

NORTHEAST OHIO REGIONAL SEWER DISTRICT

REGIONAL STORMWATER MANAGEMENT PROGRAM

Highland Park Golf Course Stream Restoration
Mill Creek Watershed in Highland Heights

Watershed Advisory Committee
October 2017

Your Sewer District Keeping our Great Lake great.

Agenda

- Stormwater Construction
 - On-going projects
 - 2018 Stormwater Construction Plan
- Stormwater Master Plan
- Stormwater Inspection and Maintenance
- GIS Resources
- Community Cost-Share Update



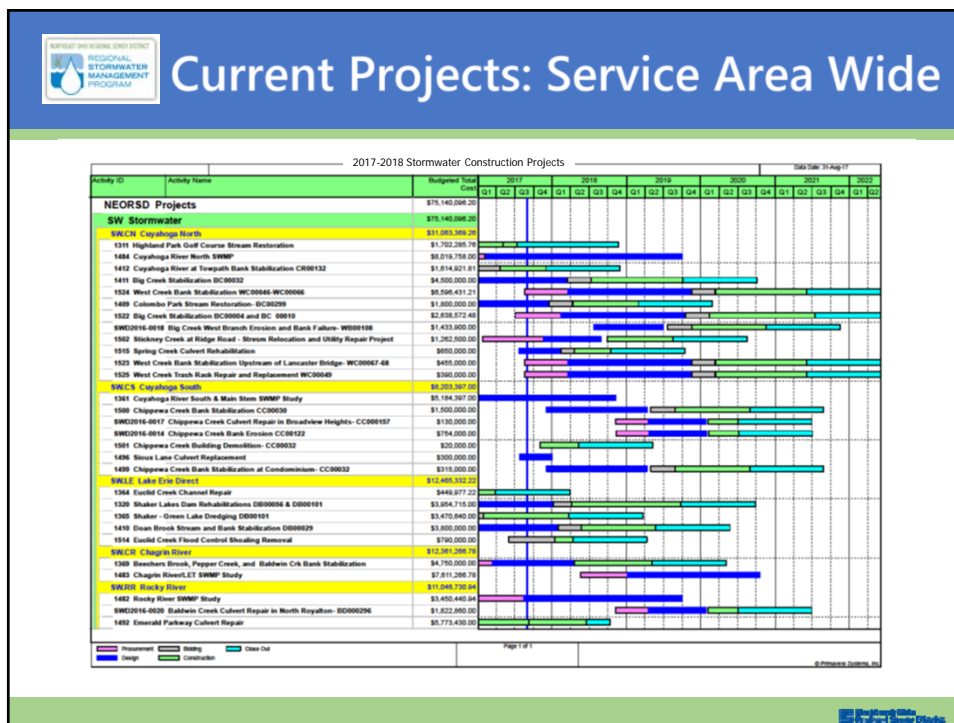
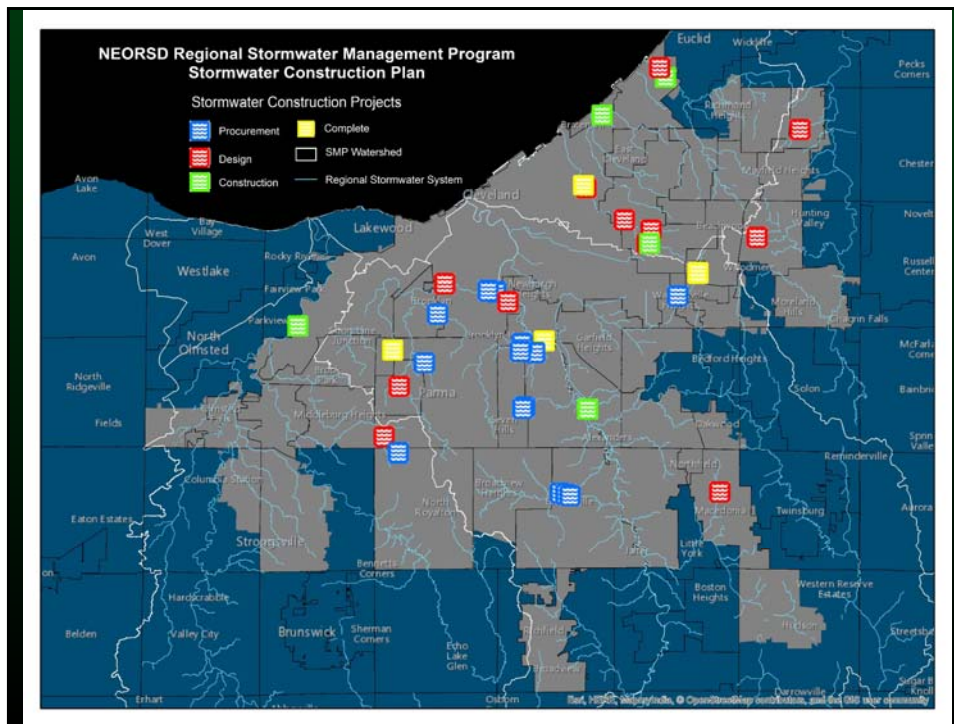
Cuyahoga River Towpath Stabilization
Cuyahoga Valley NP in Valley View

Stormwater Construction Plan



Your Sewer District Keeping our Great Lake great.







