



Green Infrastructure Curriculum and Training

SIP the Green Juice!



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Community & Rural Affairs



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Why? Who? What?
When? Where?



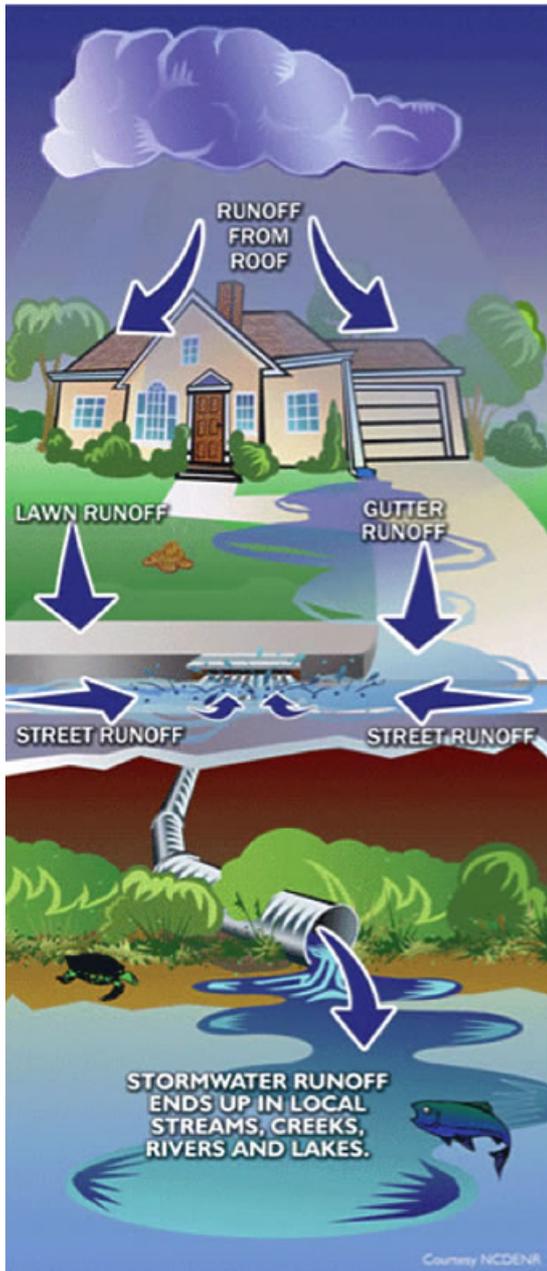
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WHY?



