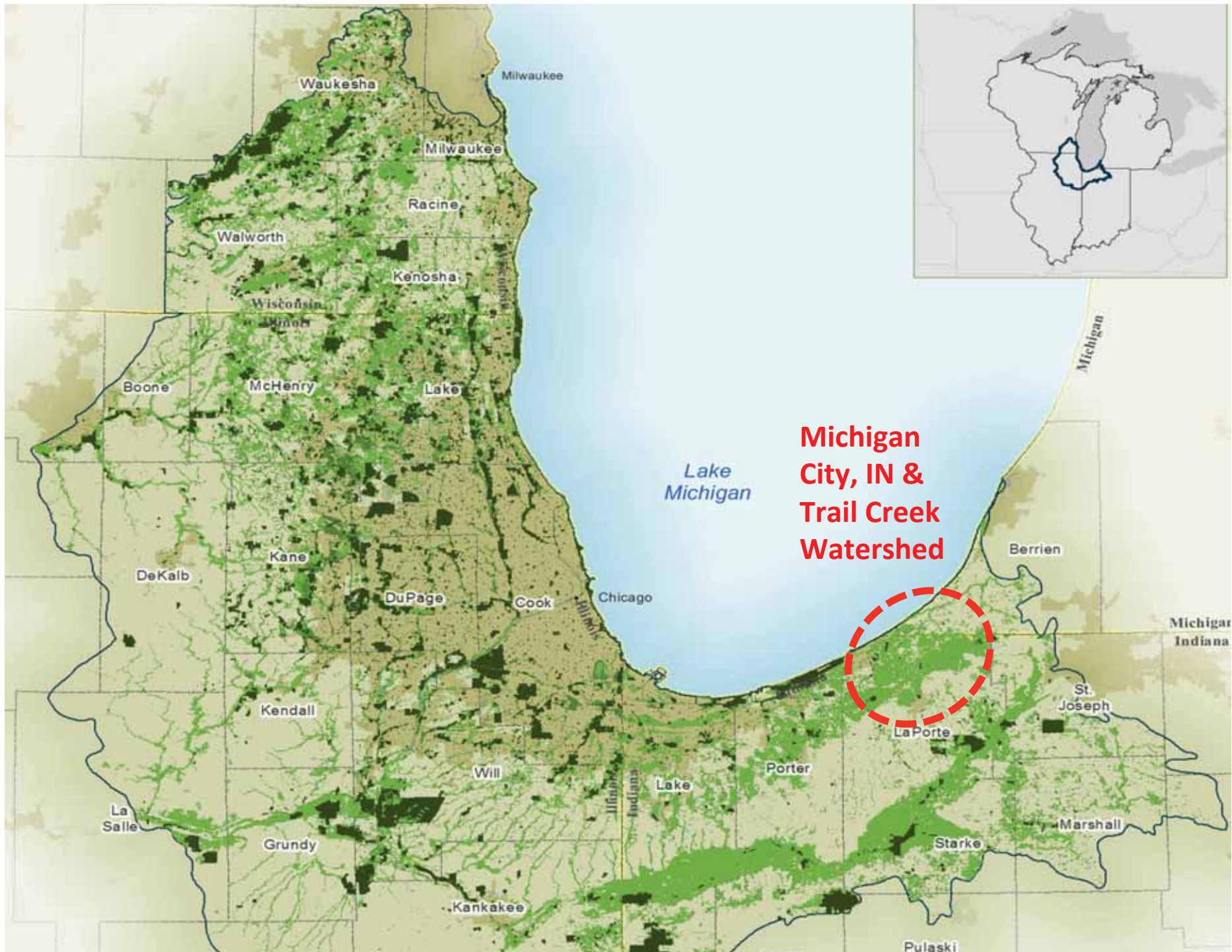
ontario



erie







**Michigan
City, IN &
Trail Creek
Watershed**





Stakeholders

- Ron Meer, **Mayor**
- Michael Kuss, **Sanitary District**
- Jim Meyer, **Sanitary District**
- Craig Phillips, **Planning Department**
- Shannon Eason, **Parks Department**
- Nicole Messacar, **Soil & Water Conservation District, and Trail Creek watershed**
- Natalie Johnson, **Purdue University Calumet, and Urban Waters**