Current Projects: Cuyahoga River North

2017-2018 Stormwater Construction Projects			State Fiscal Year 2017											
Activity ID	Activity Name	Budgeted Total Cost	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
NEORSRD Projects														
SW Stormwater														
SWCN Cuyahoga North														
1311	Highland Park Golf Course Stream Restoration	\$1,702,285.76												
1484	Cuyahoga River North SWMP	\$8,019,758.00												
1412	Cuyahoga River at Towpath Bank Stabilization CR00132	\$1,614,921.81												
1411	Big Creek Stabilization BC00032	\$4,500,000.00												
1524	West Creek Bank Stabilization WC00046-WC00066	\$6,596,431.21												
1409	Colombo Park Stream Restoration- BC00299	\$1,800,000.00												
1522	Big Creek Stabilization BC00004 and BC 00010	\$2,638,572.48												
SWD2016-0018	Big Creek West Branch Erosion and Bank Failure- WB00108	\$1,433,900.00												
1502	Stickney Creek at Ridge Road - Stream Relocation and Utility Repair Project	\$1,262,500.00												
1515	Spring Creek Culvert Rehabilitation	\$650,000.00												
1523	West Creek Bank Stabilization Upstream of Lancaster Bridge- WC00067-68	\$455,000.00												
1525	West Creek Trash Rack Repair and Replacement WC00049	\$300,000.00												

■ Acquisition ■ Bidding ■ Close Out
■ Design ■ Construction

Page 1 of 1

© Stormwater Systems, Inc.

Shelburne County
Highway Stormwater Division



Cuyahoga River at the Towpath Bank Stabilization



Substantial Completion- Nov. 30, 2017

Est. Construction Cost: \$1.614 M

Project Elements

- Riprap stabilization of 700 linear feet
- Large woody debris stream barbs
- Riparian enhancement
- Coordination with Cuyahoga Valley National Park



Shelburne County
Highway Stormwater Division



Spring Creek Culvert Rehabilitation



Construction Commencing: 1Q 2018

Est. Construction Cost: \$675,000

Project Elements:

- Replace 120 linear feet of collapsed culvert
- Apply structural spray liner to rehabilitate the remainder of culvert
- Involves coordination with City of Cleveland, CSX railroad, and private property owners



Shelby County
Regional Stormwater Division



Lower Twin Lakes Dam Repair



Anticipated Construction NTP 2Q 2018

Est. Design & Construction Cost: \$300,000

Project Elements:

- Repair of sinkhole in the earthen portion of the dam



Shelby County
Regional Stormwater Division



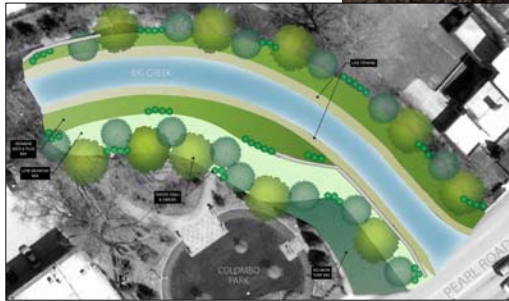
Colombo Park Bank Stabilization

Anticipated Construction NTP April 2018

Est. Construction Cost: \$1.5 M

Project Elements:

- Stabilization of eroding bank to protect sanitary infrastructure
- Stabilization of stream bed to reduce downcutting
- Riparian and floodplain enhancement



Shelburne County
Regional Stormwater Utilities



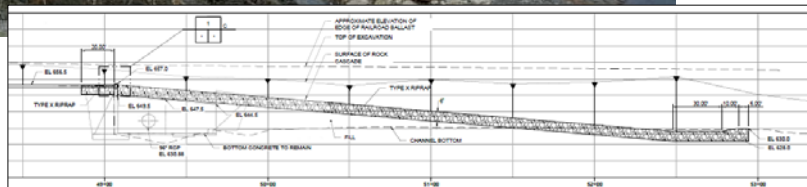
Big Creek Concrete Spillway Rehabilitation and Bank Stabilization

Anticipated Construction NTP July 2018

Est. Construction Cost: \$4.5 M

Project Elements:

- Replacement of spillway with rock fill structure
- Adjacent bank stabilization



Shelburne County
Regional Stormwater Utilities



Baldwin Creek Bank Stabilization



Anticipated Construction NTP 2Q 2018

Est. Construction Cost: \$600,000

Project Elements:

- Repair of failing retaining wall
- Bank stabilization to minimize risk to infrastructure and utilities



Northwest and Regional Storm District
Regional Stormwater Management Program



Stickney Creek at Ridge Rd. Stream Relocation and Utility Repair

Design Commencing: December 2017

Est. Construction Cost: \$1,262,500

Issue to Address:

- Eroding streambanks has exposed 150 Lf of 66" brick sewer
- Reduce or eliminate the adverse effect the erosion of Stickney Creek is having on the structural integrity of the combined sewer
- Repair and rehabilitate the existing combined sewer
- Stabilize/rehabilitate Stickney Creek
- Manage urban hydrology and reduce stream energy



Northwest and Regional Storm District
Regional Stormwater Management Program



West Creek Bank Stabilization WC00046-WC00068



Planning/Procurement Commencing: 1Q 2018

Est. Construction Cost: \$5M

Issue to Address:

- Stream eroding and destabilizing bank along railroad and parking lots.

Shirleyville State
Highway Trust Fund



West Creek Trash Rack Repair and Replacement



Planning/Procurement Commencing: 1Q 2018

Est. Construction Cost: \$300,000

Project Elements:

- Replace the current racks with new racks
- Providing a permanent access to the racks for maintenance
- Repair the damaged bank



Shirleyville State
Highway Trust Fund



Sioux Lane Culvert Replacement, Macedonia

Stormwater Construction Plan Annual Review Process



Your Sewer District Keeping our Great Lake great.



Stormwater Construction Plan Process

Project Nomination
Up to August

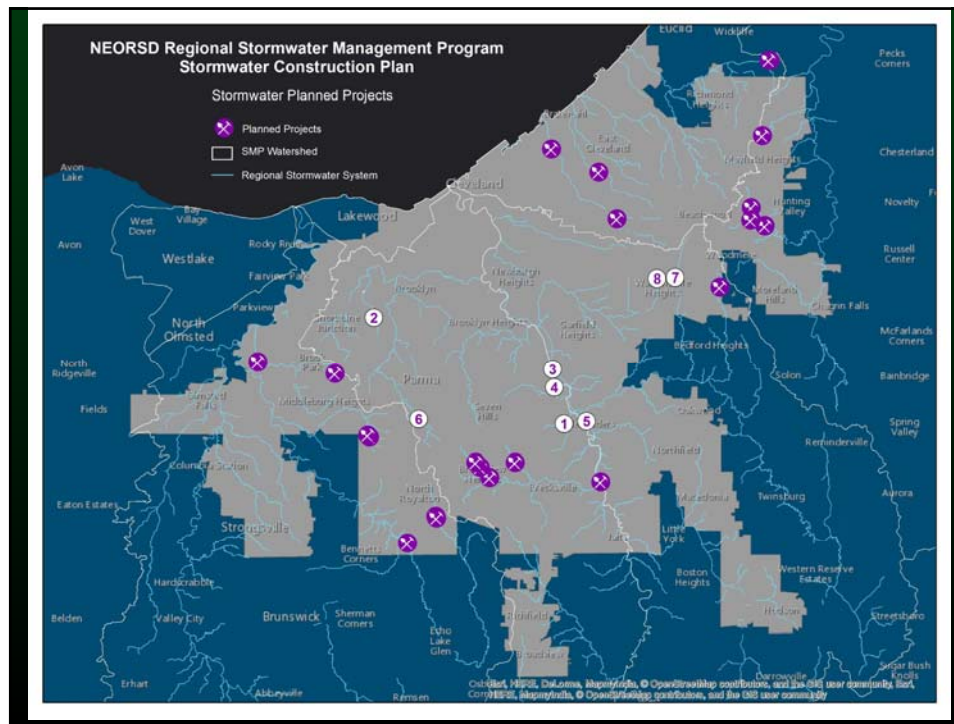
Validation
August

**Business Risk Exposure
Scoring**
November

**Stormwater
Construction Plan**
Finalized in March

Stormwater Inputs
Further Analysis Project
SW Master Plan Recommendations
Community Identified Project
Watershed Group Project



