Stormwater Advisory Commission Kickoff Meeting

February 22, 2018

Credits

- Kimberly Brewer, Tetra Tech
- Nora Deamer, NCDEQ

Goals

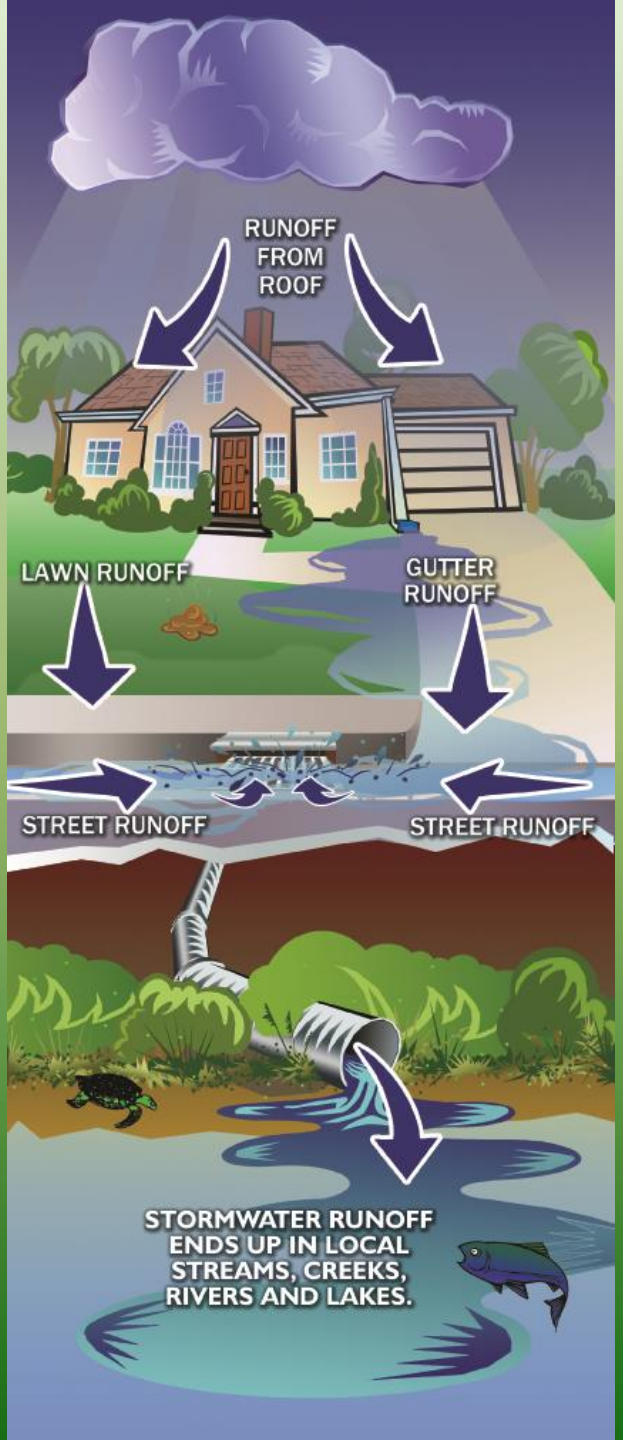
- Broadbrush overview
- Introduce near term/frontburner task at hand
- Identify topics for longer term/ backburner consideration

*

Challenges

- Impacts to ecosystems….
  - Water quantity….
  - Water quality….
- Impacts to people/property, infrastructure….

What is stormwater ….



What is stormwater… runoff….

Typical pre-development conditions:

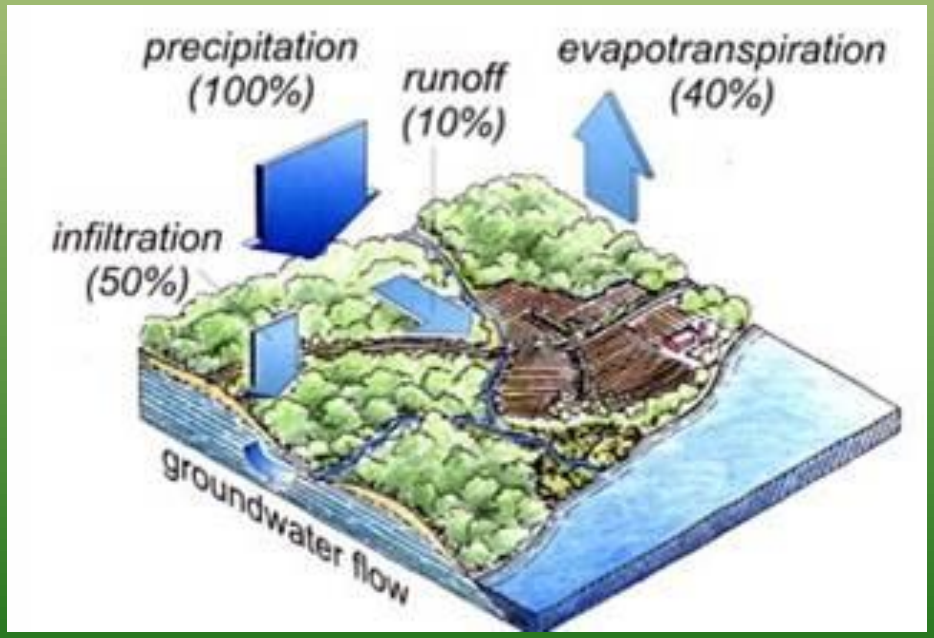
Runoff = 10%

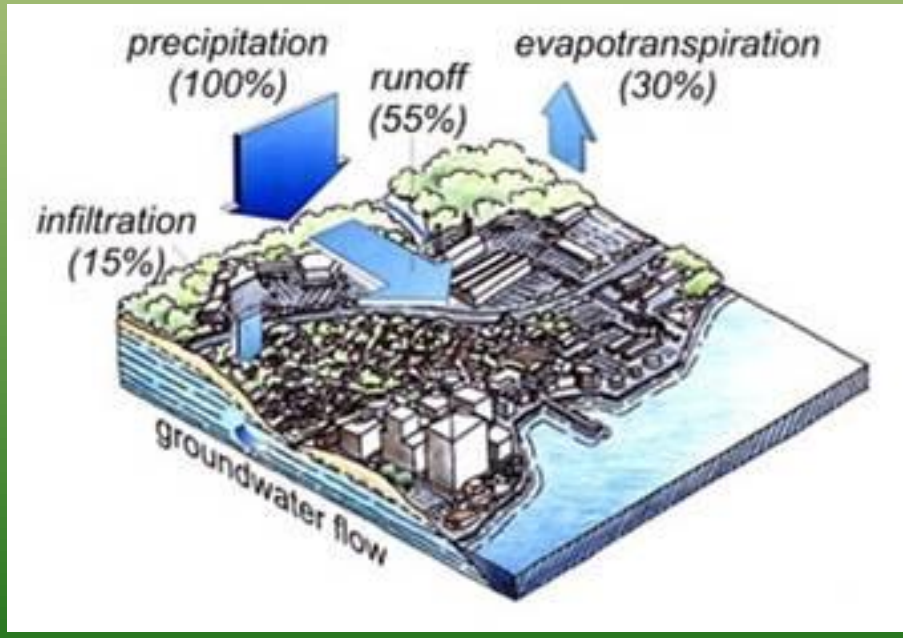
Infiltration = 50%

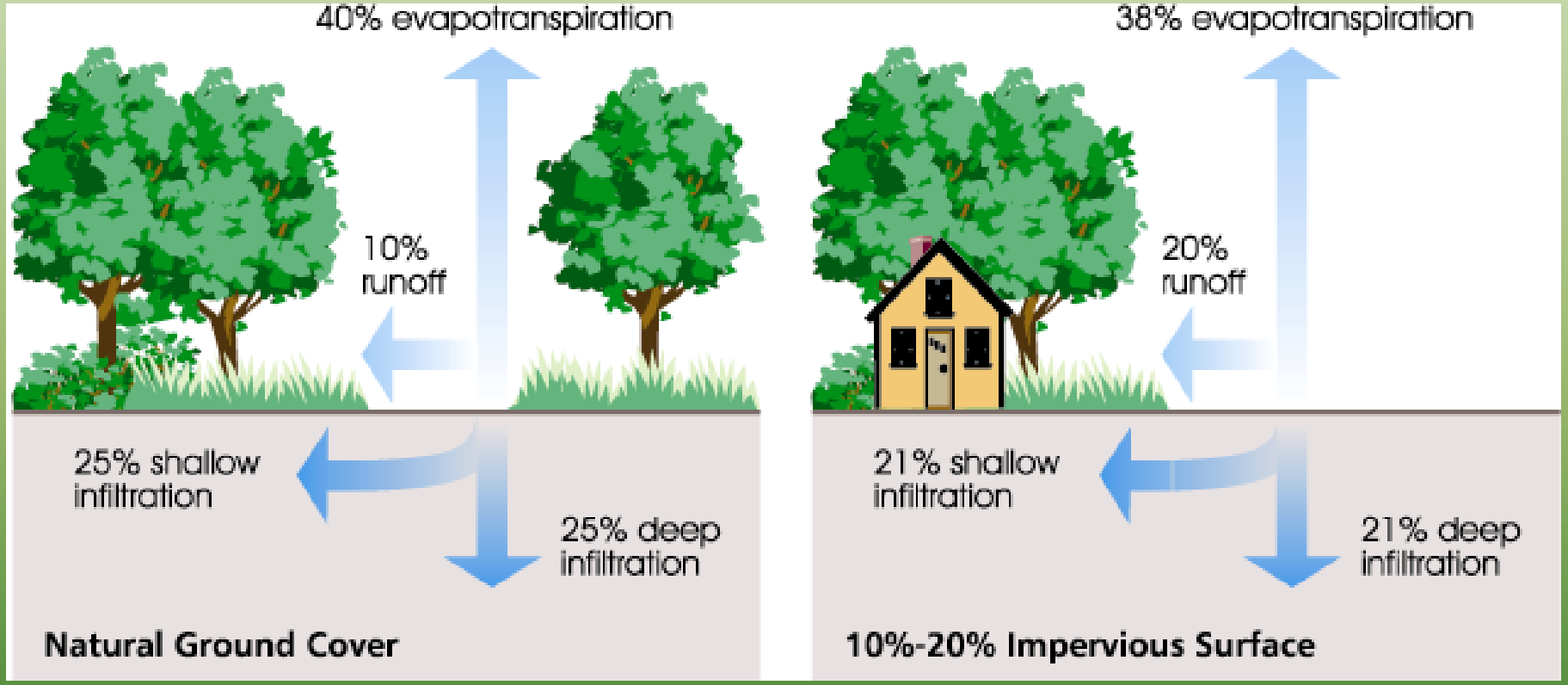
Typical post-development conditions:

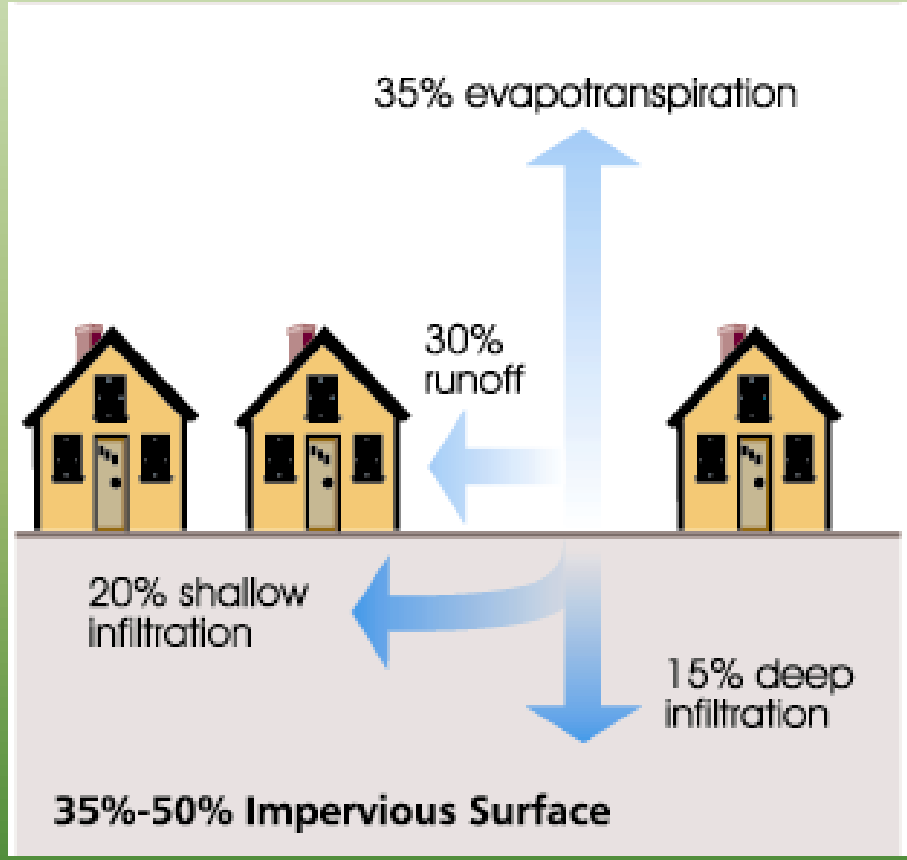
Runoff = 55%

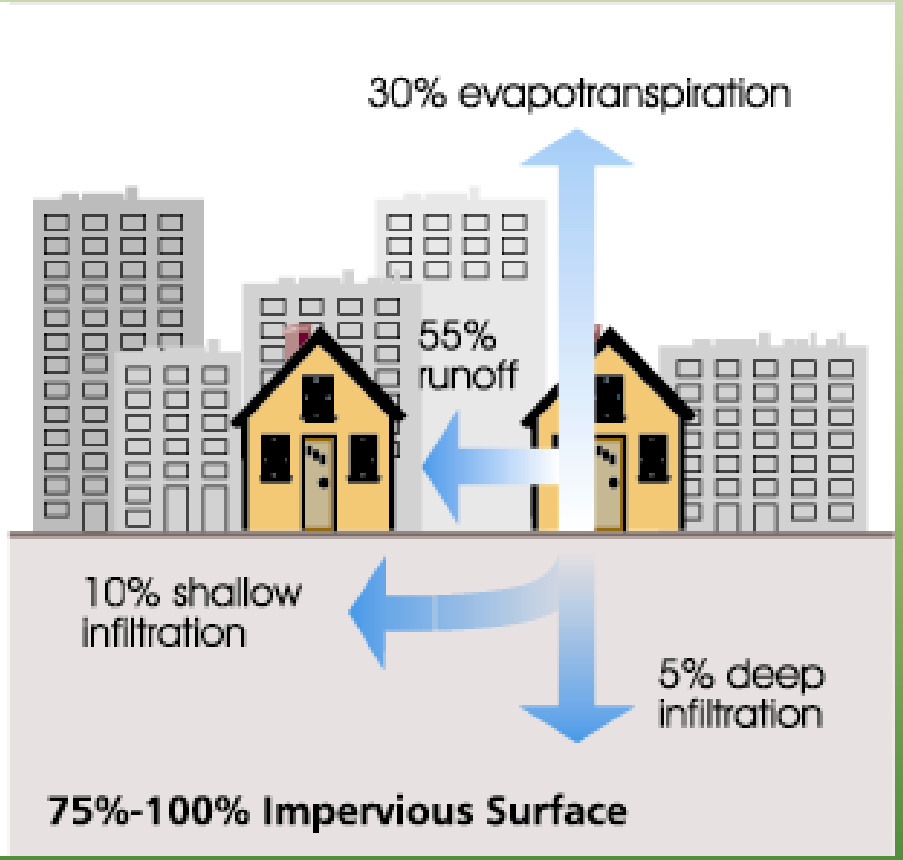
Infiltration = 15%






40% evapotranspiration
10% runoff
25% shallow infiltration
25% deep infiltration
Natural Ground Cover
38% evapotranspiration
20% runoff
21% shallow infiltration
21% deep infiltration
10%-20% Impervious Surface


35% evapotranspiration
30% runoff
20% shallow infiltration
15% deep infiltration
35%-50% Impervious Surface


30% evapotranspiration
55% runoff
10% shallow infiltration
5% deep infiltration
75%-100% Impervious Surface

Changing Hydrology Effects

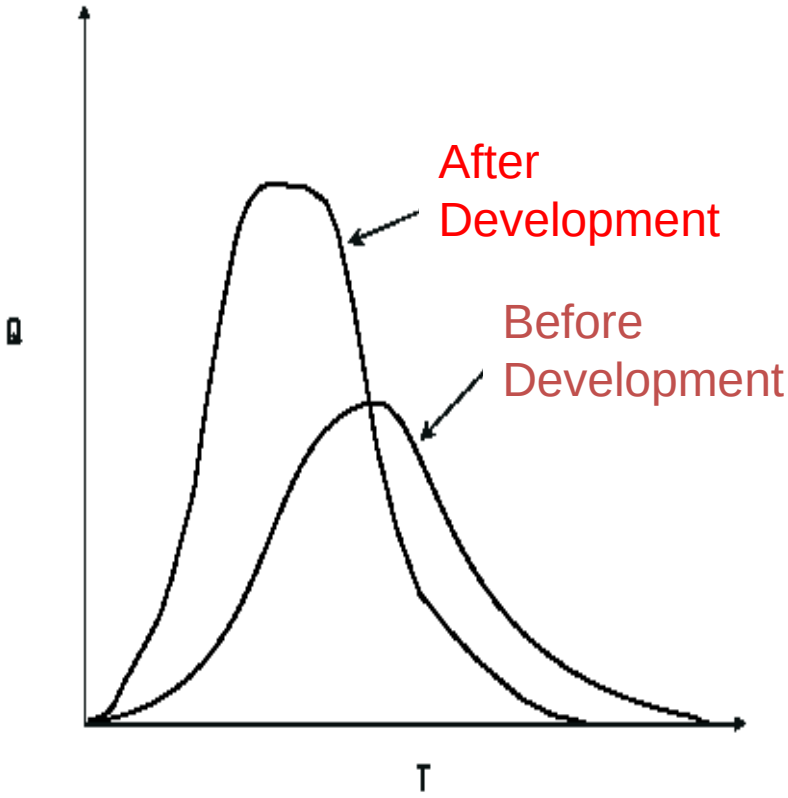


Figure 1.4. Hydrologic Alterations Due to Site Development

- Forces more water (energy) more quickly
- Physically damages stream channel

What is Stormwater….