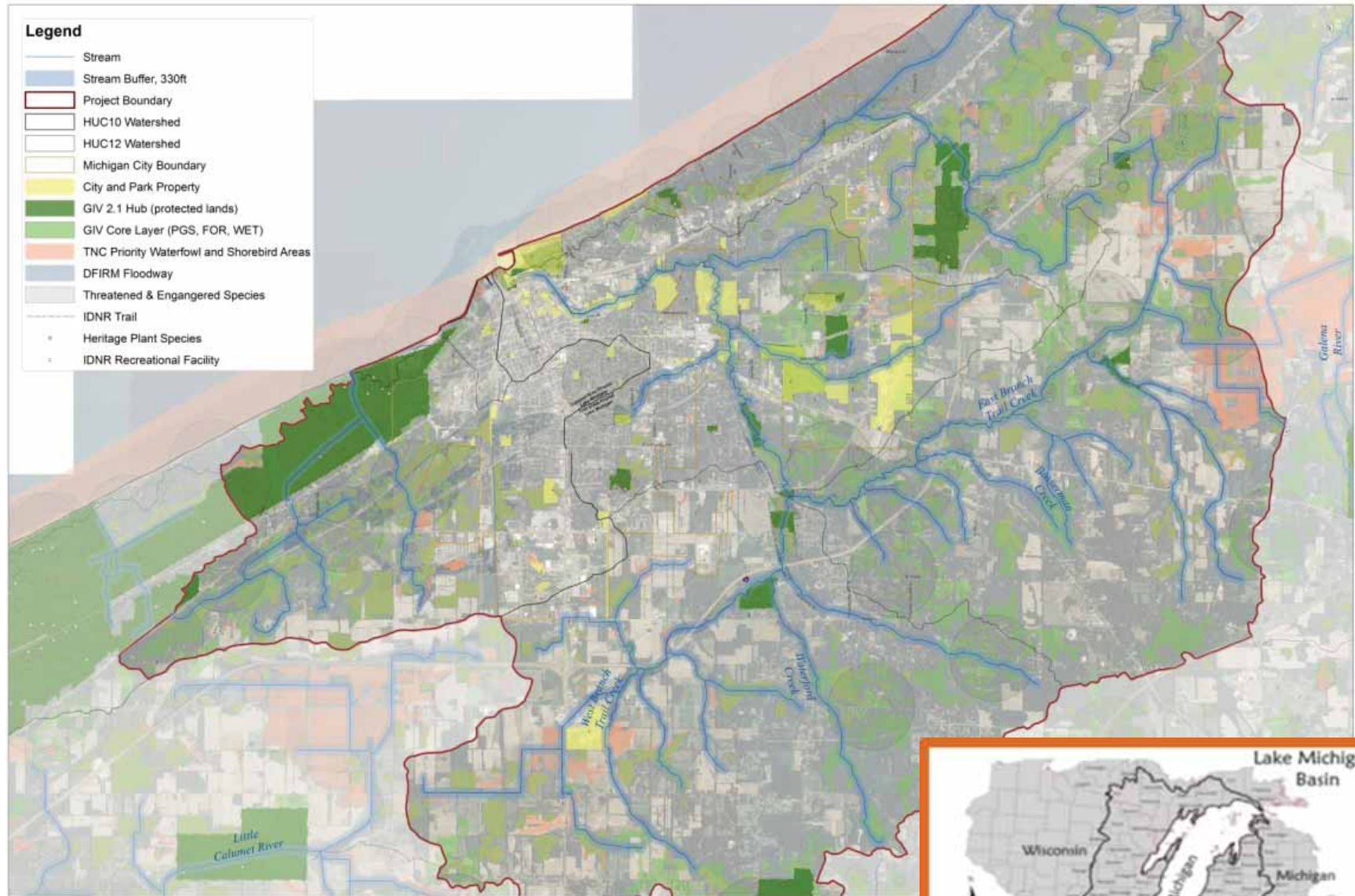


Lake Michigan Implementation Strategy,
artistic rendering of proposed river walk



Goals

- Meet and exceed water quality standards
- Increase infiltration on site
- Decrease volume of stormwater entering sewer system
- Increase recreational access



More Extreme Rain Events



Increased

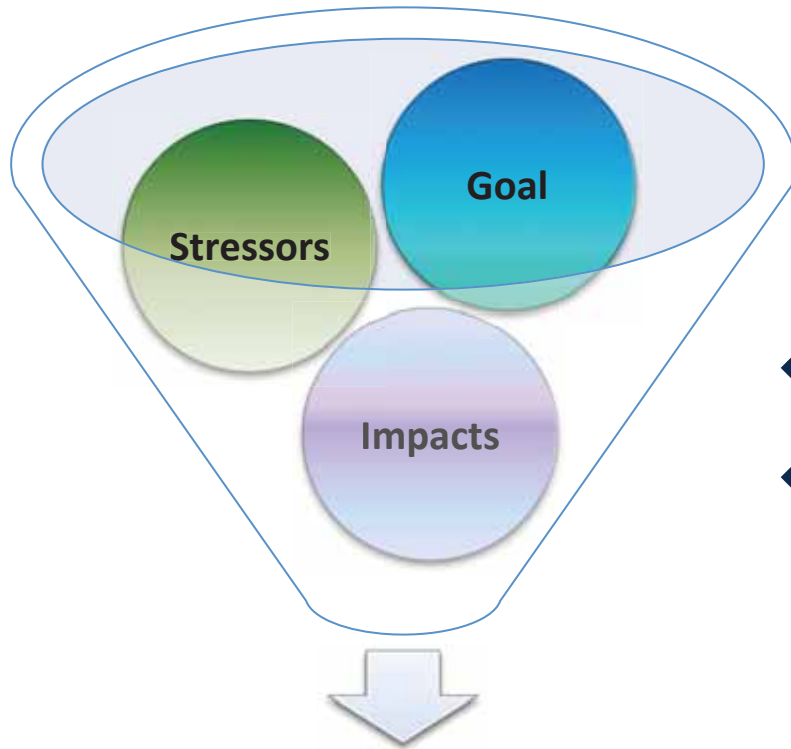
- Flashiness
- Streambank erosion
- Run off



- Increased nutrients, pollutants, sediments
- Decreased use of recreational amenities
- Increased frequency of erosion
- Scouring of aquatic habitats