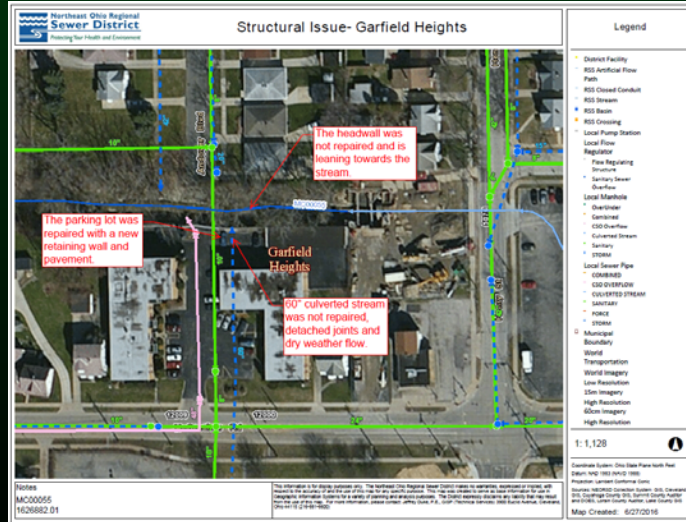




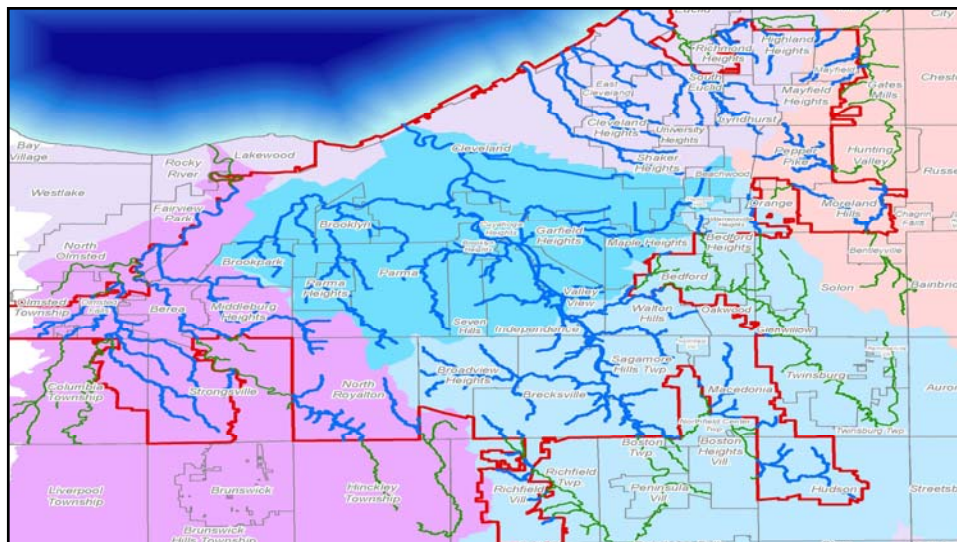
New Projects Approved for Construction Plan

Map Number	Proposed Project Name	RSS Asset ID(s)	Subwatershed	Project Community	Total BRE
1	Unnamed Trib to Cuyahoga_Failed Gabions CH00156	CH00156 - CH00155	Cuyahoga River West Unnamed	Independence	61
2	Chevy Branch_Erosion and Bank Failure WB00108	WB00108	Big Creek West Branch	Cleveland	59
3	Cuyahoga River_Erosion at BTU CY00103C_T001	CY00103B	Cuyahoga River Mainstem (east)	Independence	51
4	Hemlock Creek_Stream Erosion at HC00005	HC00005	Hemlock Creek	Independence	39
5	Cuyahoga River_Erosion DS Fitzwater Rd CY00179A	CY00179A	Cuyahoga River Mainstem (east)	Valley View	35
6	Big Creek_West Branch Stabilization -BC00351, WB00072, WB00104	BC00351, WB00072, WB00104	Big Creek	Parma	29
7	Mill Creek_Erosion Control - MC00135, MC00057	MC00135, MC00057	Mill Creek	Highland Hills	24
8	Mill Creek_Floodplain Restoration/Bank Stabilization in Highland Hills Park - MC00133	MC00133	Mill Creek	Highland Hills	3

Conveyance Responsibility



Your Sewer District Keeping our Great Lake great.

