ASBPA 2021 Best Restored Shore Samuel Myers Park, Racine, WI

Dr. Julie Kinzelman

University of Wisconsin – Parkside

(City of Racine Public Health Department, Retired)

Restoring Coastal Ecosystems in a Changing Environment

- *Create a space that was **resilient** to environmental stressors*
- *Enhance system diversity, endurance and viability over time (**sustainability**)*
- *Provide **ecosystems service*** co-benefits

Nature-based Solutions & Ecosystem Services

Studies have shown that trees, parks and other green space contribute to better mental/physical health, educational outcomes and crime reduction

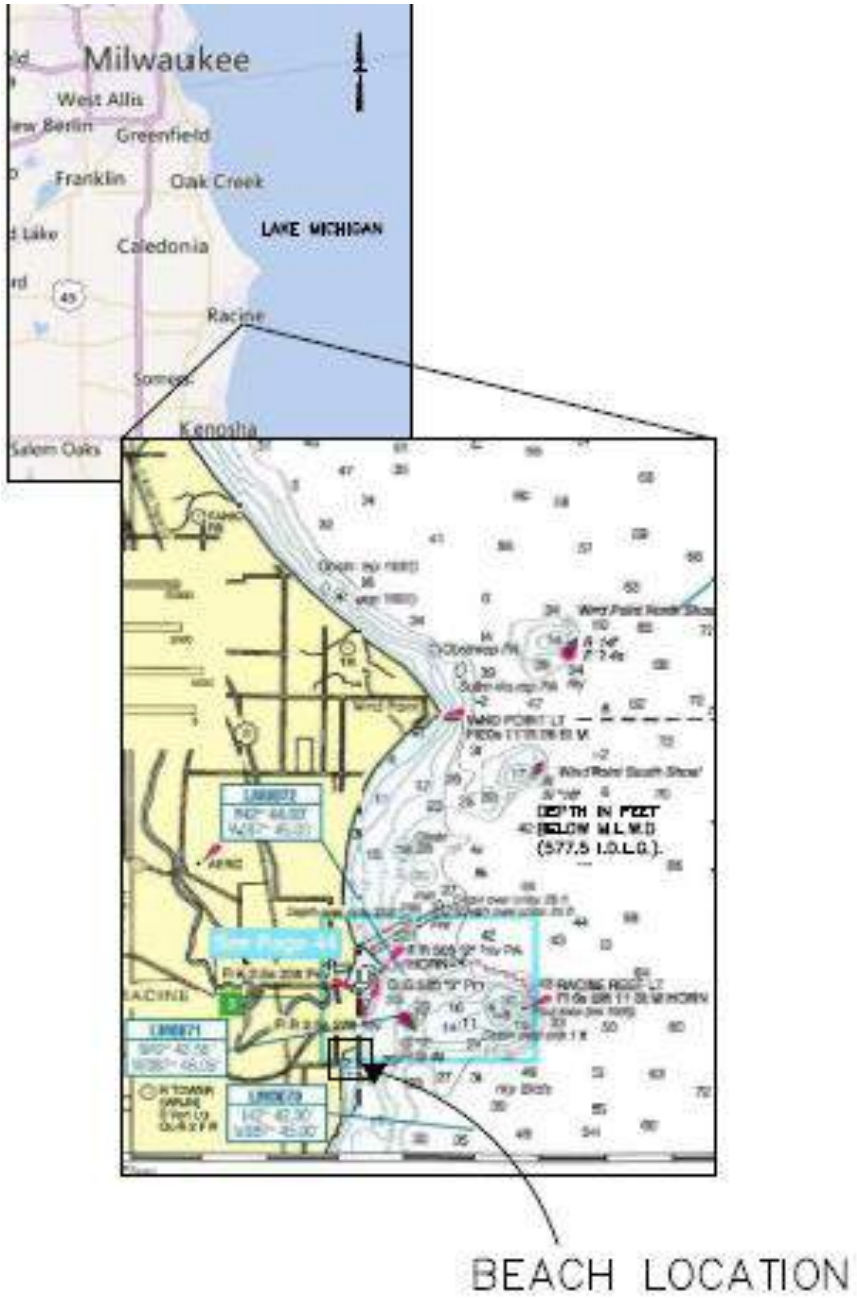
Trees infiltrate stormwater, sequester carbon/CO2, reduce urban heat island effects, create habitat and promote biodiversity