Adaptation Strategies

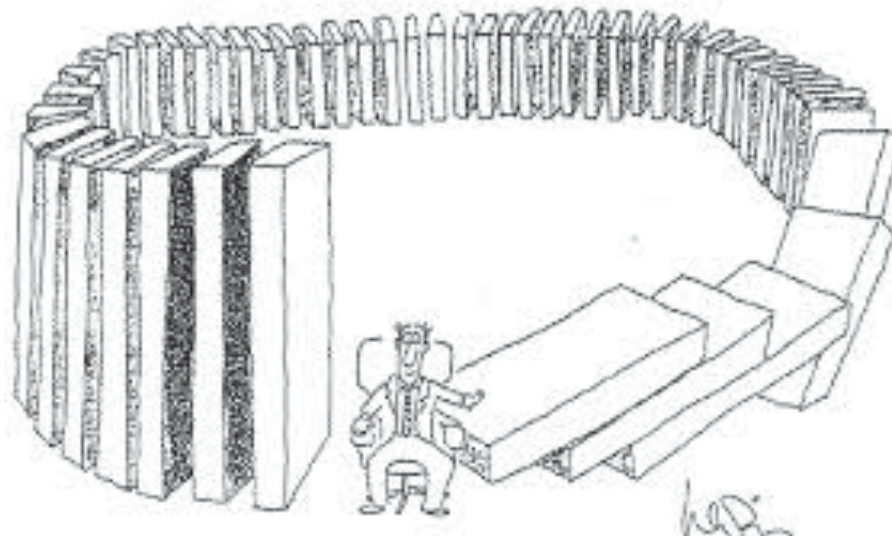


- ❖ Connect strategies back to goal
- ❖ Identify timeframe & types for strategies

Adaptation Strategies

Adaptation Strategies

- Plan, implement, maintain demonstration projects
- Implement policies (*zoning, MS4*)
- Develop land acquisition criteria
- Acquire land



Winding Creek Cove Park '15



Wabash Street Project '16



Cheney Run '17-'18

- **Create a sub-watershed plan for Cheney Creek**
- **Plan for projected climate change precipitation increases**
- **Plan and construct ~5 acres of wetlands at outfall site**



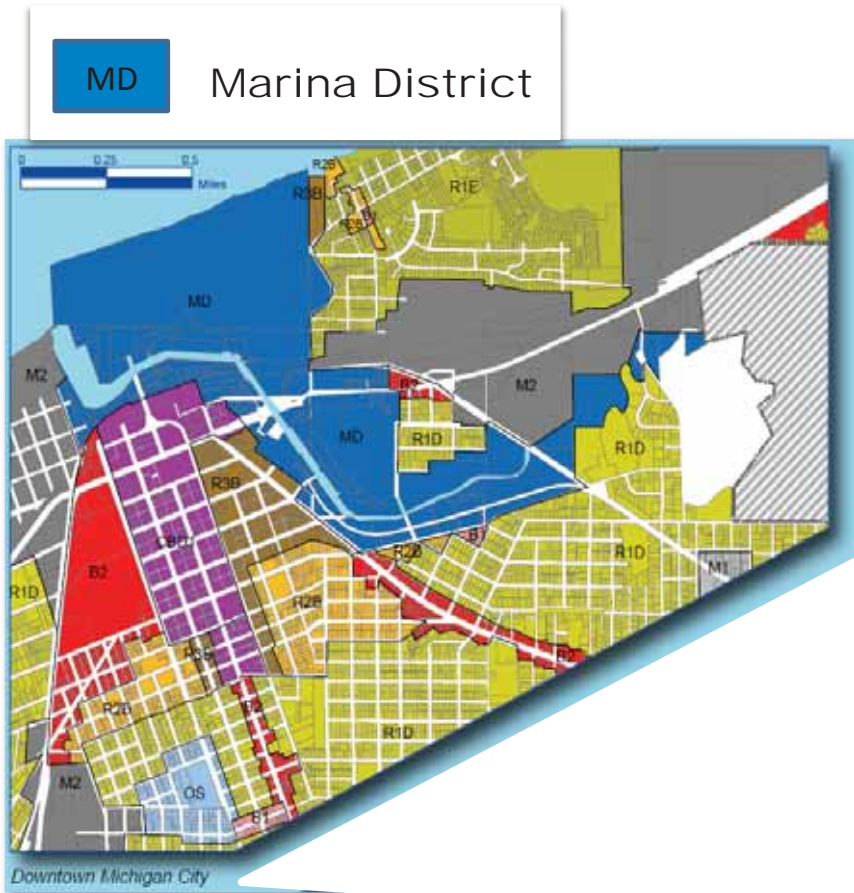
Coming soon!!

Policies

Planned Development in the Marina District



Policies



Zoning Concerns


- No setbacks from waterway
- No building orientation to the waterway
- No recommended stormwater control
- No trail protection
- Maximum impervious cover encouraged

Policies

Recommendation

Marina District Overlay: Impact Zone

 Zone A Boundary (Marina District)

 200-foot Buffer

 100-year Floodplain

 Proposed Trails

 No-Impact Parcels

Impacted Parcel Characteristics:

43 Edge Parcels

Average Acreage = 4.34

Average Square Footage = 188,972.62

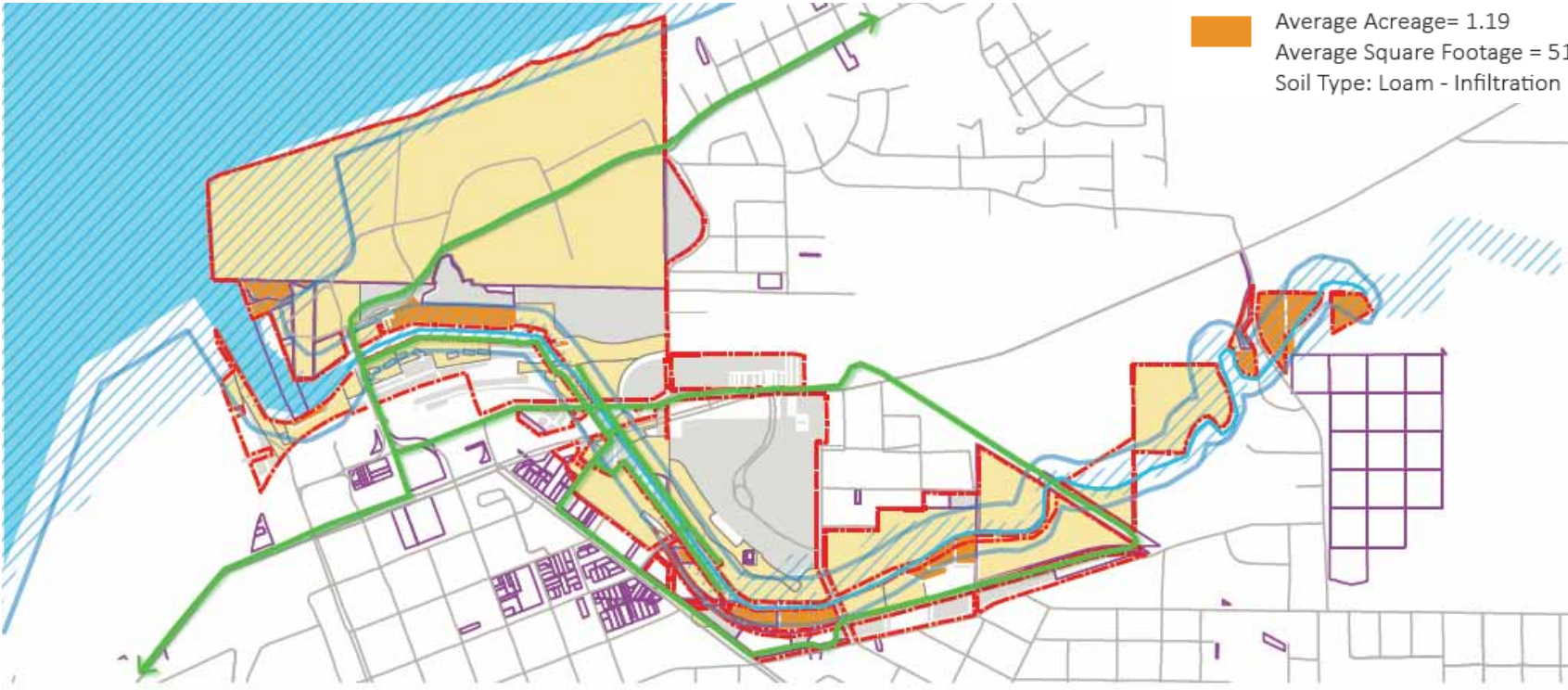
Soil Type: Sandy - Infiltration rate = .8 in/hr

19 Center Parcels

Average Acreage = 1.19

Average Square Footage = 51,919.19

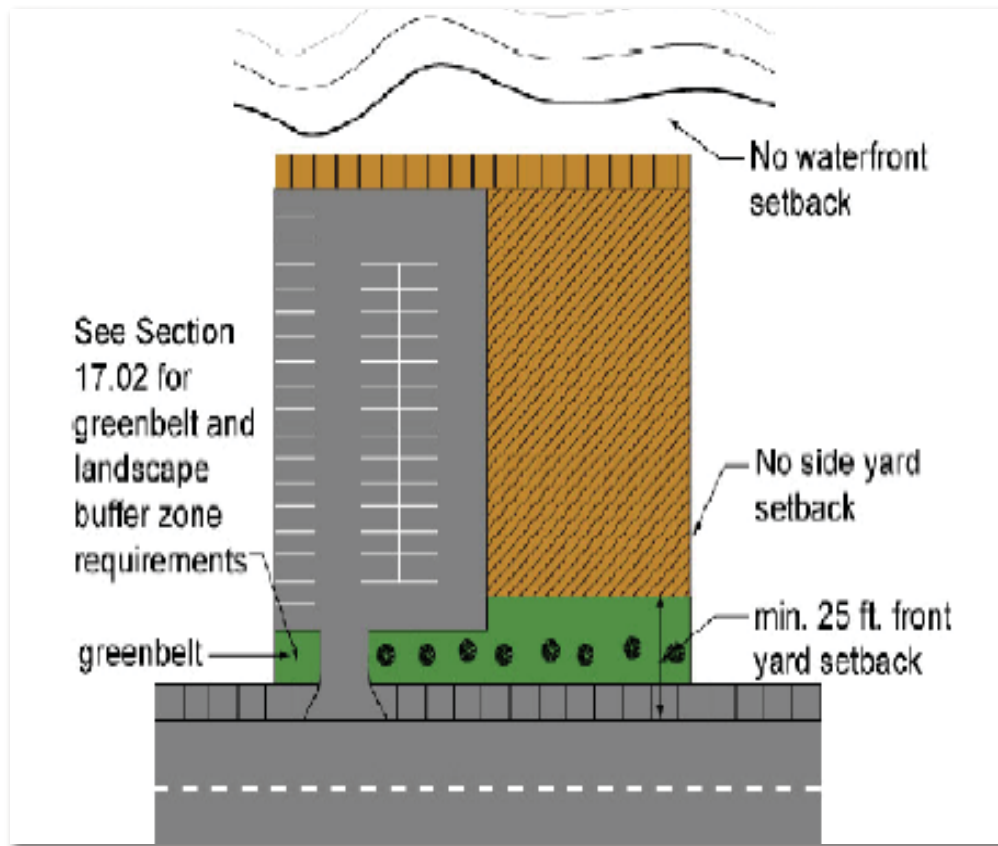
Soil Type: Loam - Infiltration rate = .4 in/hr



