

# Rain Gardens: Lessons Learned

## Tips, Maintenance, and Troubleshooting

Rain Garden Certification

Alabama Cooperative Extension System

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*Adapted from North Carolina State University*

*USDA Southern Regional Water Program*

# Rain Gardens Are Not.....

- Ponds, wetlands or bogs
  - Rain soaks in less than 48 hours
- Mosquito breeding grounds
  - 7 to 12 days of standing water needed to hatch eggs
- High maintenance
  - About the same as any landscape bed
  - Depends on size, location, plant choices, etc.
- NO MAINTENANCE
  - Require establishment, weeding, remulching

# 7 Essential Tips for Rainwater Harvesting

# 1. Begin with thoughtful observation

Look at the property during a rain event.

Where do the gutters drain?

Where is rainfall currently being directed?

How much water flows from other properties?

Where are the pre-existing contours?

2. Start at the top of the watershed, work your way down

Don't try to solve the problems of more than one property at the base of a hill

Use mini-interventions throughout the watershed

Think about cisterns, swales, more than one rain garden. . . .

3. Start with small, simple strategies that harvest the rain as close as possible to where it falls

Simple, small water-harvesting techniques:

Rain gardens

Terraces

Contour berms

Proper plant selection

Xeriscaping

Rain barrels

Harvest the rain where it falls, on the land.

## 4. Maximize living and organic groundcover

Increase groundwater storage with groundcovers (mulch or plants) to increase infiltration

Create a “living sponge” effect that will utilize the harvested water

- Provides additional food for wildlife, aesthetically appealing

- Improves the soil’s ability to infiltrate and hold water

- Develops a vast network of growing roots and beneficial microorganism.

## 5. Spread, slow, infiltrate the flow of water into the soil

Transform potentially erosive rain events into productive resource while reducing water loss to runoff

Increase the time water spends on the surface of the landscape, increase infiltration



## 6. Always plan an overflow route and manage it as a resource

All water-harvesting systems will meet a storm that exceeds their capacity, so don't get taken by surprise

Idea: Divert overflow from a rain barrel, into a rain garden, divert garden overflow into the rest of your yard.

7. Continually reassess your system and improve it

# 7 Essential Rainwater Harvesting Tips

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# Maintenance Recommendations

# Maintaining the Rain Garden

Irrigation

Fertilizer and lime

Re-mulching

Weeding and Replacement Planting

Monitor and Reevaluate

# Irrigation



After installation until plants are established (need 1" per week)

During "dry-spells"

Hook-up to a rain barrel overflow?

# Fertilization and Liming



Get a Soil test with ACES  
It's \$7.

## Fertilization

Never in 'bowl' of rain garden  
Maybe on berm and banks if  
poor grass growth

## Lime Amendment

Our soils are acidic  
Apply lime according to soil  
test recommendations or  
every 2-3 years

# Re-Mulching



Prefer shredded hardwood

Annually 3 inches maximum -  
Don't bury plants

Do not over mulch or fill water  
storage pool with mulch



# Weeding and Pruning



## Weeding

What is a weed?

Removing unwanted seedlings during establishment is essential

Will decrease over-time

## Pruning

Plants grow with water and nutrients

Follow spacing guidelines!  
(tempting to over-do it)



# Plant Replacement



*Why are plants dying?*

Replace with more tolerant species

Re-assess garden design?

Move around to keep them 'happy'

Plant on edges or mounds

# Monitor and Re-Assess

Is there erosion?

Is water entering the inlet? Reposition, replant, rethink

Is the berm too low or too high?

Where is the overflow and is it effective?

Do you need a larger outlet? Where is it water going?

Reuse or re-direct it.

Is sediment entering the garden?

If so, from where? You may need to talk to your neighbor.

Is it draining?

What, there's trash building up?

# Renovation



As the rain garden ages...