Increased

- Impervious surface
- Runoff volume
- Runoff velocity
- Stream bank erosion
- Stream channelization
- Soil disturbance
- Soil compaction

Decreased

- Vegetative cover
- Riparian buffer zones
- Soil infiltration
- Water Quality
- Aquatic Habitat
- Groundwater base flow rates
- Drought stream flow rates

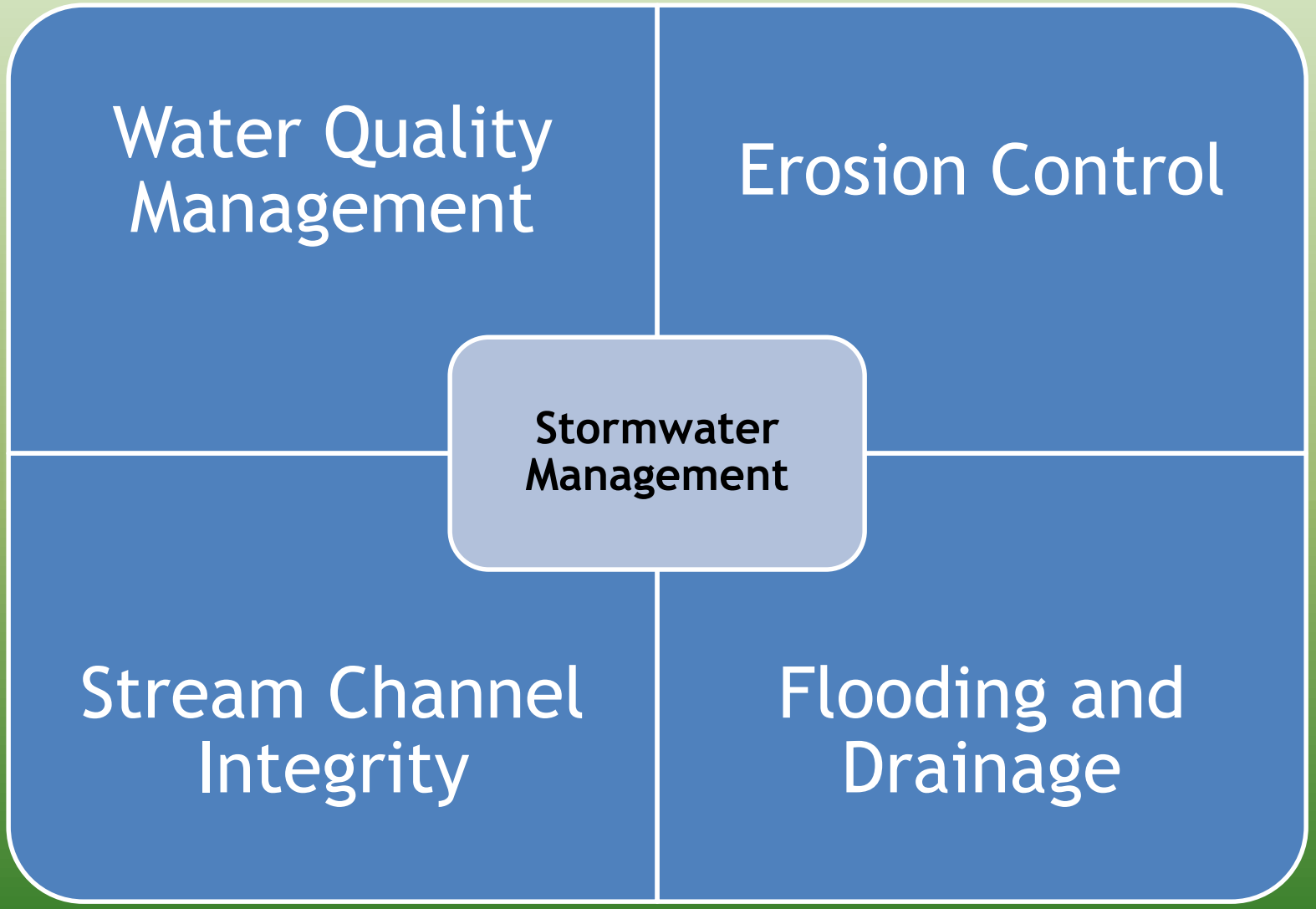
What is stormwater….water quality

Increased

- Stream bank erosion
- Sedimentation\Turbidity
- Water temperatures
- Conductivity
- Pollutant Concentrations (nutrients, pesticides, oils, metals)
- Bacterial loading (animal and human waste)
- Algal/Periphytic growth
- Water supply treatment cost

Decreased

- Aquatic habitat
- Aquatic biodiversity
- Aquatic health & reproduction
- Dissolved Oxygen


Water Quality Management
Erosion Control
Stormwater Management
Stream Channel Integrity
Flooding and Drainage

Muddy Water Watch Project

PROTECT OUR STREAMS FROM SEDIMENT POLLUTION

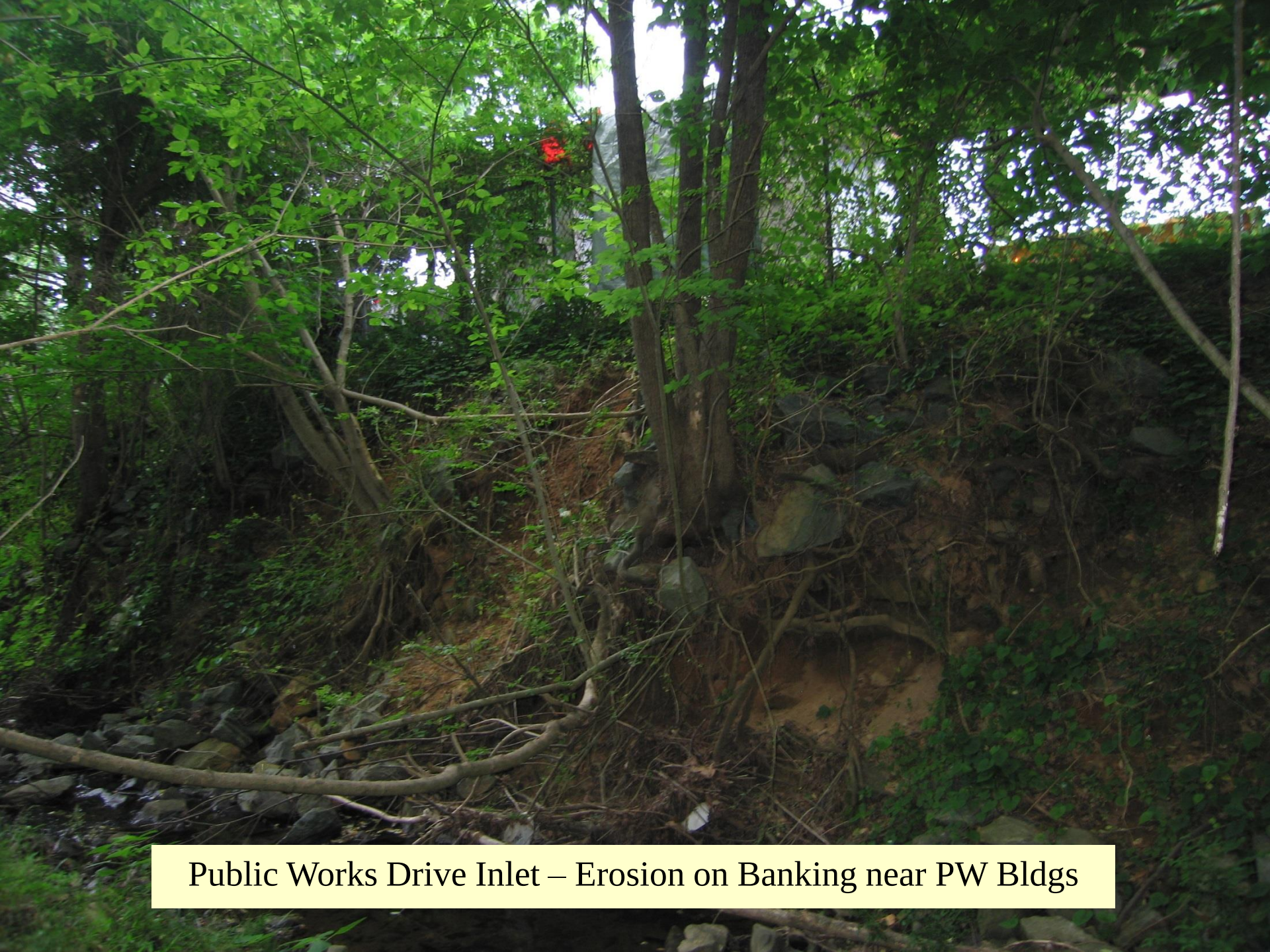
Join Haw River Assembly and Orange County's Erosion and Sediment Control team to learn how to identify sediment pollution and defend the water quality of the streams in our watershed.

September 6/ 6-8 PM
NC Botanical Gardens
Joslin Classroom C (107)
100 Old Mason Farm Rd.
Chapel Hill, NC

Receive training on reporting potential sediment violations to county officials, and an information packet on local ordinances and regulations to protect our watershed.

