

Flooding: Causes and Solutions

Clear Water Alabama 2024 Seminar
Landmark Park – Dothan, Alabama
September 25, 2024



**and why
is the carpet
all wet.
TODD?**



Flooding

- Flooding is an overflowing of a large amount of water beyond its normal confines, especially over what is normally dry land.
- Causes negative impacts on a community:
 - Damages to homes and businesses
 - Public safety is compromised
 - Loss of life

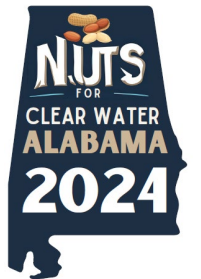


Causes of Flooding

- Catastrophic Dam Break
- Heavy rain event such as a tropical depression
- High intensity, short duration rain events
- Undersized stormwater conveyance systems
- Backwater from river crests
- Debris & Maintenance



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Flood Evaluation Process

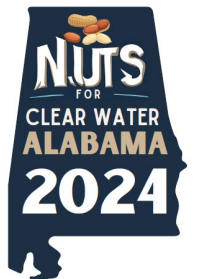
- Define current flood problem
- Assess future flooding based on land use maps
- Low Impact Development (LID) BMPs for future development
- Identify flood reduction alternatives
- Assess flood scenarios
- Compare benefits and costs
- Develop implementation priorities
- Communicate assessment results



Flood Reduction Alternatives

- Upstream Peak Flow Attenuation
 - In-stream structure
 - Off-line Detention/Retention Structures
- Land Management and Infiltration
 - Vegetation preservation
 - Effective Flood Plain Management
 - Low Impact Development Best Management Practices or Green Infrastructure
- Hydraulic Capacity Enhancement

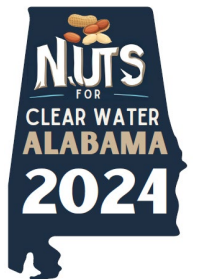
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In-Stream Attenuation

- Berms or dams used for this option
- During normal flow, run-of-stream through a tunnel
- Requires land that can be flooded upgradient during peak flood events
- Not common in Alabama on a large scale
- Tarrant Flood Mitigation Dam on Five Mile Creek


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Off-Line Attenuation

- Applicable to new and existing development areas
- Construction sediment basins converted for future attenuation
- Long-term maintenance can be an issue
- Common practice

Land Management and Infiltration

- Vegetation preservation
 - Greenways
 - Streetscapes
- Effective flood plain management
- Low Impact Development Best Management Practices or Green Infrastructure

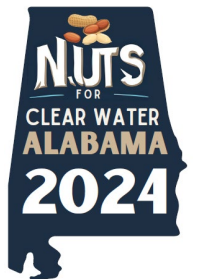


Hydraulic Capacity Enhancement

- Previously discussed flow attenuation strategies can occur anytime – required capacity reduction downstream
- Conveyance improvements must consider downstream capacity
 - Channels
 - Ditches
 - Culverts
 - Bridges
- Begin downstream and work upstream



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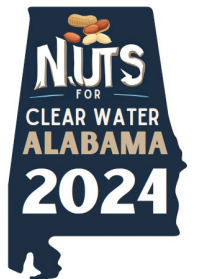


Summary

- Look for sustainable and resilient solutions to address urban flooding
- Designs need to maximize vegetative preservation
- Encourage the implementation of LID BMPs
- Increase conveyance capacity where needed
- Protect water quality while considering flood mitigation strategies



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A photograph of a lush green field in the foreground, with a dense forest of tall trees in the background. The text "Green is good!" is overlaid in the center in a bold, yellow font.

Green is good!



Thank you!

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