St. Joseph River Basin Commission

2018 River Basin Roundup

River Basin Roundup

Jordan Beehler

Elkhart County
Soil & Water Conservation District

ELKHART COUNTY
SOIL & WATER
CONSERVATION DISTRICT

Storm Water Alliance Management Program

(SWAMP)

ELKHART COUNTY
SOIL & WATER
CONSERVATION DISTRICT

Storm Water Alliance Management Program

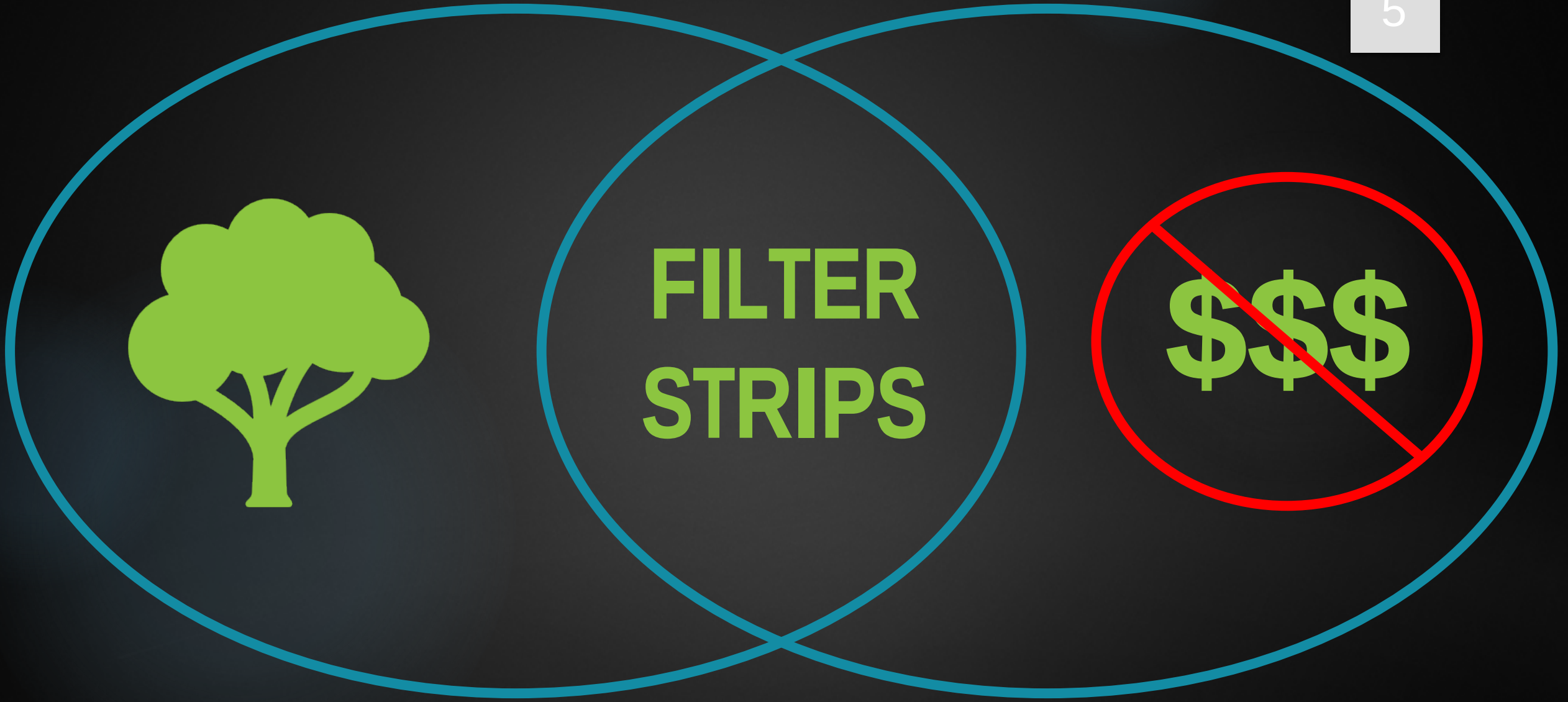
(SWAMP)

SWCD Goal

Conservation on the Land!

County Goal

Spend no money.


FILTER
STRIPS
$$$

Elkhart County Stormwater Fee

aka “the pot of money”

SWAMP ≠ USDA NRCS EQIP/CRP etc.

SWAMP ≠ USDA NRCS EQIP/CRP etc.

County Goal

~~Spend no money~~……

Allocation Year 1:

$50,000

We spent the money.

Spent Year 1: $50,298

We put conservation on the land.

Cover Crop Acres Year 1: around 1600

We got more money.

Allocation Year 2: $100,000

Awareness & Options

Support of County & City Officials

Impacts

2017 Cover Crops

Sediment **Not Eroded**	On-Farm Benefit **Nutrients**	Off-Farm Benefit **Water Quality**
15,517 tons	$32,585	$76,498

Impacts – Filter Strip

1 installed filter strip over 25 years

Without
Filter Strip

$34,848

With
Filter Strip

$3,448

Impacts – County Departments

Partnerships & Awareness

Health Department

Surveyor

Commissioners

ELKHART COUNTY
SOIL & WATER
CONSERVATION DISTRICT

Storm Water Alliance Management Program

(SWAMP)

River Basin Roundup

Thank You!

River Basin Roundup

Questions?

(only 3 minutes…)

River Basin Roundup

Questions?

(only 2 minutes…)

Questions?

(only 1 more minute…)

River Basin Roundup

Korie Blyveis

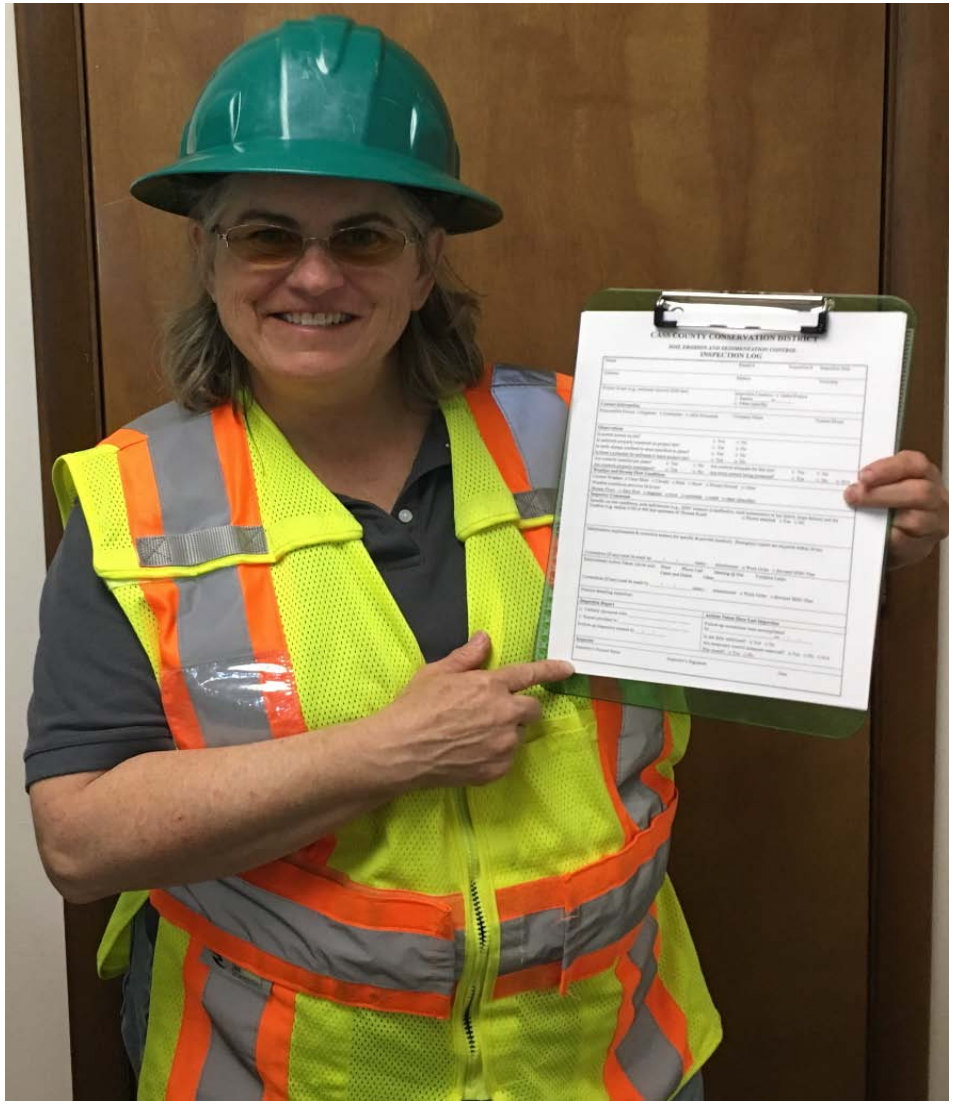
Cass County Conservation Distrcit

SOIL EROSION & SEDIMENTATION CONTROL PROGRAM

CCCD
Korie.blyveis@macd.org

Soil Erosion & Sedimentation Control

The Board of Commissioners of Cass County appointed the District as the County Enforcing Agency (CEA) to administer & enforce Michigan State Law Part 91: Soil Erosion & Sedimentation Control (SESC) of the Natural Resources & Environmental Protection Act.

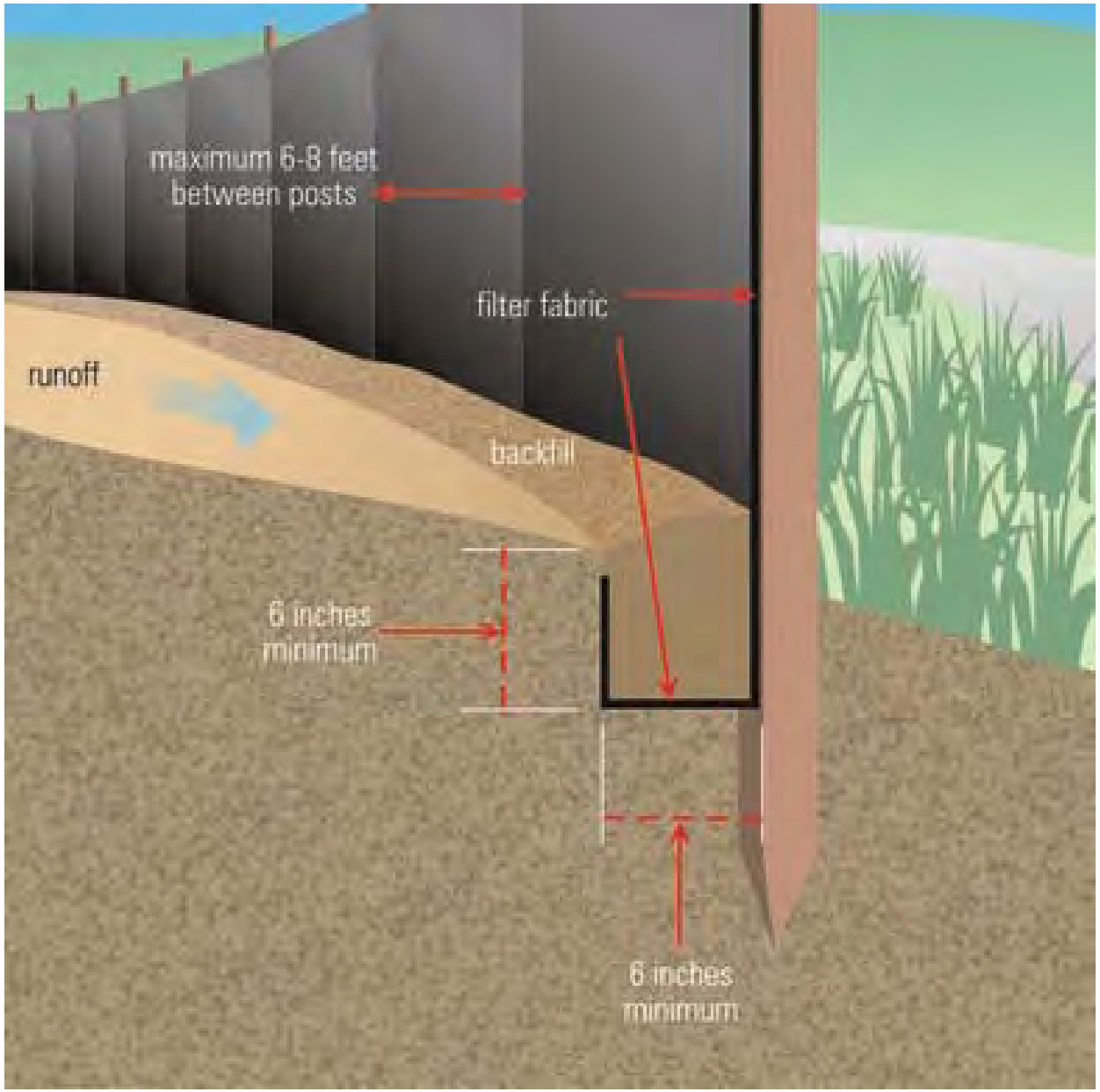


A SESC permit is generally required from our office when a landowner is making any “earth change” that is within **500 feet of a lake or stream or is one acre or more in size.**

Some earth change activities may be exempt from obtaining a permit; however,

all projects are required to comply with Part 91 and ensure that no soil or sediment crosses property lines or enters lakes, streams or wetlands.

Silt Fence


maximum 6-8 feet
between posts
filter fabric
runoff
backfill
6 inches
minimum
6 inches
minimum

Cass County Conservation District
1127 E State St., Cassopolis, MI 49031
Tel: 269-445-8641 Ext. 5 www.casscdistrict.org

NOTICE OF VIOLATION

Soil Erosion & Sedimentation Control Permit Number:

Location of Project: Cass County, Porter Township
Lakeshore Drive

Site Inspection Date: 2/20/2018

Violations of Part 91 Soil Erosion and Sedimentation Control, PA 451 of 1994, as amended:

1. Silt fence failure between work area and Birch Lake and neighbor to north.
2. Silt fence needs repair/maintenance on roadside, northside, and lakeside.
3. Soil/sediment on roadway
4. Permit not posted.

Corrective Action to Be Taken:

1. Properly maintain silt fence and any other soil erosion controls.
2. Sweep street of soil/sediment.
3. Recommend placement of erosion control blanket to prevent more movement of soil.
4. Post permit.

$50 fee for <u>each</u> re-inspection due to violation.

Failure to Comply

1. A person who violates Part 91 may be responsible for a municipal civil infraction with fines up to $2,500. A person who knowingly violates after a notice of determination is responsible for payment of a civil fine of not less than $2,500 or more than $25,000 for each day of violation.

Corrective actions must be adequately accomplished by Monday, February 26, 2018.

Reminder: Per Part 91 - A person shall complete permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land within 5 calendar days after final grading or the final earth change has been completed. If it is not possible to permanently stabilize a disturbed area after an earth change has been completed or if significant earth change activity ceases, then a person shall maintain temporary soil erosion and sedimentation control measures until permanent soil erosion control measures are in place and the area is stabilized.

Please contact our office with plans for stabilization and notify us when corrective action required above is complete.