www.hawriver.org/projects/mww/orange

Stormwater challenges in Carrboro…



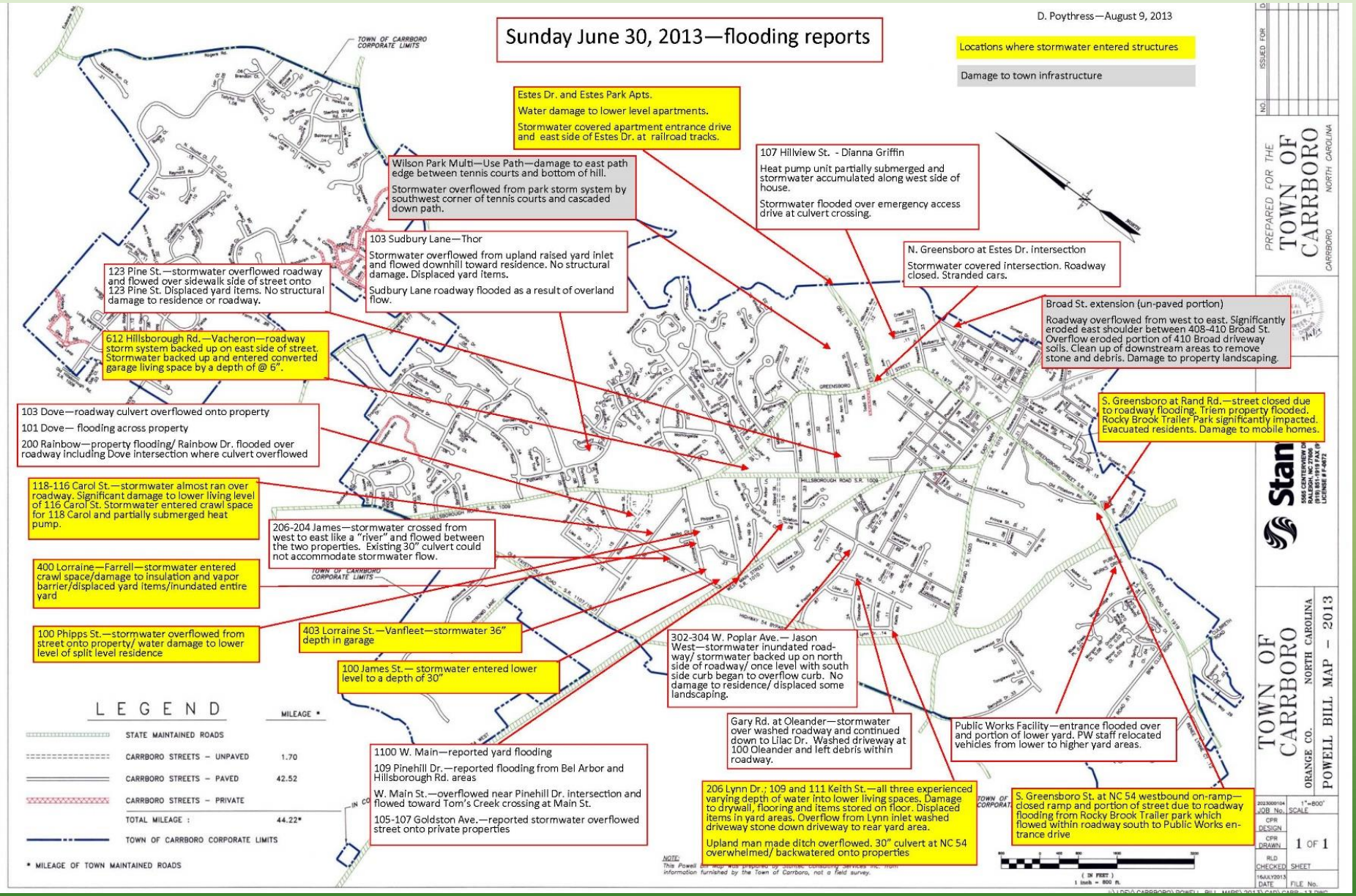
Public Works Drive Inlet – Erosion on Banking near PW Bldgs

Sunday June 30, 2013—flooding reports

D. Poythress—August 9, 2013

Locations where stormwater entered structures

Damage to town infrastructure



Flood Impacts*

http://gis.ci.carrboro.nc.us/Carrboro/FloodEvents/

http://gis.ci.carrboro.nc.us/Carrboro/FloodReport

Report Flooding

Please tell us about flood events in Carrboro

1. Enter Information

Date of Flood Incident

When did the flood happen (not when you are reporting it)?

Date of Report

September 27, 2016 5:47 PM

Date reporting if no date for flooding available

Address of Flood

120 Hideaway Lane

Address where the flood occurred--optional. You can specify the location below.

Describe the Flooding

Describe what happened. For example, water overtopped the curb and flooded my yard.

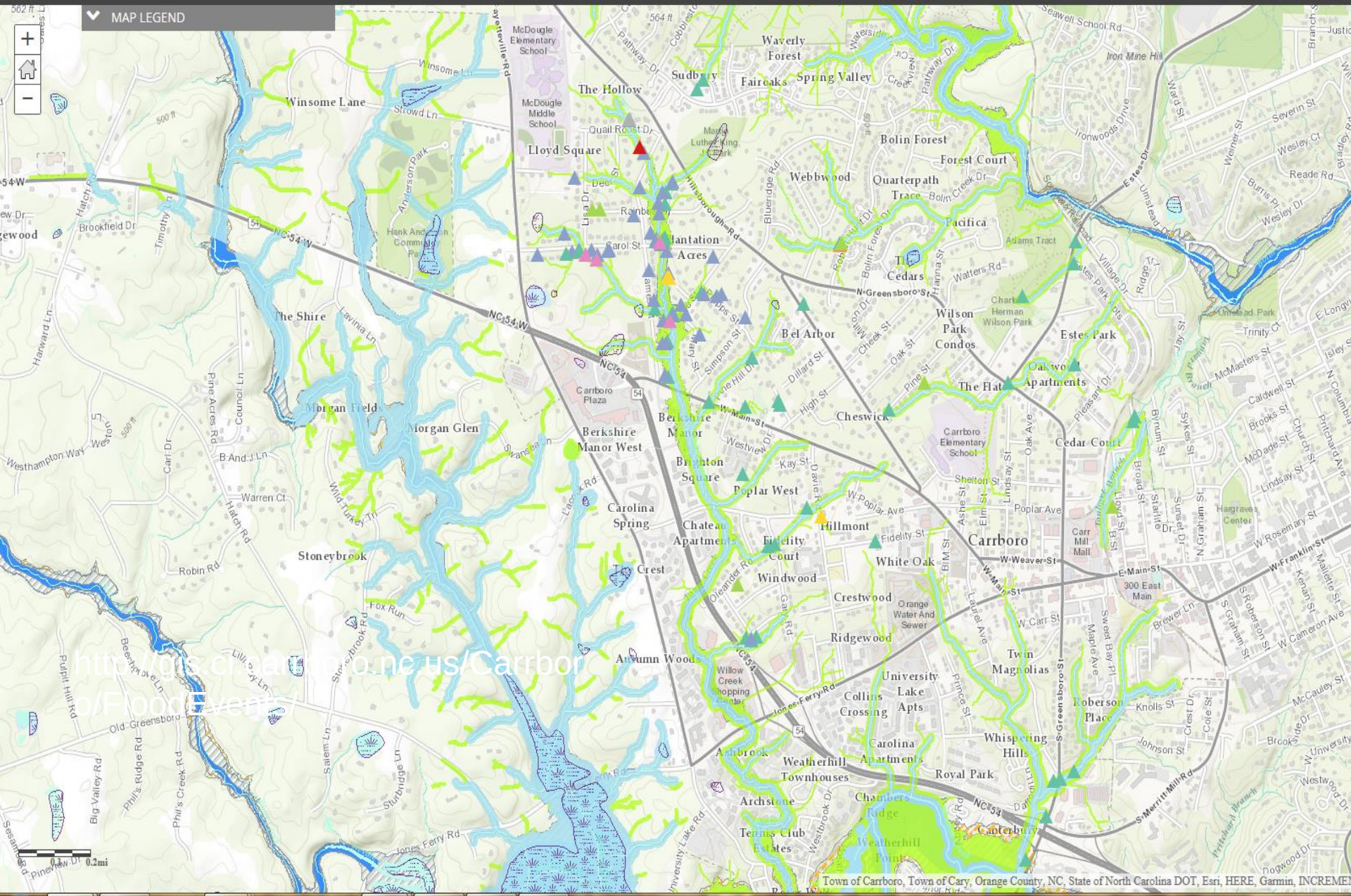
What happened? What flooded? 255 characters remaining

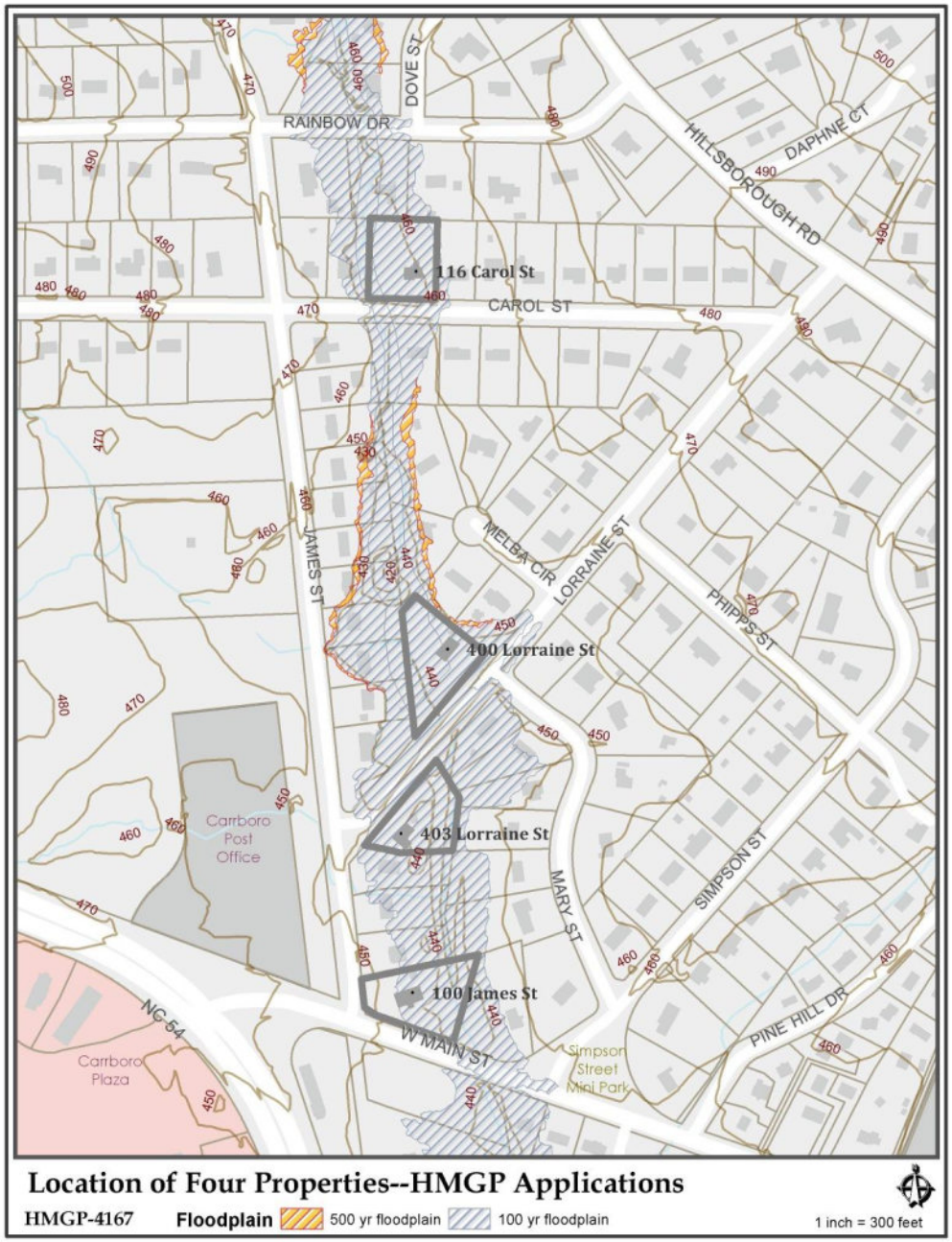
What Caused the Flooding?