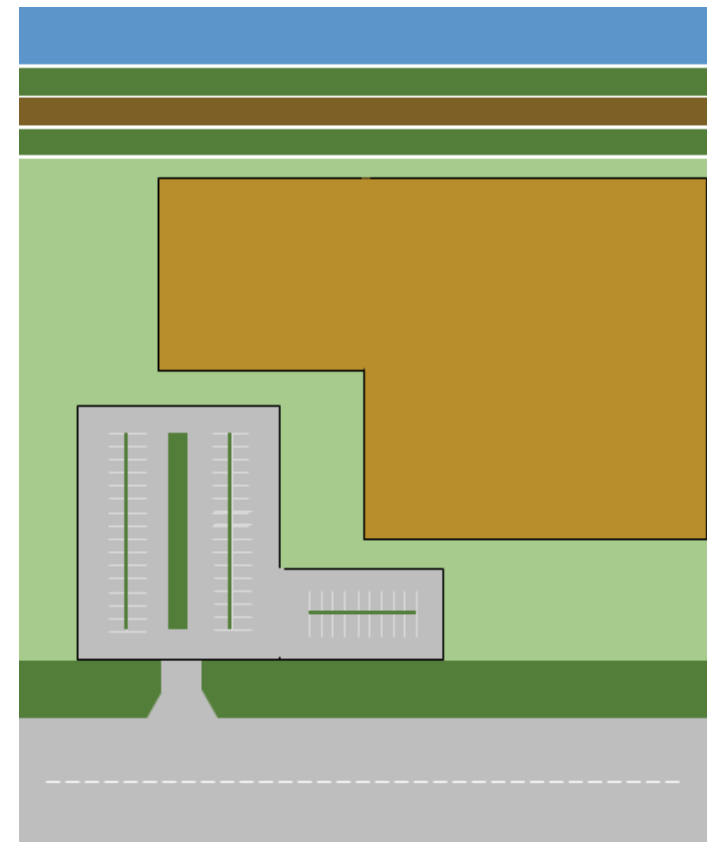
Policies

Recommendation

Impact Zone Site Design Requirements



Old



New

Policies

Design Guidelines



Policies

Design Guidelines



*GREEN INFRASTRUCTURE
DESIGNS
SCALABLE SOLUTIONS TO LOCAL
CHALLENGES*



<http://delta-institute.org/delta/wp-content/uploads/Green-Infrastructure-Designs-July-2015.pdf>

Policy

Recommendations

Municipal Separate Storm Sewer System (MS4) Code

- **Required pre-development meeting with planning dept**
- **Infiltration requirements**
- **Clear about who is responsible for maintenance and what maintenance is required**