Sincerely, Korie Blyveis, County Enforcing Agent, Cass County Soil Erosion & Sedimentation Control Program

CC: Michigan Department of Environmental Quality and Porter Township


DE

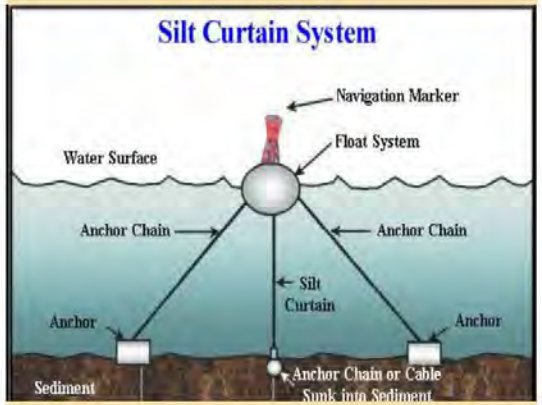

KOMATSU


SOLD

Soil Erosion/Sedimentation Control Supplies

- Turbidity curtain (waterfront construction sites, see below for details)
- Mulch (hardwood is best)
- Grass Seed
- Wattles
- Erosion control blankets
- Turf reinforcement mat
- Storm inlet sediment trap

Turbidity curtains are flexible sediment control barriers designed to prevent the spread of silt and sediment in lakes and other water bodies when work is being performed in water, on or near the shoreline.



Please contact the Michigan DEQ Water Resources Division at 269-567-3500 to permit work below the high water mark (seawalls).

How does construction and development affect water quality?

Eroded soil from construction and development sites is carried to streams and lakes where it causes:

- Excess cloudiness that harms aquatic life, increases water treatment costs, and makes the water less useful for recreation
- Sedimentation that clogs drainage ditches, stream channels, water intakes and reservoirs, and destroys habitat

CASS COUNTY CONSERVATION DISTRICT

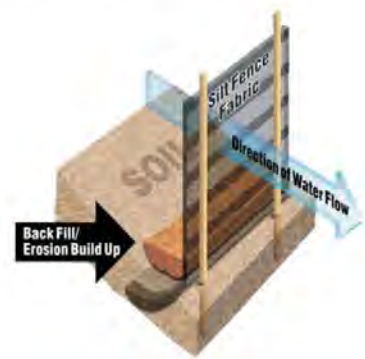
The Cass County Conservation District is appointed to administer & enforce MI State Law Part 91: Soil Erosion & Sedimentation Control (SESC) of the Natural Resources & Environmental Protection Act. Contact us to obtain a permit for any "earth change" over 1 acre in size or within 500' of a lake or stream.

We'd be happy to talk with you about your project needs. Contact us at:

1127 East State Street
Cassopolis, MI 49031
(269) 445-8641 X5
www.casscdistrict.org

_and please connect with us on

Water Quality Protection for Construction & Development



KEEP SOIL ON THE SITE!

Reference guide for contractors, homeowners & affiliated parties.

How to Properly Install Silt Fence

1. Dig a trench about 6 inches wide and 6 inches deep across the slope where you wish to install the fencing.

2. Place the base of the silt fencing in the trench. Be sure that the posts are positioned on the down slope side.

3. Backfill the trench being sure to compact the soil.

4. If fabric with a support fence (wire or plastic) is used, posts should be spaced 10 feet apart at most. If no support fence is used, the spacing should be reduced to 6 feet apart. Posts should be driven at least one foot into the ground.

5. Silt fencing should be no higher than 3 feet.

6. If you must join two pieces of silt fencing, splice the fabric at a support post and overlap the fabric a minimum of 6 inches – twisting the two sections onto the post. Seal it as securely as possible.

Stormwater Tips

Keep these tips in mind during the planning process to help mitigate damaging soil erosion and manage stormwater runoff.

- Install a rain garden; helps to prevent flooding and runoff
- Install a swale; helps redirect excess water to an area with good drainage and water tolerance
- Use heavier mulch; hardwood mulches are best and help keep soil in place, unlike lighter mulches

Keep Drainage in Mind!

Be sure to pay attention to where water drains on your construction site to properly address any issues that may arise. Install the correct soil erosion and sedimentation control measures to prevent flooding or soil erosion issues on site.

Native vegetation helps prevent soil erosion and conserves water!

Be aware invasive species often flourish in disrupted areas. Avoid them by quickly establishing desired vegetation. Contact us with concerns regarding invasive species.

<u>Don't</u> expect silt fence to handle huge rain events on large sites! It would be better to have more grass buffer or stage excavation.

<u>Don't</u> use silt fence as a retaining wall for stockpiles of soil!

Do use silt fence to protect lakes, rivers, streams, and wetlands!

River Basin Roundup

Thank You!

River Basin Roundup

Questions?

(only 3 minutes…)

River Basin Roundup

Questions?

(only 2 minutes…)

Questions?

(only 1 more minute…)

River Basin Roundup

Kieran Fahey

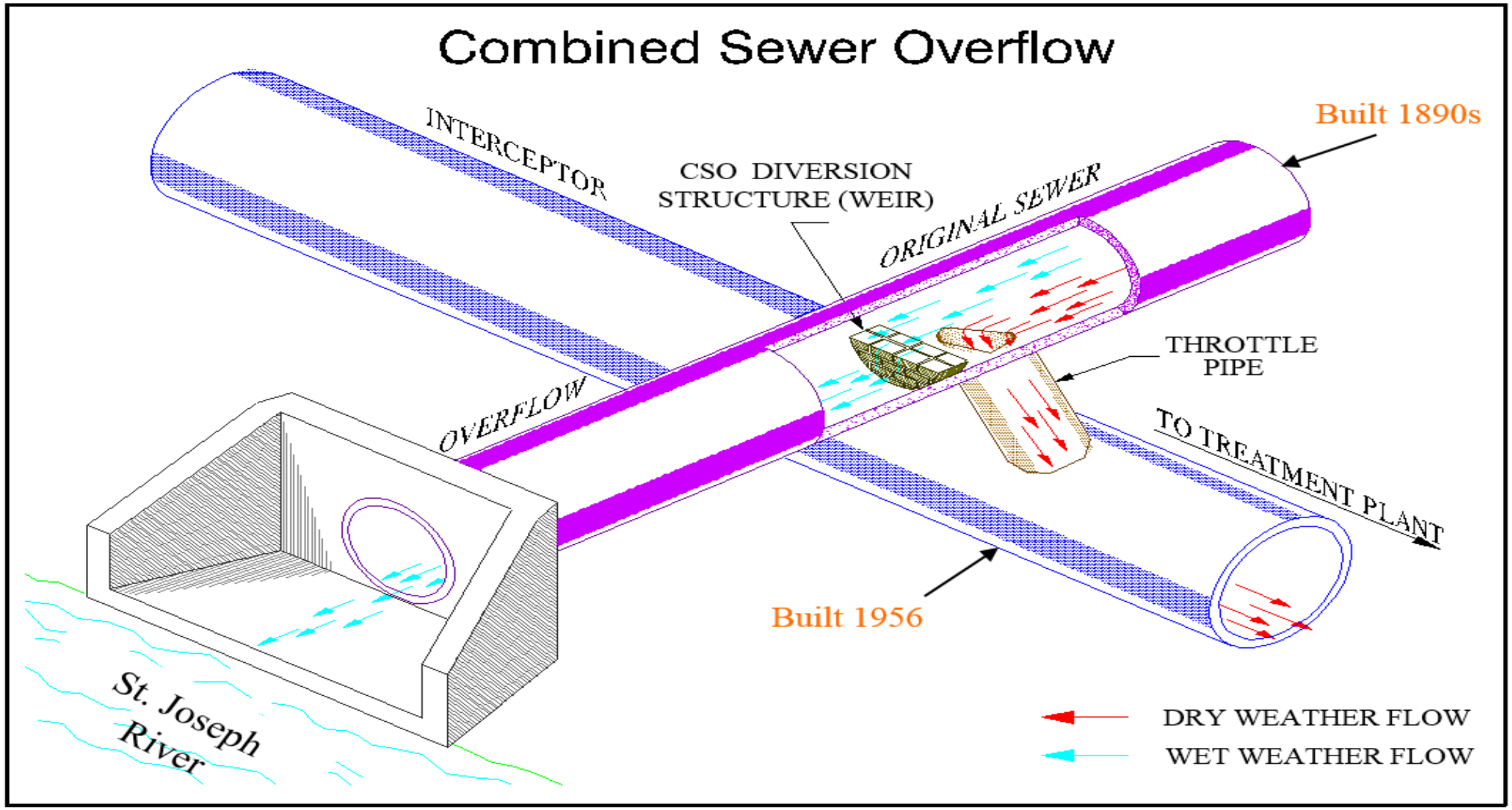
City of South Bend
Public Works

Reinventing CSO Solutions

City of South Bend, Indiana

Kieran Fahey

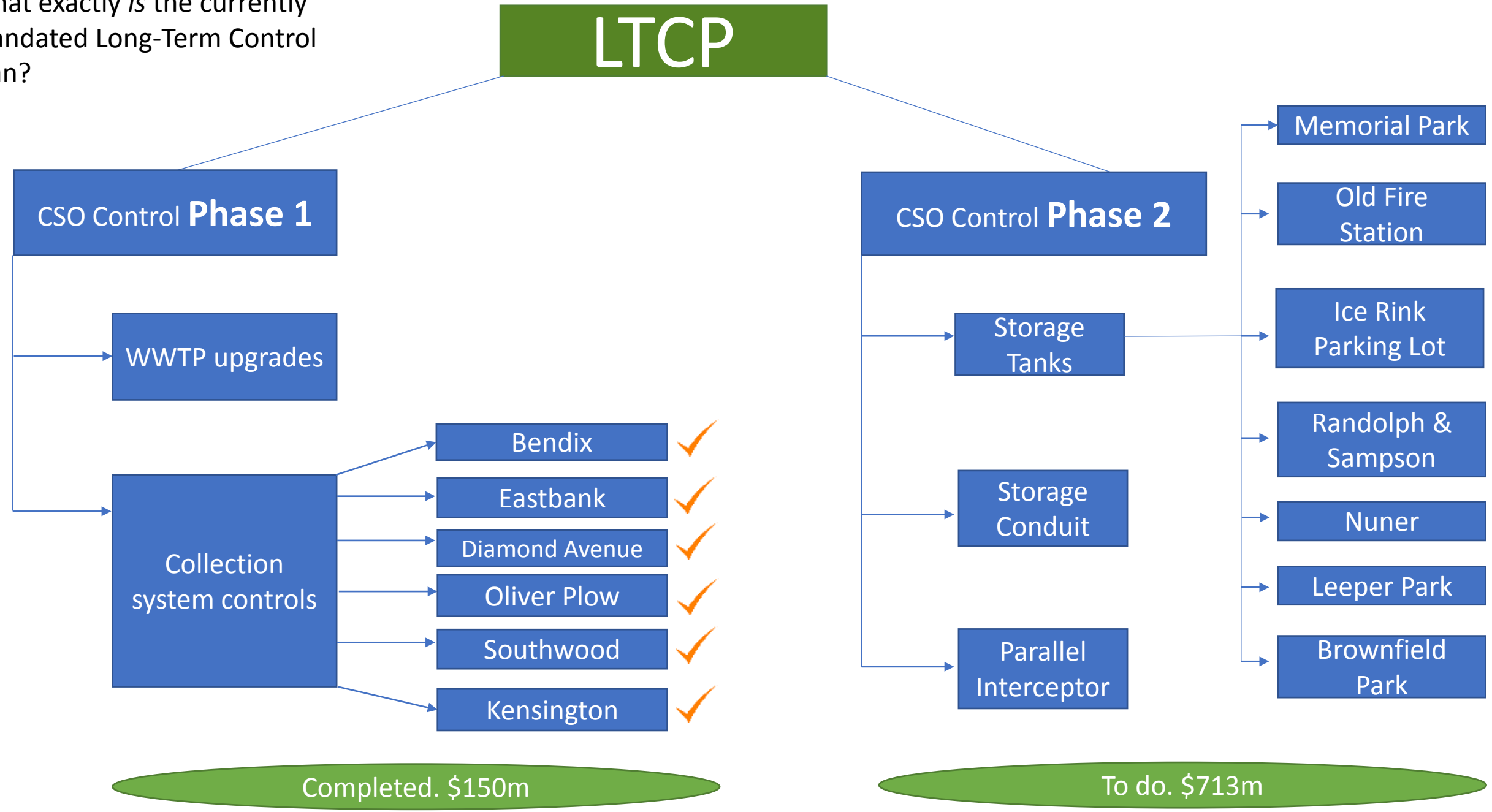
CITY OF SOUTH BEND
PUBLIC WORKS


Combined Sewer Overflow
INTERCEPTOR
CSO DIVERSION
STRUCTURE (WEIR)
ORIGINAL SEWER
Built 1890s
THROTTLE
PIPE
OVERFLOW
TO TREATMENT PLANT
Built 1956
St. Joseph
River
DRY WEATHER FLOW
WET WEATHER FLOW

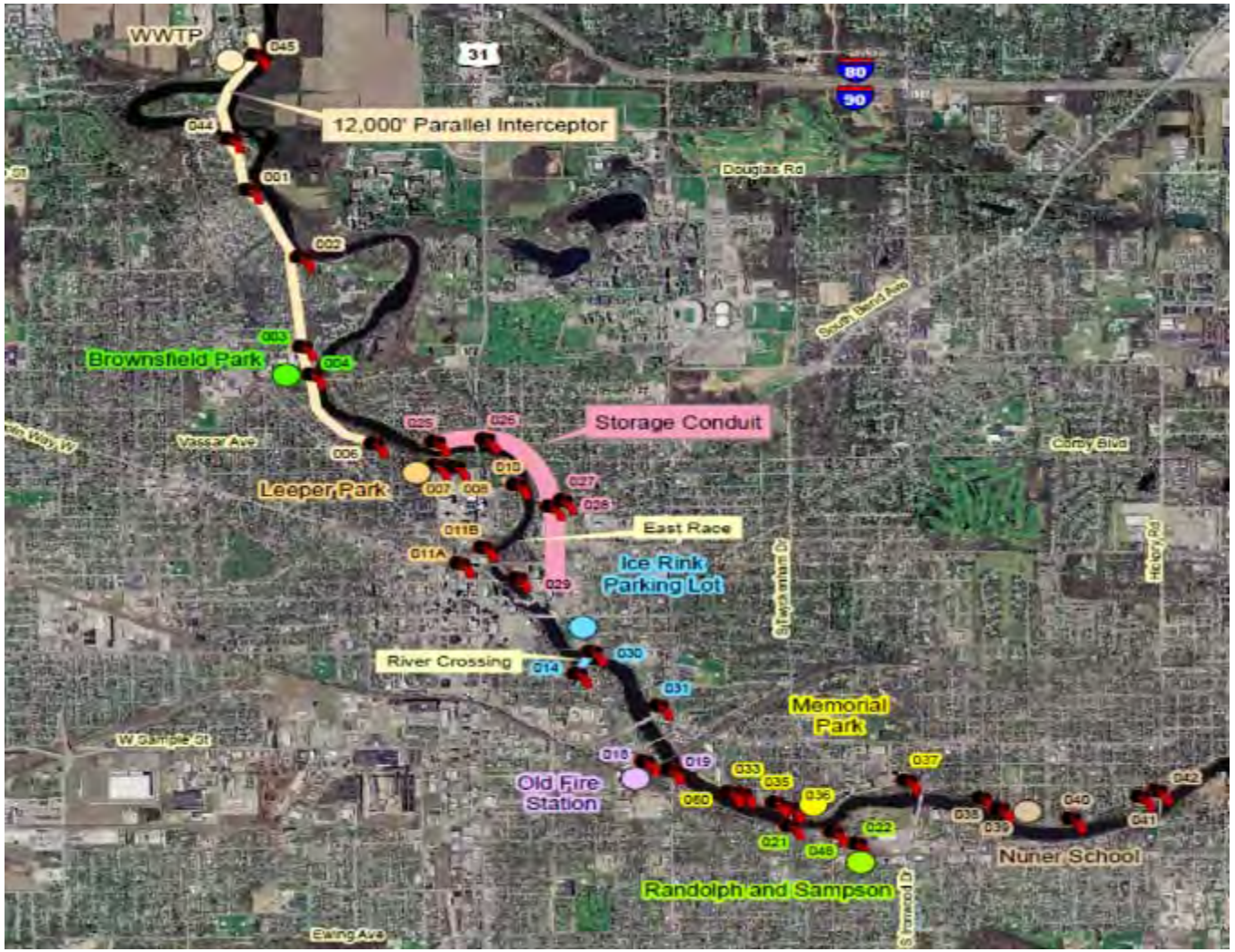
Changing away from CSO approach

- 1994 EPA CSO policy
- 2012 Consent Decree
- 20 year Plan (Long-term Control Plan- LTCP)

What exactly *is* the currently mandated Long-Term Control Plan?