# Rain Garden Maintenance Tasks and Schedule

<b><u>TASK</u></b>	<b><u>SCHEDULE</u></b>
<b>Prevent Soil Erosion</b>	<b>Keep watch on out parcels and parking lot use</b>
<b>Trash removal</b>	<b>Weekly</b>
<b>Pruning</b>	<b>Annual</b>
<b>Mulch renewal</b>	<b>After 1st frost in fall or last frost in spring</b>
<b>Mulch removal</b>	<b>Every 3 years</b>
<b>Plant replacement</b>	<b>As needed</b>
<b>Remove sediment</b>	<b>As needed or during mulch renewal</b>
<b>Perimeter Mowing</b>	<b>As needed</b>

# Troubleshooting and FAQs

# Is installing a rain garden (or any garden) expensive?

It doesn't have to be

Utilize grants

(Yes, homeowners, businesses)

Work with local Cooperative

Extension for ideas

Check out local plant sales

Swap plants you have already,  
trade with neighbors

Local developers cutting trees to  
provide mulch



Will there be standing water?



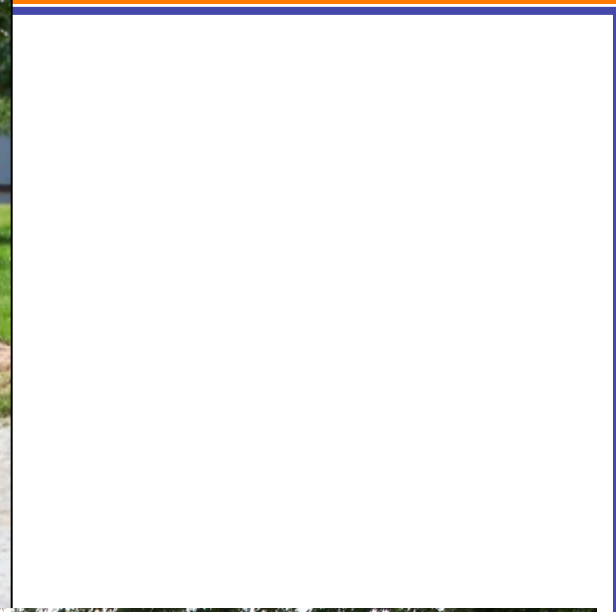
YES! After it rains, it may even look flooded.  
THIS IS OKAY!



# 7 Essential Tips to Avoid Catastrophes

1. One Call. Be aware of rights of way, underground service lines or utilities, ordinances  
(Use it! **1-800-292-8525**, [www.al1call.com](http://www.al1call.com))
2. At least 10' from house; downslope of home
3. Not where water tends to pool (soils poorly drained)
4. Not directly beneath a tree
5. Along a gentle slope (< 10% slope)
6. Water table at least 2' below soil
7. Not directly over septic system or near a wellhead (25' away)

# Installation Errors: Pop Quiz!











**The garden**

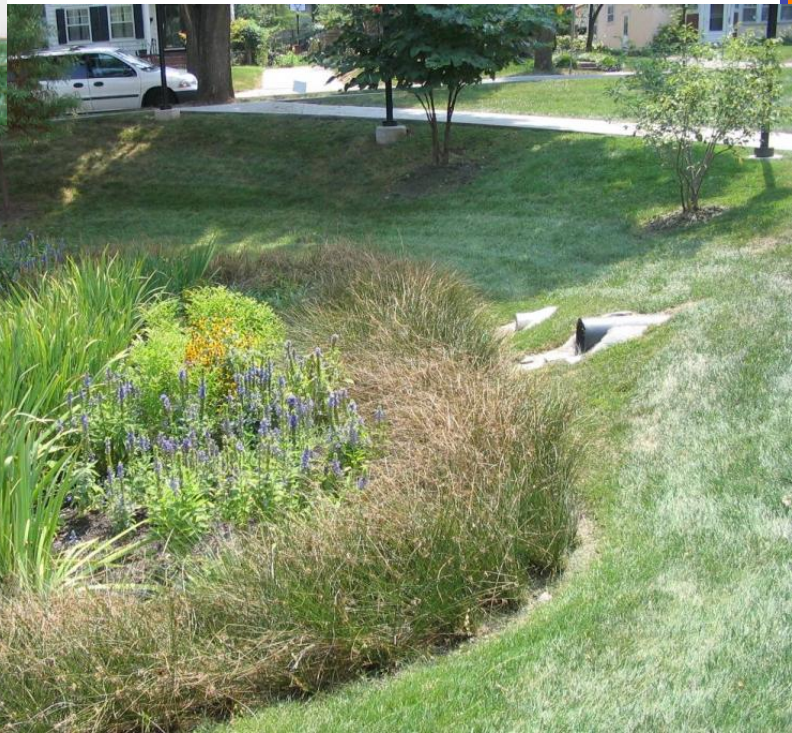
**The outflow (for the same garden)** →











# Ultimate lessons learned...

Every site is different.

