

# Rouge 2009

## Preserving Our Future



## Preserving Our Future

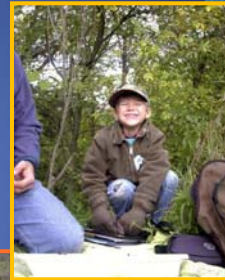
- The Rouge River communities, residents and partners continue to address watershed issues
- Water quality and ecosystem health continues to improve
- CSO & SSO issues are being addressed
- Community projects are focused on green infrastructure

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## Water Quality Monitoring

### Benthic Macroinvertebrate, Frog and Toad, and Geomorphology Surveys

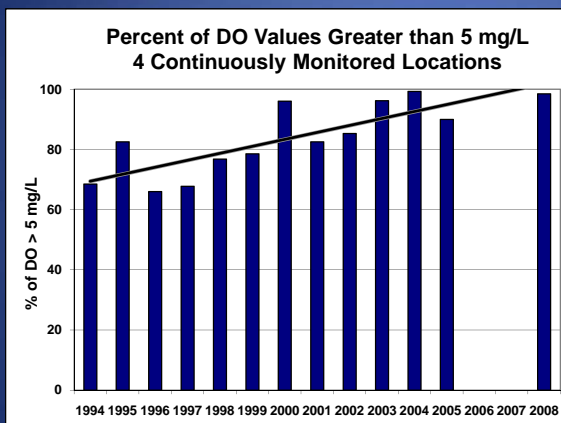


Macroinvertebrate and frog and toad survey results can be accessed at <http://www.therouge.org>

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## Water Quality Improvements

### Dissolved Oxygen (DO)



- In 2008 DO was nearly always above the State water quality criteria of 5 mg/l
- Conditions rebounded from the very hot and dry 2005 summer that depressed DO levels that year

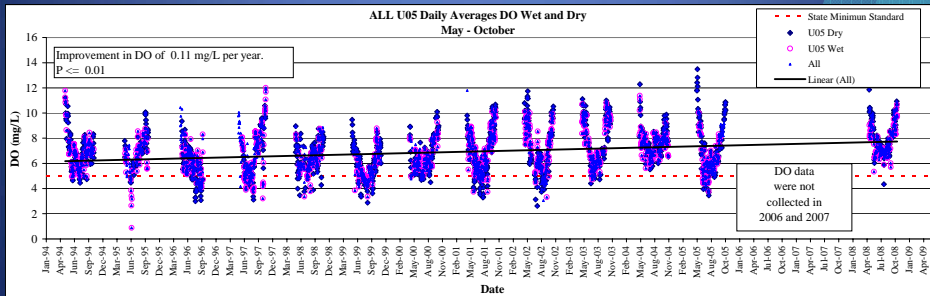
Plymouth Road (U57), Telegraph Road (U05), Hines Drive/Ford Road (D06), and Military Road (L05D)

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# Water Quality Improvements

## Dissolved Oxygen (DO)

- Upper Rouge at Telegraph Road
  - DO concentrations have improved 0.11 mg/L per year
  - In 2008, the standard was met 99.5% of the time

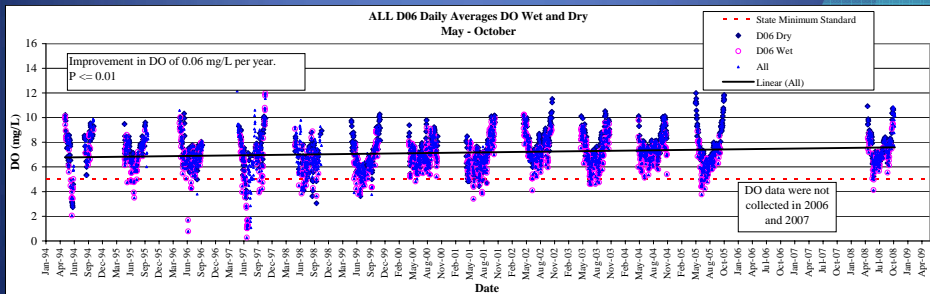


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# Water Quality Improvements

## Dissolved Oxygen (DO)

- Middle Rouge at Hines and Ford Road
  - DO concentrations have improved 0.06 mg/L per year
  - In 2008, the standard was met 99.0% of the time