Freely available recreational venues provide social equity with respect to access

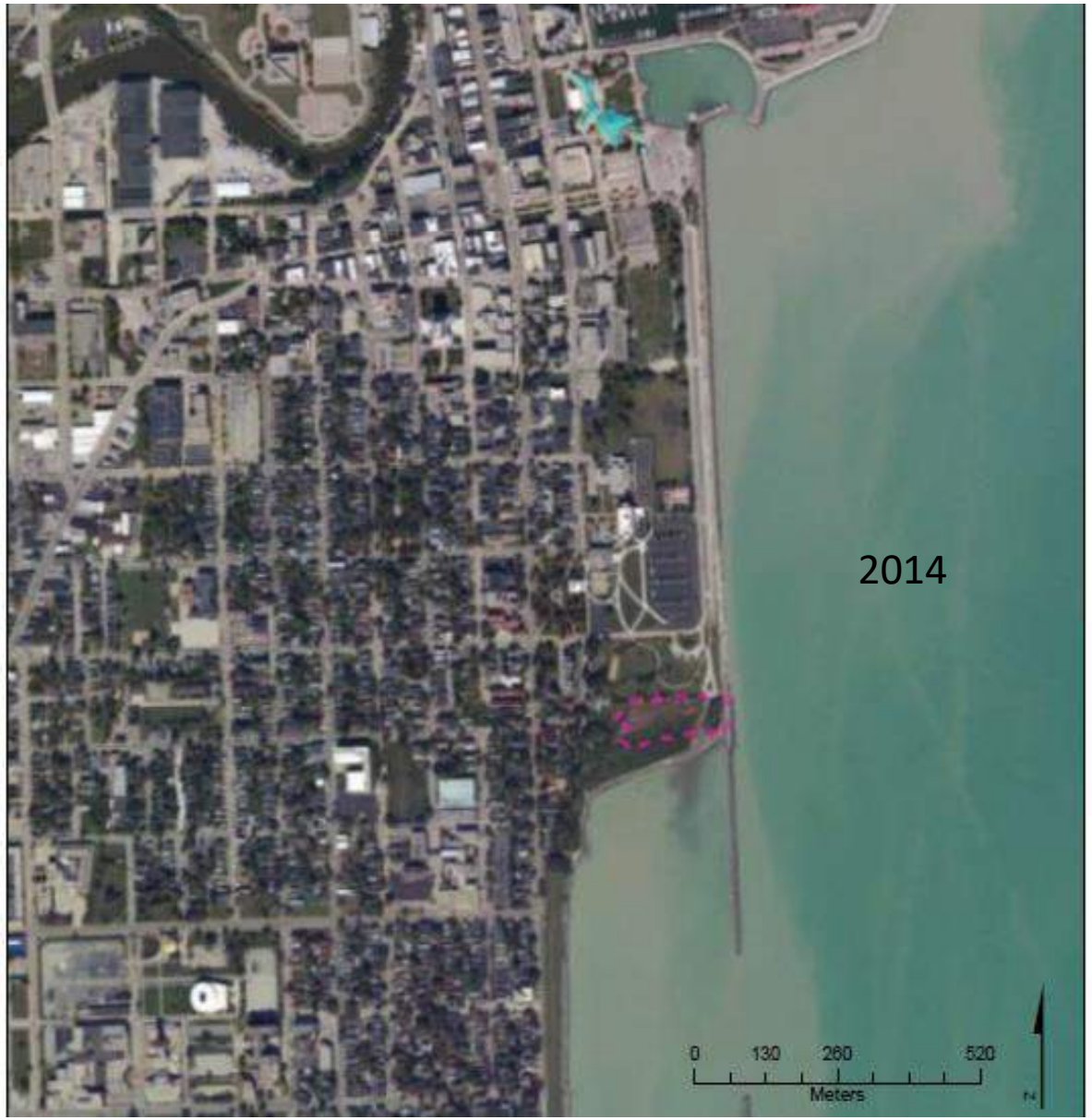
High quality coastal resources contribute to quality of life and provide direct/indirect economic benefits (including avoided damages)