A culvert backed up, a stream overflowed its banks, etc.

Flooding Events in Carrboro, NC

Reports of flooding in Carrboro from September 2012 to the present

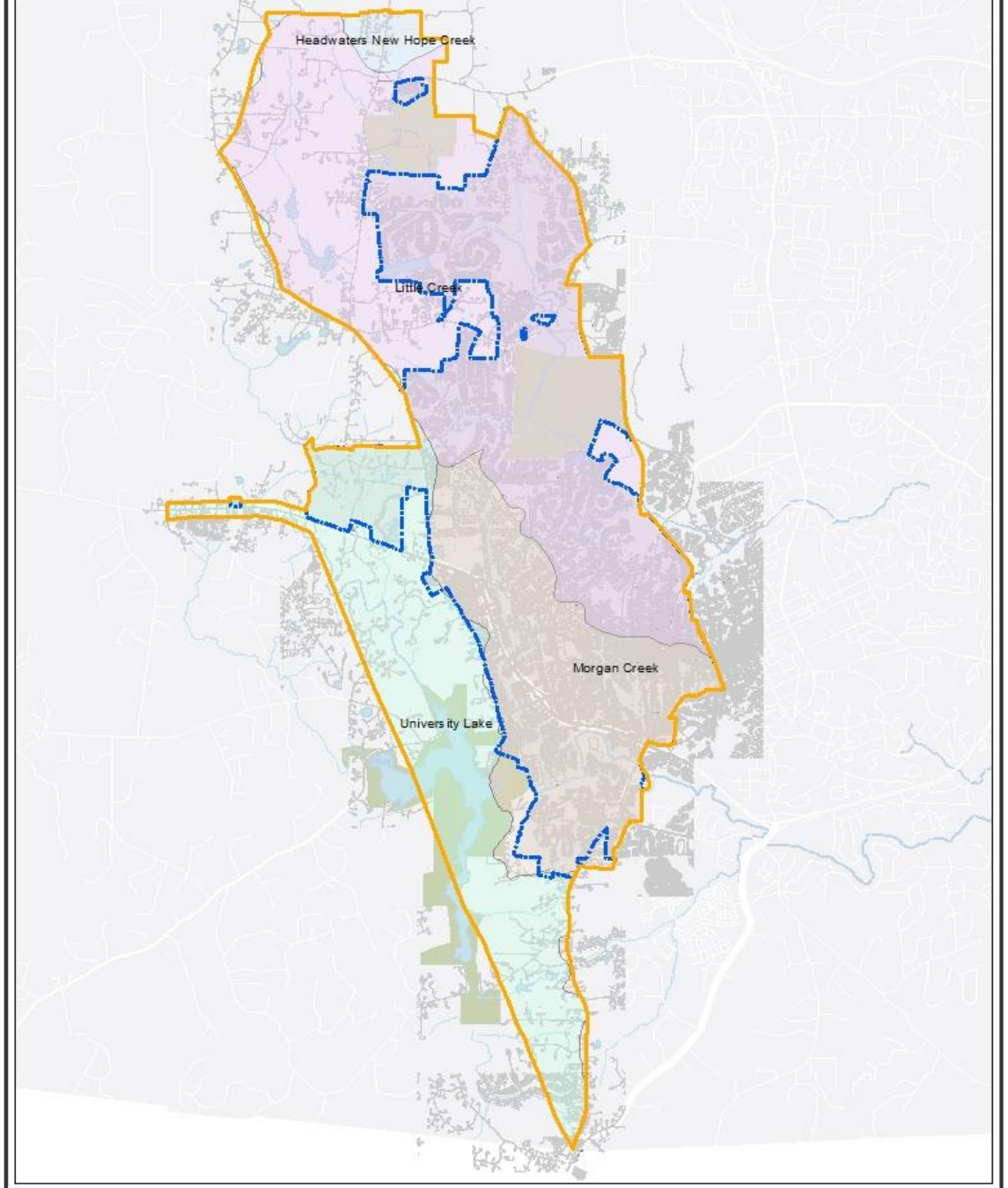



RAINBOW DR
DOVE ST
HILLSBOROUGH RD
DAPHNE CT
116 Carol St
CAROL ST
JAMES ST
MELBA CIR
LORRAINE ST
PHIPPS ST
400 Lorraine St
403 Lorraine St
MARY ST
SIMPSON ST
100 James St
W MAIN ST
NC 54
PINE HILL DR
Carrboro Post Office
Carrboro Plaza
Simpson Street Mini Park
Location of Four Properties--HMGP Applications
HMGP-4167
Floodplain
500 yr floodplain
100 yr floodplain
1 inch = 300 feet