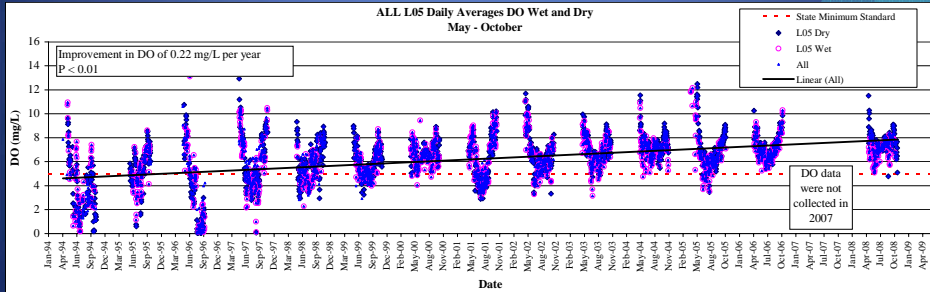


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# Water Quality Improvements

## Dissolved Oxygen (DO)

- Lower Rouge at Military Road
  - DO concentrations have improved 0.22 mg/L per year
  - In 2008, the standard was met 98.9% of the time

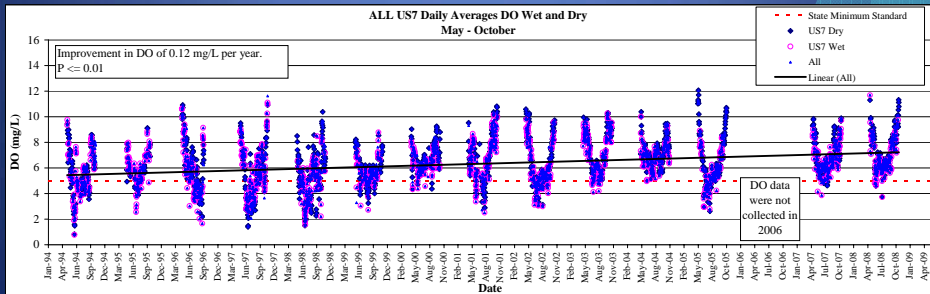


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# Water Quality Improvements

## Dissolved Oxygen (DO)

- Main Rouge at Plymouth Road
  - DO concentrations have improved 0.12 mg/L per year
  - In 2008, the standard was met 96.4% of the time



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## Water Quality Improvements

### Wayne County *E. coli* Monitoring 2007-2009

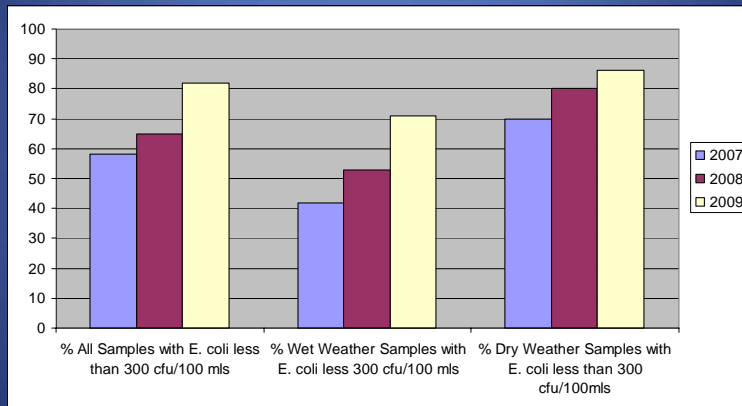


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## Water Quality Improvements

### Middle Rouge River

### Wayne County *E. coli* Monitoring, 2007-2009

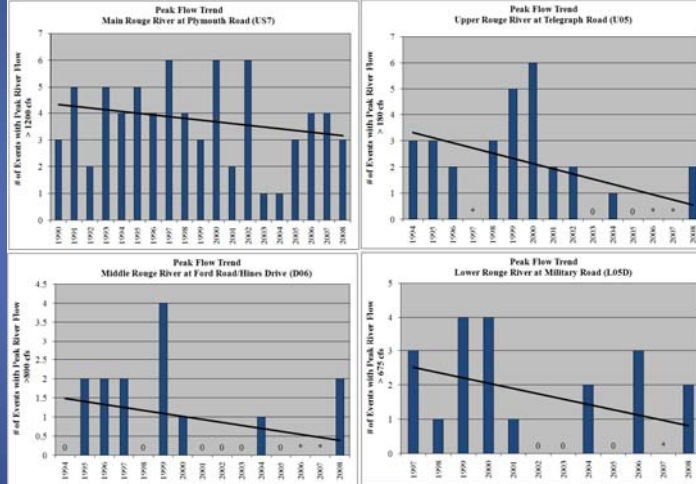


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# Water Quality Improvements