LTCP Phase 2 (Price tag $713m)



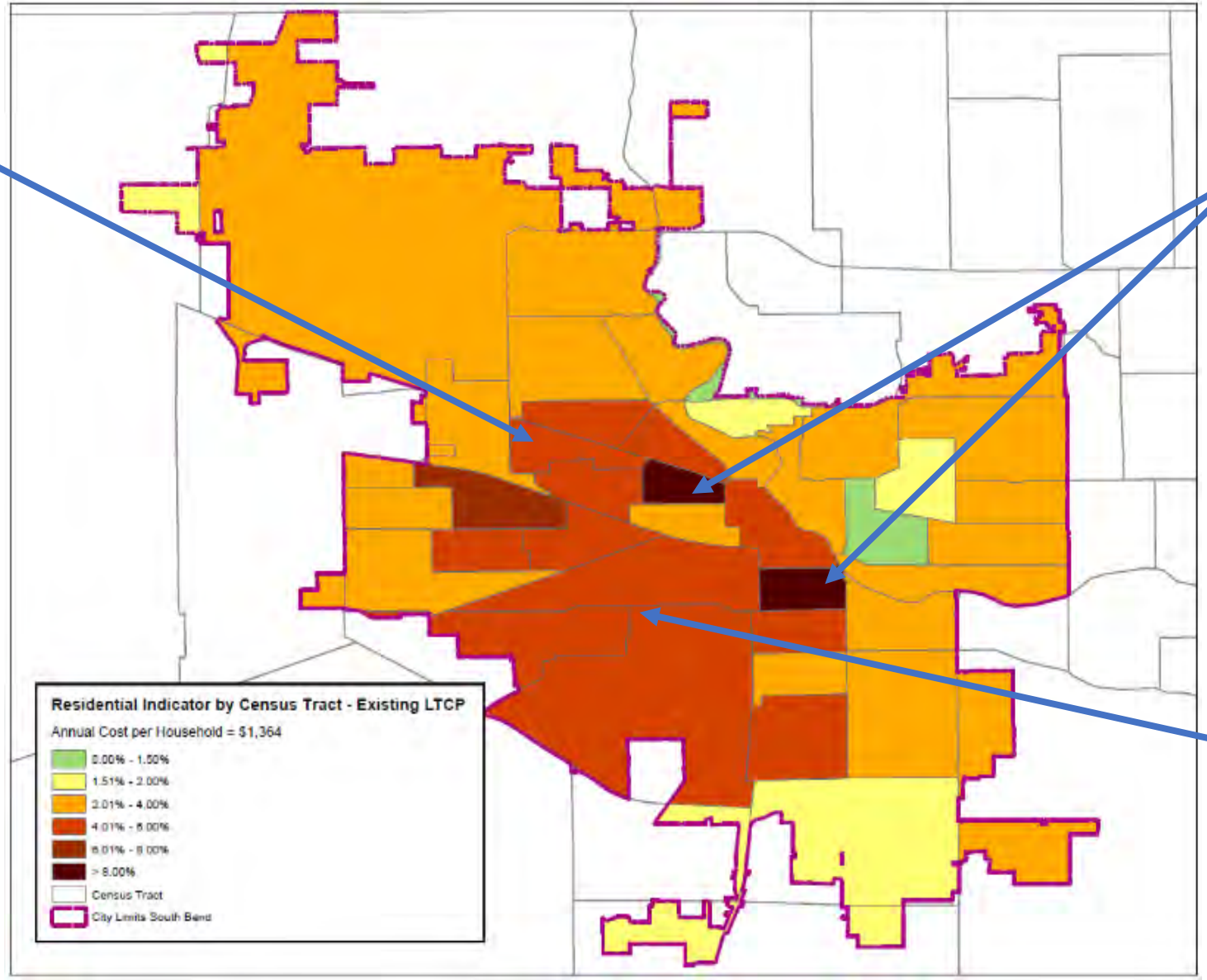
Phase 2 is an exclusively grey infrastructure approach. Unfortunately no smart or green technology.

- 7 Storage tanks
- 1 Storage conduit
- 1 parallel interceptor

But the Problem is Affordability ($713m)

- **1 in 5** households would pay **10%** of their household income just toward their water bill.
- **1 in 10** would pay **14%.**
- On average 3.69% of MHI

Residential Indicator across South Bend



- MHI 35% below National Average
- 1 in 5 Residents over 10% of MHI

Per Capita Income $19K

>20% residents make <$15K

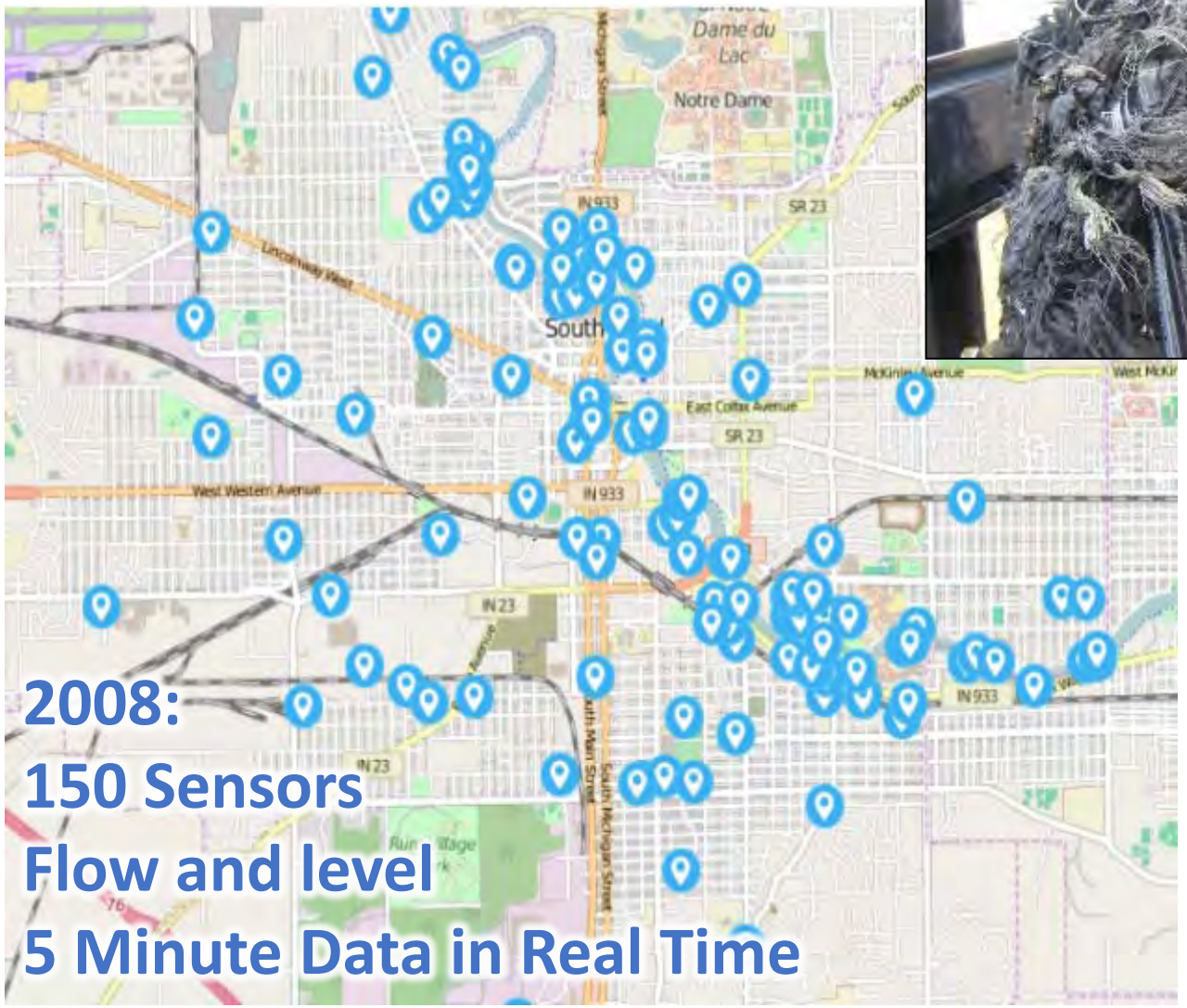
Phase 2 cost $713m. That's $10K for man, woman and child

Affordability ($713m)

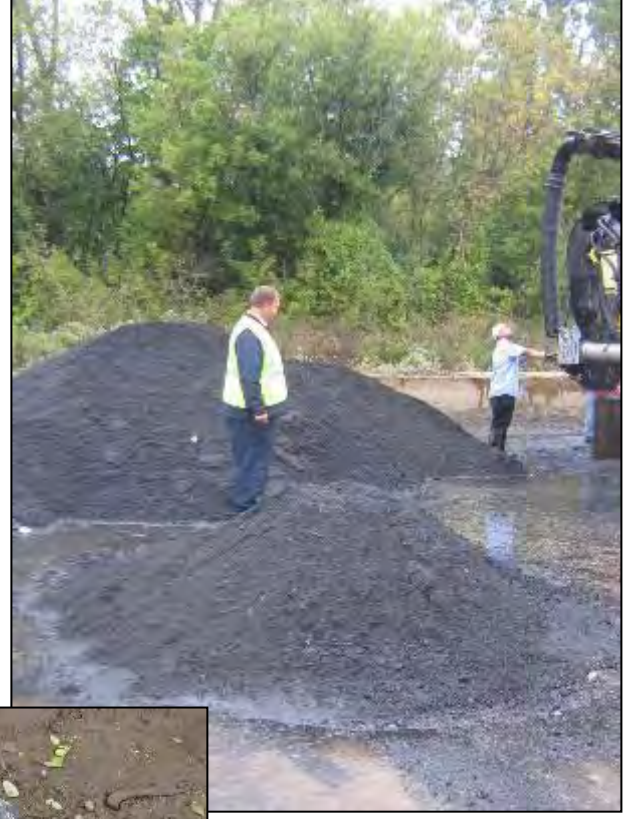
Due to affordability there was clearly need to reimagine the CSO solution.

We used Smart Sewer Sensoring technology and combined it with Green Stormwater Infrastructure and a reduced plan for Grey infrastructure to save over $500m