RAND RD
S Greensboro ST
DEAD END

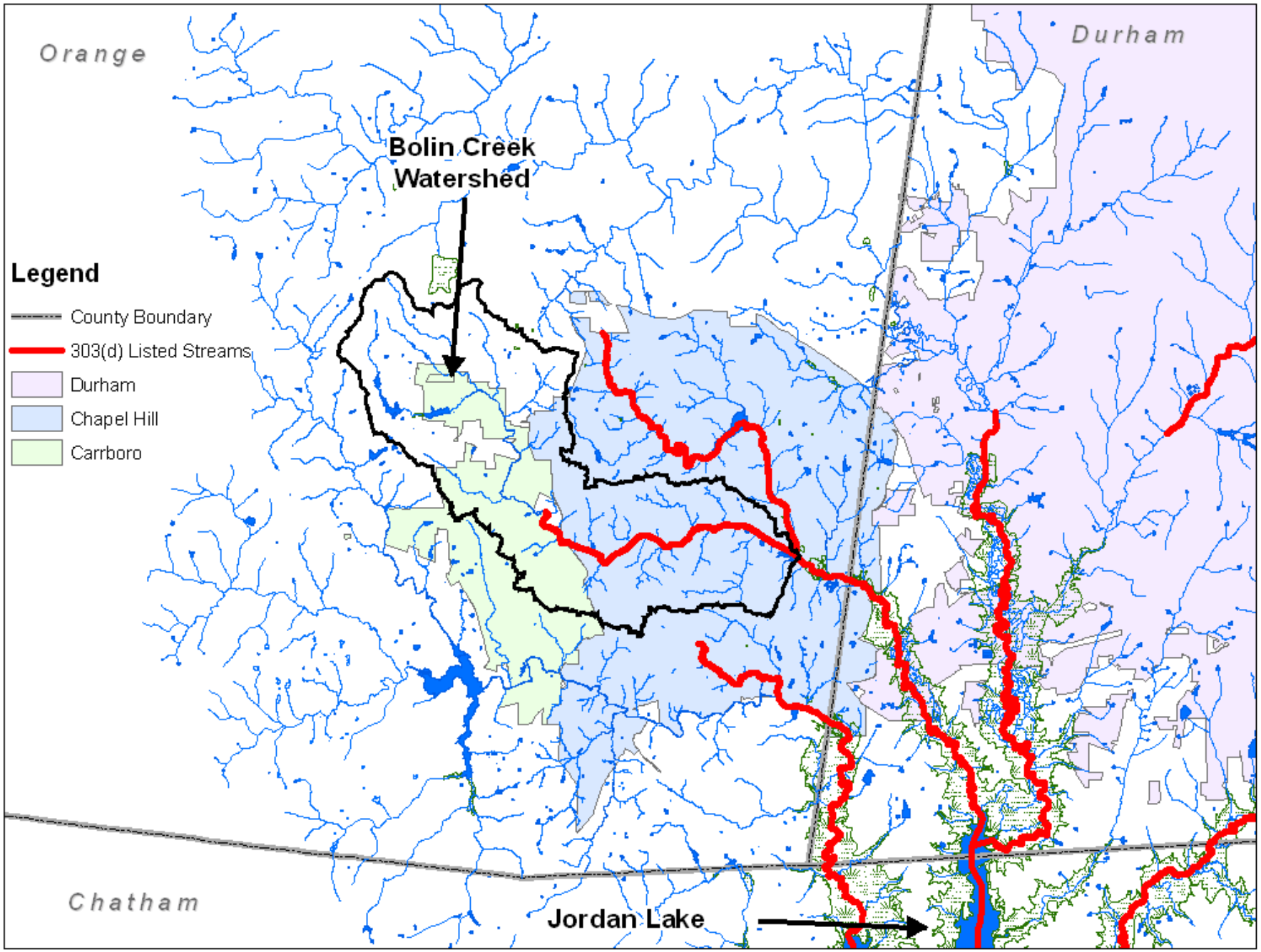

JCT
54

400 Broad Street Inlet close-up - Looking Downstream

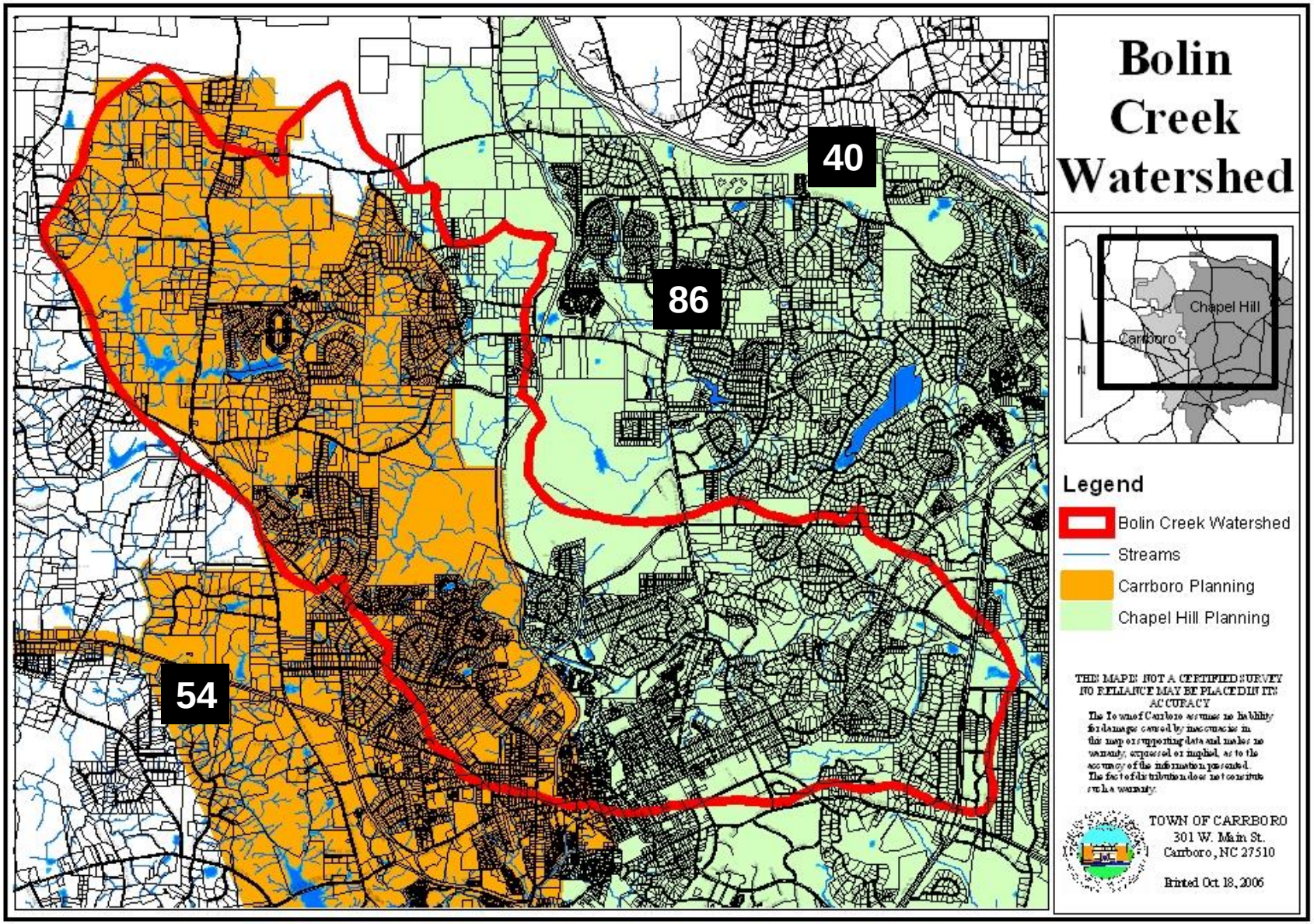


Carrboro Impervious Surface Change

Current Development | Previous Development | Carrboro Planning Jurisdiction | Carrboro Town Limits


Orange
Durham
Bolin Creek
Watershed
Legend
County Boundary
303(d) Listed Streams
Durham
Chapel Hill
Carrboro
Chatham
Jordan Lake

Benthic macroinvertebrate studies*


Bolin Creek Watershed
40
86
54
Chapel Hill
Carrboro
Legend
Bolin Creek Watershed
Streams
Carrboro Planning
Chapel Hill Planning
THIS MAP IS NOT A CERTIFIED SURVEY
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TOWN OF CARRBORO
301 W. Main St.
Carrboro, NC 27510
Printed Oct 18, 2006

Bolin Creek Watershed Restoration *

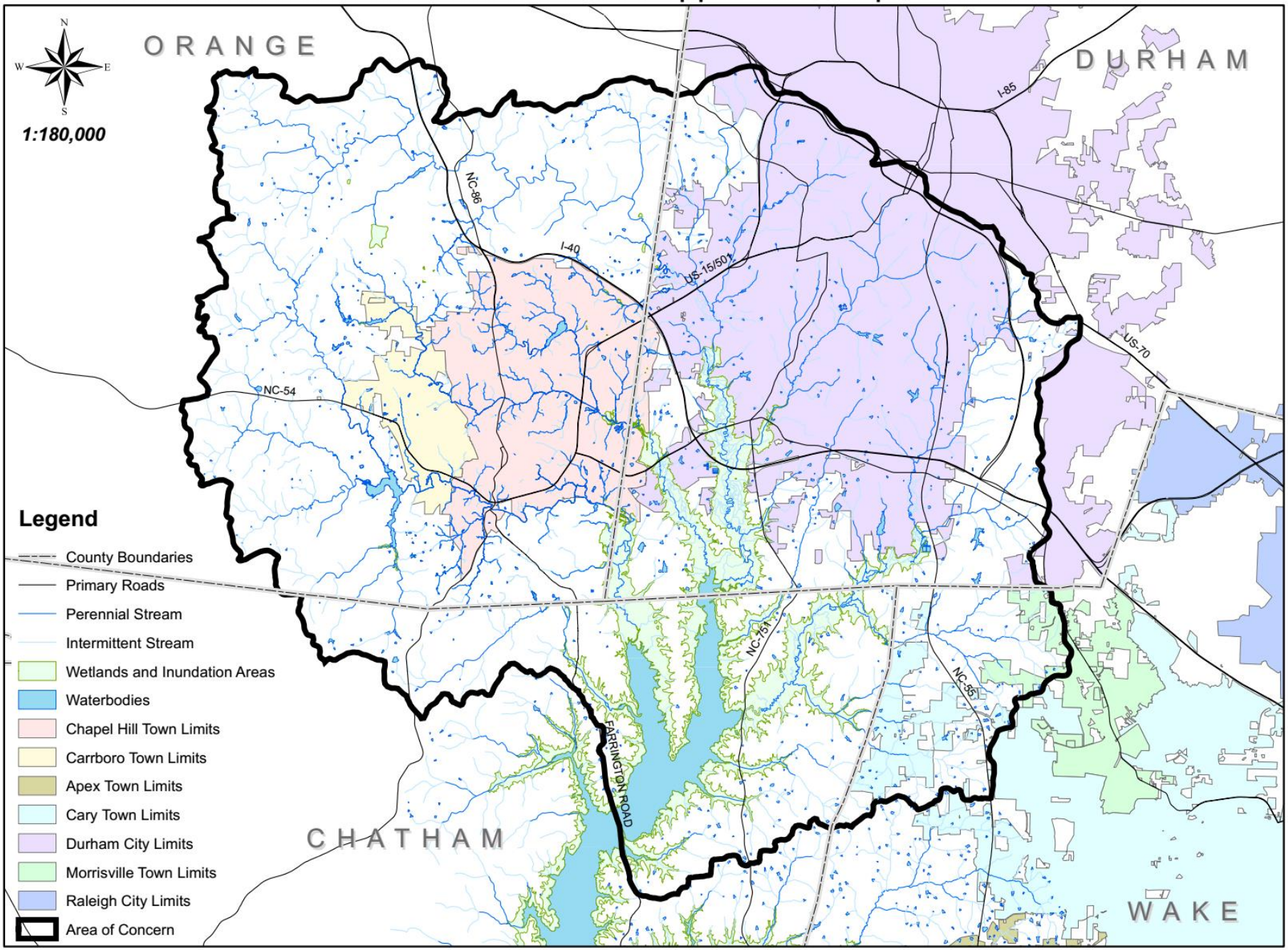
BOLIN CREEK WATERSHED RESTORATION PLAN

NOVEMBER 1, 2012

Jordan Lake Rules*

- **.0262** Watershed Nutrient Reduction Goals
- **.0263** Nutrient Management
- **.0264** Agriculture
- **.0265** Stormwater Management for New Development
- **.0266** Stormwater Management for Existing Development
- **.0267** Protection of Existing Riparian Buffers
- **.0268** Mitigation for Riparian Buffers
- .0269 Options for Offsetting Nutrient Loads
- **.0270** Wastewater Discharge Requirements
- **.0271** Stormwater Requirements for State and Federal Entities
- **.0272** Riparian Buffer Mitigation Fees
- **.0311** Cape Fear River Basin (Schedule of Classifications)

Local Juridisdictions and Basins of the Upper New Hope Arm of Jordan Lake



Summary

- Carrboro's creeks and downstream waters are impacted by stormwater runoff (as are Carrboro's citizens and the public infrastructure)

Opportunities…….

How can we proactively reduce impacts from existing development?