## Flow

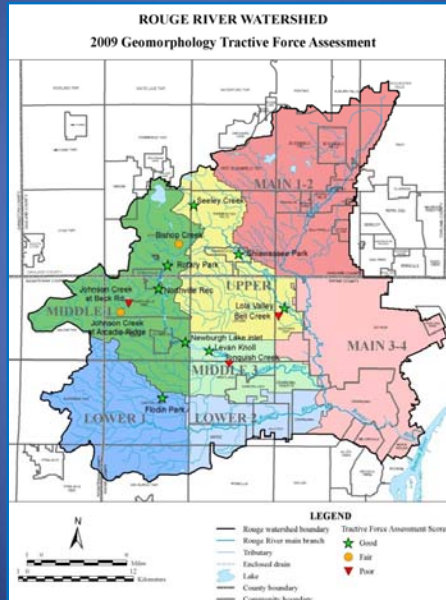
- Number of flood events has reduced
- Peak flows are lower and low flows are higher
- Efforts to manage storm water runoff as upstream areas are developed are helping to protect the ecosystem



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# Ecosystem Health Improvements

## Wayne County – Geomorphology Assessments



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## Ecosystem Health Improvements

Stonecat found at Firefighters Park  
Photo credit: FOTR

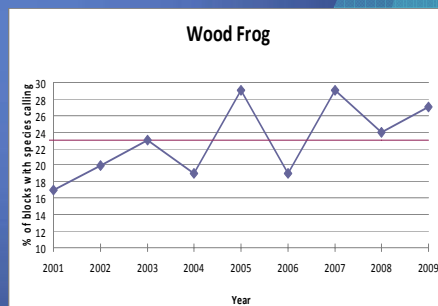


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## Ecosystem Health Improvements: FOTR Frog and Toad Survey

- 2009 was the 12<sup>th</sup> year of the Rouge River Frog and Toad Survey
- 334 attendees at four workshops in 2009
- 202 blocks were surveyed
- Wood frogs were heard in a higher percentage of blocks

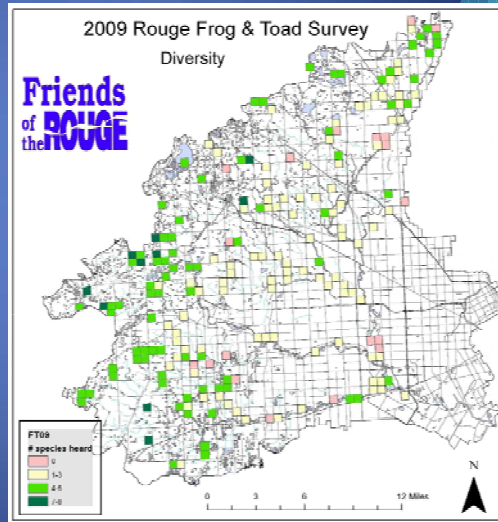


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## Ecosystem Health Improvements: FOTR Frog and Toad Survey

- The Rouge headwaters continue to support a diversity of amphibians
- Areas in the Main Rouge, Upper and Lower 2 showed a decline



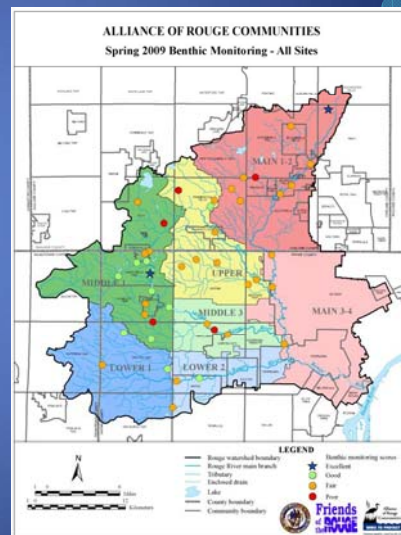
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## Ecosystem Health Improvements: Benthic Macroinvertebrates (Bugs)

- 46 sites were monitored Spring 2009
- 2 sites scored EXCELLENT
  - 12 sites scored GOOD
  - 27 sites scored FAIR
  - 5 sites scored POOR



Stonecat found at  
Firefighters Park!



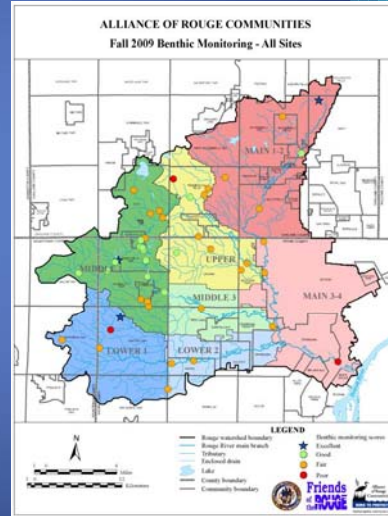
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## Ecosystem Health Improvements: Benthic Macroinvertebrates (Bugs)