#1 Turn on the lights

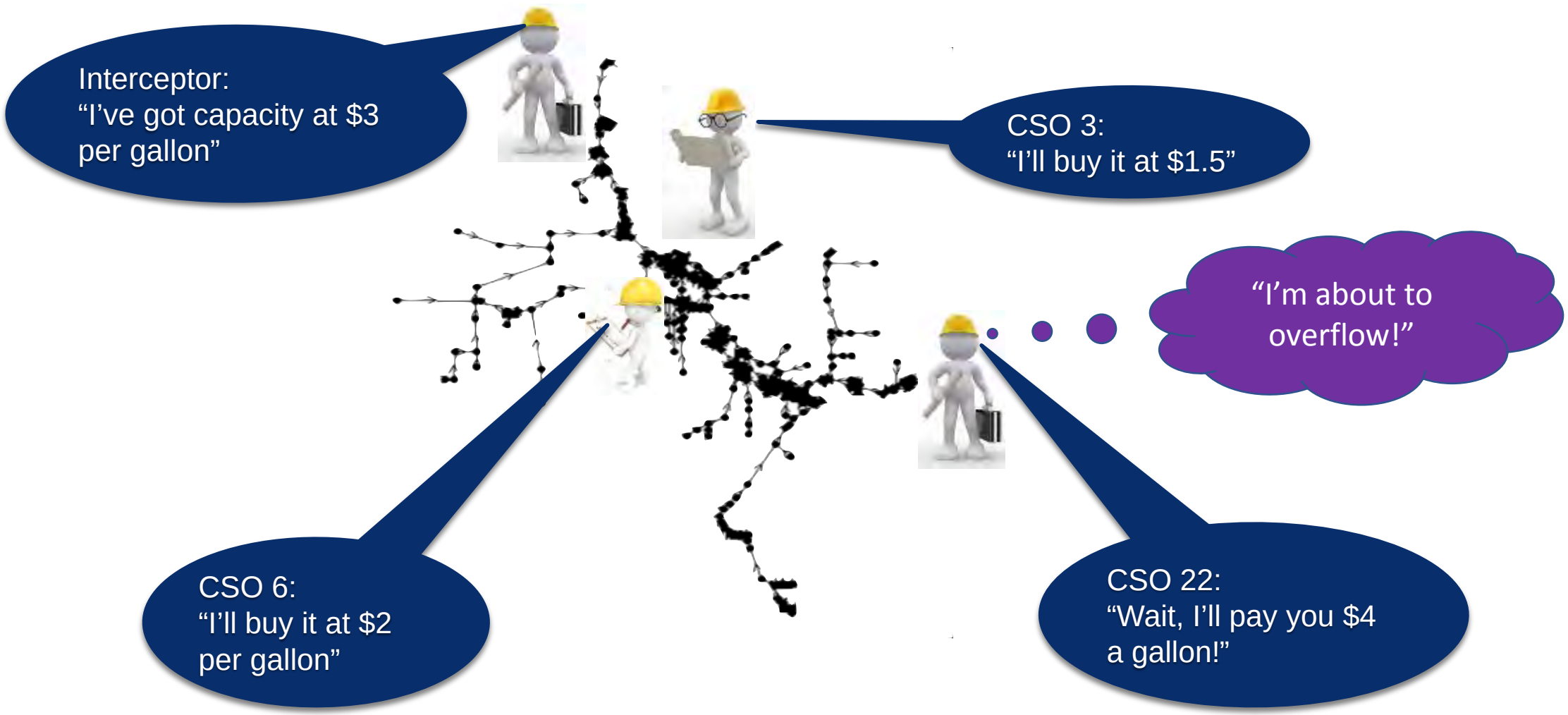


2008:
150 Sensors
Flow and level
5 Minute Data in Real Time



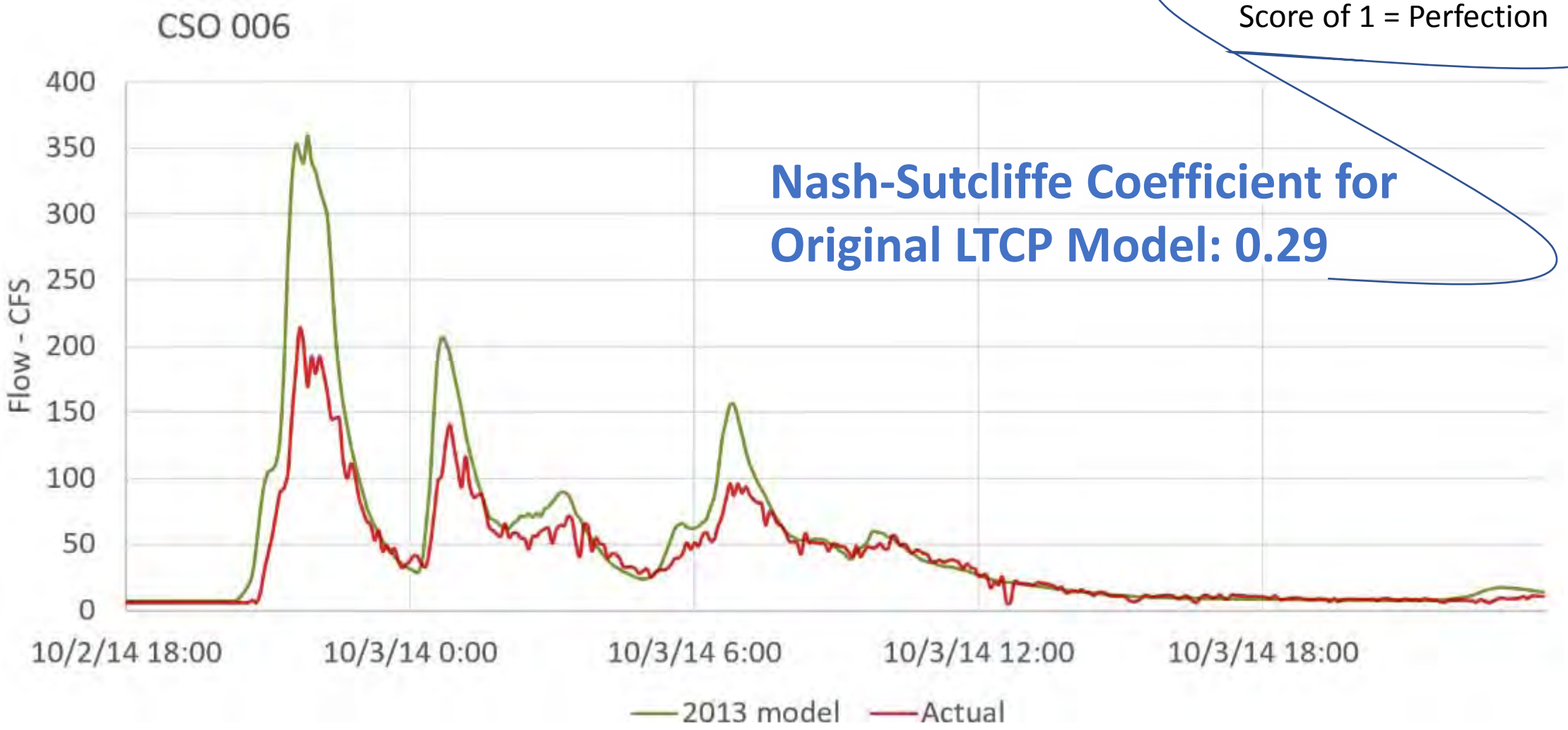
Most densely monitored Sewer System in the World
11,826,000 hours or 1,350 years of data

#2 Operate the Sewershed



#3 Old/Existing LTCP Model

Score of 1 = Perfection



Nash-Sutcliffe Coefficient for Original LTCP Model: 0.29

#3 New Data Driven Model (using gathered “real data”)

Revising the LTCP- summary of previous slides

1. Data-driven maintenance created increased capacity;
2. Real Time Control exceeded expectations in reducing overflows;
3. New hyper-accurate model shows deficiencies in old LTCP model;
4. Original LTCP builds infrastructure but would not address the problem.

Novel South Bend Proposal:

We use our smart sewer data and new model to optimize the LTCP in the cloud!

Revising the LTCP: OptiSWMM

Previously we described how we came up with a better model- meaning, from a quality perspective, it was a better, more quality, product.

The next step regards the frequency of ‘running’ that new model.

Introducing OptiSWMM- allows us to run 1000s upon 1000s of model runs, not just a few scenarios like before. This allows many more permeations of LTCP alternatives to be considered.

LTCP update- how we were able to change

Sewer sensors + time = system knowledge

System knowledge → informing model with real data (CHRS data)

Real Data (CHRS data) + Optimization modelling x 10,000's runs (via OptiSWMM)

→ Next Generation Data Driven alternative

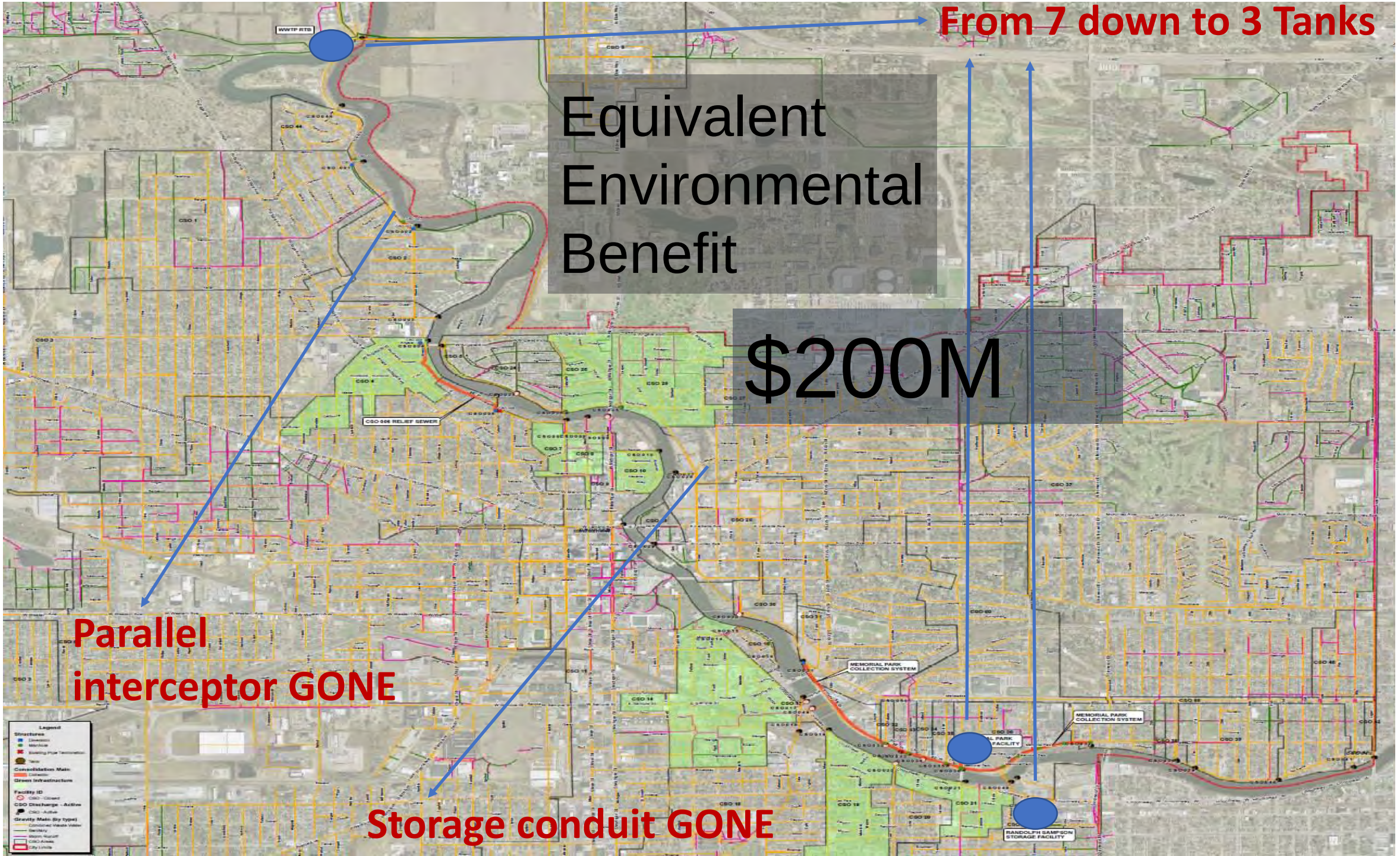
Smarter Alternative for a Greener Alternative

\+ **Plus Green stormwater Infrastructure**

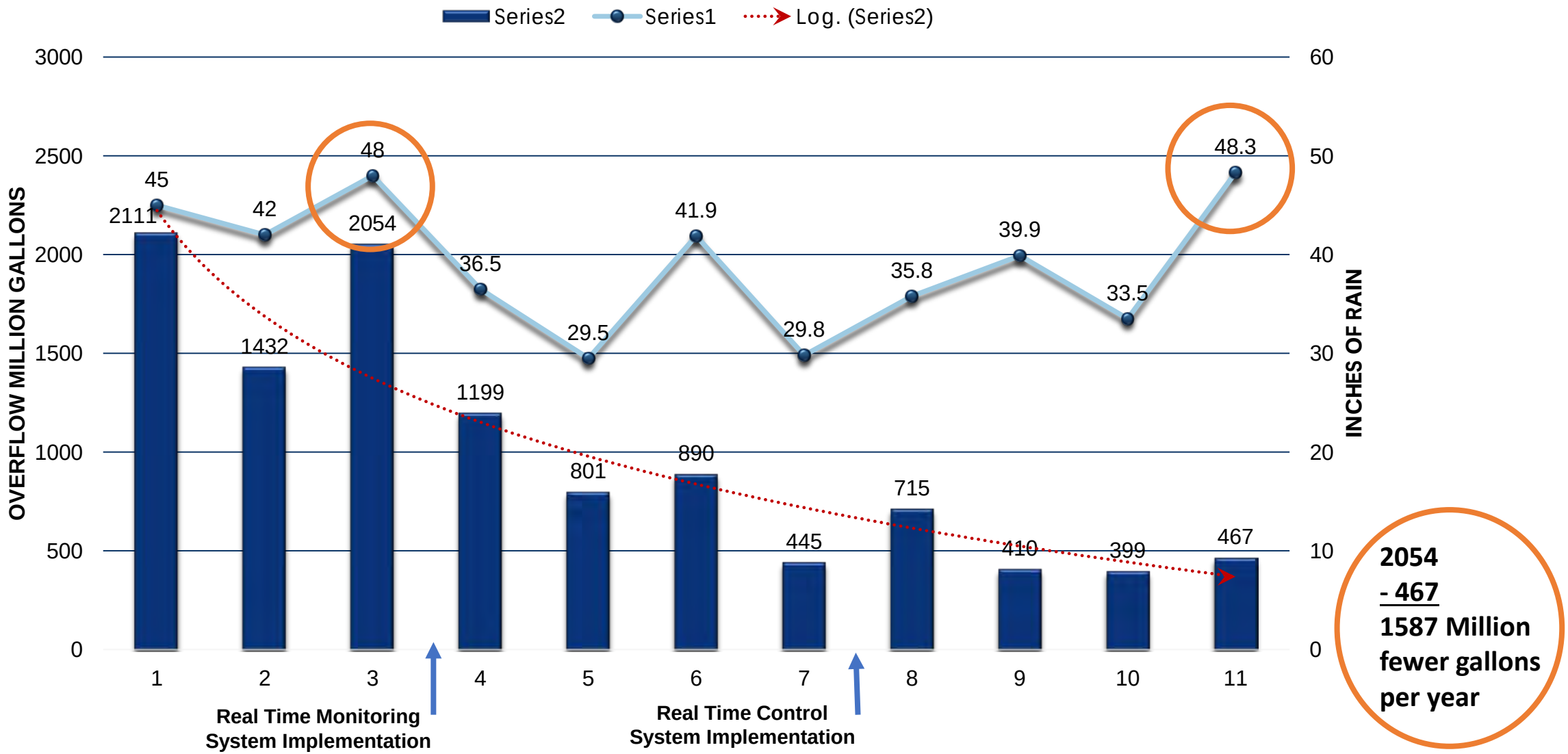
SAGE-SAGE-SAGE-SAGE-SAGE-SAGE-SAGE-SAGE

•South Bend's SAGE plan

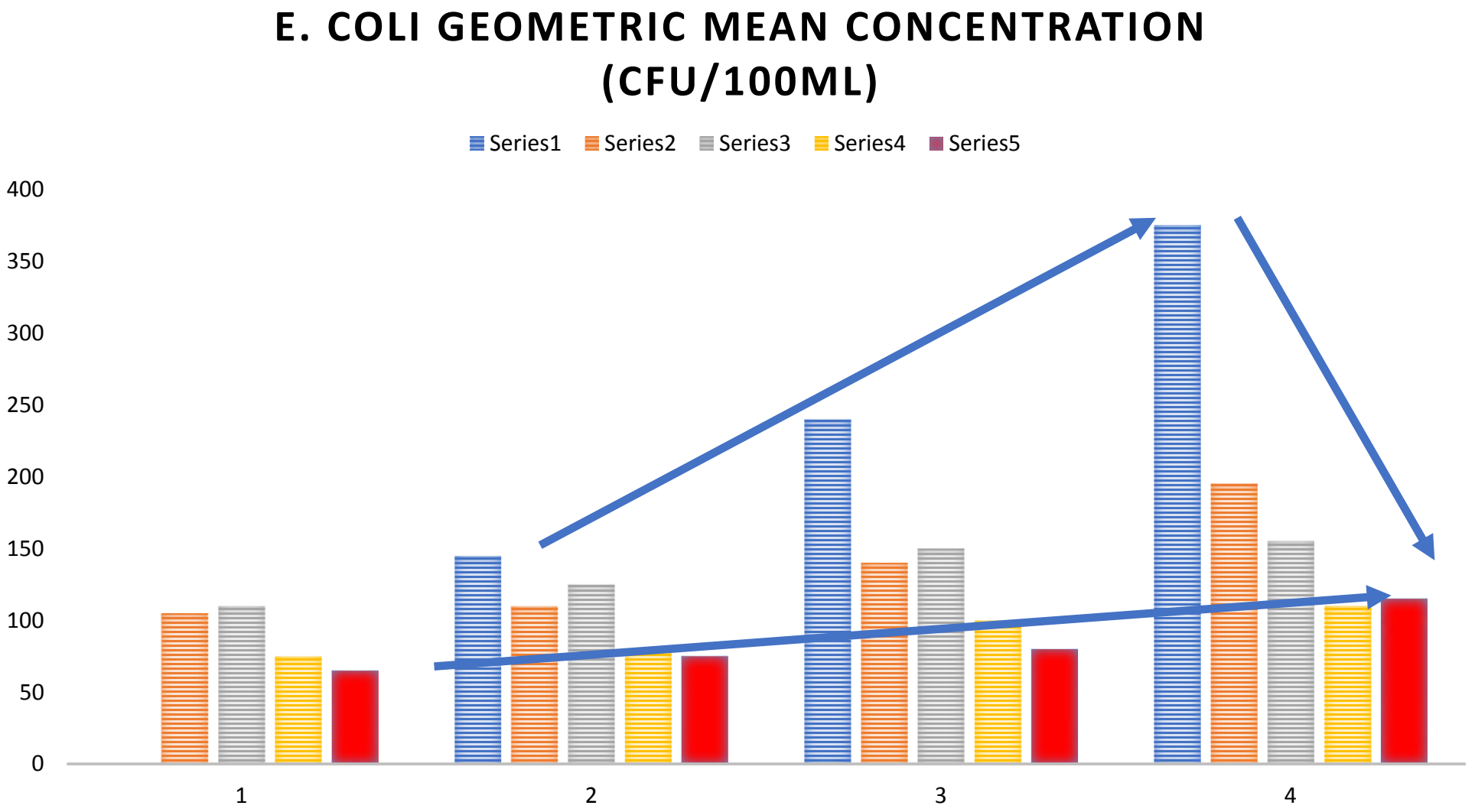
- **Smarter**
- **Alternative for a**
- **Greener**
- **Environment**


From 7 down to 3 Tanks
Equivalent Environmental Benefit
$200M
Parallel interceptor GONE
Storage conduit GONE
SAGE

Success so far:



Steady Water Quality Improvement – Reduced E Coli



The Regulators

Successes so far-

“the EPA and IDEM strongly encourage South Bend’s efforts to develop a less expensive LTCP”

“(South Bend has) pursued an innovative approach by installing over 100 smart sensors in its sewer system”

Thank you! *That’s all folks*

River Basin Roundup

Thank You!