5 Key Points – To be more successful we need to…

- Address uncontrolled runoff from existing development
- Be realistic about what can be achieved in restoring our streams
- Build on our strong stormwater performance standards
- Consider new incentives and requirements for green practices
- Select practices that provide multiple benefits

TETRA TECH

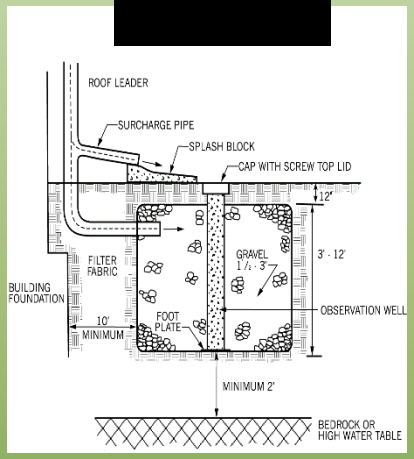
Stormwater Pollution Best Practices…*

- Divert roof drains to vegetated areas
- Use rain barrels/cisterns
- Convert lawns to natural area
- Vegetate bare areas
- Use environmentally friendly lawn care
- Keep storm drains clean
- Inspect/maintain septic systems
- Pick-up pet waste
- Restore stream buffers
- Support land use & stormwater planning
- Minimize paved areas or use pervious pavement materials
- Wash vehicles on grassy areas

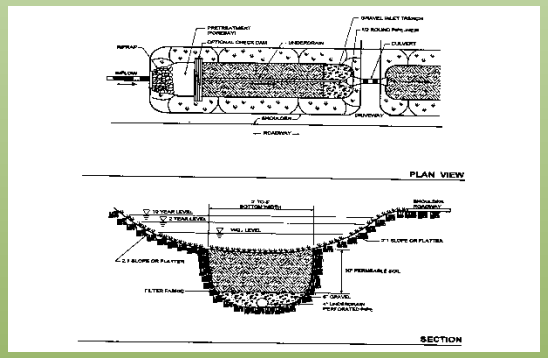
Neighborhood Streets Retrofits*

Landscape enhancements….

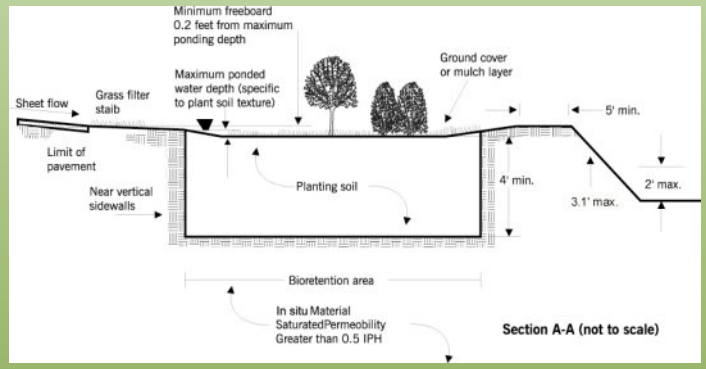
Dry Well



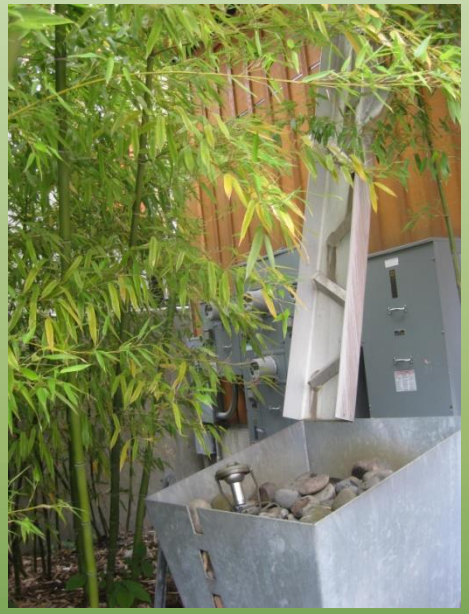
Vegetated Swale



Bioretention Area or Raingarden



Landscape Enhancements…..



Public Property Retrofits*

School micromanaging stormwater throughout the site.

Park stormwater detention basin also serving as playing field.

Baldwin Park Stream Restoration

SITE 19

Legend

- Stormwater Lines
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Stream, unknown flow

EarthTech
A tyco International Ltd. Company

AERIAL PHOTO VIEW

BOLIN CREEK WATERSHED
Geomorphic Analysis and Potential Site Identification For
Stormwater Structures and Retrofits

0 25 50 100 Feet

1 Inch equals 50 feet

Construction

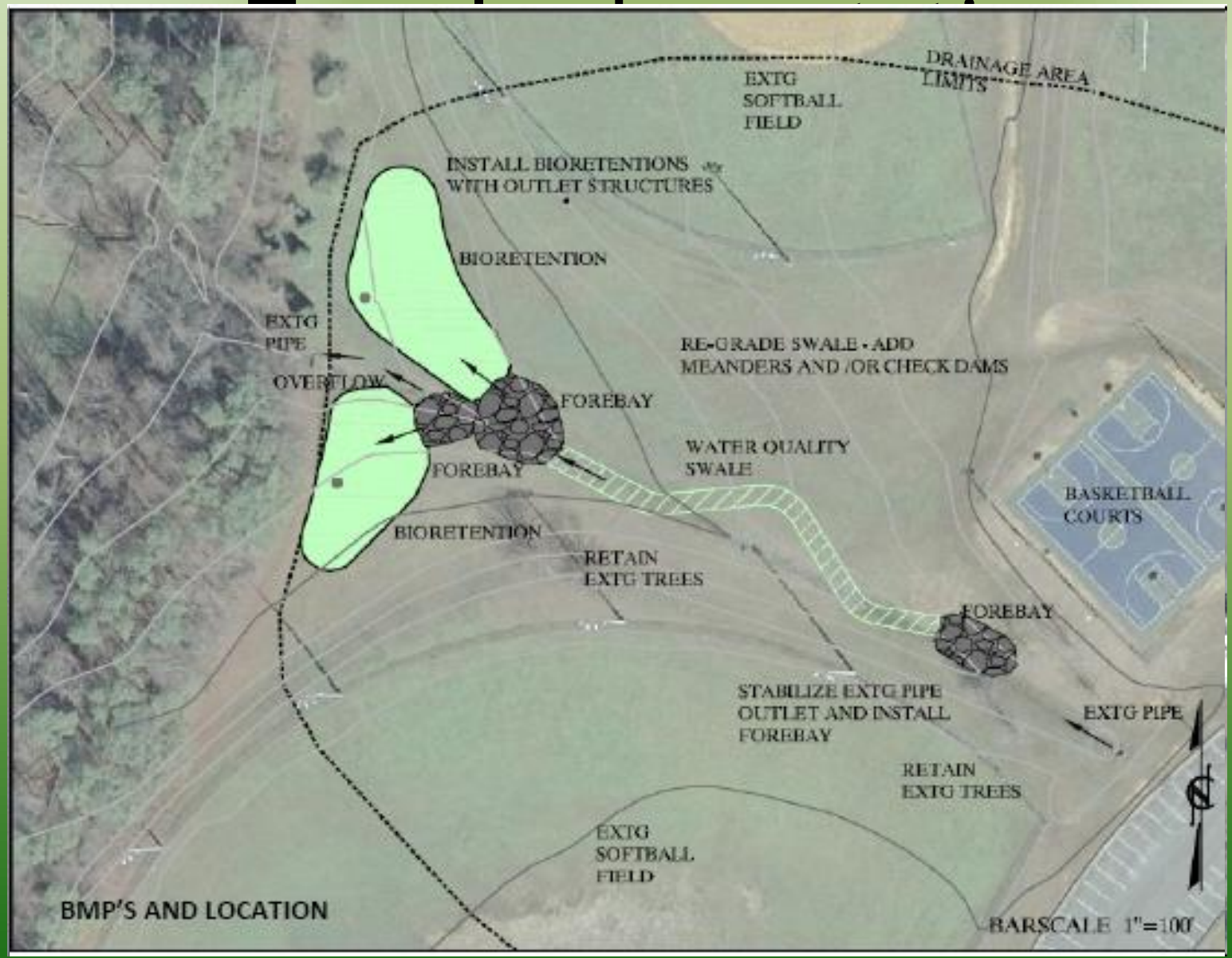
After Construction

After construction


23


Credit: Dave Otto

Jordan Lake Existing Development



Downtown Streetscape Retrofits*

Drainage Assistance Program*

Service Directory | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

Bid Notices | Calendar | News | Contact Us | Jobs | GIS/Maps | Chapel Hill 2020

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TOWN OF CHAPEL HILL

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- Stormwater Management
  - Contact Us
  - Stormwater Management Utility & Fees
  - Flooding, Drainage, Report a Problem
  - Construction - Stormwater Regulations
  - FAQs
    - Stormwater Management FAQs
    - DRAINAGE ASSISTANCE
    - Resource Conservation District (RCD) FAQ
  - Public Education and Participation
  - Know Your Watersheds
  - Water Quality
  - Prevent Water Pollution
  - Links
  - Fee Schedule

Town Hall » Departments & Services » Public Works » Stormwater Management » FAQs

DRAINAGE ASSISTANCE

Font Size: Share & Bookmark Feedback Print

The Stormwater Management Division maintains stormwater drains in public rights-of-way. Property owners are responsible for maintaining stormwater drains and structures on private property. In some instances, shared responsibility exists and a project can be evaluated for the Drainage Assistance Program. Regardless of the situation, stormwater engineers will visit with property owners to evaluate problems and share technical advice.

What is the Drainage Assistance Program?
Property owners with drainage problems may receive cost-sharing opportunities and assistance from the Town including technical advice, engineering design, maps, reports, construction services and project inspection depending on the cause of the drainage problem and the scope of the work. Drainage problems involving both public and private property are typically handled cooperatively by the Town and the property owner through the Drainage Assistance Program.