- 47 sites were monitored Fall 2009
- 3 sites scored EXCELLENT
  - 16 sites scored GOOD
  - 25 sites scored FAIR
  - 3 sites scored POOR



Matt Best leads a team of students from Old Redford Academy sampling at Willow Creek  
(Photo credit: Laura Corsun)



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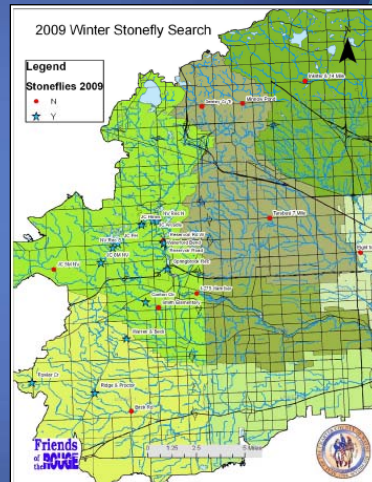
## Ecosystem Health Improvements: 2009 Winter Stonefly Search

- 81 Volunteers participated
- 23 Sites were sampled
- Stoneflies were found at 13 sites



Stoneflies are sensitive indicators of healthy streams

The Winter Stonefly Search is part of Friends of the Rouge's volunteer benthic monitoring program



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## Watershed Improvement and Restoration Activities



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## Watershed Improvement Activities

### Recently Completed CSO/SSO Control Projects

#### Projects Completed in 2008:

- **Farmington Hills:** In the East Lincolnshire district, constructed new storage/relief sanitary sewers to eliminate SSO discharges to the Rouge River and to prevent basement flooding
- **Inkster:** CSO Outfall L49 Sewer Separation and Relief Sewer to Andover Pump Station
- **Dearborn:** Sewer Separation of CSO Outfall 012



Construction of Storage/Relief Sewers, East Lincolnshire Service Area, Farmington Hills

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## Watershed Improvement Activities

### Ongoing CSO/SSO Control Projects

- Dearborn:
  - Currently revising CSO Control Program
- Dearborn Heights:
  - Currently revising CSO Control Program
- Detroit:
  - Construction of Oakwood District sewer improvements underway
  - Upper Rouge Tunnel construction halted in 2009; city currently negotiating new plan for remaining CSO outfalls
- Inkster:
  - Construction of CSO retention treatment basin at Middlebelt Road underway October 2008

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## Watershed Improvement Activities

### Ongoing CSO/SSO Control Projects

- North Huron Valley/Rouge Valley Sewer System Short-Term Corrective Action Plan underway: \$ 23,000,000
- Rehabilitation and Repair of 1,013 manholes
- Sewer Lining of 10,000 lineal feet
- Improvements to Lift Station 1A, select Comfort Stations in Hines Park, and select regulator structures
- Funded by customer communities
  - Low interest loan from the State Revolving Fund (SRF) Program
  - Grant under the American Recovery and Reinvestment Act (ARRA)
- Construction begins February 2010; project complete by August 2011

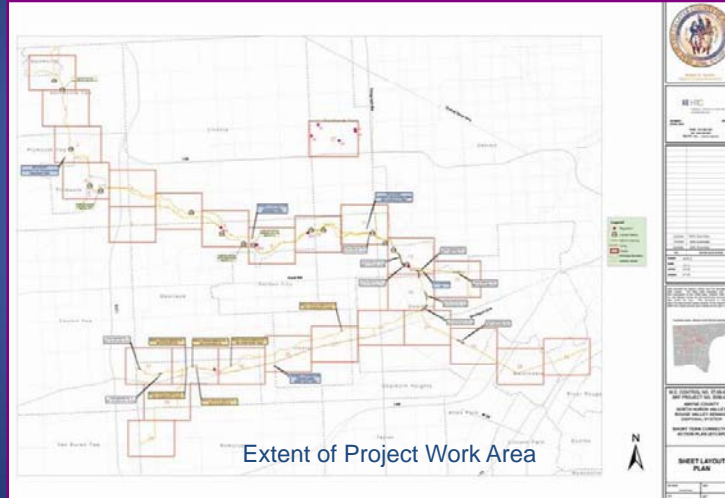


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# Watershed Improvement Activities

## North Huron Valley/Rouge Valley Sewer System Short Term Corrective Action Plan



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# Watershed Improvement Activities

## North Huron Valley/Rouge Valley Sewer System Short Term Corrective Action Plan



- Sewer Lining Location, Segment 6



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## Watershed Improvement Activities

### New SSO/CSO Control Projects



New SSO/CSO control projects started in 2009 under the Round IX Subgrant program

- Total Project Costs (Rouge Grant Funded): \$ 870,000
- Completed Dearborn Sewer Separation Project (Outfall 009) in 2009
- Oakland County CSO Basins: Total Residual Chlorine Reduction Project