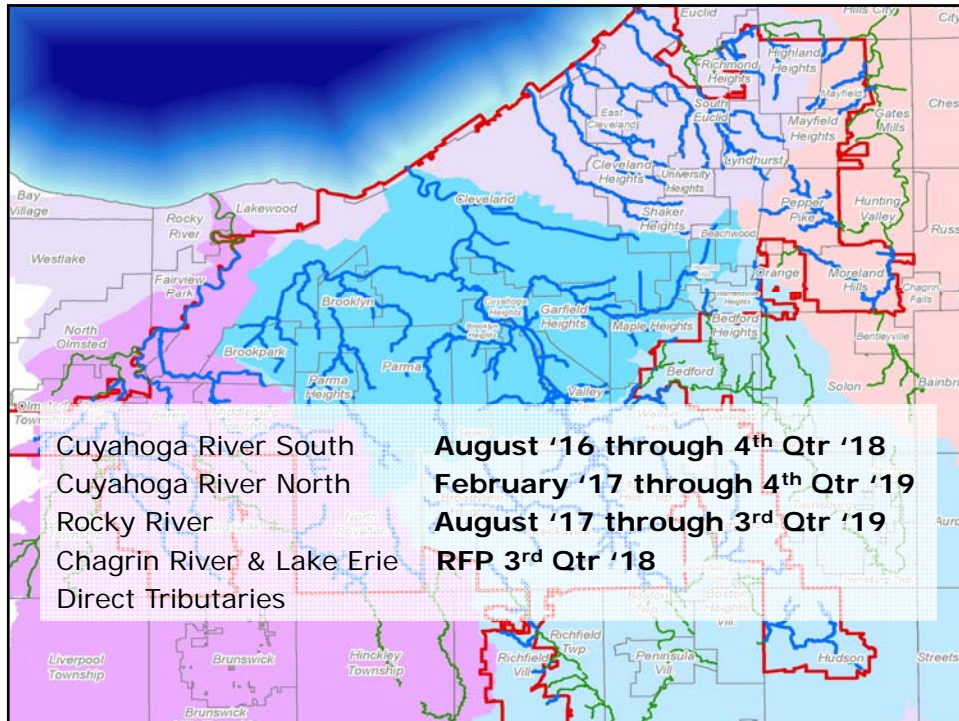


Stormwater Master Plan



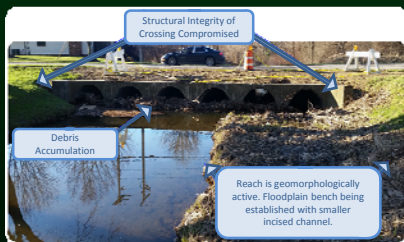
Your Sewer District Keeping our Great Lake great.





Stormwater Master Plans Goals and Objectives

Operational Performance Evaluation



Modeling & Alternatives

Alternatives Evaluation (Chapter 8)	
Screen SCMs <ul style="list-style-type: none"> • ID Opportunities/Constraints • Protect Existing Function • Increase Function <ul style="list-style-type: none"> ✓ Reduce Runoff/ Restore Stream-Floodplain ✓ Enhance Storage – Conveyance • Buyout/Reduce ALR • Formulate 2 Alternatives 	Evaluate Alternatives <ul style="list-style-type: none"> • Size to achieve ALR • Estimate cost • Define multiple benefits • ID Business Case (TBL) • Select Alternative • Check watershedwide performance

Recommendations and Report



Results: Prioritized list of construction and maintenance projects at the Watershed-level and Program-level



Cuyahoga River North Field Investigations



Your Sewer District Keeping our Great Lake great.



Cuyahoga River North Field Investigations – Spherical Data



Your Sewer District Keeping our Great Lake great.



Cuyahoga River North

Field Investigations – Spherical Data



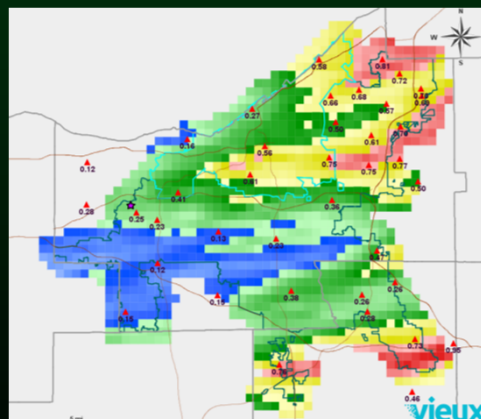
Your Sewer District Keeping our Great Lake great.



Stormwater Master Plan

Monitoring: Rainfall Data

- New data source:
District subscription for
gauge-adjusted radar
rainfall
- Verify NEORSD rainfall
data for selected events with:
 - Nearby rain gauges
by other entities
 - Gauge-adjusted
radar rainfall



Your Sewer District Keeping our Great Lake great.



Stormwater Master Plan

Monitoring: Stream/Flow Data



- Trail Cams and stream gauges
- High water mark gauges
- Flow Meters



Your Sewer District Keeping our Great Lake great.



Stormwater Master Plan

Modeling: Impervious Area inside Service Area



Cuyahoga Co.
road polygons
Summit Co.
centerline offset



District
impervious layer



Your Sewer District Keeping our Great Lake great.



Stormwater Master Plan

Asset Condition & Criticality

Compare model results to FEMA

- ID BTUs added / removed from 100YR flood area



SWMP model results

FEMA 100YR Flood Area

Stormwater Master Plan

Alternatives Evaluation

STEP 1: Identify and Screen Alternatives

- ID Opportunities / Constraints
- Protect Existing Function
- Increase Function
 - Reduce runoff / restore stream-floodplain
 - Enhance storage-conveyance
- Property Acquisition or reduce acceptable Level of Risk



Your Sewer District Keeping our Great Lake great.



