Rain Garden Overview
What is a Rain Garden?

- A shallow depression in a landscape that captures water (1 to 1.5-inch rainfall) and holds it a short time
- Runoff water is captured and infiltrated into the soil
- An attractive addition to a landscape
Benefits of Rain Gardens

• Reduces water pollution downstream
• Reduces flooding downstream
• Low maintenance, low water use
• Can increase water infiltration 30-40%
• Creates habitat in the landscape
• Beautiful landscape feature!
Rain Garden or Bioretention…..?

Basically – It’s a matter of scale…..
Rain Gardens

- Similar plants
- No PE / RLA approval required
- Usually small, ‘homeowner sized’ (average 60-100 sqft)
- Utilizes in-place / native soil
- Have customers that like plants??? This is for you!

Bioretention

- Similar plants
- Installed to meet regulatory requirements
- RLA / PE approval required
- Can be small - very large
- Usually use specialized engineered soils / soil media and under drains to insure that it drains
Rain Gardens Improve Water Quality

- Handles stormwater at its source.
- Keeps water on the surface aiding infiltration
- Decreases the velocity of water flowing from impervious surfaces.
- Improves water quality before it enters the stream or ditch.
- Reduces nutrients, heavy metals, sediment, fecal coliform
- Cost effective (average $2-$5 per sq ft. – w/o underdrain)
Basic Rain Garden Components

Overflow

Evaporation

Runoff In

Ponding Area

Infiltration
Rain Gardens are like. . .
Rain Garden will be…

Very wet sometimes…

2-3 days (max)
Goals of Low Impact Development

- Reduce impervious surfaces
- Retain runoff on-site
- Promoting infiltration and evapotranspiration

- Replicating pre-development hydrologic conditions as closely as possible

- Davis, 2005
Denitrification in Riparian Buffers

$N_2$ (atmospheric N)

WATER

Zone 1: 30' undisturbed forest vegetation

anaerobic conditions + carbon

Zone 2: 20' managed vegetation

$NO_3^-$
Raingardens Mimic Buffer Conditions
State BMP Manual Credit for Bioretention

<table>
<thead>
<tr>
<th>Regulatory Credits</th>
<th>Pollutant Removal – No IWS</th>
<th>Pollutant Removal – with IWS</th>
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<tbody>
<tr>
<td></td>
<td>Total Suspended Solids</td>
<td>Total Suspended Solids</td>
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<tr>
<td>85%</td>
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**Coastal Plain & Sand Hills**
- Total Suspended Solids: 85%
- Total Nitrogen: 60%
- Total Phosphorus: 60%

**Piedmont & Mountains Counties**
- Total Suspended Solids: 85%
- Total Nitrogen: 40%
- Total Phosphorus: 45%
Flow Volume (Charlotte, NC)
flow...viewed another way

More Runoff Arriving Faster

Flow Rate, cfs

Time, hours

hydrograph

Pittsboro Rain Garden Certification
October 2014
Nutrients – Chapel Hill, NC

![Bar chart showing nutrient load in and out for NO3, TKN, TN, and TP.]}
Temperature Effects?

Temperature Effects?

![Graph showing median water temperature by location.](image-url)
Rain Garden Installation Examples
Rain Garden Installation Examples
Rain Garden Installation Examples
The “Dash” / OK, Winston-Salem
Brunswick County/ Holden Beach
Bill Hunt’s Old House
Siler City Town Center
Rain Garden Installation Examples (?)