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## Watershed Restoration Activities

### Kingfisher Bluff, Henry Ford Community College

- Stabilized the stream bank at Kingfisher Bluff to eliminate this area as a source of excessive sediment to the Rouge River.
- Created scenic overlook and installed interpretive signage to educate the public about the Rouge River
- Constructed a short walkway to the Gateway Trail that connects to the Rouge Parkway and continues to Michigan Avenue.
- Installed best management practices to manage storm water from the adjacent campus parking area



Kingfisher Bluff Streambank Erosion, Henry Ford Community College, Main Rouge River



Kingfisher Bluff Restoration, Henry Ford Community College, Main Rouge River

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## Watershed Restoration Activities

### Beech Woods Streambank/Soil Erosion Control, Southfield

- Mitigated damage caused by streambank erosion along the Main Branch of the Rouge River at the Beech Woods Golf Course, a municipal golf course owned by the City of Southfield
- Combined hard and soft stream bank stabilization techniques, such as bioengineering and naturalizing, to stabilize the 200-foot long portion of stream bank and provide natural areas along the river



Streambank Erosion, Main Rouge River, Southfield



Construction of Streambank Stabilization, Main Rouge River, Southfield

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## Storm Water Management Activities

### Rouge Round IX Subgrant Program

- 12 new storm water/watershed management projects underway
- Total Project Costs: \$2.24 Million

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## Storm Water Management Activities

### Rouge Subgrant Program – Detention Pond Retrofits

- Canton Township: Pheasant Run Golf Club Detention Basins Enhancements



*Meadowbrook Subdivision (2003)*



*Meadowbrook Subdivision (Today)*

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## Storm Water Management Activities

### Rouge Subgrant Program – River-based Recreation Enhancements

- Canton Township: Lower Rouge River Recreational Trail and Bridges Project
- City of Southfield: Valley Woods Trail Head and Storm Water Improvements



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## Storm Water Management Activities

### Rouge Subgrant Program –Public Education and Involvement

- U of M – Dearborn
  - 2009 Rouge River Water Festival & Real Time Monitoring Exhibit
- Cranbrook
  - 2009 Rouge River Water Festival at Cranbrook Institute of Science
- Oakland County Water Resources Commissioner
  - Rouge Oakland Public Service Announcements



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## Storm Water Management Activities

### Public Education and Involvement: FOTR



2,288 volunteers at 37 work sites in 25 communities

- Removed
  - 76 cu. ft. + 710 bags of trash
  - 4 cars
  - 492 bags of invasive plants
- Native plantings at 10 sites
- Woody debris management at 9 sites
- Invasive plants removal at 19 sites



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## Storm Water Management Activities

Public Education and Involvement: FOTR

### Rouge Education Project 2009

- 54 Schools
- 29 Communities
- 114 Teachers
- 2,895 Students
- 19 College Student Assistants
- 100+ Volunteers from Corporations, Parents and Students



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## Storm Water Management Activities

Rouge Subgrant Program –Streambank Restoration

- City of Birmingham
  - Rouge River Streambank Stabilization at Booth Park
- Randolph Street Inter-County Drain Drainage District
  - Randolph Street Drain Streambank Restoration Project



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## **Storm Water Management Activities**

**Rouge Subgrant Program –Low Impact Development (LID)  
and Illicit Discharge Elimination**

- **City of Southfield used LID techniques for Beech Woods Park Greening Project, Phase I - North Parking Area**
- **Oakland County Water Resources Commissioner: Illicit Discharge Elimination in the Upper Rouge River Watershed**

**Rouge 2009**

## **Pollution Prevention-Illicit Discharge Elimination Programs**

- **Wayne County IDEP for 2009 (to date)**
  - 222 Facilities inspected
  - 12 illicit discharges identified
  - IDEP training provided for 40 local community staff (almost 1,900 local staff trained to date)
- **49,100 gallons of polluted flow removed from year 2009 activities**
- **Over 77 million gallons of polluted flow prevented from entering the Rouge River each year from now on**

**Rouge 2009**

## Pollution Prevention-Illicit Discharge Elimination Program

- Oakland County Water Resources Commissioner (2008-2009)
  - 96 illicit discharges were discovered during complaint investigations, discharge point surveys and follow-up investigations
  - 11 sewage sources were identified and corrected
  - 8 fuel, oil, and/or grease pollution sources were corrected
  - Other identified improper discharges included pool filter backwash and illegal dumping or spills of various chemicals
  - 76 illicit discharges were corrected with the identified sources being eliminated

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## Green Infrastructure Activities