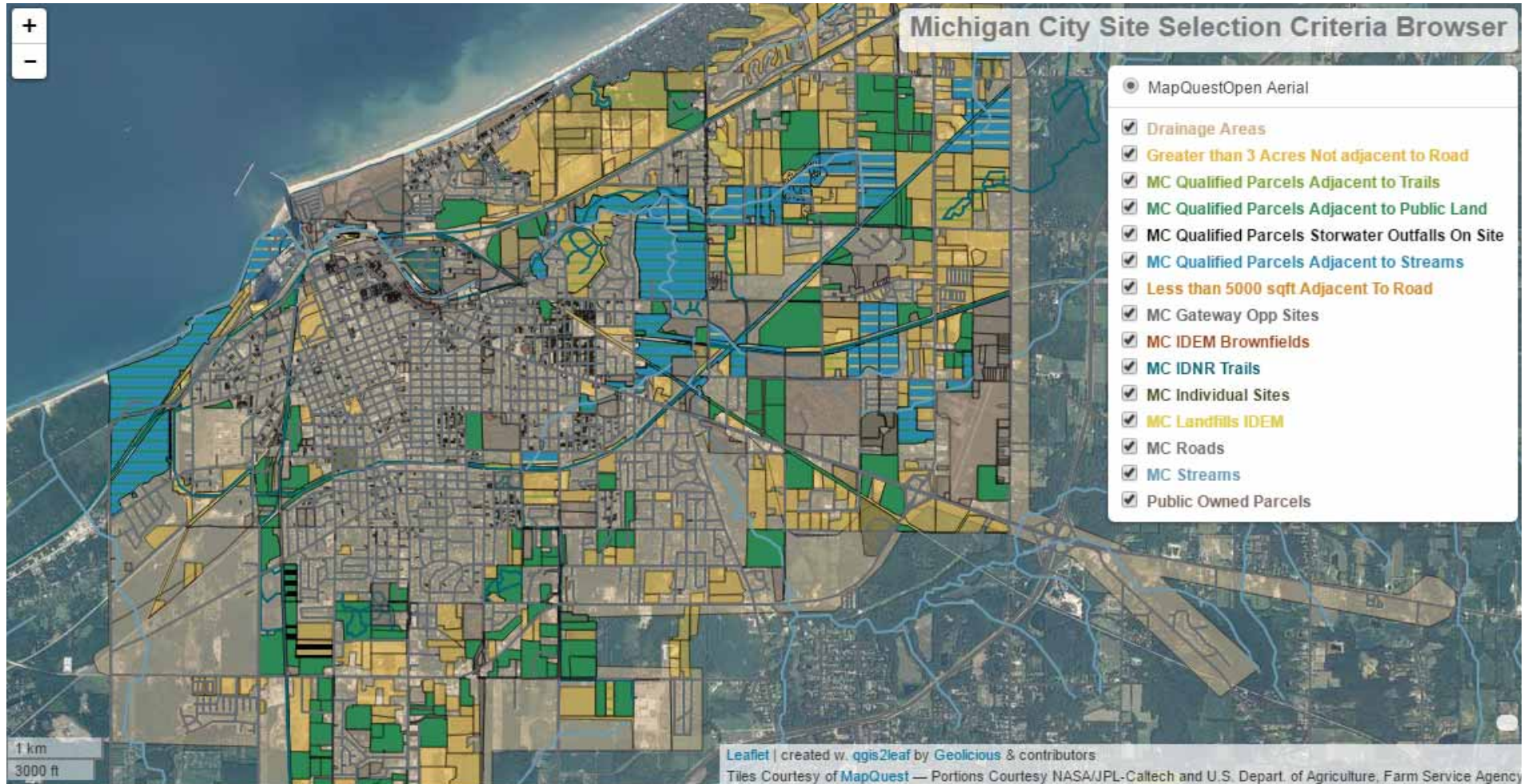
Policy

Recommendations

Dedicated Funding & Capital Programs

- **Create a dedicated funding source for maintenance of installed GI sites**
- **Integrate on-site stormwater management through GI whenever roads are updated or improved**

Land Acquisition Criteria



<http://deltainstitute.github.io/MC-site-selection/selection-criteria/webmap/#13/41.7039/-86.8524>



Policy

Recommendations

Develop Land Acquisition Strategy

- **Plan out top 20 parcels for acquisition for natural stormwater management or conservation**
- **Develop decision making guide for acquisition deals**
- **Develop process, protocols, legal templates for acquisition**

**Building Political and
Public Support
City-Wide Implementation**

Workshop Series

- **Field trip for elected officials**
- **Maintenance challenges and solutions**
- **Resident and business engagement**

Coming to a Great Lakes City Near You!