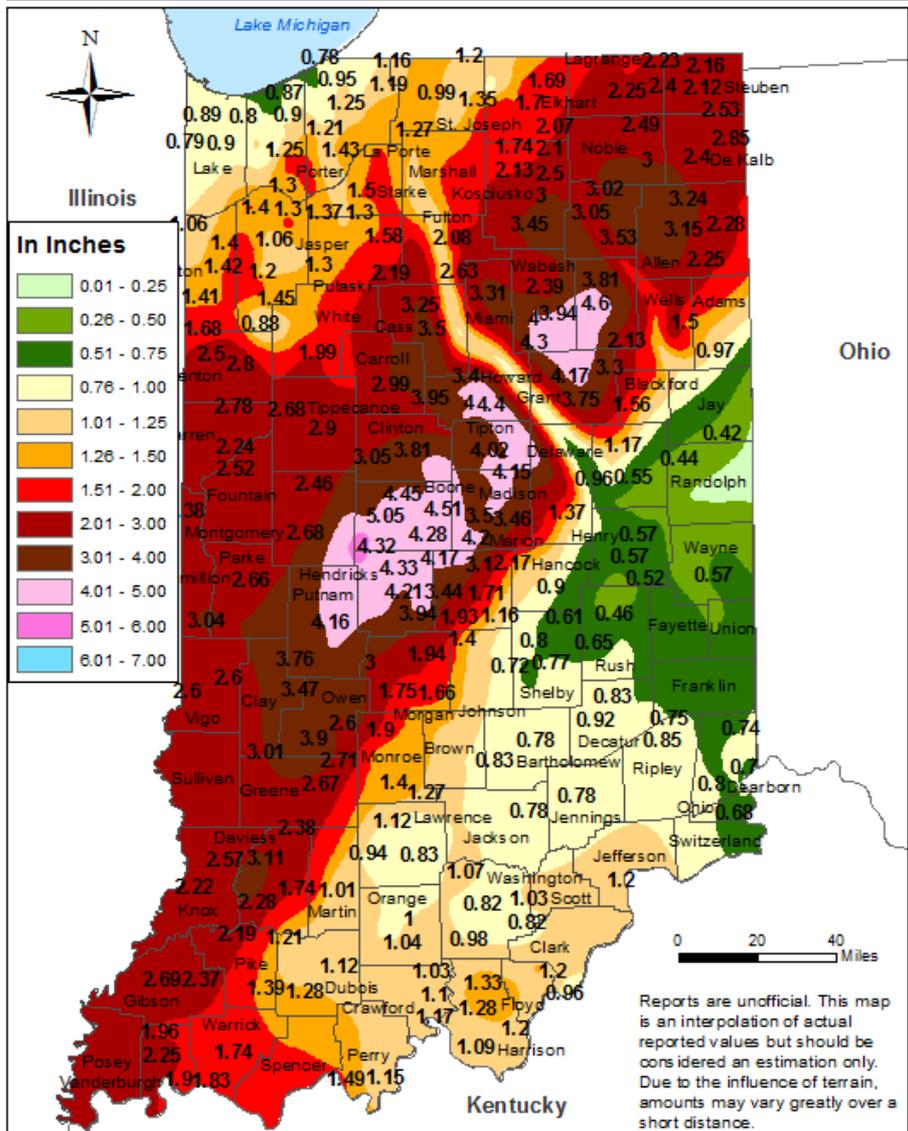
Stormwater and Flooding

- Impact of long-term changes in climate
- Need to better manage water resources
- Promote green infrastructure to improve stormwater management and become more resilient as a community





Indiana 24 - Hour Rainfall Totals - April 19, 2013



Sources: NWS Cooperative Observers, ASOS, RAWS, CoCoRaHS, Mesonets, Trained Spotters, Personal Weather Stations, Public

Created by the National Weather Service Indianapolis, Indiana
Created Apr 19 2013



Community Resiliency

- Ability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in face of turbulent change
- Furthers OCRA's Mission



Benefits of Green Infrastructure



**WATER QUALITY
& QUANTITY**



COMMUNITY



AIR QUALITY



HABITAT & WILDLIFE



**ENERGY &
CLIMATE CHANGE**









Stormwater Improvement Program 'SIP'





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Consultant Team





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WHO?



Who Should Attend this Training?

ELECTED OFFICIALS	LOCAL GOVERNMENT			PROJECT PARTNERS
Councilors	Public Works	Parks & Recreation	Stormwater Management & Permitting	Engineering & Planning Firms
Managers	Code Enforcement	Transportation	Building & Development Services	Grant Writers
Mayors	Fiscal & Budget	Zoning Board		Regulatory Agencies



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WHAT?



GI Curriculum & Training

6 Trainings

3 Sessions

- 1. Overview of Green Infrastructure*
- 2. Policies, Incentives, and Funding for Green Infrastructure*
- 3. Implementation of Green Infrastructure*



Purpose, Message & Call to Action

Purpose: provide local governments and project partners information to design stormwater projects which integrate GI

Message: Grey to Green

Call to Action: Allow, Promote & Use GI



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Changing attitudes
to change behavior.

Changing behavior to
influence attitudes





1. Overview of GI

Time: 8:00 am – 9:30 am

Target Audience: elected officials, decision-makers, and staff interested in overview of GI

Desired Outcome: overview of the different types of GI practices, benefits, and integration into municipal projects

Green Infrastructure is...



1. CLUSTER-TYPE DEVELOPMENT



3. SOURCE CONTROL PRACTICES



2. BETTER SITE DESIGN



Not New Technology...