Achieved successful basic design.

Watch, learn, adapt, especially w/ plant placement.

‘What if’ always happens – plan ahead!

5 in. rainstorm, no rain, drains way too fast, wildlife ate your plants

No such thing as a maintenance-free garden

# Summary

## Rain Garden Certification

Alabama Cooperative Extension System

*Adapted from North Carolina State University  
USDA NIFA Southern Regional Water Program*

# Thank you.

# Changing land uses influence water...

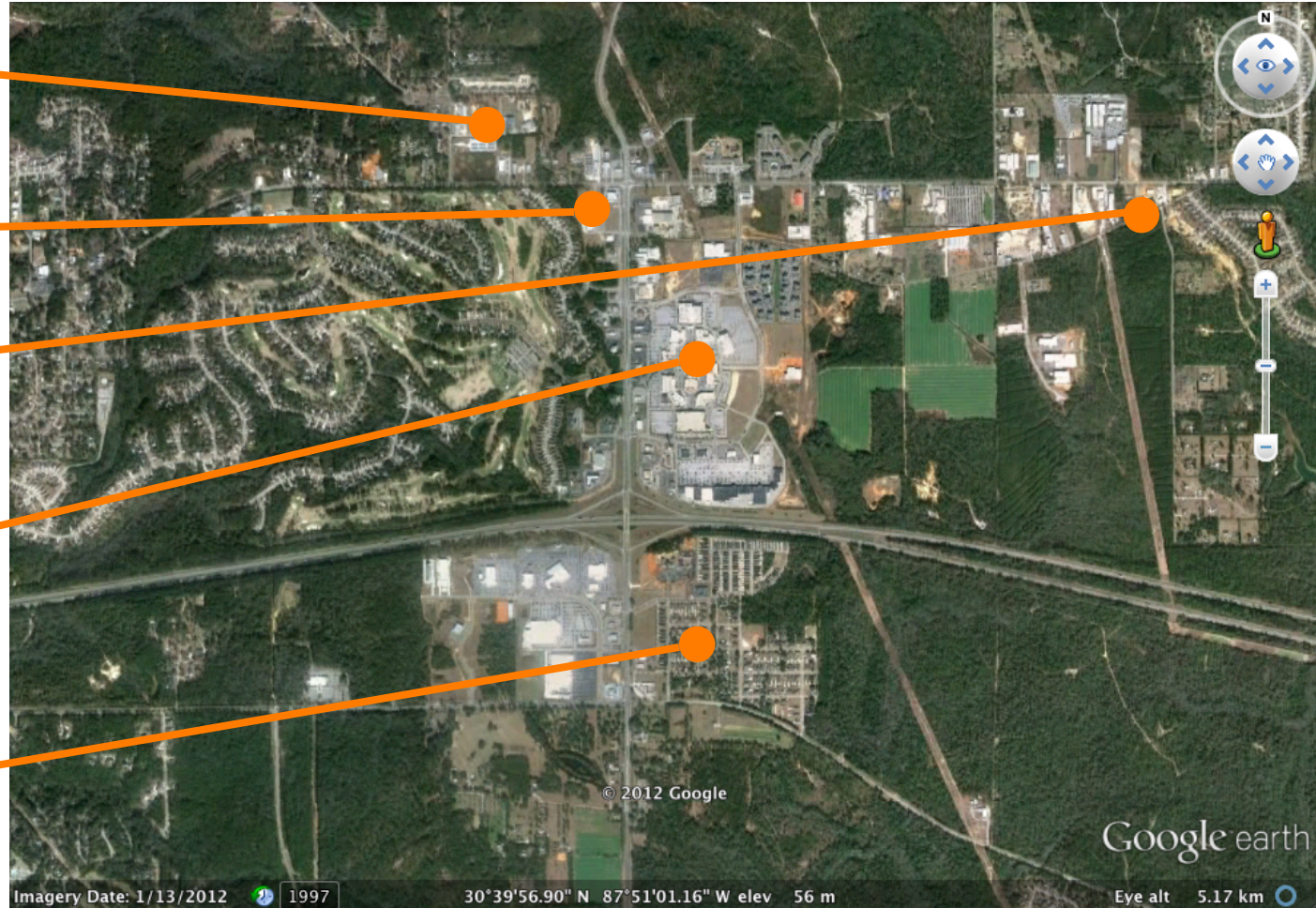
Removal of  
vegetation

Land compaction

Erosion &  
sedimentation

Increase in  
impervious  
surfaces

Conventional  
stormwater  
management

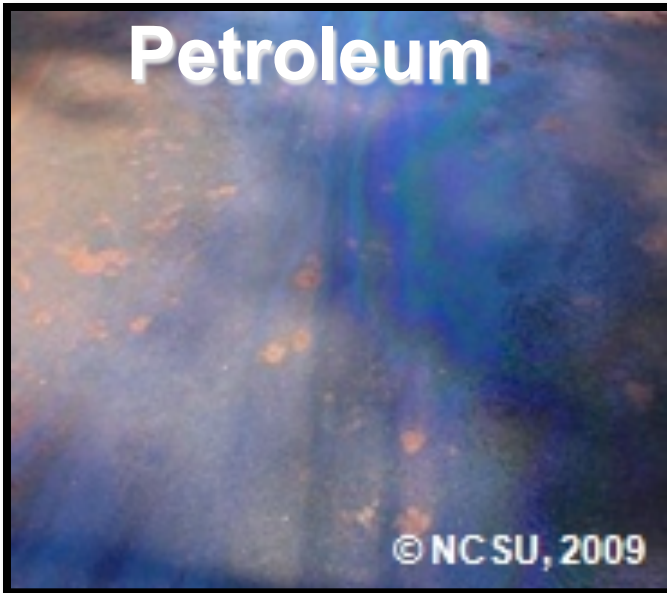




**Sediment**



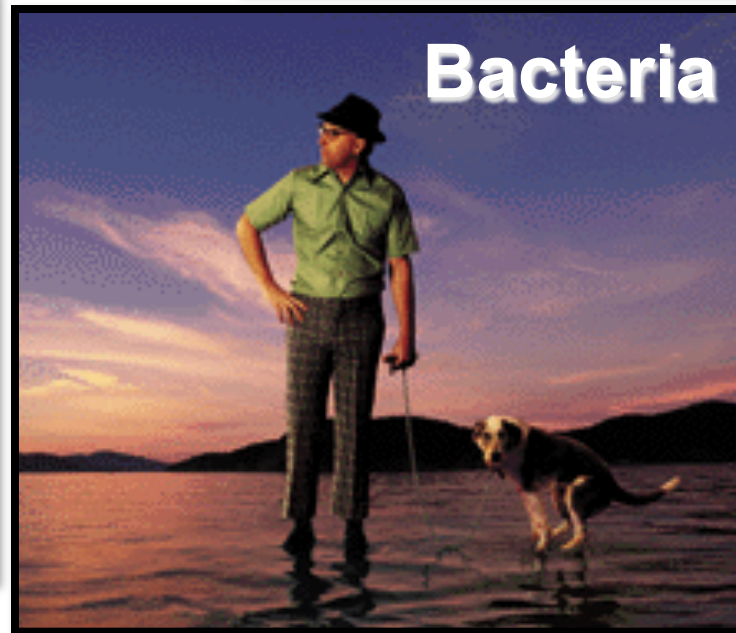
**Nutrients**



**Petroleum**

© NC SU, 2009