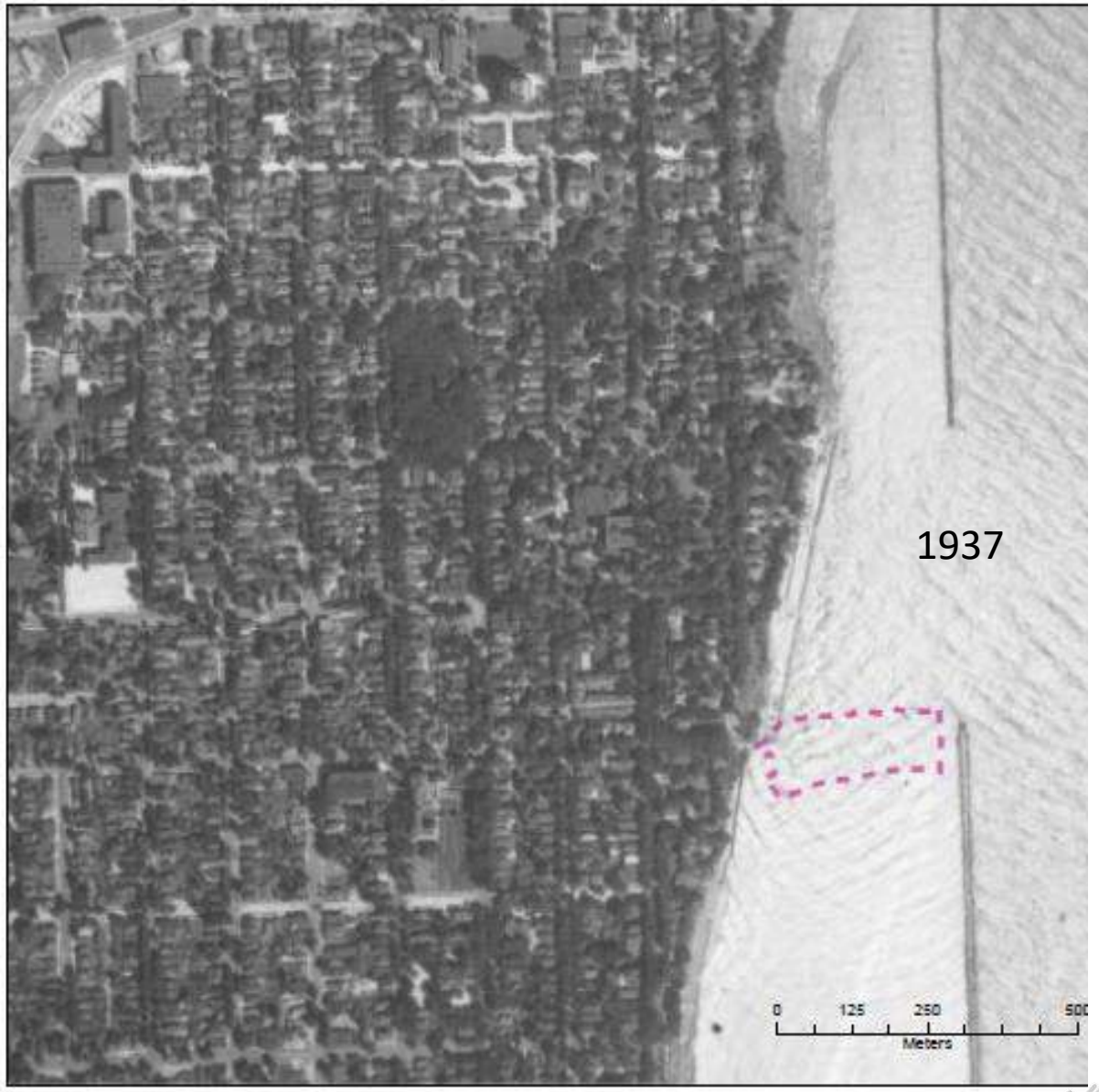
Naturalization of shorelines can reduce pollutants and provide resilience with respect to extreme weather events and changing lake levels