GREEN ROOFS



PERMEABLE PAVERS



RAINWATER HARVESTING



Integration into Municipal Projects

Allow

**Code
it.**

**Retrofit
it.**

**Scale
it.**

Promote

**Incentivize
it.**

**Market
it.**

**Flip
it.**

Use

**Coordinate
it.**

**Expand
it.**

**Foster
it.**



Allow: Grey to Green

- Codes and ordinances shape development
- Create incentives to retrofit existing sites
- Scale applications in accordance with your community's vision



Promote: Grey to Green

- Stormwater fees and incentives
- Identify benefits, opportunities and limitations
- Substitute green for grey



Implement: Grey to Green

- Coordinate details and responsibilities
- Case studies and demonstration projects
- Encourage and inspire innovation



2. Policies, Incentives & Funding for GI

Time: 10:00 am – 12:00 pm

Target Audience: elected officials, decision-makers, and staff responsible for municipal finances, policies, and planning

Desired Outcome: overcome barriers to GI and prepare more competitive SIP applications



Overcoming Barriers

1. Technical & Physical Barriers
2. Legal & Regulatory Barriers
3. Community & Institutional Barriers
4. Financial Barriers





3. Implementation of GI

Time: 1:30 pm – 4:30 pm

Target Audience: staff responsible for design, plan review, construction, and maintenance of GI practices

Desired Outcome: better understand GI and how to incorporate into municipal operations



BMP Selection

1. Site Assessment & Site Design
2. Source-control & Water Quality Treatment
3. Site Restoration

1. Site Assessment & Site Design



**MINIMIZE SOIL
COMPACTION**



**PROTECT SENSITIVE AREAS
PROTECT RIPARIAN BUFFERS
PROTECT NATURAL FLOW PATHWAYS**



**CLUSTER-TYPE DEVELOPMENT
MINIMIZE TOTAL DISTURBED AREA**



**MINIMIZE IMPERVIOUS SURFACES
STORMWATER DISCONNECTION**

2. Source-control & Water Quality



**PERMEABLE PAVEMENT
BIORETENTION/RAIN GARDENS
PLANTER BOXES/TREE BOXES**



**VEGETATED FILTER STRIP
VEGETATED SWALE/BIOSWALE
INFILTRATION PRACTICES**

**WET/DRY STORMWATER PONDS
CONSTRUCTED WETLANDS**



**GREEN ROOFS
RAINWATER HARVESTING**

3. Site Restoration



NATIVE REVEGETATION



RIPARIAN BUFFER RESTORATION



SOIL RESTORATION





BMP Function

- Performance Standards
- Design
- Construction
- Maintenance

Integration in Municipal Projects

Create stormwater microparks



Build in green features during routine right-of-way maintenance and operations



Design traffic safety features to manage stormwater and improve aesthetics



Green Infrastructure Opportunities

Build or retrofit parking facilities to be greener



Build rain gardens at public facilities



Grey to Green – Residential Street

STORMWATER CURB EXTENSIONS

Conventional curb extensions (also known as curb bulb outs, chokers, or chicanes) have been used for decades to enhance pedestrian safety and help in traffic calming.

A stormwater curb extension simply incorporates a rain garden into which runoff flows.