**Extension**  
SYSTEM



**Bacteria**

**Rain Garden  
Certification**

# The Result





# Benefits of Rain Gardens

Low maintenance, low water use, beautiful landscape feature

Increases infiltration of rainwater in landscapes with impervious surfaces

Infiltrates as much as 30 % more water than a flat or sloped lawn area

Reduces flooding

Creates habitat in the landscape



# RAIN GARDENS

**Smaller**

**No PE/RLA Approval**

**Native soils**

**Same Plants**

**Reduce Runoff**

**Remove  
Pollutants**

**Larger**

**PE/RLA Approval Rec'd**

# BIORETENTION

**Eng'rd Soils**

# Watershed Approach

Multiple stormwater control practices to direct and infiltrate stormwater

Mimic natural hydrology

Low Impact Development



# Chocolate Chips

Practices are site specific

Drainage area treated

Amount of land available

Landowner acceptance

Regulations

Rain Garden (101)

Bioretention (201)

Bioswale (201)

Constructed Wetland (201)

Stream Enhancement (201)



# Bioretention

Substrate is brought in:

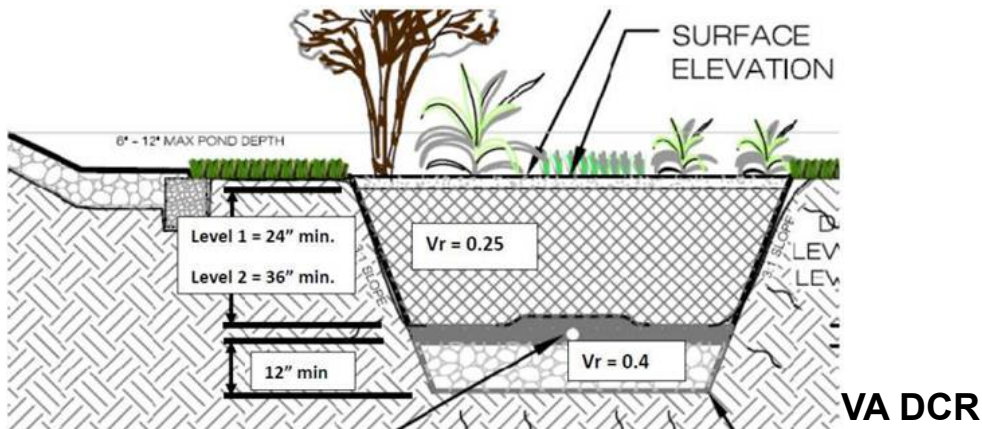
85% sand

10% fines

5% organic

Same vegetation, same drainage time (< 48 hours)

May have underdrains to increase internal water storage



# Bioswale

Similar substrate as bioretention

Similar plants (sometimes turf)

May have pretreatment



# Constructed Wetlands

Saturated conditions in most years

Multiple elevations (deep pools, shallow water, shallow land, upland)

Excellent for pollutant removal, but requires more land to maximize efficiency



# Stream Enhancement

Replant streamside forests (remove invasive exotics)