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## Green Infrastructure Activities

### Rain Garden Education, Lawrence Technological University

- Created a living storm water laboratory that features innovative storm water management techniques
- Addresses research questions while also providing educational and outreach opportunities
  - Field measurements to quantify the performance of rain gardens as structural storm water BMPs
  - Determining the influence of planting mixtures on surface infiltration
  - Determining the effect of aging on rain garden performance
- Rain gardens instrumented with sensors, and incorporated into classes and outreach activities



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## Green Infrastructure Activities

### SOCWA Public Education for Healthy Lawns, Landscapes, Rain Gardens & Rainwater Harvesting

- Rain garden network in southeast Oakland County continues to expand
  - 28 small rain gardens in Lathrup Village
  - Streetside rain gardens: 3 - Southfield, 1 - Farmington Hills, 2 - Beverly Hills
    - Of these, 3 were installed summer 2009
- All-weather "Rain Garden for the Rouge" signs available to homeowners and businesses to communicate the rain garden story
- 8 rain garden maintenance work days completed this fall



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# Green Infrastructure Activities

## Friends of the Rouge Schoolyard Habitat Program

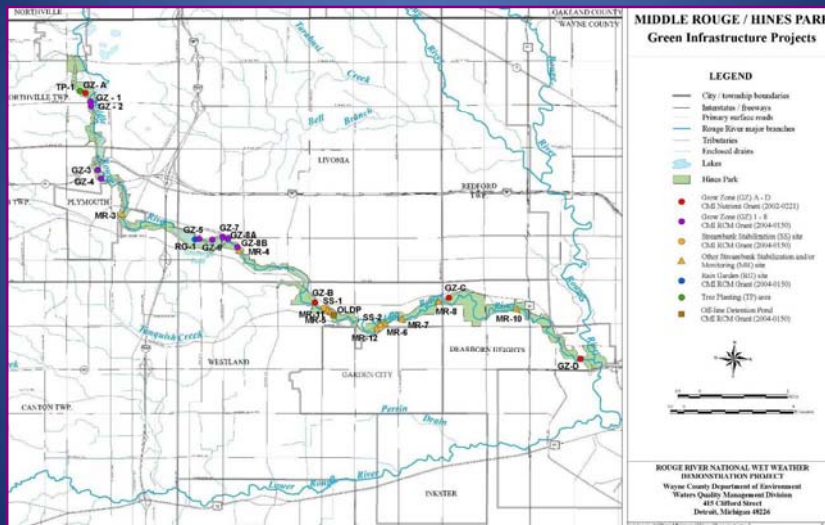
- Smith Elementary, Plymouth
- OW Holmes Elementary, Detroit
- Burger School for Students with Autism, Garden City
- Total Participation:
  - 400 students
  - 15 teachers
  - 914 native plants



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# Green Infrastructure Activities

## Wayne County Middle Rouge/Hines Park Project Sites



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## Green Infrastructure Activities

### Wayne County - Elm Grove Streambank Stabilization (SS-1)



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## Green Infrastructure Activities

### Wayne County - Bennett Arboretum Grow Zone (GZ-A)



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## Green Infrastructure Activities

### Wayne County - Newburgh Pointe Rain Garden (RG-1)



Before



After

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## Green Infrastructure Activities

### Wayne County - Infiltration Rates & Improvements

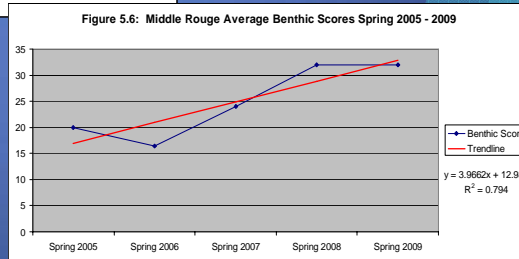
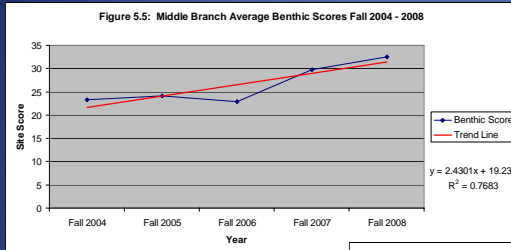
Site ID: Name	Soil Type	Average Infiltration Rate* (in/hr)		Infiltration Improvements	
		Grow Zone Area	Mowed Area	Rate Increase	% Increase
GZ - A: Bennett Arboretum	B	15.7	13.9	1.8	13%
GZ - B: Nankin Mills	B	13.5	9.7	3.8	39%
GZ - C: Inkster Road	D	15.8	9.5	6.2	65%
GZ - D: Ford Road/Outer Dr	D	15.9	10.3	5.7	55%
Overall Average		15.2	10.9	4.4	43%

\*Infiltration rates were calculated based on average field measurements taken using the Turf Tech Infiltrometer between Spring 2008 and Spring 2009.