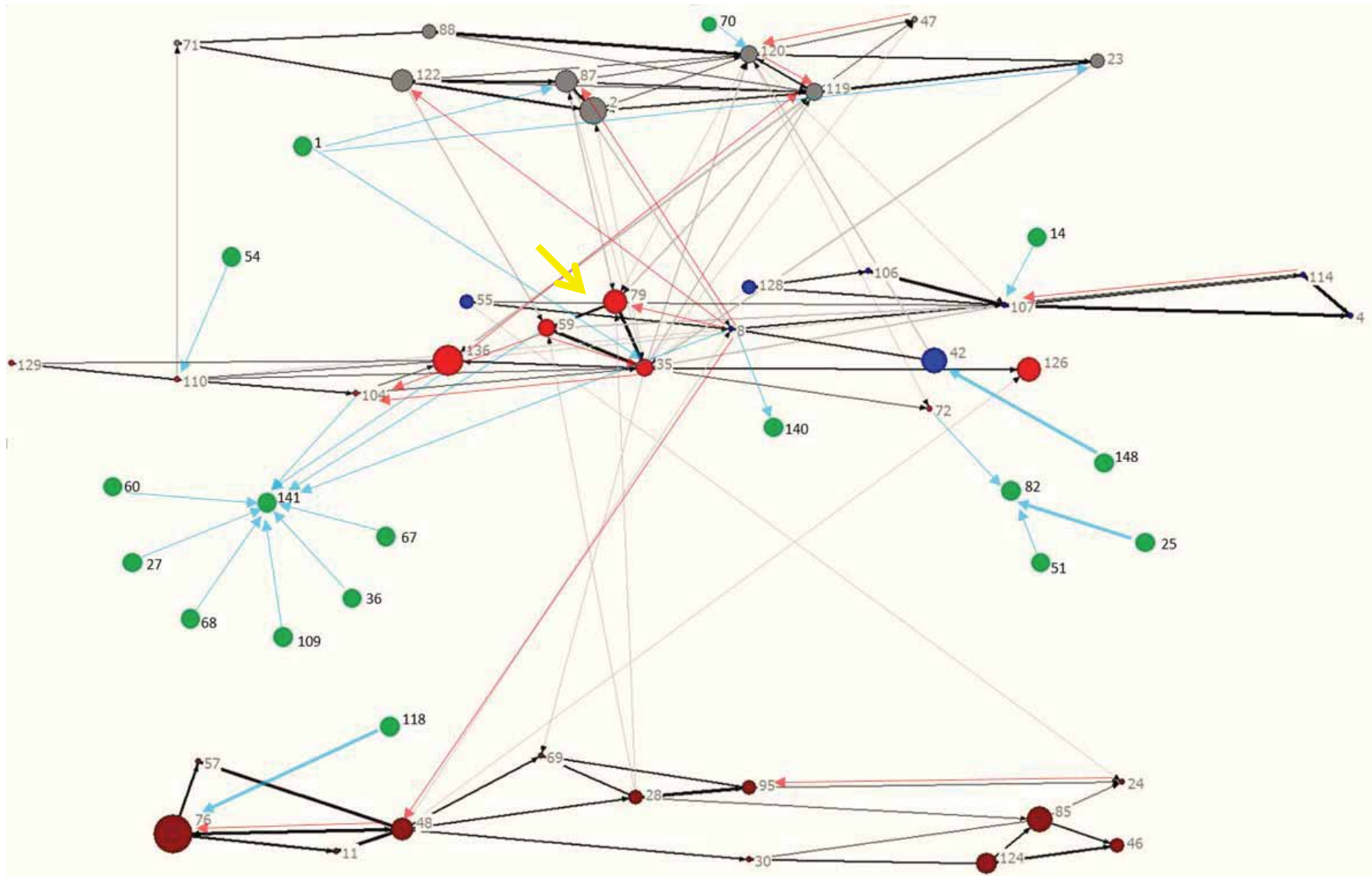
- **Gary, IN**

- Comp & Green Infrastructure Plans
- Zoning
- Implement G.I. on vacant lots – *scalable?*
- Community supported site selection and design
- Maintenance / local governance / workforce development – *scalable?*

Coming to a Great Lakes City Near You!

- **Detroit, MI**
 - Green Infrastructure for Greenways
 - Community Organizing & Advocacy
 - Implementation of demo projects
 - Stewardship and youth development







Developing a Community of Climate-Informed Conservation Practitioners to Protect a Priority Landscape in Illinois and Wisconsin

Angela Larsen¹, Abigail Derby Lewis², Olga Lyandres¹, Tingqiao Chen^{3,4}, Ken Frank^{3,4}

¹Alliance for the Great Lakes

²The Field Museum, Science Action Center

³Michigan State University, Department of Fisheries and Wildlife within the College of Agriculture and Natural Resources

⁴Michigan State University, Department of Counseling, Educational Psychology and Special Education within the College of Education

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Recommended Citation:

Larsen, A., Derby Lewis, A., Lyandres, O., Chen, T., Frank, K. 2014. *Developing a Community of Climate-Informed Conservation Practitioners to Protect a Priority Coastal Landscape in Illinois and Wisconsin.*

For further questions, please contact alarsen@greatlakes.org or aderby@fieldmuseum.org

White Paper:

Larsen, A., Derby Lewis, A., Lyandres, O., Chen, T., Frank, K. 2014. ***Developing a Community of Climate-Informed Conservation Practitioners to Protect a Priority Coastal Landscape in Illinois and Wisconsin.***

http://glisa.umich.edu/media/files/projectreports/GLISA_ProjRep_ILWI_Ravines.pdf

Tools and Resources



*GREEN INFRASTRUCTURE
DESIGNS
SCALABLE SOLUTIONS TO LOCAL
CHALLENGES*



<http://delta-institute.org/delta/wp-content/uploads/Green-Infrastructure-Designs-July-2015.pdf>

Tools and Resources

GRAND RAPIDS VITAL STREETS DESIGN GUIDE

THE OBJECTIVES OF THE GUIDE ARE TO:

- » Improve safety for all road users
- » Increase coordination
- » Provide consistent guidelines
- » Institutionalize “life-cycle” thinking and green infrastructure
- » Provide clear methods for prioritization and selection
- » Identify metrics and methods for performance evaluation
- » Increase accessibility
- » A step forward in achieving a vision of zero traffic-related fatalities



<http://www.grcity.us/engineering-department/Construction-Updates/Pages/Vital-Streets-Plan.aspx>

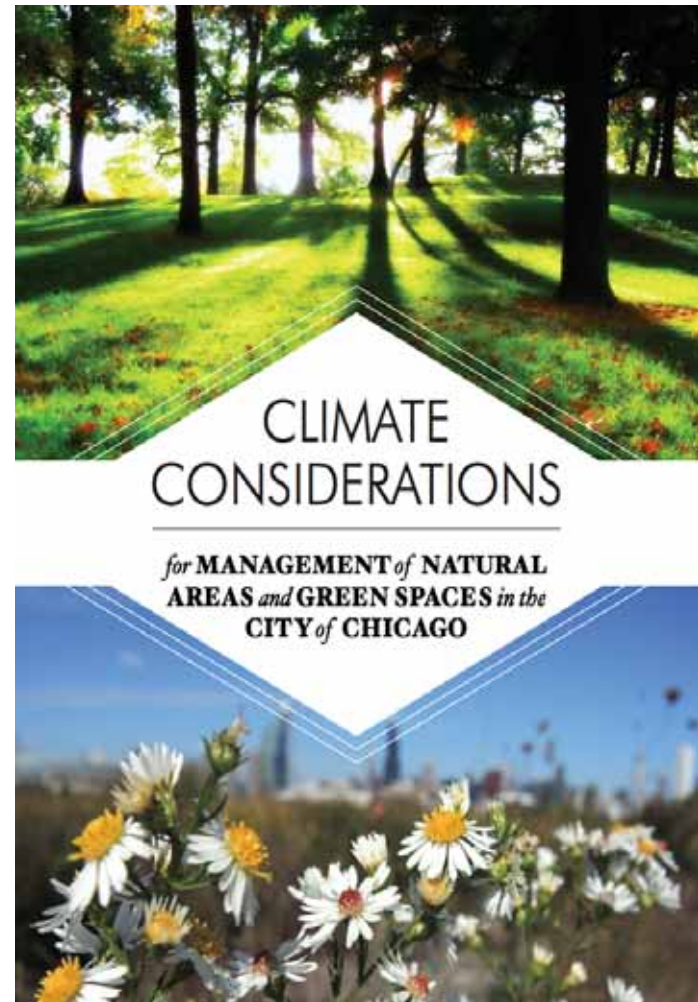
Tools and Resources

US EPA Climate-Ready Estuaries workbook

Being Prepared for Climate Change
A Workbook for Developing
Risk-Based Adaptation Plans