The water we swim in is also our source of drinking water



Samuel Myers Park
Racine, WI


2014
0 130 260 520
Meters


1937
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Meters

Restoration Approach

- Reduce overtopping events
- Prevent stagnation along the breakwater
- Capture/infiltrate direct stormwater runoff
  - Nutrients
  - Bacteria
- Maintain beach sands
- Deter loafing gulls and geese
- Remove and manage invasive species
- Restore coastal habitat (flora)
- Encourage native fauna (migratory bird flyway)
- Improve public access
- Create recreational amenities
  - Including an off-shore swim zone

An 11-Phase Plan Allowed the City of Racine to Identify Multiple Funding Streams to Actualize Co-benefits

Prior to Restoration – Low Profile/Poor Drainage/Lack of Access

Creating a “Blank Slate” Prior to Construction

Enhance Existing Rubble Mound Breakwater

Increased Height (↓ Overtopping)

Added Return Channel (↓ Stagnation)

Green Infrastructure

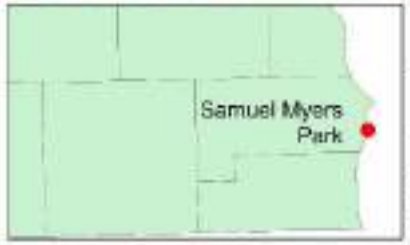
- Engineered Wetlands (2)
- Rain Garden
- Bioswale
- Stormwater Trees (~300)

Soil Amendment & Beach Nourishment

- Beneficial reuse of dredged spoils
  - Supplemented with clean upland sands
- Dry (sand) prairie enhances infiltration
  - Creates additional habitat
- Dune features act as bounding structures for engineered wetlands
  - Facilitated invasive species management
  - Creates additional habitat

Invasive Species Management

2014



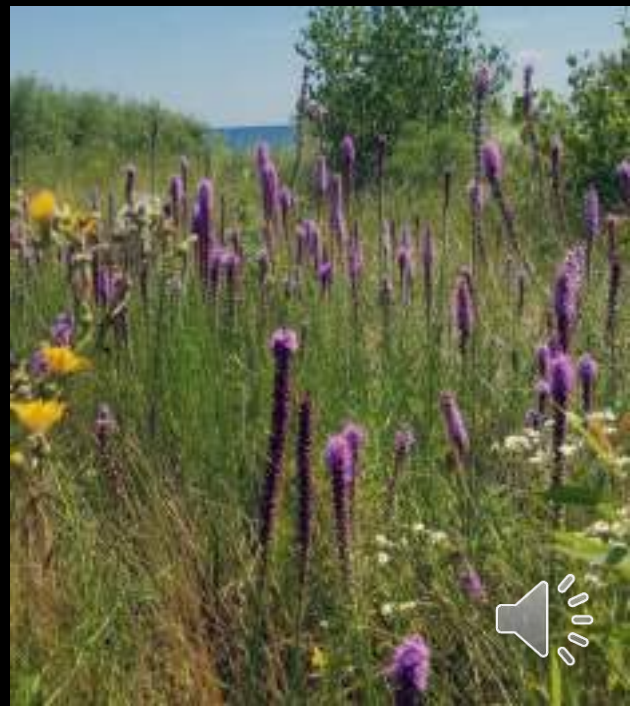
Section	Species	Area (acres)	Ave. Depth (ft)	Notes
A	*Phragmites*	0.004	0.5	~10% Coverage
B	Purple Loosestrife	0.004	0.5	~3% Coverage

This survey was conducted on October 17th, 2019.
Areas proposed for treatment with glyphosate.

2019

Depressional Storage

- Rain garden captures and treats impervious surface and landscape runoff before being discharged to engineered wetlands
- Bioswale captures and redirects runoff from vehicular access points
- Sedge (wet) meadow replaced turf grass in upland area of the park



Improved Public Access

Outcomes

Improved Recreational Water Quality

E. coli has decreased!

Decades long swim ban removed - 2018

Site	Year	Sample Depth (ft.)	n	Median *E. coli* (MPN)	No. Advisories	%
SM-E2	2015	2	6	346.0	4	66.7
SM-E2	2016	2	12	79.5	4	33.3
SM-E2	**2017**	2	13	52	2	**15.4**
SM-E3	2015	3	14	178.5	6	42.9
SM-E3	2016	3	8	108.5	1	12.5
SM-E3	**2017**	3	13	41	1	**7.7**
SM-W2	2015	2	14	469.5	9	64.3
SM-W2	2016	2	12	166.5	5	41.7
SM-W2	**2017**	2	13	75	4	**30.8**