Stormwater Master Plan

Alternatives Evaluation

STEP 2: Evaluate 2 Alternatives

- Size to achieve acceptable Level of Risk
- Estimate cost
- Define multiple benefits
- ID Business Case (triple bottom line)
- Select Alternative
- Check watershed-wide performance
- Community input

Cuyahoga River North Communication

- Member Community Work Plans
- Problem Area Review – Community Meeting
- Alternatives Evaluation – Community Meeting
- Recommendations and Community Report

Your Watershed Team Leader serves as the point of contact between the communities and the District



Your Sewer District Keeping our Great Lake great.



Cuyahoga River North WAC Fall 2017

- **SWIM Follows an Asset Management Approach:**
 - Condition – Probability of failure (sediment/debris, Structural Integrity), Hydraulic Performance
 - Criticality – Consequence of failure
 - Business Risk Exposure (BRE) = Condition x Criticality

Condition Rating	Criticality						
	3	4	5	6	7	8	9
1	3	4	5	6	7	8	9
2	6	8	10	12	14	16	18
3	9	12	15	18	21	24	27
4	12	16	20	24	28	32	36
5	15	20	25	30	35	40	45

- 19

SW Inspection and Maintenance Quick Review

- Asset Class Types:
 - Streams (Open)
 - Crossings (Bridges/Culverts)
 - Culverted Streams (Long Reaches of Buried Pipe)
 - Basins (Dry/Wet, Regulated/Unregulated)
 - Major Structures (Low Head Dams/Drop Structures/Locks)
- Acronyms:
 - ALR – Acceptable Level of Risk
 - RSS – Regional Stormwater System
 - BTU – Building, Transportation, Utility Assets along the RSS
 - BEHI/NBS –Bank Erosion Hazard Index/Near Bank Stress
 - SWSA – Stormwater Service Area

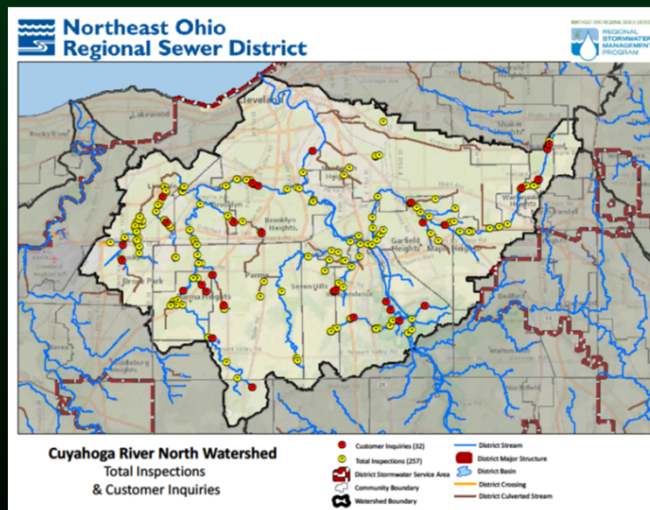


Your Sewer District Keeping our Great Lake great.



SWIM Inspections

Cuyahoga River North: 2017 Summary



257 Total Inspections
(**911** in SWSA)

32 Customer Inquiries
(**157** in SWSA)

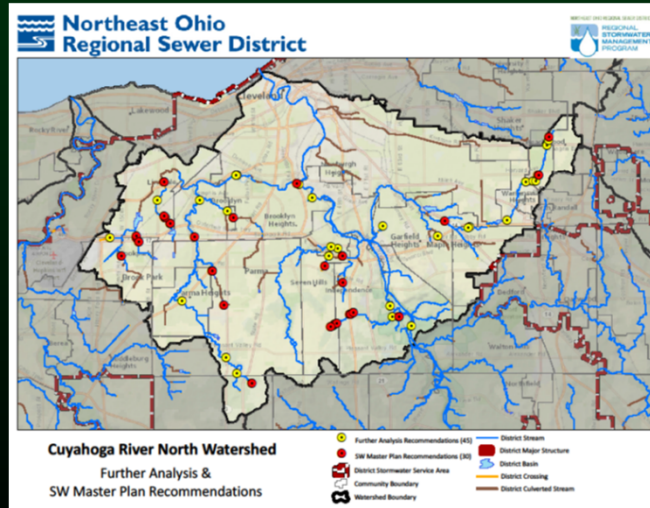


Your Sewer District Keeping our Great Lake great.