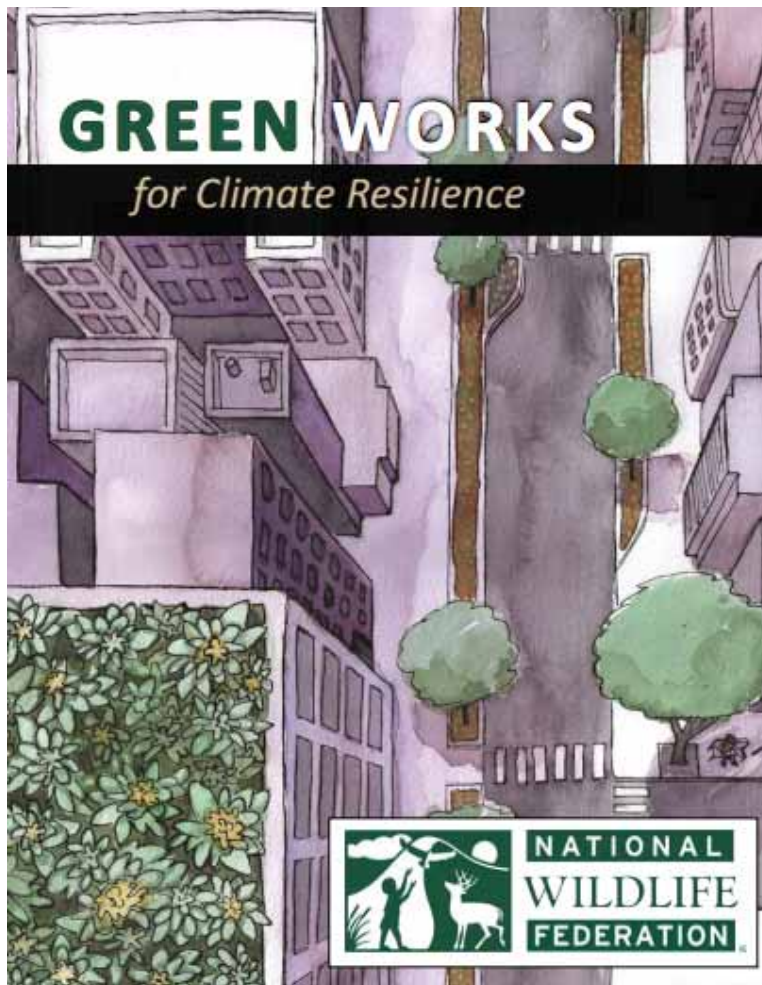


Climate Consideration Guidebook



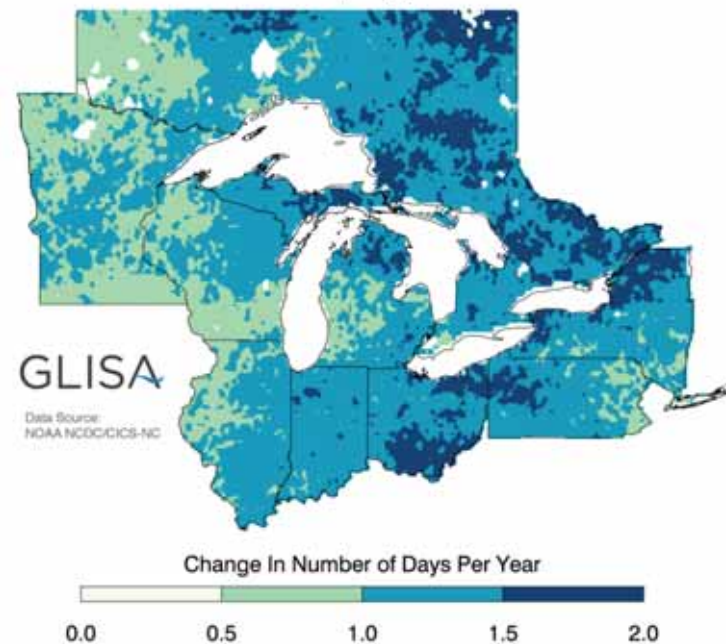
Tools and Resources

Green Works for Climate Resilience



Great Lakes Integrated Science and Assessment Center (GLISA)

Projected Change in Number of Heavy Precipitation Days
Period: 2041-2070 | Higher Emissions: A2



Thank you!



The Project Team

Alliance staff

Ethan Brown, S. Lake Michigan ebrown@greatlakes.org

Khalil Ligon, Detroit kligon@greatlakes.org

Margaret Catania, Calumet kligon@greatlakes.org

Judy Freed, Communications jfreed@greatlakes.org

Researchers

Ken Frank, GLISA and Michigan State University,
kenfrank@msu.edu

Tingqiao Chen, Research Assistant, chentinqiao@msu.edu

Thank you