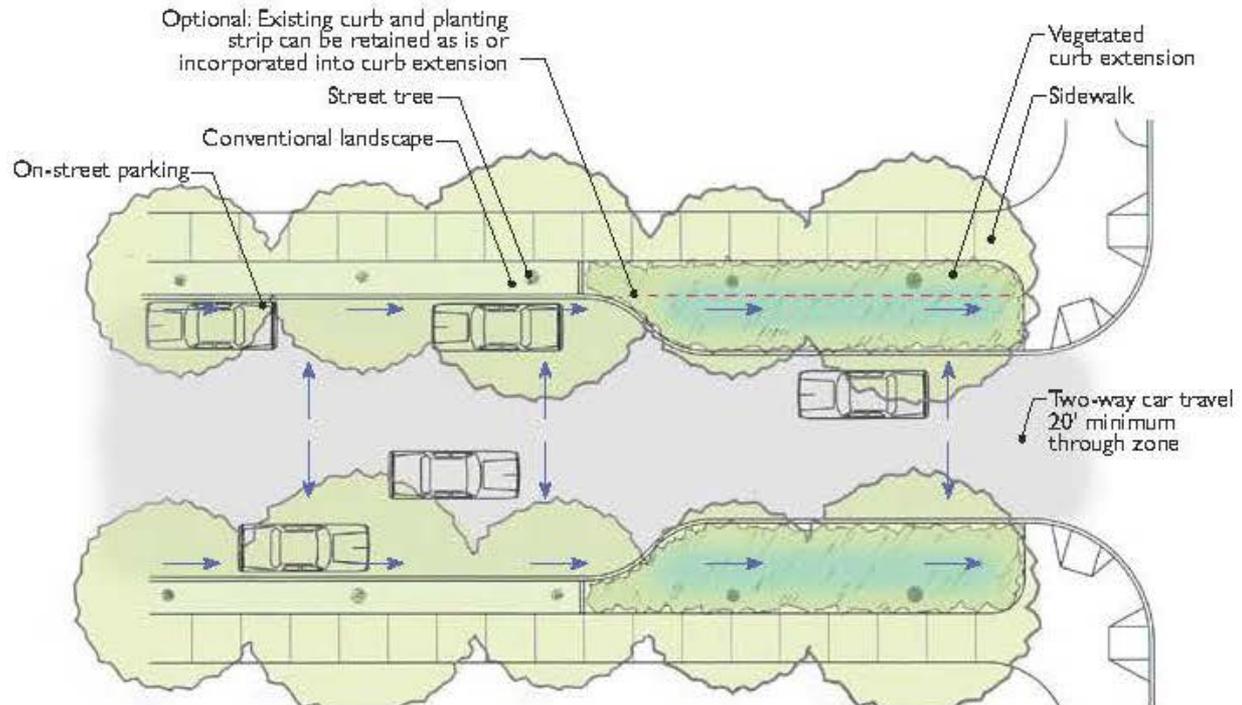
TYPICAL STREET



OPPORTUNITY



IMPLEMENTATION



Grey to Green – Commercial Street

PERMEABLE PAVING

Permeable paving on commercial streets can be incorporated into sidewalks and parking lanes.

Recent advances in permeable paving technologies now make many appropriate for higher speeds or where large, heavy vehicles are expected to be parked—areas such as loading zones and bus stops.