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# Ecosystem Health Improvements

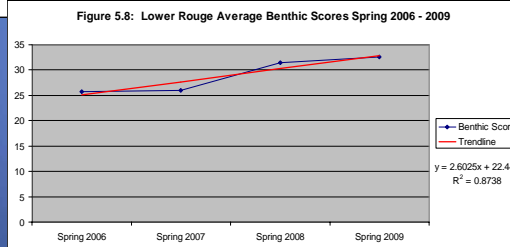
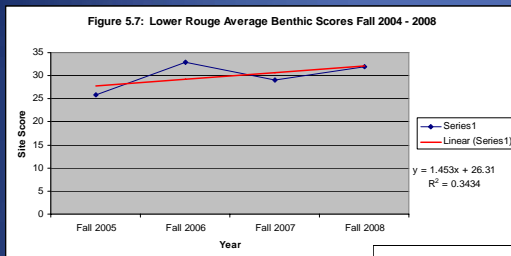
## Wayne County - Middle Rouge Benthic Monitoring Scores & Trends



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# Ecosystem Health Improvements

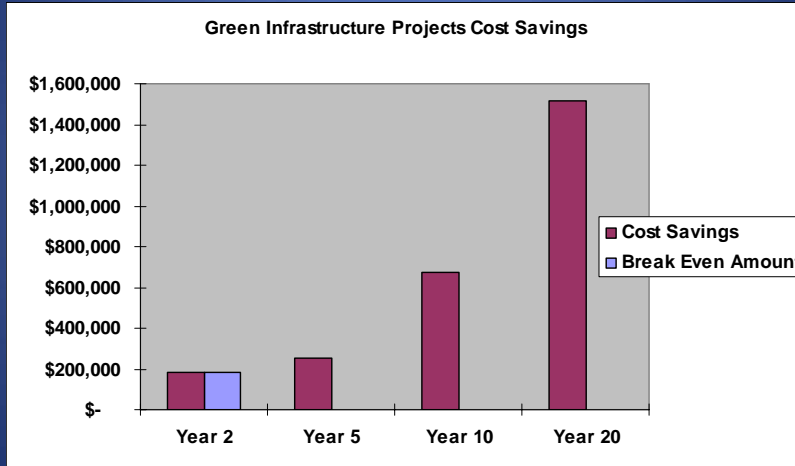
## Wayne County - Lower Rouge Benthic Monitoring Scores & Trends



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## Green Infrastructure Activities

### Wayne County - Middle Rouge/Hines Park Green Infrastructure

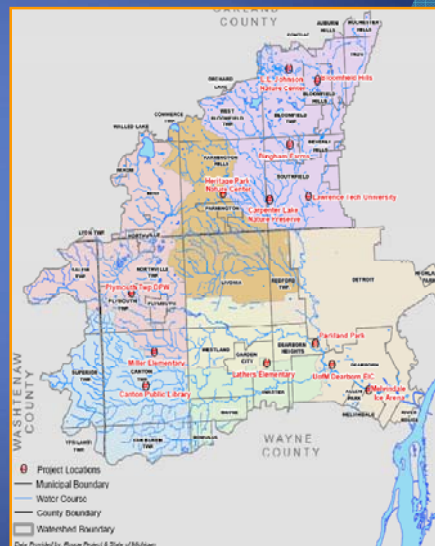


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## Green Infrastructure Activities

### Alliance of Rouge Communities

The ARC completed 13 green infrastructure projects in 2009



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## Green Infrastructure Activities

### Alliance of Rouge Communities – 2009 Sites

- EL Johnson Nature Center, Bloomfield Township
- UM-D Environmental Interpretive Center
- Lawrence Technological University, Southfield
- Bingham Farms
- City of Southfield green roof
- Parkland Park, Dearborn Heights
- Bloomfield Hills Neighborhood
- Canton Township Library
- Plymouth Township DPW yard
- Farmington Hills Heritage Park
- Melvindale Ice Arena
- Miller School, Canton Township
- Lathers School, Garden City



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## Green Infrastructure Activities

### Alliance of Rouge Communities

- 3 workshops and 3 bus tours around the watershed



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## Green Infrastructure Activities

### Alliance of Rouge Communities

- Current Land resources are mapped by category, such as forest, water and impervious surfaces
- Maps and analysis provide an accurate means of managing and monitoring change of natural resources over time:
  - Storm water runoff prediction, drainage requirements and pollution impact studies
  - Environmental assessment of undeveloped and vacant land identification
  - Planning green space and recreational usage
  - Urban planning assessment



Green – Green Space  
Gray – Impervious  
Brown - Bare

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## So... What Can You Do ?