River Basin Roundup

Questions?

(only 3 minutes…)

River Basin Roundup

Questions?

(only 2 minutes…)

Questions?

(only 1 more minute…)

River Basin Roundup

Kevin Haight

Two Rivers Coalition, Inc.

Two Rivers Coalition service area.

TRC only covers the main stem, not the Big South Branch of the Paw Paw River.

TRC works to protect the health of the Black River and Paw Paw River watersheds through **conservation, education, and advocacy**.

This is our 5th season of volunteer stream monitoring for macroinvertebrates.


TRC has been working for years on river clean-ups.
WILDERNESS SYSTEMS


Old Town

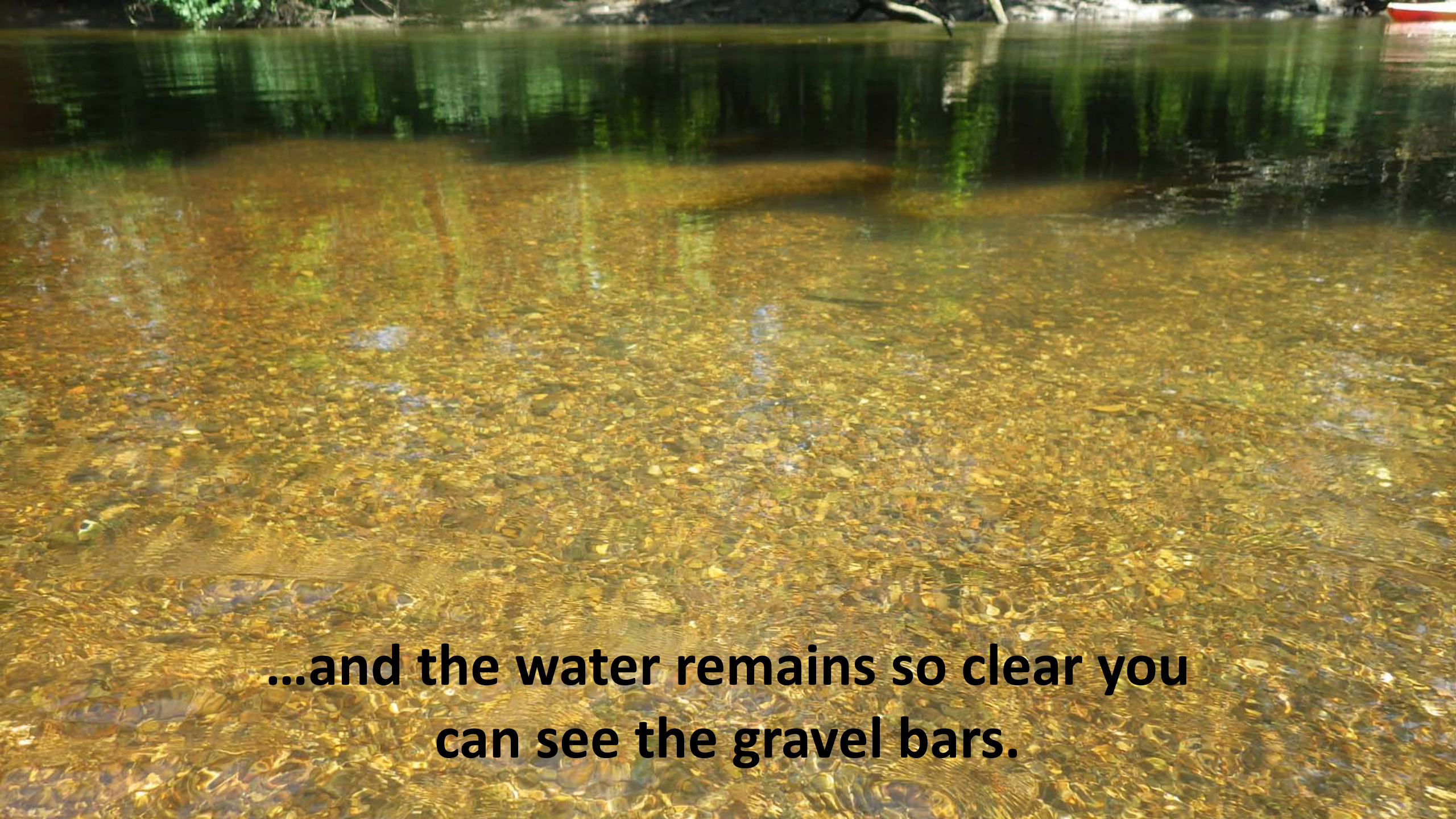

…yes, that is a portable toilet.


SEATTLE, WA

In 2017, TRC began testing for E. coli and has applied for a grant in 2018.


The Paw Paw River Water Trail…
(a stealth campaign to convert
paddlers into environmentalists).


TRC wants to make sure the largest contiguous floodplain forest corridor in SW Michigan is protected…

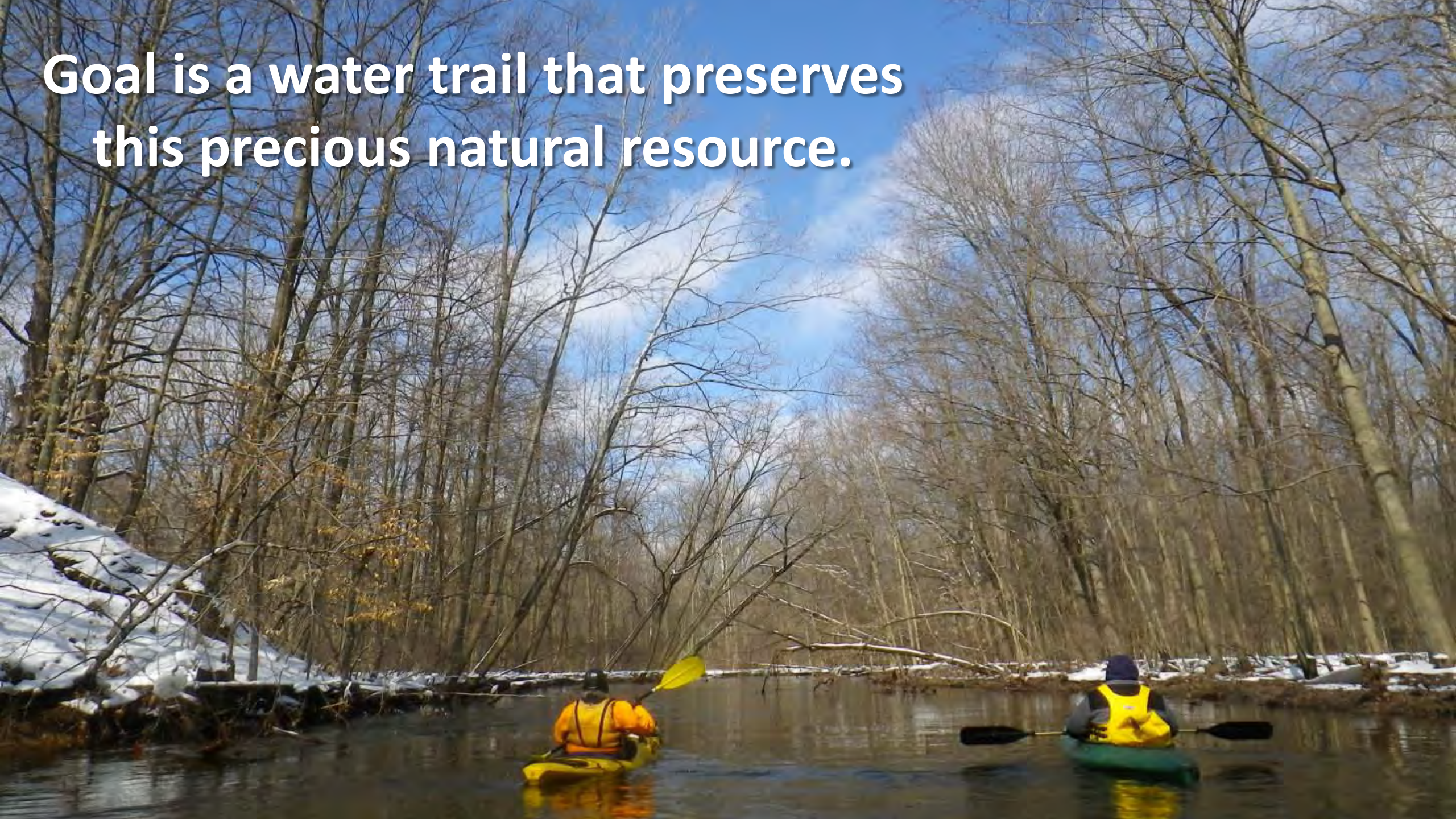

…and the water remains so clear you
can see the gravel bars.

Community paddles build support.


Water trail maintenance
(over 70 miles in 2017)

- Leave rooted or embedded stumps & logs.
- Remove floating or resting logs.


Please don’t try
this at home!


Goal is a water trail that preserves
this precious natural resource.

Full body immersion is NOT recommended

River Basin Roundup

Thank You!

River Basin Roundup

Questions?

(only 3 minutes…)

River Basin Roundup

Questions?

(only 2 minutes…)

Questions?

(only 1 more minute…)

River Basin Roundup

Marcy Hamilton

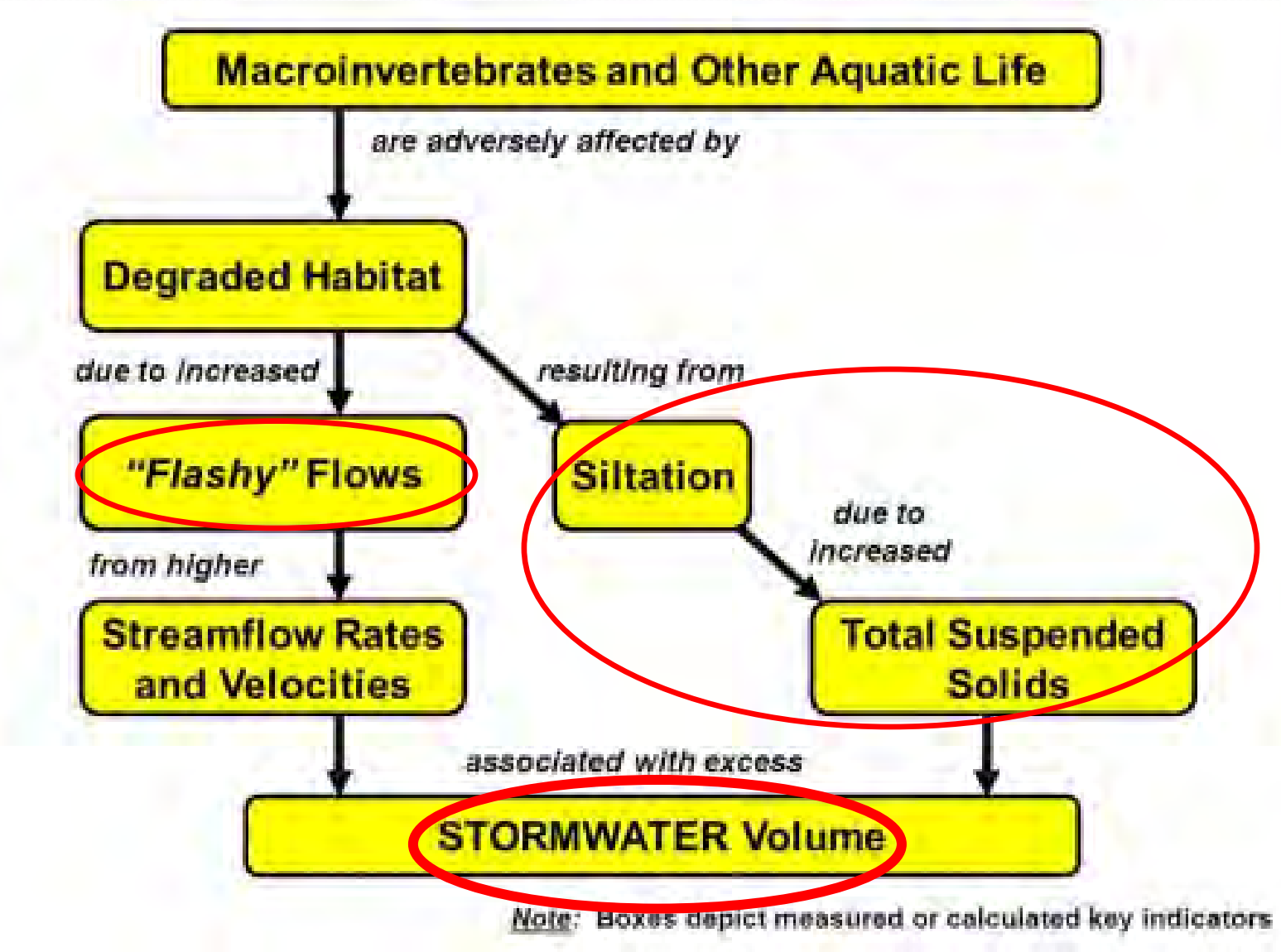
Southwest Michigan Planning Commission

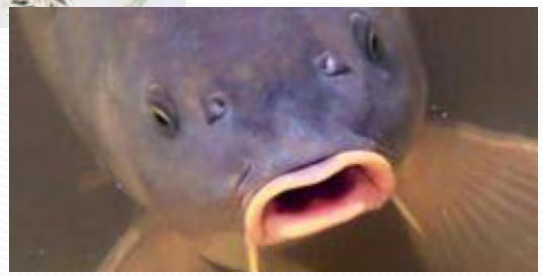
Changing Currents

Sustaining the Ox Creek Watershed

Marcy Hamilton
Southwest Michigan
Planning Commission

Why Ox Creek?