SWIM Recommendations

Cuyahoga River North: 2017 Summary



30 Assets recommended for Stormwater Master Planning (**84** in SWSA)

45 Assets recommended for Further Analysis (**131** in SWSA)

Your Sewer District Keeping our Great Lake great.



SWIM Recommendations: Further Analysis

Cuyahoga River North: Big Creek West Branch
Cleveland: Detached Garage
Asset ID: WB00072

NEORSO Condition Rating	Criticality	BRE Score
5	5	25



Structural Integrity:

- o Void under garage foundation
- o Failed bank protection at outside meander, notable scour at toe

Recommendation:

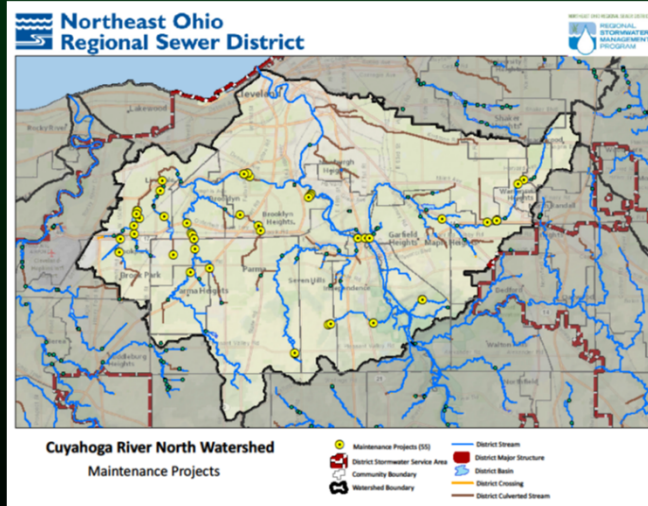
- ✓ Monitor annually
- ✓ Further Analysis



Your Sewer District Keeping our Great Lake great.

SWIM Maintenance

Cuyahoga River North: 2017 Summary



55 Maintenance Projects
(**154** in SWSA)

1,563 CY
sediment and
debris removed
(5,241 in SWSA)

 *Your Sewer District* Keeping our Great Lake great.



Stormwater Maintenance

Cuyahoga River – North: Big Creek

Cleveland

Asset ID: BC00029

Maintenance Project: Large Woody Debris Removal (24 CY)



Pre-Maintenance

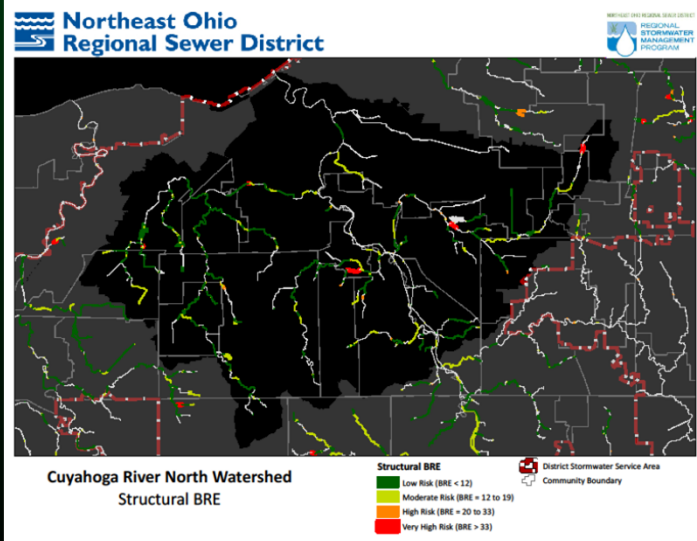


Post-Maintenance

 *Your Sewer District* Keeping our Great Lake great.



Structural BRE Update Cuyahoga River North



Your Sewer District Keeping our Great Lake great.



Structural BRE Update cont. Cuyahoga River North

Cuyahoga
River
North
Only

Asset Class Type	Total Assets	Low Risk	Moderate Risk	High Risk	Very High Risk	No Condition Scores
Streams	624	129	38	0	0	457
Basins	16	7	2	1	0	6
Crossings	323	50	111	25	1	136
Culverted Streams	77	12	9	2	4	50
Major Structures	6	0	0	0	1	5
Total Inspected (Count)	1046	198	160	28	6	654
Total Inspected (Percent)		19%	15%	3%	1%	63%
Projected BRE (Percent)		51%	41%	7%	2%	0%
Projected BRE (Count)	1,046	528	427	75	16	0

Service
Area

Asset Class Type	Total Assets	Low Risk	Moderate Risk	High Risk	Very High Risk	No Condition Scores
Streams	2,071	472	116	0	0	1,483
Basins	79	27	8	3	0	41
Crossings	1,277	198	373	73	3	630
Culverted Streams	192	29	18	3	11	131
Major Structures	21	0	0	0	1	20
Total Inspected (Count)	3640	726	515	79	15	2,305
Total Inspected (Percent)		20%	14%	2%	0%	63%
Projected BRE (Percent)		54%	39%	6%	1%	0%
Projected BRE (Count)	3,640	1,980	1,404	215	41	0