Larger scale - stream restoration



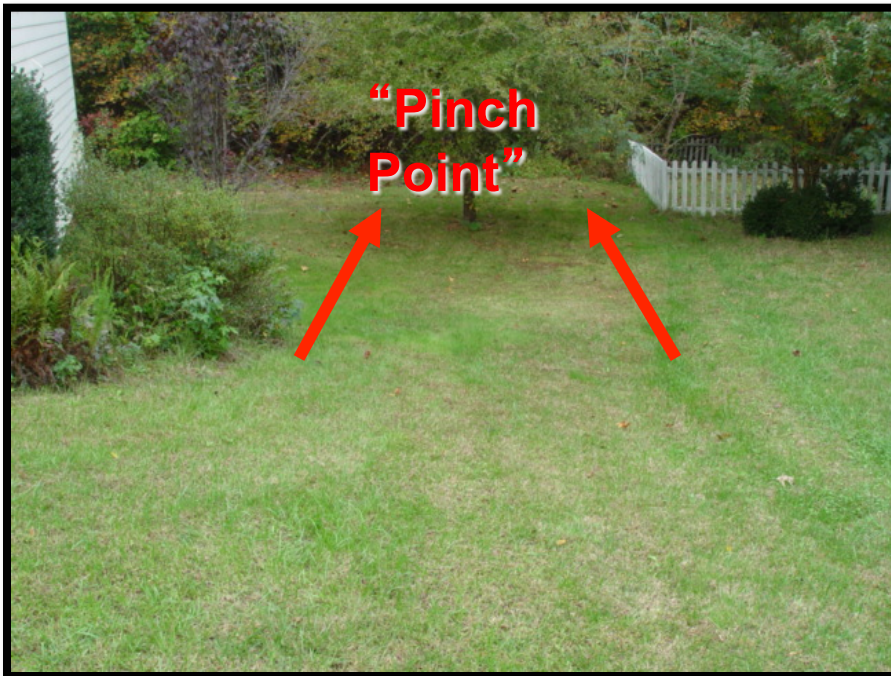


# Rain Garden Quick Look

# Step 1:

## Determine Potential Rain Garden Locations

Your rain garden should be between runoff source and destination (“pinch point”)



# Step 1:

## Determine Potential Rain Garden Locations

> 10 ft from house crawl space  
or basement

**NEVER uphill**

> 25 ft from wellhead

**NEVER uphill**

> 25 ft downhill or laterally from  
septic system drain field

**NEVER uphill**

In full to partial sun if possible



# Step 2: Infiltration Test Hole



Dig a hole to a depth of **1 foot** and fill with water  
Repeat **2-3 times.**

# Infiltration Test: Rain Garden Type

Drain Time (Drainage Rate)	Appropriate Landscape Practice
< 12 hours (> 1"/hr)	Standard Rain Garden
12 – 36 hours (0.25-0.9"/hr)	Standard Rain Garden (amended soils for better infiltration)
> 3 days (< 0.5"/hr)	Wet Rain Garden

# Wetland Soils: BAD for Rain Gardens!



# Step 3: Design your rain garden

1. Determine the watershed boundaries.
2. Estimate area of imperviousness.
3. Choose a runoff capture depth and a ponding depth.
4. Determine required size for rain garden.

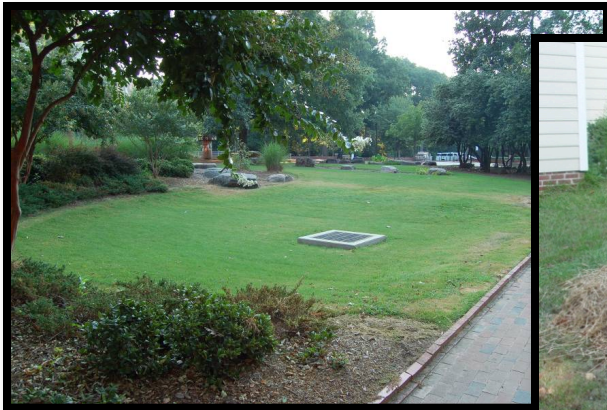
**3 inch P.D.:** 
$$\text{rain garden size} = \frac{\text{total impervious area}}{10}$$

**6 inch P.D.:** 
$$\text{rain garden size} = \frac{\text{total impervious area}}{20}$$

# Step 4:

## Determine type and size of overflow weir

Impervious Surface Area (ft <sup>2</sup> )	Overflow Weir Length (ft)
2000	1.0
3000	1.5
4000	2.0
5000	2.5





# Step 4: Construct your rain garden

Ensure watershed is stable and erosion-free

Locate all utilities, septic tanks and drainfields

Avoid compaction of soils within the rain garden

If compaction occurs, till the top 8-12 inches

Add soil amendments if necessary (soil test)



# Step 5: Mulch and Plant

Make sure plants are placed in the appropriate location within the rain garden for maximum survival

Fertilize plants to help them get established, if necessary

Water during initial planting and during dry periods

Mulch should be **NO MORE** than 3 inches deep and should be refreshed annually

Use a double- or triple-shredded hardwood mulch to minimize floating



# Step 6: Maintenance

Water plants during dry periods

Refresh/replace mulch annually

Remove weeds as needed

Prune RG plants annually

Remove trash, debris and pet waste

Replace dead plants as needed



Questions? [www.smartyards.org](http://www.smartyards.org)