Macroinvertebrates and Other Aquatic Life
are adversely affected by
Degraded Habitat
due to increased
resulting from
"Flashy" Flows
Siltation
from higher
due to increased
Streamflow Rates and Velocities
Total Suspended Solids
associated with excess
STORMWATER Volume
Note: Boxes depict measured or calculated key indicators



OX CREEK WATERSHED

LAND USE / LAND COVER 2010

- High & Medium Intensity Developed
- Low Intensity Developed
- Cultivated Crops
- Pasture/Hay
- Developed Open Space
- Forest
- Wetland
- Water

- Ox Creek Watershed
- Major Roads *(Same color as High & Medium Intensity Developed)*
- Lake, River, Creek & Drain
- Railroad

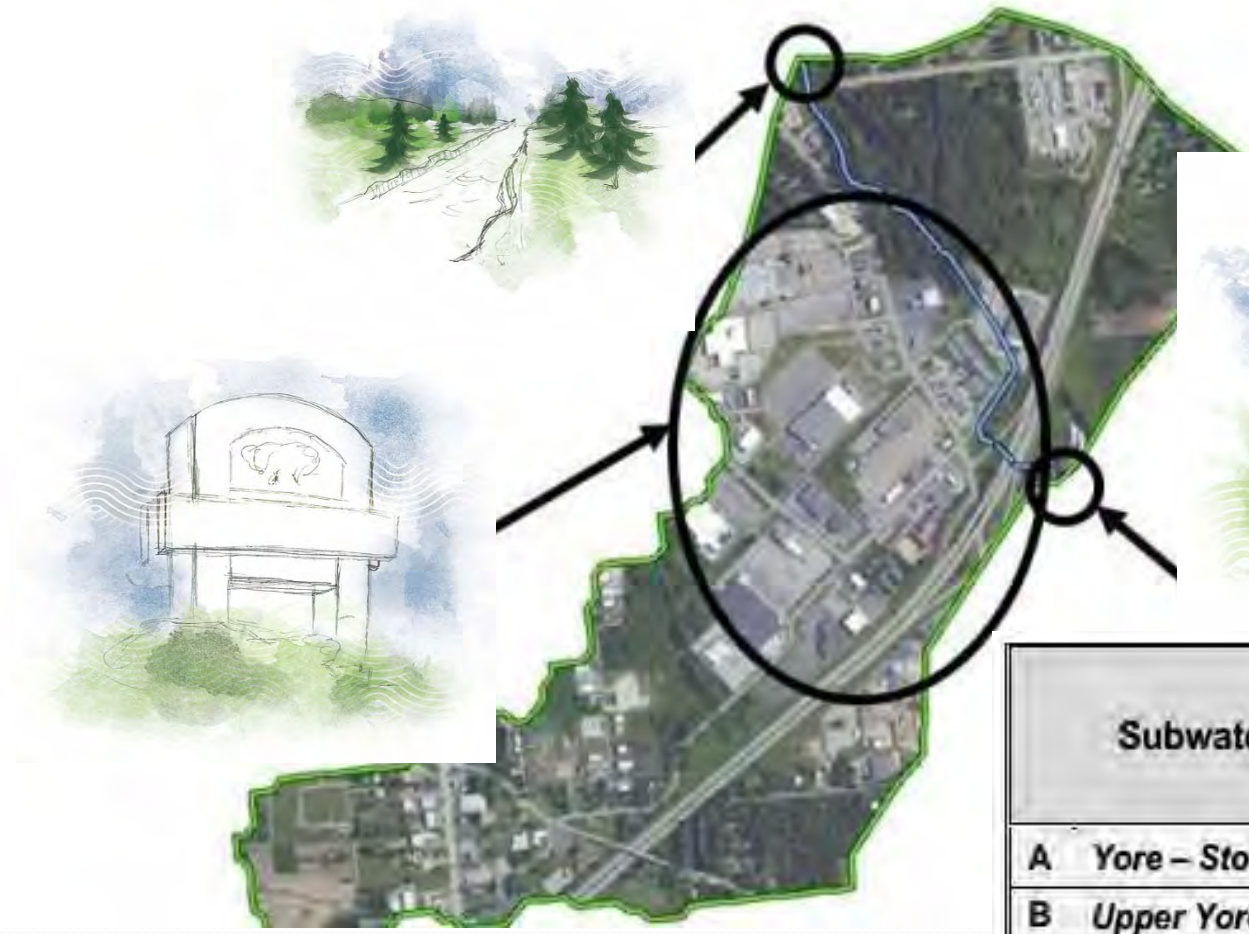
Sources:
Base Layers: Michigan Geographic Framework, V14.
Land Use/Land Cover: Western Great Lakes C-CAP 2010 Land Cover Data, NOAA's Ocean Service, Coastal Services Center (CSC)

February 09, 2016

1 Inch = 2,417 feet

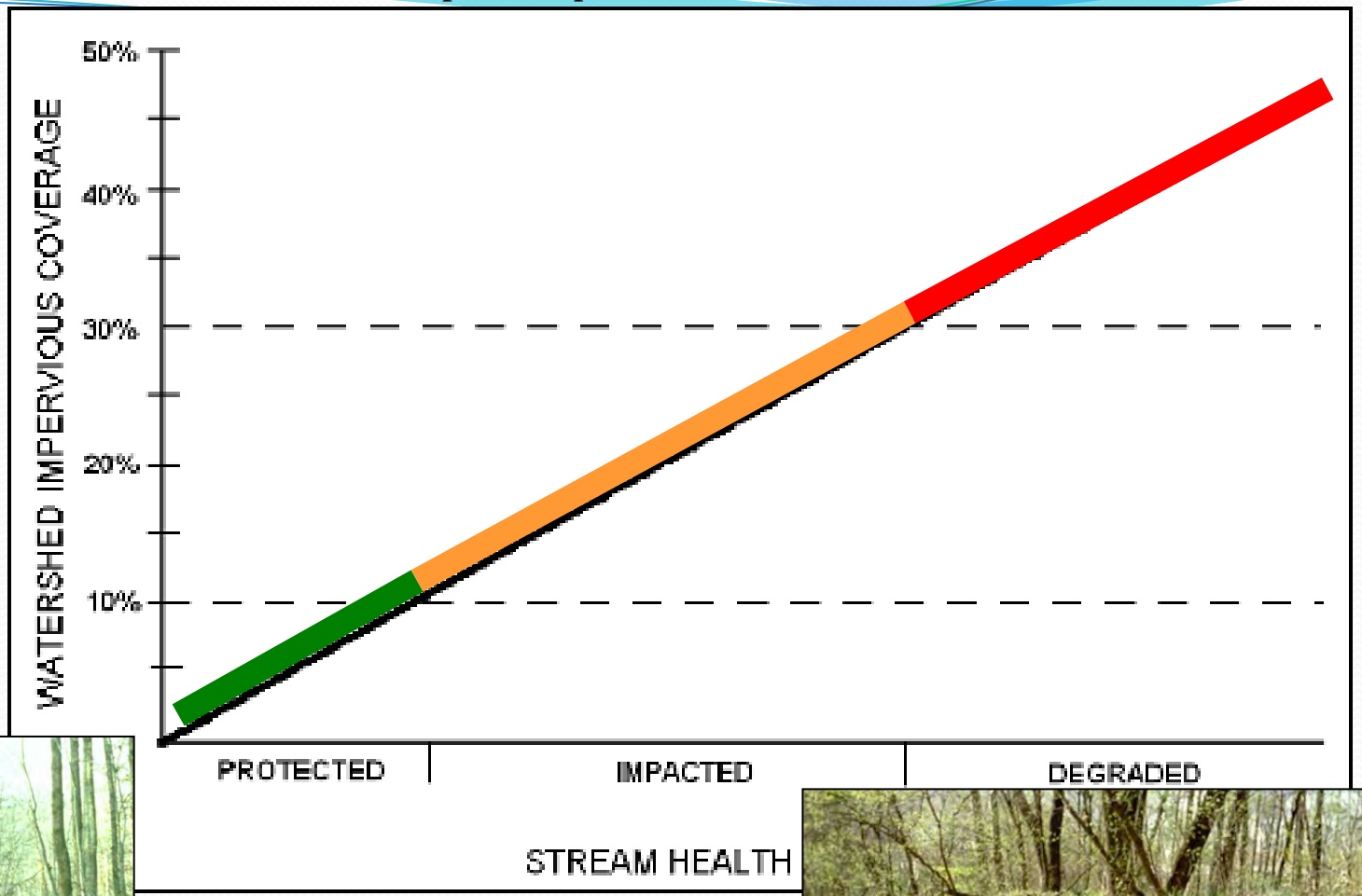
The use of this map is for general reference purposes. It is not a legal document.
Southwest Michigan Planning Commission

5_OxCreek_LULC



Subwatershed		Area (acres)	Development Intensity				Estimated Impervious Cover
			High	Med	Low	Open	
A	*Yore – Stoeffer HW*	2,150	0%	0%	4%	3%	1%
B	*Upper Yore - Stoeffer*	465	0%	0%	4%	6%	1%
C	*Middle Yore - Stoeffer*	1,755	3%	4%	17%	19%	9%
D	*Lower Yore - Stoeffer*	805	17%	27%	17%	25%	34%
E	*Ox Headwaters*	2,600	2%	4%	10%	24%	7%
F	*Upper Ox*	725	10%	20%	25%	33%	26%
G	*Middle Ox*	895	0%	8%	29%	53%	13%
H	*Lower Ox*	1,060	5%	17%	35%	39%	22%
I	*Ox Outlet*	104	20%	32%	27%	19%	41%

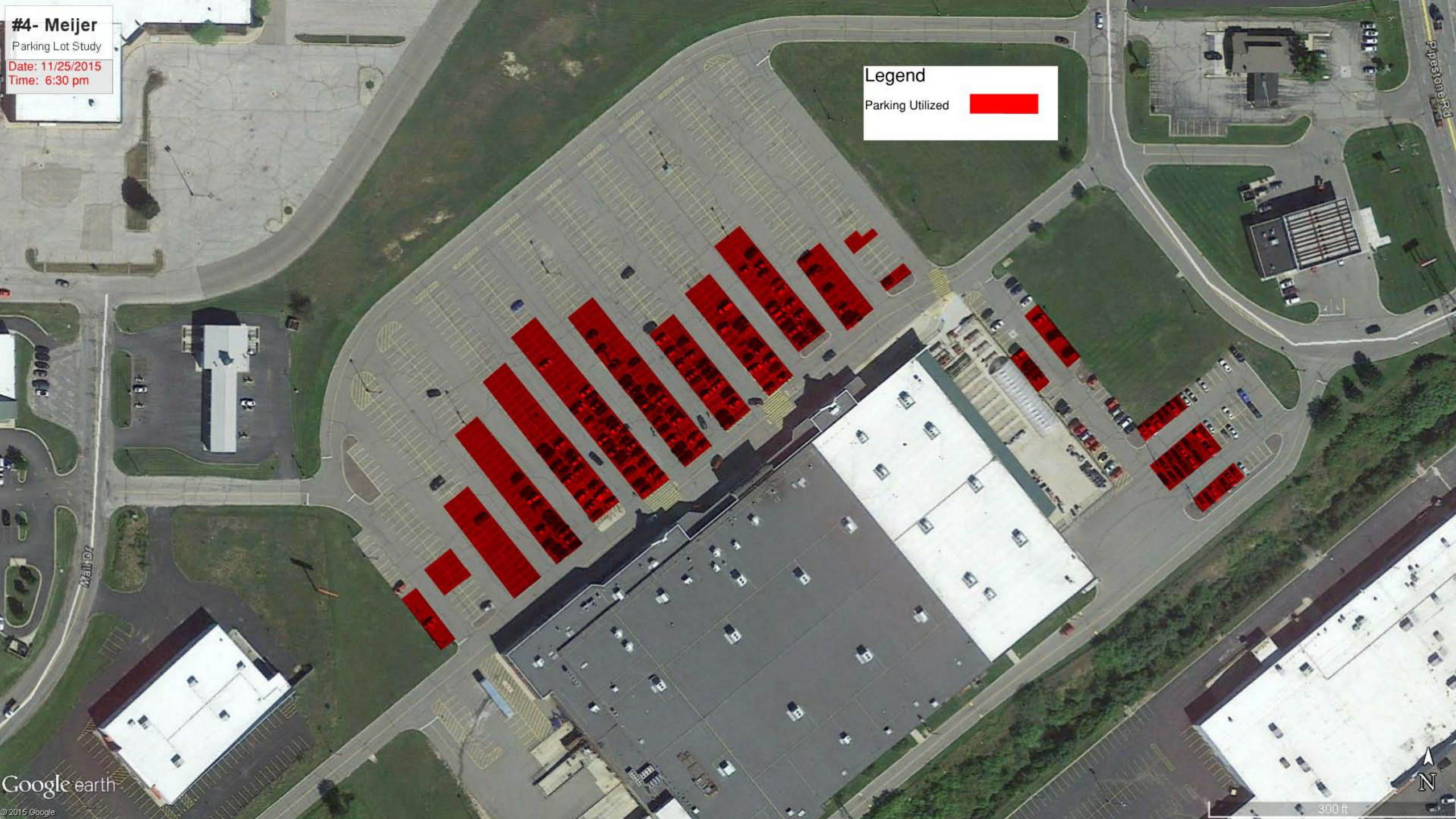
FIGURE 1 - Relationship of Impervious Cover to Stream Health



315 acres total

95 acres (30%) stormwater treated (blue areas)

220 acres (70%) stormwater not treated


#4- Meijer
Parking Lot Study
Date: 11/25/2015
Time: 6:30 pm
Legend
Parking Utilized
Mall Dr
Pipestone Rd
Google earth
© 2015 Google
N
300 ft

CHANGING CURRENTS

Sustaining the Ox Creek Watershed

OX CREEK

EXIT 29

PIPESTONE CORRIDOR

ORCHARDS MALL

MALL DRIVE RESIDENTIAL/COMMERCIAL DISTRICT

AGRICULTURAL LAND

A sustainable Ox Creek Watershed will enhance the quality of life in Benton Township by improving environmental vitality and supporting regional economic growth.

Low impact, mixed use development, increased green space, and improved accessibility will promote clean water, beautify the surrounding area, and establish an attractive destination for local businesses, residents and visitors.

CHANGING CURRENTS

Sustaining the Ox Creek Watershed

12/1/16: Steering Committee Kick-Off Meeting

1/17/17: Benton Charter Twp Kick-Off Meeting

DISCOVERY

REQUEST INPUT

2/8/17: Stakeholder's Meeting @ Orchards Mall

ENGAGEMENT

REVIEW

2/24/17: Design Charrette with Andrews University

VISION

REVIEW & REVISE

Ongoing Meetings: Township, Drain Commission, Business Owners

PLANNING

REVIEW & REVISE

9/30/17: WAI Rain Garden Installation

SHORT-TERM IMPLEMENTATION

ASSESS & ADJUST

DEQ Grant, Drain Commissioner's Office, Twp. Master Plan.