Greater Habitat Diversity

- Upland
- Dry Prairie
- Dune
- Wetland
  - Existing/Enhanced
  - Constructed
- Beach Face

Proposed as *Critical Species Habitat* by the SE WI Regional Planning Commission (2021)

Engineered (Constructed) Wetlands

Coverage by Wetland Zone

Plant Coverage Estimates (2019)	
Location	Estimated Herbaceous Plant Coverage (%)
EEWL	80
ECWL	87.5
LEWL	80
WWL	75

30+ Species of Native Wetland Plants

Spiderwort

Blue Flag Iris

Prairie Smoke

Dry (Sand) Prairie

~10,000 individuals plus seeds planted by staff and volunteers

~50 unique native plant species

Monarch Waystation Designation

Butterfly gardens attract insects and add visual interest

Provided training/job opportunities for Great Lakes Conservation Corps participants

MONARCHWATCH.ORG
WAYSTATION NETWORK

Increased Number of Native Trees & Shrubs

Increased tree canopy creates habitat, captures stormwater & sequesters CO_2

Eastern White Pine

23 different species since October 2016

- Red Twig Dogwood
- Pussy Willow
- Potentilla
- Chokeberry
- American Hornbeam
- Multiple Betula spp. (Birch)
- Various Rubus spp
- Red Maple
- Hackberry
- Juniper
- Black Hills Spruce
- Serviceberry
- Tamarack
- Multiple Quercus spp (Oak)

Horse Chestnut

Improved Stormwater Infiltration/Capture

- Between 40-52% of pre-restoration non-infiltrated precipitation came directly from impervious surfaces
  - Little obstruction existed to prevent runoff into Lake Michigan prior to restoration
  - Impervious surfaces still a significant contributor and will require offsets
- SMP will infiltrate an additional 1579-2474m^3 of incident-stormwater annually based on tree growth alone
  - Silver maples in the dry-prairie expected to capture >10.0m3/year at maturity
  - Benefits from upland stormwater tree-plantation are noteworthy and produce appreciable differences in non-infiltrated precipitation
- GI captures additional stormwater runoff
  - Rain garden, bioswale and bio-retention area are not anticipated to exceed capacity, even under climate change scenarios

Increased Utilization

Swimming/Beach Activities

Boating/Kayaking/Paddleboarding

Diverse Recreational Opportunities

North American Sea Glass Association

Hoy Audubon Big Sit

Bird Watching

Hoy Audubon

Beach (Sea) Glass Collecting

Friends of Myers Park

Coastal Resilience

- Resilience is the ability to resist, recover and adapt to disturbances and hazards
- January 2020 storm event resulted in a federal disaster declaration for southeast WI
- Coastal erosion would have been worse without protection afforded by naturalized shoreline
- Samuel Myers Park suffered damage to some facilities
- FEMA funds will be used to restore to pre-disaster conditions and provide mitigation, as needed

Many Project Contributors!

- US EPA - GLRI $1,254,461
- Fund for Lake Michigan
- WI Coastal Management Program
- US Forest Service
- US Fish & Wildlife Service
- Kiwanis of Racine
- Root-Pike Watershed Initiative Network
- Wege Foundation
- Lexi Kazian Foundation
- Ozaukee Washington Land Trust
- Friends of Myers Park
- Great Lakes CCC/Americorps NCCC

- Miller Engineers & Scientists
- A.W. Oakes & Son
- Distinctive Woodwork, Inc.
- Vaash & Sons Excavating
- Ray Hintz, Inc.
- Racine Yacht Club
- Racine-Kenosha Bike Club
- Friends/Family of Judge Jack Jude
- Walden III Middle & High School
- UW-Parkside
- Alliance for the Great Lakes
- Educator's Credit Union/Kid's First/YMCA

Contact Information

Dottie-Kay Bowersox
Public Health Department Administrator
City of Racine, WI
Dottie-Kay.Bowersox@cityofracine.org

Shannon Powell
Chief of Staff/Communications Director
City of Racine, WI
Shannon.Powell@cityofracine.org

Julie Kinzelman, PhD
Associate Lecturer
University of Wisconsin – Parkside
kinzelma@uwp.edu
(City of Racine, WI - *Retired*)