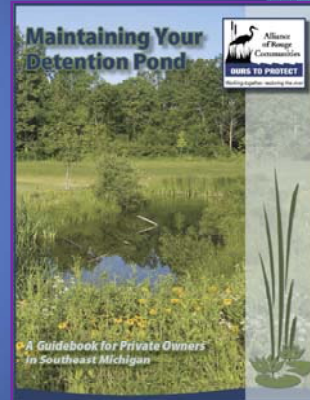
Climb Aboard the Green  
Infrastructure Express

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## Other ARC Activities

- Public Education through MiEarth
- Updated detention pond maintenance manual
- Annual report template development
- Revising Watershed Management Plan
- Created a non-profit foundation to accept grants
- Funding benthics survey by FOTR
- Development of collaborative SWPPI action plan
- Bulk Public Education material printing



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## ARC Partnerships

- Partnered with Rouge Green Corridor, Six Rivers Land Conservancy, City of Detroit, Friends of the Rouge and Wayne County to apply for 'Sustain Our Great Lakes Grant'
- Sponsored tour with RRAC of AOC target sites for NOAA and MDEQ representatives
  - Wayne Dam
  - Henry Ford Estate Dam
  - Greenfield Village Oxbow
  - Oxbows/wetland treatment along channel
  - Evans Ditch
  - Berberian property/Streamwood



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# ARC 2010 Initiatives

- GLRI grant application(s)
- Completed land cover inventory
- 8-10 new green infrastructure sites
- IDEP Field Investigations/Training
- Outfall Mapping
- Storm Water Reporting System (annual report template)

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# ARC 2010 Initiatives

## Water Quality Monitoring

- The ARC will continue to implement the new five-year monitoring plan (2009-2013) consistent with the updated Rouge Watershed Management Plan (WMP)

Element	Monitoring Locations	D = Non-Alliance Services (no charge to ARC)				
		2009	2010	2011	2012	2013
<b>Planning &amp; Reporting</b>						
ABC develop/refine monitoring plan	Not Applicable	X	X	X	X	X
Data Handling, Data Management & Analysis	Not Applicable	X	X	X	X	X
Report Monitoring	Not Applicable	X	X			
Report/Brochure/Press Release	Not Applicable	X	X			
<b>Physical Monitoring</b>						
Geography/Geology Stream Identification	X sites (WQD/POPR)	O	O	O	O	O
Precipitation	Apex/Sec at 25 sites (17 sites total)	O	O	O	O	O
<b>Continuous Stream Discharge/Flow (13 sites total)</b>						
Year-round						
Main 1/2	3 sites (154, 155, 156)	X	X	X	X	X
Upper	162 run by year + 130 run by year	X	X	X	X	X
Module 1	1 site at outlet (152)			X		
Module 2	162 run by year + 130 run by year	X	X	X	X	X
Lower 1	1 site at outlet (152)			X		
Lower 2	154 run by year + 154 run by year	X	X	X	X	X
Main 3/4	1 site (155)	X	X	X	X	X
<b>Water Quality</b>						
Continuous DO and Temp (13 sites)	Map-On					
Main 1/2						
Upper	1 site at outlet (154)	X				
Module 1						
Module 2	1 site at outlet (152)			X		
Lower 1						
Lower 2	1 site at outlet (152)			X		
Main 3/4	1 site (155)				X	X
Point						
Point (Phosphorus) (15)	As selected by MDEQ	O				
Point (Suspended Solids) (16)	As selected by MDEQ	O				
Outfall (Organic Nitrogen Creek)	As selected by MDEQ	O				
<b>Additional Items</b>						



Element	Monitoring Locations	D = Non-Alliance Services (no charge to ARC)				
		2009	2010	2011	2012	2013
Fish Macroinvertebrates, I, II, III, Habitat	As selected by MDEQ	O				
Macroinvertebrates	20-24 throughout the watershed by POPR	X	X	X	X	X
Macroinvertebrates	15-20 in Wayne Co. by SCC WQD	O	O	O	O	O
Great Lakes Watershed (Land Cover) Monitoring	Across ABC	O	O	O	O	O
<b>Public</b>						
Streamway/Restoration						
Public Safety	Not Applicable					
Summary of Watershed Restoration Efforts	Not Applicable	O	O	O	O	O
<b>Public Participation</b>						
Out of Character Identified & Eliminated	Not Applicable	O	O	O	O	O

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Photo credit: Terry Heatlie, NOAA



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