LONG-TERM IMPLEMENTATION

ASSESS & ADJUST

ENGAGEMENT

POSITIVE CHANGE

TOP OF THE LIST

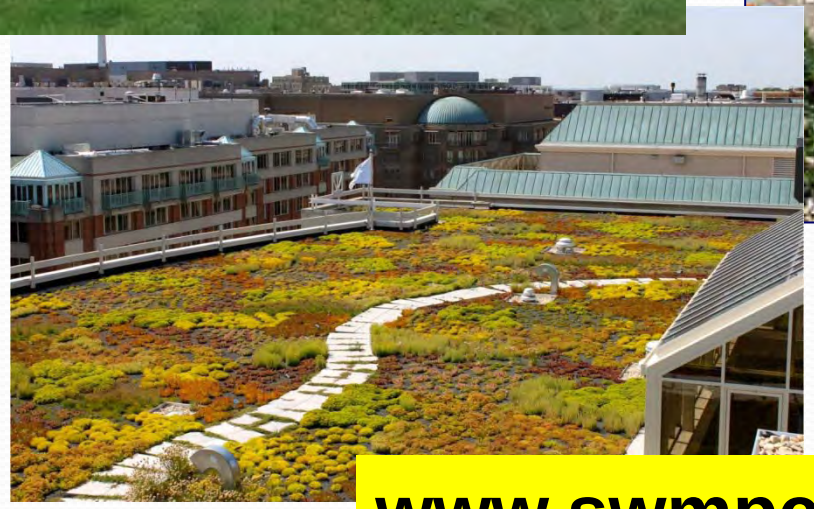
- Improve Road Safety
- Manage Water Run-Off
- Revitalize Mall Area

Ox Creek Low Impact Development Phase I

- Berrien County Drain Commission
- Southwest Michigan Planning Commission
- Benton Charter Township
- Brookfied Chrysler Dodge
- Wightman
- Two Rivers Coalition
- Cornerstone Alliance

Low Impact Development

- Water – slow it down, spread it out, soak it in



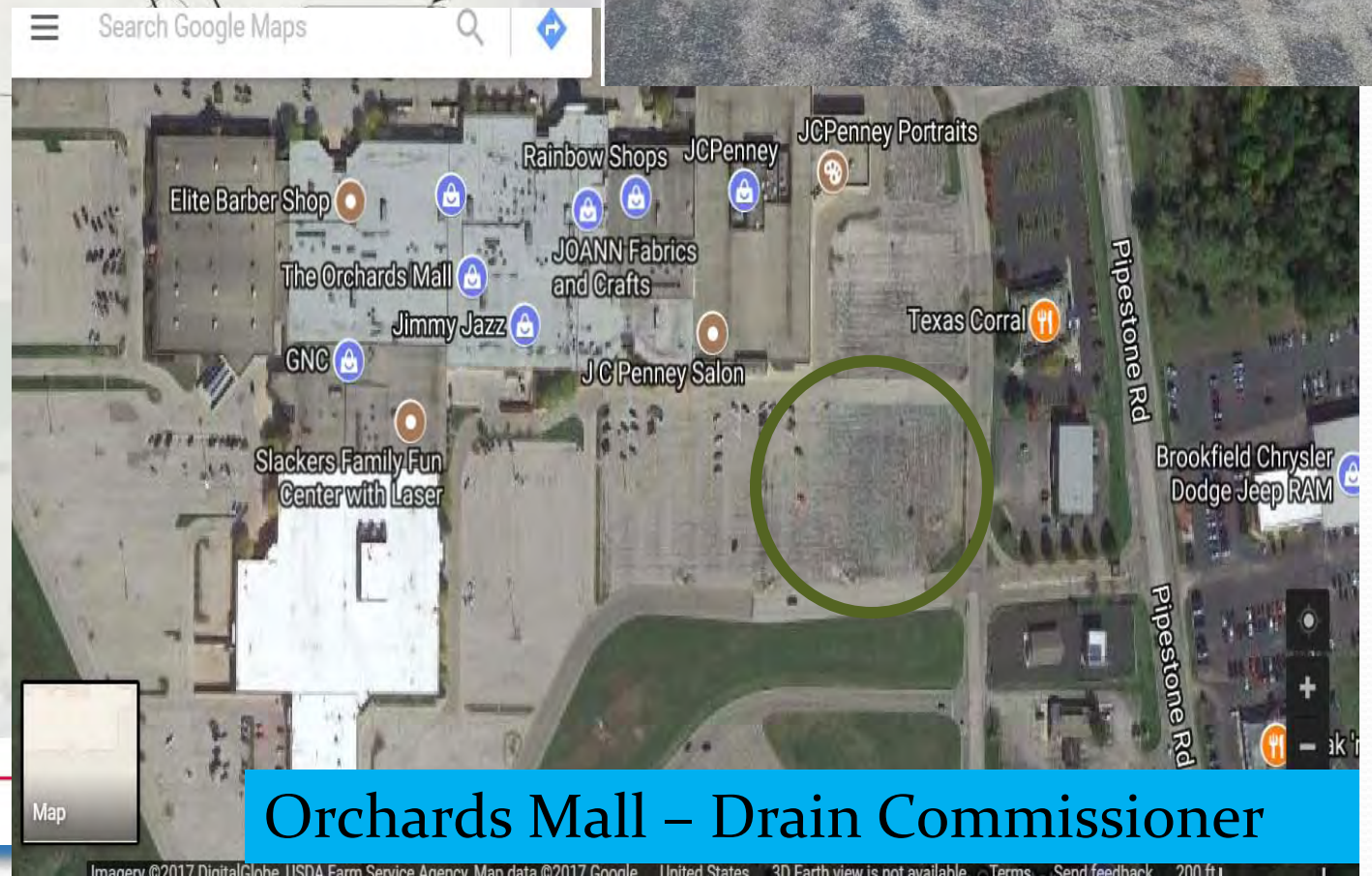
www.swmpc.org/lid.asp

Wightman Rain Garden

SHORT-TERM IMPLEMENTATION

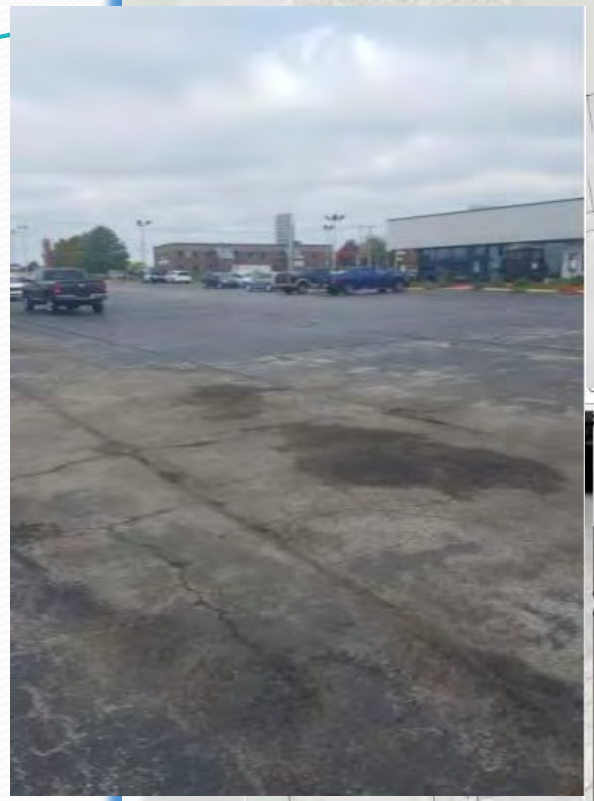
SHORT-TERM IMPLEMENTATION

Remove 46,000 ft²
11,200 ft² swales
35,400 ft² dry detention



Orchards Mall – Drain Commissioner

Remove 8,000 ft^2
4 rain gardens
1 infiltration basin 14,200 ft^2



Brookfied Chrysler Dodge

RESULTS

Treat 30 acres

Annual Reductions of:

48,000 lbs sediment

345 lbs nitrogen

27 lbs Phosporus

Ancillary Benefits

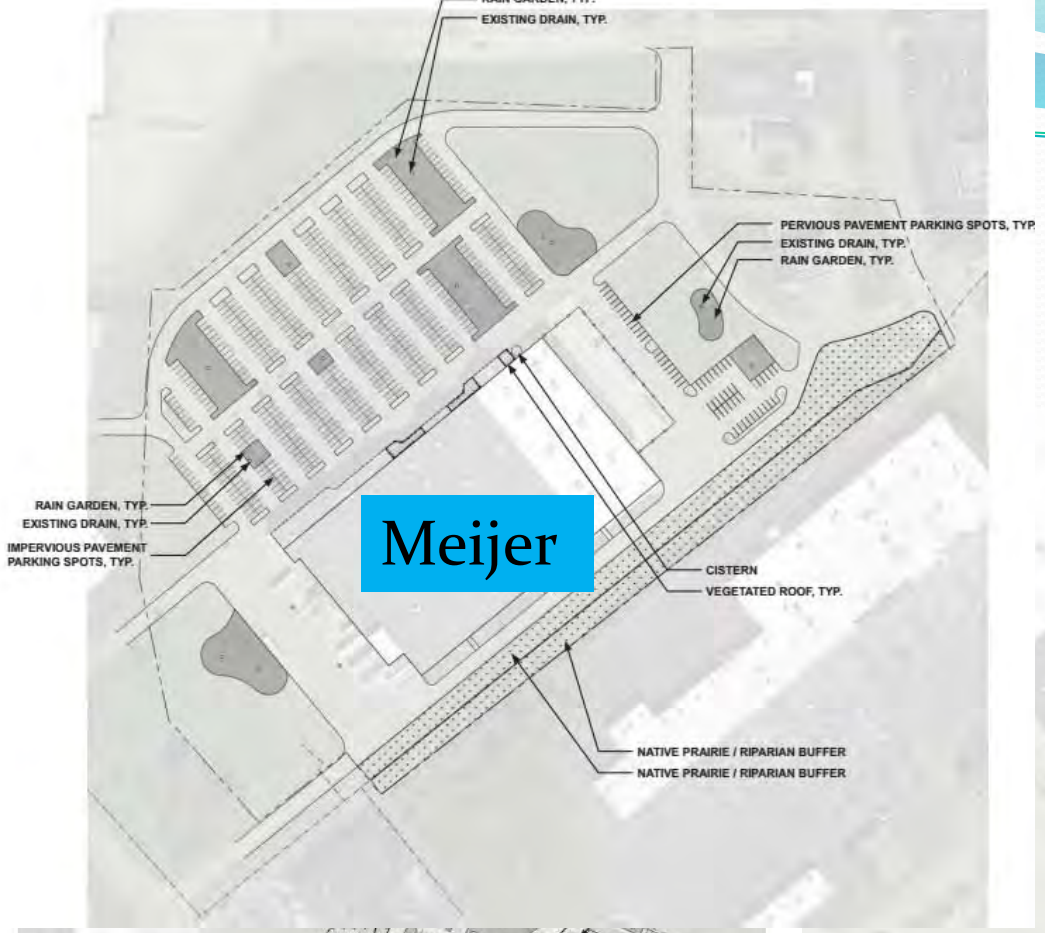
Green – improve aesthetics

Placemaking Opportunity

Attract Development & Investment

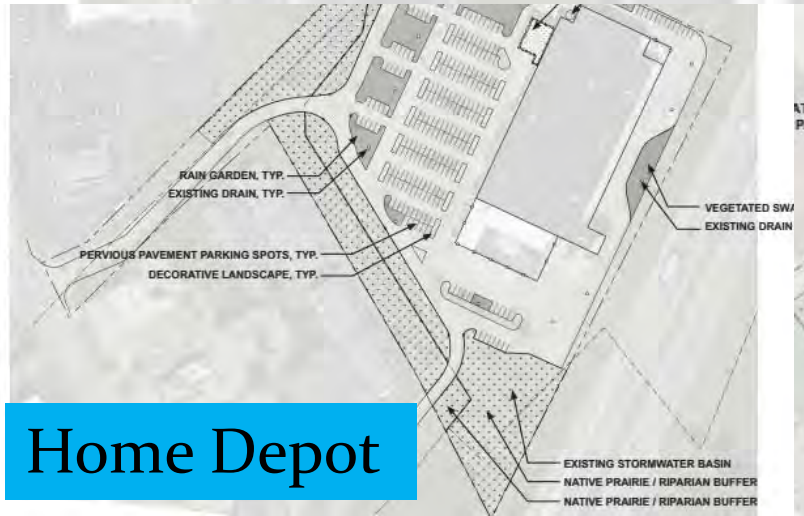
PLANNING

I-94/Pipestone Exit



Meijer

Celebration Cinemas



Home Depot

Benton Charter Township Master Plan

Incorporate Ox Creek – Orchards Mall vision

Recommendations:

- Green Infrastructure Guidelines
- Parking Standards
- Frontage Requirements
- Signage/Wayfinding
- Sidewalks/non-motorized improvements
- Corridor Improvement Authority
- Petition Drain Project

A sustainable Ox Creek Watershed will enhance the quality of life in Benton Township by improving environmental vitality and supporting regional economic growth.

Low impact, mixed use development, increased green space, and improved accessibility will promote clean water, beautify the surrounding area, and establish an attractive destination for local businesses, residents and visitors.

River Basin Roundup

Thank You!

River Basin Roundup

Questions?

(only 3 minutes…)

River Basin Roundup

Questions?

(only 2 minutes…)

Questions?

(only 1 more minute…)

River Basin Roundup

Jonathon Schramm

Merry Lea Environmental Learning Center of Goshen College

“In wild wetlands is the preservation of the world”

or, Wetland restoration and the future of our rivers

Dr. Jonathon Schramm
Sustainability and Environmental Education Dept.
Goshen College

Merry Lea
Environmental Learning Center
of Goshen College

The first call to action was to acute threats,

our call is to a chronic one, the simple loss of habitat.