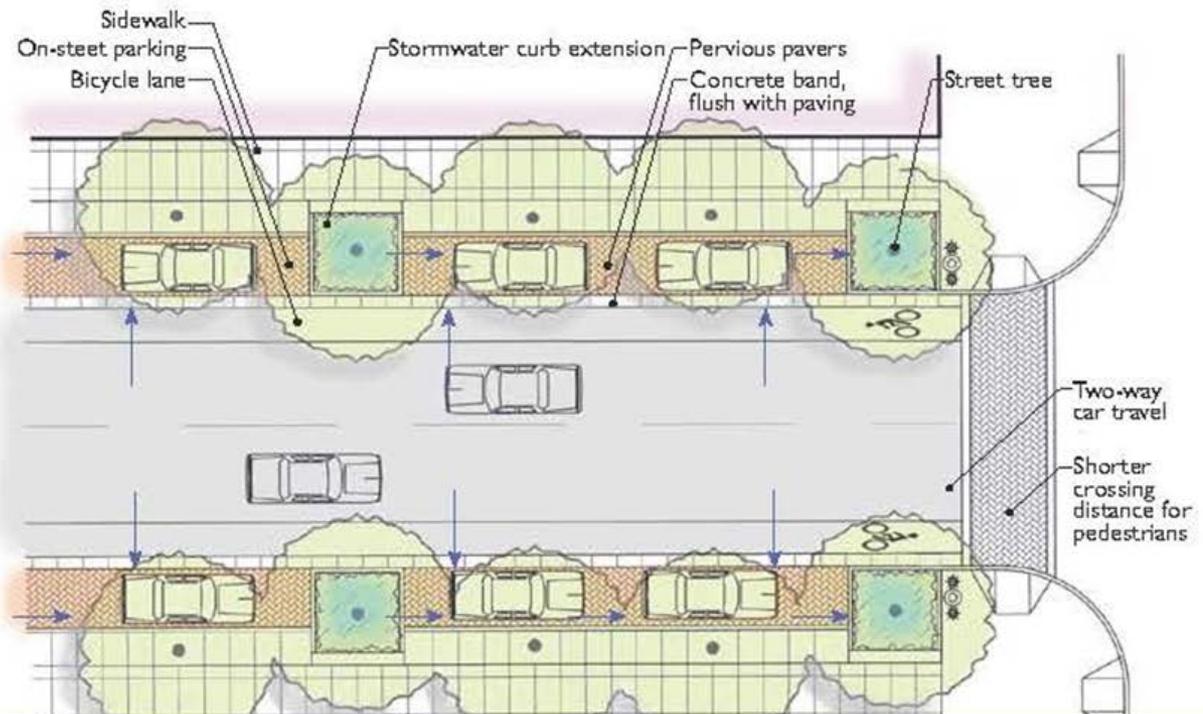
EXISTING



OPPORTUNITY

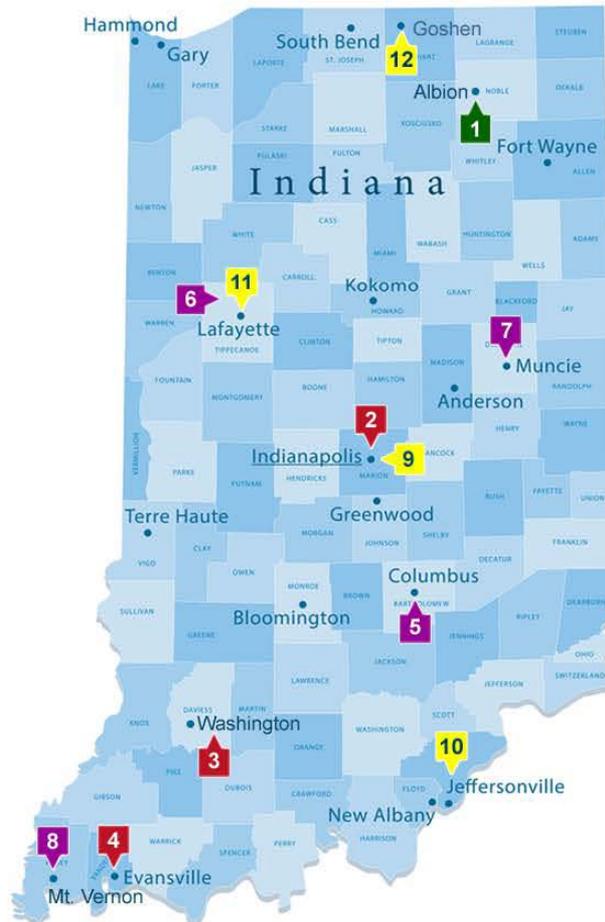


IMPLEMENTATION





Green Infrastructure Curriculum and Training Selected Case Studies



Columbus, Indiana
Cleo Rogers Memorial Library
Plaza Renovation

Library plaza retrofit incorporates a rain garden, infiltration trenches, tree planters and an overflow infiltration bed. This retrofit restored ADA accessibility and directed 100% (15,000 sq. ft. of impervious surface area) of stormwater runoff into the ground on site.

[Case Study Details – Click Here](#)