SWIM Recommendation: Further Analysis

Cuyahoga River North: West Creek
Brooklyn Heights: Lancaster Drive
Asset ID: WC00067

BEHI Rating	NBS Rating	NEORS Condition Rating	Criticality	BRE Score
Moderate	High	4	8	32



Structural Integrity:

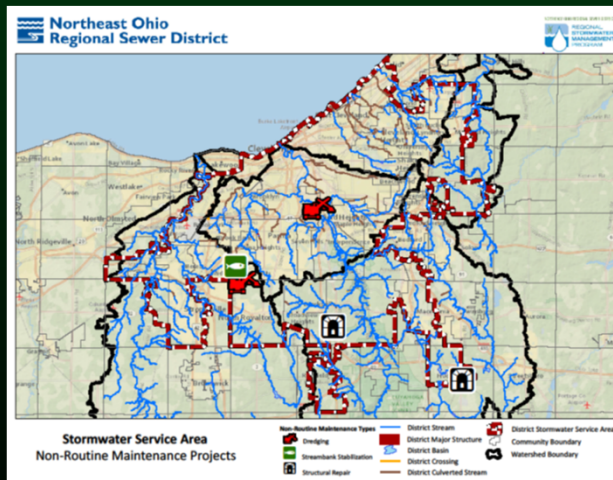
- Geotechnical failure
- Toe scour
- Rip rap washed away

Recommendation:

- ✓ Further Analysis
- ✓ Monitoring
- ✓ Notify Owner

SW Maintenance

Non-Routine Maintenance Projects: Pilot Update



Currently Piloting:

- Streambank Maintenance
- Basin Maintenance (e.g., Dredging)
- Structural Maintenance

Contact SWIM or WTL to discuss other potential locations

SW Inspection and Maintenance Planned Activities 2018

- Implement Recommended Maintenance Projects from SWMPs
- Continue Piloting Non-Routine Maintenance Projects
- Inspect RSS assets and BTUs without condition scores
- Request Record Drawings from Member Communities



Your Sewer District Keeping our Great Lake great.



Questions

Rocky River: Baker Creek
Columbia Township

After

NEORSD ArcGIS Online Home Page

Home Gallery Map Scene Groups Content Organization

NEORSD GIS SERVICES

WebGIS Platform

FEATURED MAPS

NEORSD Collection System Viewer

NEORSD Stream Photo Viewer

neorsd.maps.arcgis.com

Username: WAC Member

Password: wacneoh2017

Mission: Provide the highest quality

Vision: Create an environment of highest quality

Mantra: "Clean" water through "Clean" information....

Keep.com ArcGIS Marketplace Help Terms of Use Privacy Contact Us Report Abuse Contact Us

Your Sewer District Keeping our Great Lake great.

STORMWATER MANAGEMENT

Web GIS Platform Featured Content

Sort By: Most Viewed

Show

All

Maps

Layers

Scenes

Apps

Tools

Files

Search the website or visit the ArcGIS Marketplace

NEORSD GIS SERVICES

Cleveland Historical Map Viewer

Subwatershed Viewer

Soil Boring Web Application

Bikeway Projects - 2016

2014 NEORSD Sewer Pipe Condition Rating

SWMP Map

SWIM Map

NEORSD Gallery Maps

- SWMP
- SSES
- SWIM

Your Sewer District Keeping our Great Lake great.

STORMWATER MANAGEMENT



Community Cost-Share



Your Sewer District Keeping our Great Lake great.



Community Cost-Share

- CCS Funds Balance (9/30/2017): **\$16,303,570**
- 45 approved projects: **\$ 4,629,622**
- CCS Funds available to Member Communities: **\$11,673,948**
- 9 approved allocation agreements: **\$ 4,607,183**
- 31 Member Communities currently participating

CCS Workshop – November 2017



Your Sewer District Keeping our Great Lake great.



What's Next...

- Community designation of WAC representative – January 2018
- Phase II Services: PIPE and IDDE
 - Submit for reimbursement for 2017 PIPE services from SWCD
 - No change in services for 2018
 - SWCD will invoice 1st Quarter for services
- Next WAC meeting - March 2018



Your Sewer District Keeping our Great Lake great.



Questions

Donna Friedman

216-881-6600 Ext. 6768

friedmand@neorsd.org

Jeff Jowett

216-881-6600 Ext. 6881

jowettj@neorsd.org

Stormwater Program: Community Resources

<http://www.neorsd.org/communitystormwaterresources.php>