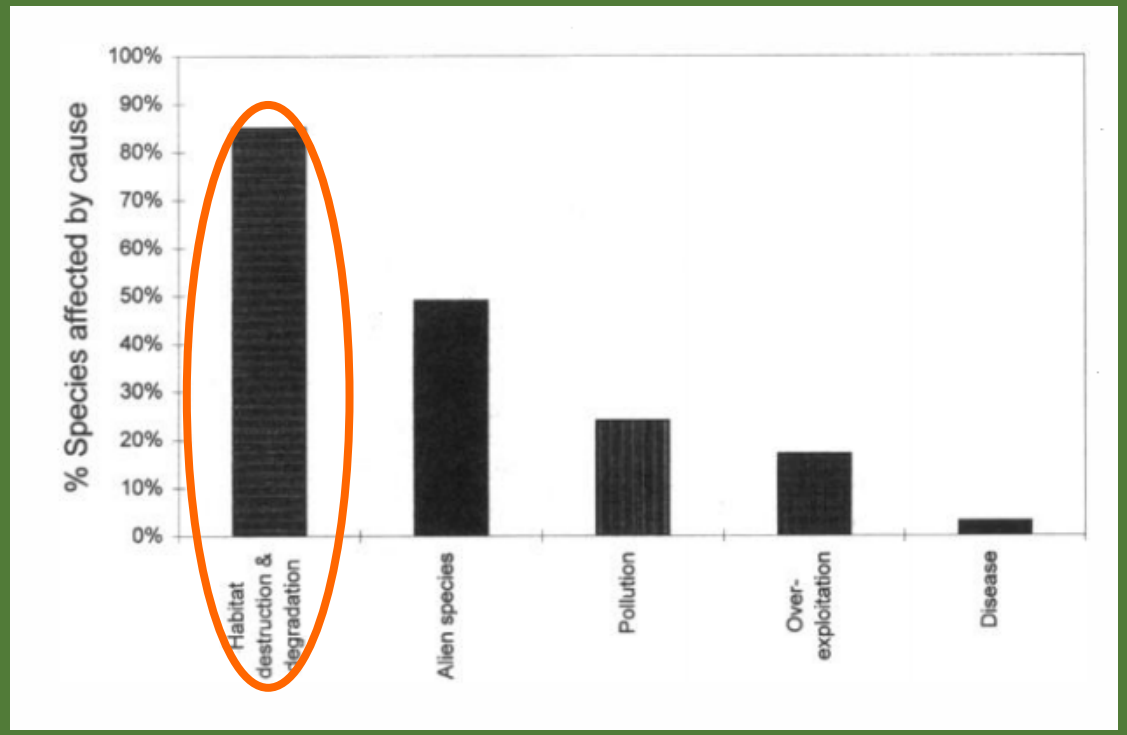
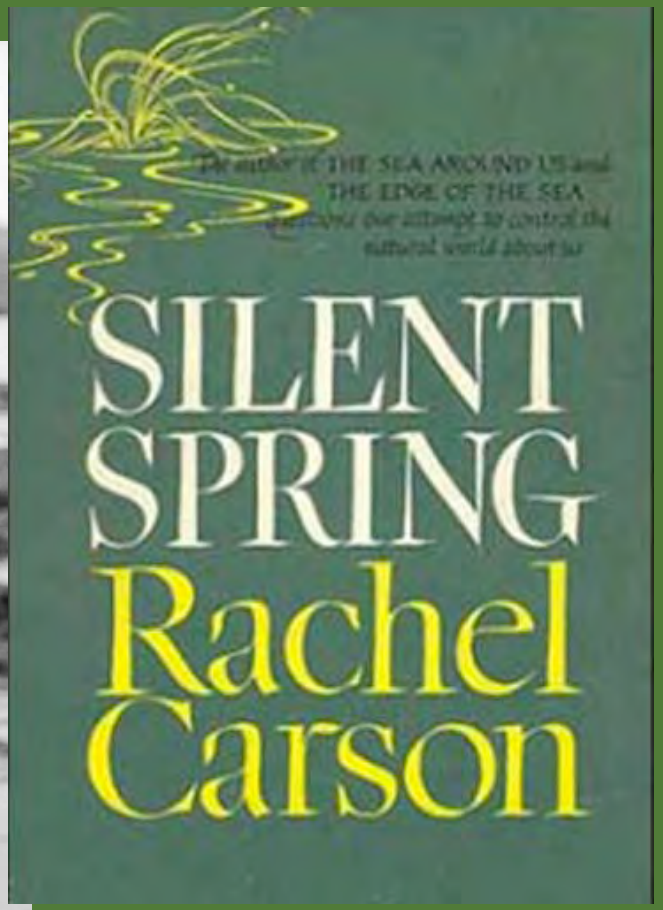
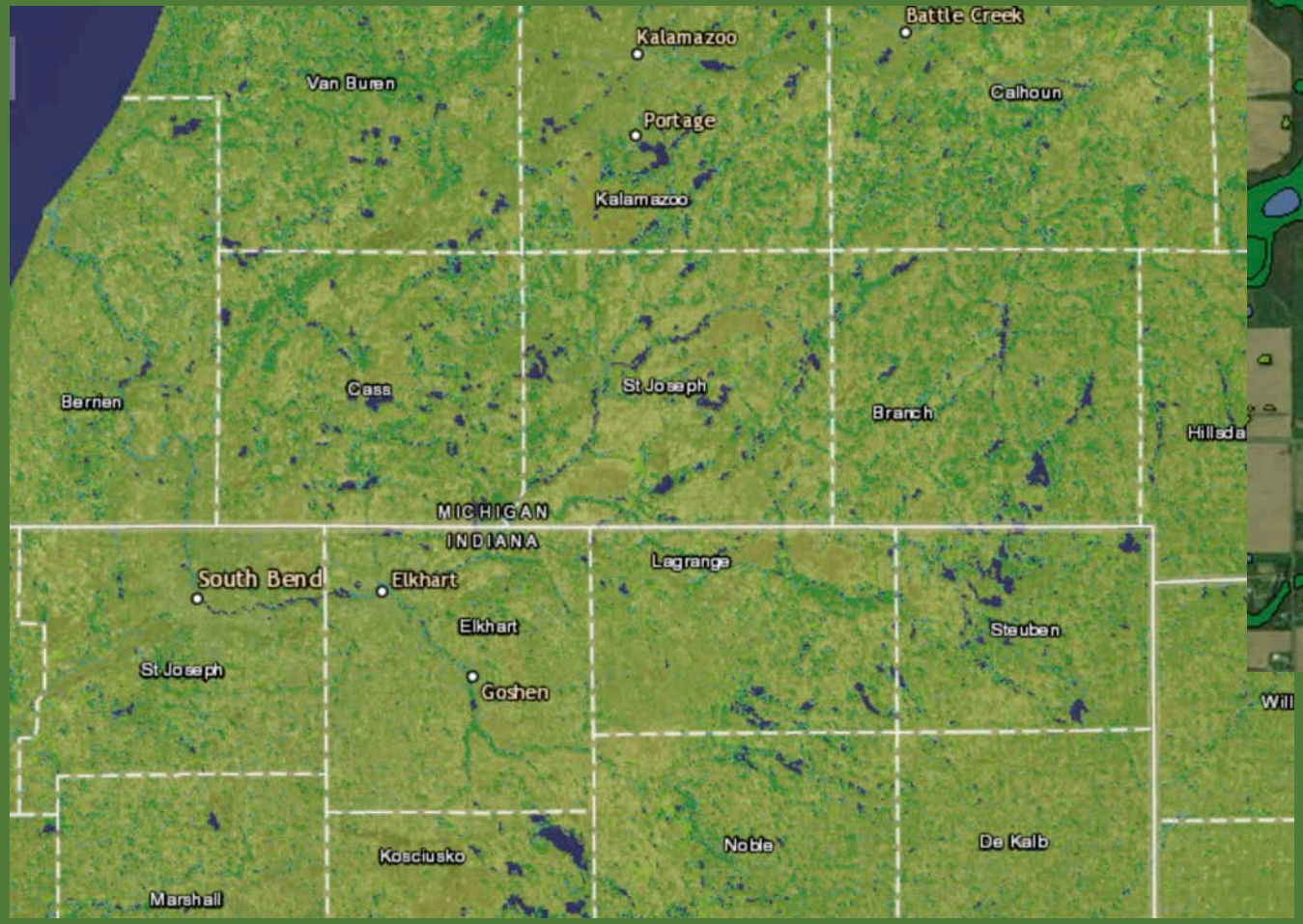


Photo by Alfred Eisenstaedt, LIFE Picture Collection



Source: Wilcove et al. 1998, *Bioscience*

Merry Lea
Environmental Learning Center
of Goshen College

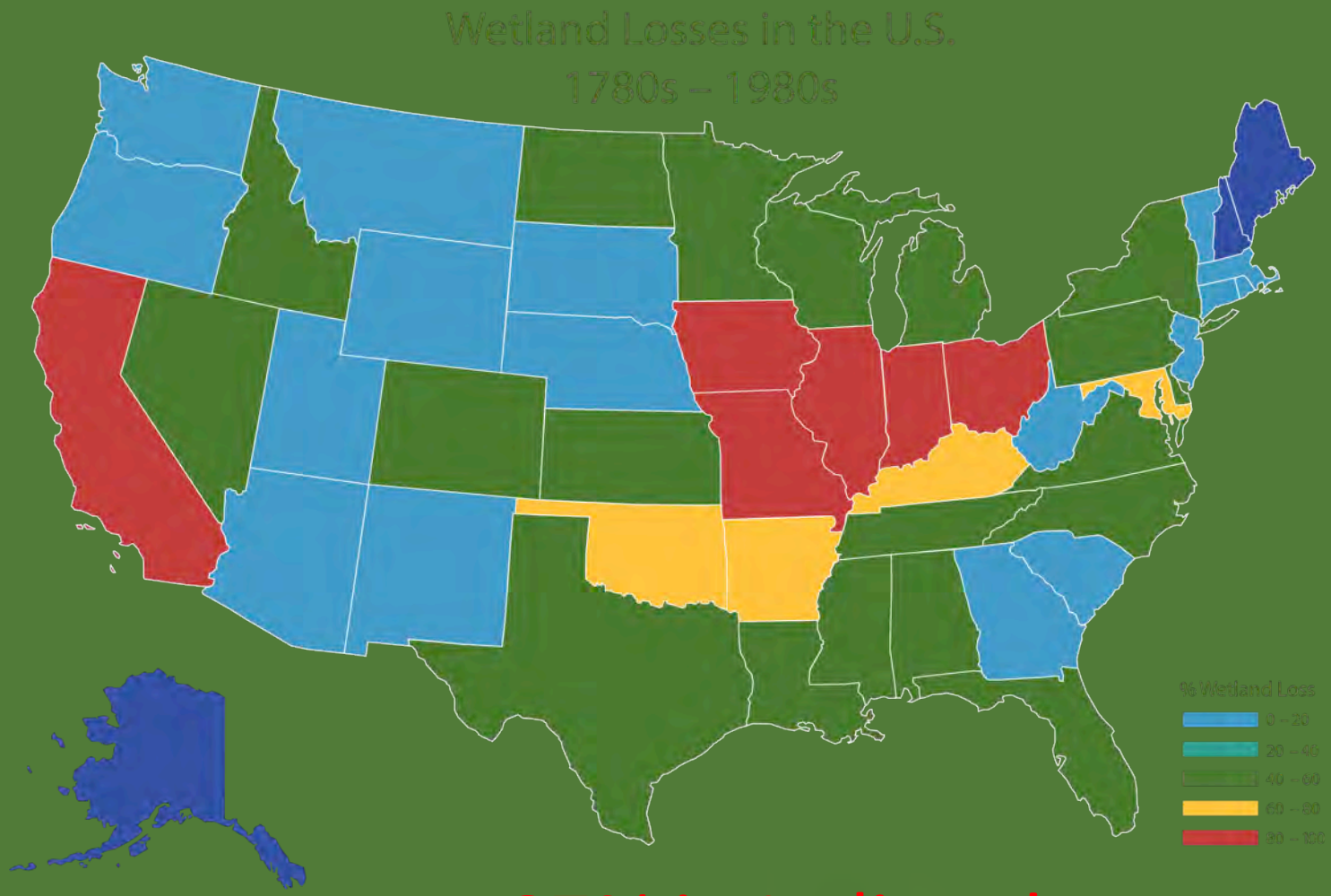


Source: US FWS, Wetlands Mapper

Merry Lea
Environmental Learning Center
of Goshen College

Wetland Losses

- Glacial Midwest has been especially hard hit
- Agricultural drainage and urban development



87% in Indiana!

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of Goshen College

Legislation and Wetlands

Source: Wheaton (IL) archives

Source: King County (WA)

- Swamp Lands Acts (1849, 1850, 1860)
- More holistic: Clean Water Act (1977) and Food Security Act (1985)

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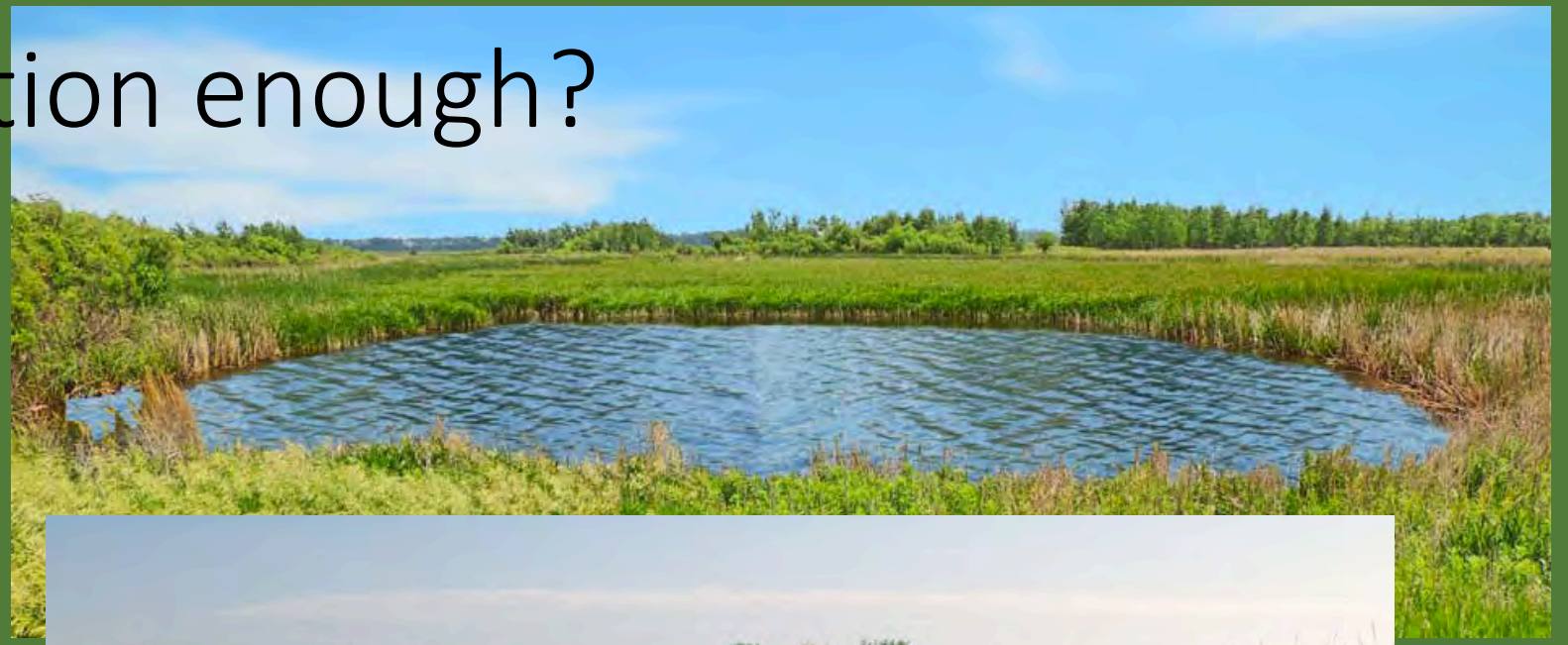
Is mitigation enough?



tion Co.

Source: Ducks Unlimited Canada

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of Goshen College

Wetland Restoration at Merry Lea

Merry Lea
Environmental Learning Center
of Goshen College

Onion Bottom - 1991

Onion Bottom - 1991


Onion Bottom - 2016

Kesling Wetland - 1991

Kesling Wetland - 1993

Kesling Wetland - 2014

Wilmer Meadow - 2010

Wilmer Meadow - 2011

Wilmer Meadow - 2016

Benefits of Aiming High

- Biodiversity is waiting (and beautiful)!

- Improved hydrology increasingly crucial in changing world

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of Goshen College

Imagine the St. Joe Basin…

- Continuing to add wetland acreage year-by-year
- Investing in quality restorations that benefit people and place

This can be our future!

River Basin Roundup

Thank You!

River Basin Roundup

Questions?

(only 3 minutes…)

River Basin Roundup

Questions?

(only 2 minutes…)

Questions?

(only 1 more minute…)

River Basin Roundup

Thank You Everybody!