Main plaza after construction with rain gardens



After photo of plaza being used as an event space



Close up photo of rain garden and new pavers



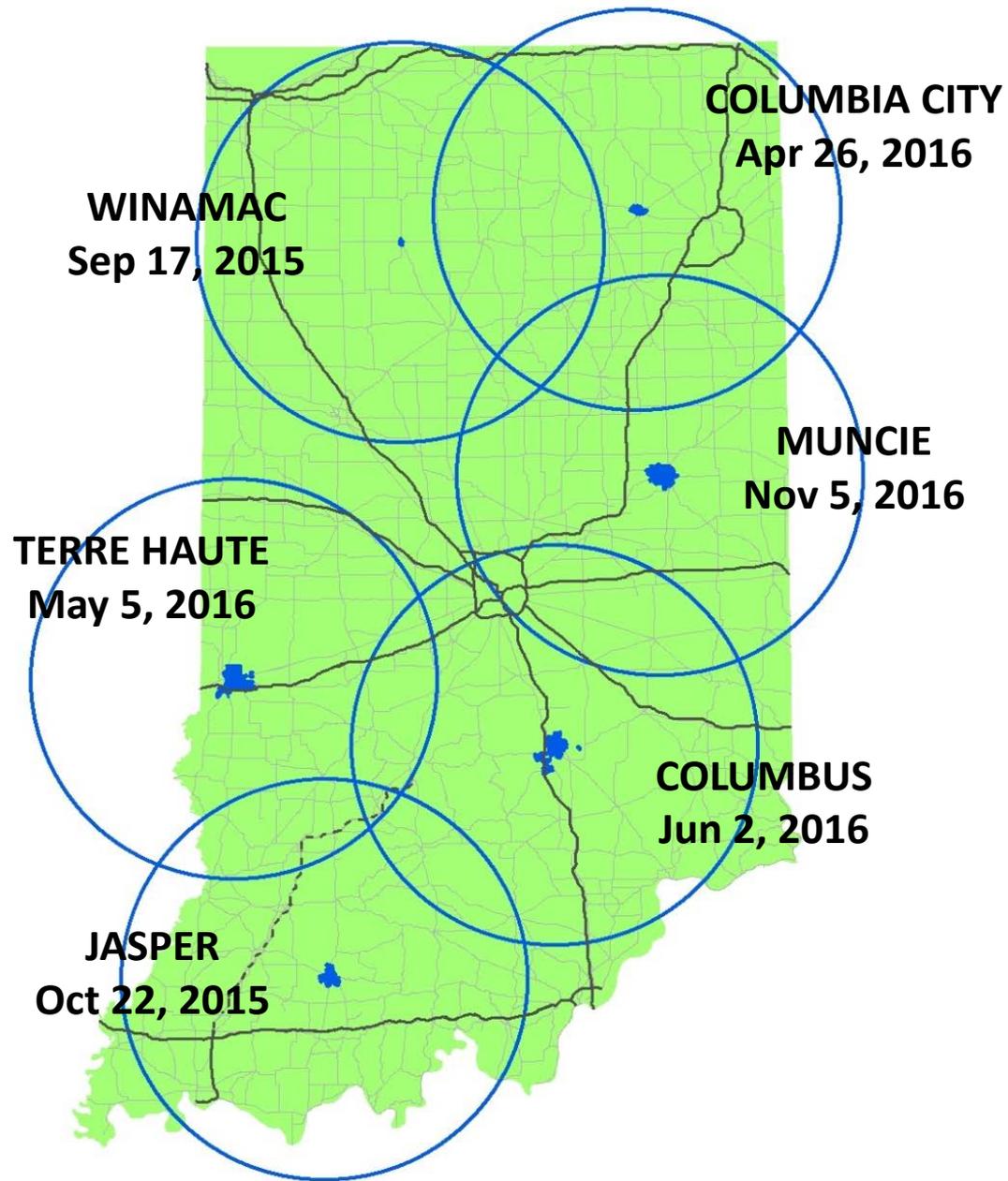
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WHEN?



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WHERE?



WINAMAC
Sep 17, 2015

COLUMBIA CITY
Apr 26, 2016

MUNCIE
Nov 5, 2016

TERRE HAUTE
May 5, 2016

COLUMBUS
Jun 2, 2016

JASPER
Oct 22, 2015



SAVE THE DATE

LEARN GREEN FOR STORMWATER MANAGEMENT



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Why: Learn how green infrastructure can be incorporated into municipal projects to reduce flooding and improve water quality and how this may make your OCRA Stormwater Improvement Program (SIP) grant application more competitive.

What/Who: OCRA is conducting trainings for municipalities to learn about green infrastructure. The trainings are free and intended for elected officials and public employees. You may attend the entire day or just the session of greatest value to you.

Where/When: (Click the date to register - Registration password is "OCRA")

- Winamac, IN – September 17, 2015
- Jasper, IN – October 22, 2015
- Muncie, IN – November 5, 2015
- Columbia City, IN – April 27, 2016
- Terre Haute, IN – May 5, 2016
- Columbus, IN – June 2, 2016

Registration is required and space is limited.

SO BOOK IT NOW!

QUESTIONS?

ocratraining@cbbel-in.com

317-266-8000

SIP the Green Juice!

**Kathleen
Weissenberger**

*Office of Rural & Community
Affairs*

kweissenberger@ocra.in.gov

317.232.1703

Sheila McKinley

*Christopher B. Burke
Engineering, LLC*

smckinley@cbbel-in.com

317.226.8000