How do I sign up for the Drainage Assistance Program?
Call the Stormwater Management Office at 919-969-7246 or email us at stormwater@townofchapelhill.org to describe your drainage problem. Stormwater staff will schedule a time to meet with you onsite to evaluate your situation.

How does the Town decide which drainage assistance projects to undertake?
Each project is prioritized according to a ranking form developed for this program. The projects that score the highest get first priority, based on available funds.

My neighbor's stormwater runoff floods my yard! Can you intervene for us?
Drainage problems stemming from private property and/or associated with a dispute between two private property owners must be resolved by the property owner(s). If the problem involves a stormwater management facility or feature that was required by Town permit, the responsible party (e.g. homeowners' association) needs to undertake whatever measures necessary to correct the problem.

In private disputes the Town can provide technical assistance and/or information on upstream contributing areas, flow paths of streams and storm sewer lines, soils, topography, and other hydrologic information associated with the problem. Private consulting engineers and contractors can analyze situations and suggest solutions such as waterproofing, drains, ditches, and other methods. Most significant drainage improvements would require a Town development permit obtained through the Planning Department.

If regulatory compliance is involved, the Town may issue a notice of violation requiring that mitigation measures be taken by the responsible party or fines will be levied. Where stormwater is flowing from construction sites onto private property, the Town will investigate to ensure that the construction activity is in compliance with the development permit and associated regulations.

Nearby stream levels are higher than ever after a rainfall. Can the Town dredge or clear them out so they'll drain faster?
The Stormwater drainage crew periodically inspects and, if necessary, cleans debris blockages out of accessible segments of Little, Bolin, Booker and Morgan Creeks. Any dredging or channel work requires a host of expensive and time-consuming permits, both State and Federal, and does not always reduce flooding. DO NOT ATTEMPTY TO DREDGE OR RESHAPE A CREEK BY YOURSELF ! IT IS AGAINST THE LAW without approved plans and permits.

Note: As the amount of impervious surface area increases due to development in local watersheds, streams may flow at increasingly

State/Federal

Federal Clean Water Act passed

Jordan Lake declared nutrient sensitive

Jordan Lake impounded

Town

Land Use Ordinance adopted

Drainage policy adopted

Watershed protection regulations begin

Joined National Flood Insurance Program

State/Federal

Jordan Lake water quality studies

EPA adopts stormwater regulations

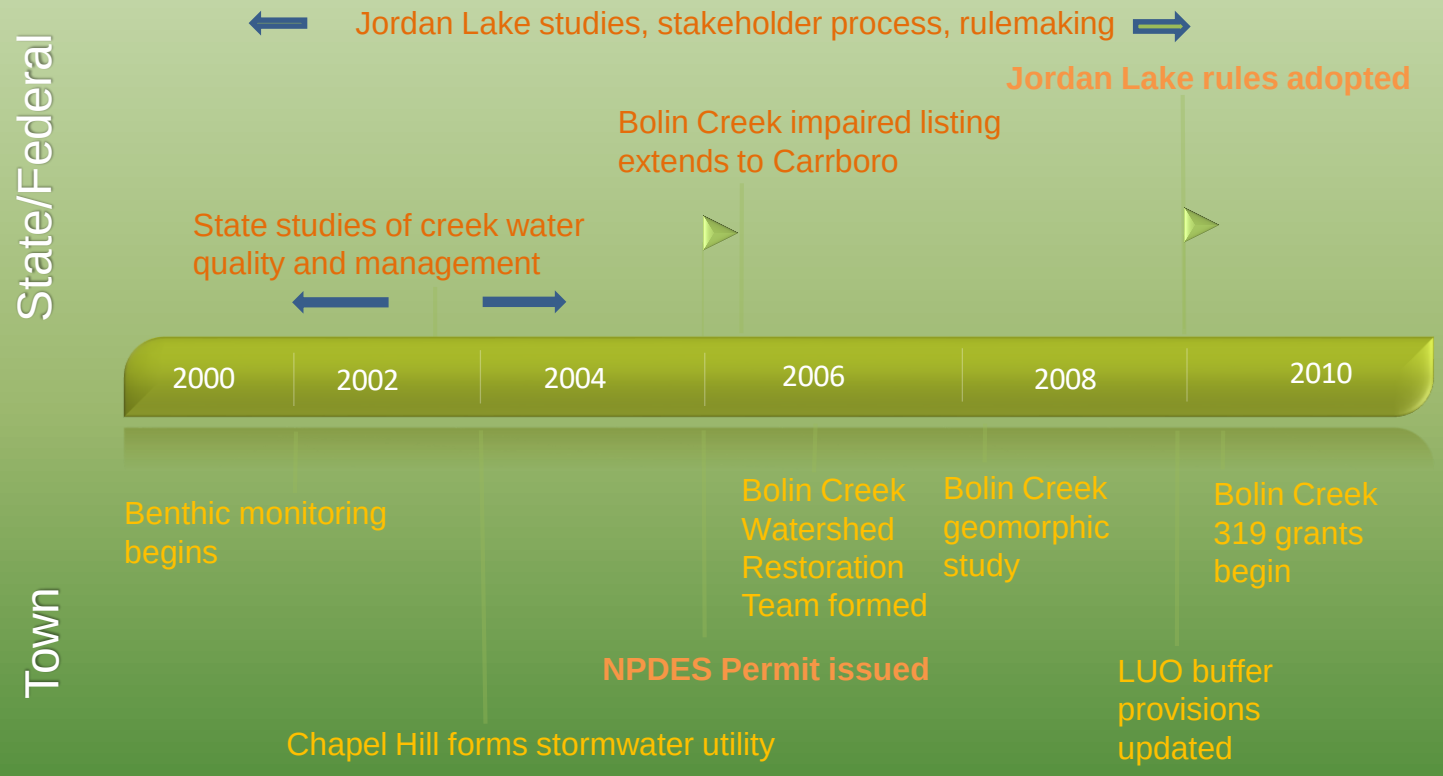
EPA adopts “Phase II” stormwater regulations for small communities

Town

Land Use Ordinance updates: flood damage prevention, watershed protection, stormwater management, buffers

Town notified of NPDES requirements

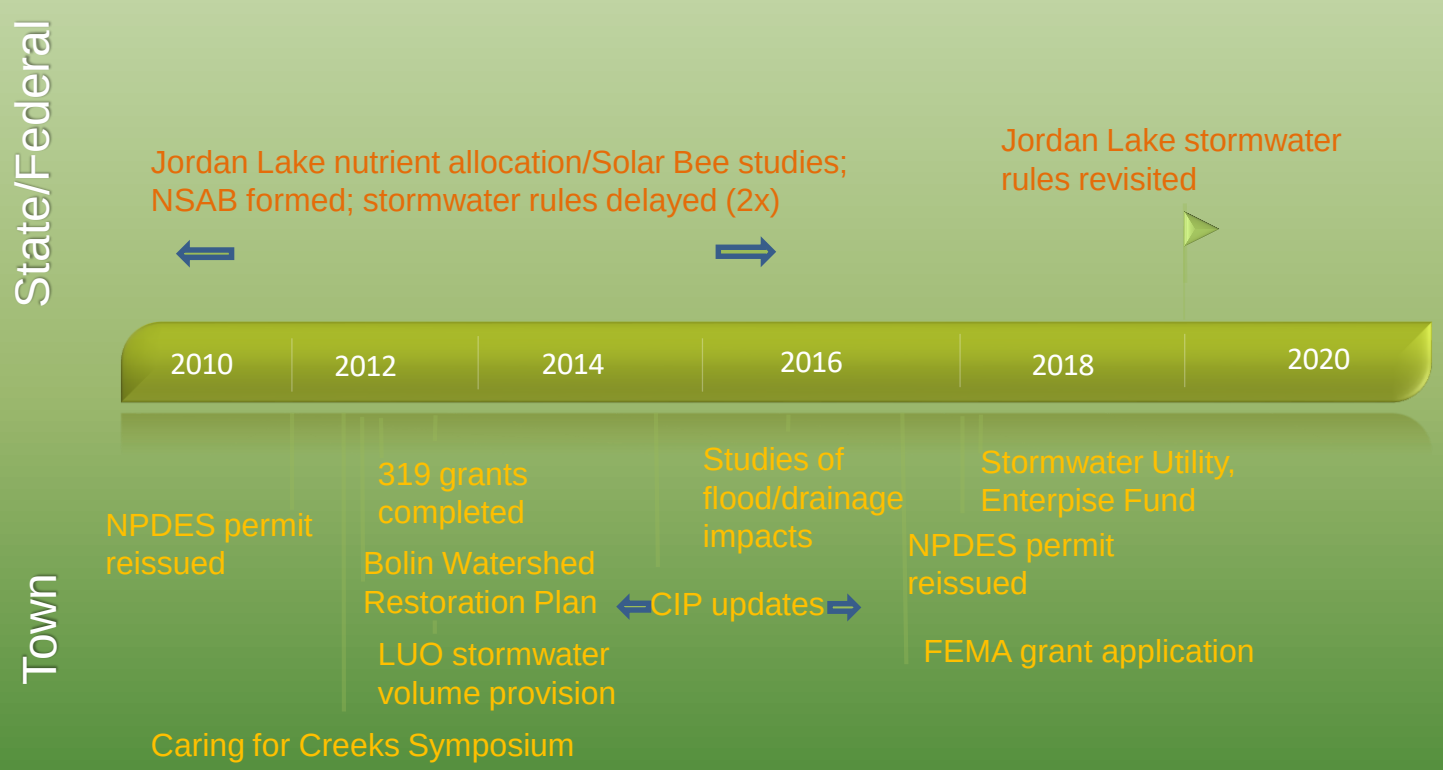
Town begins water quality monitoring partnership with Chapel Hill

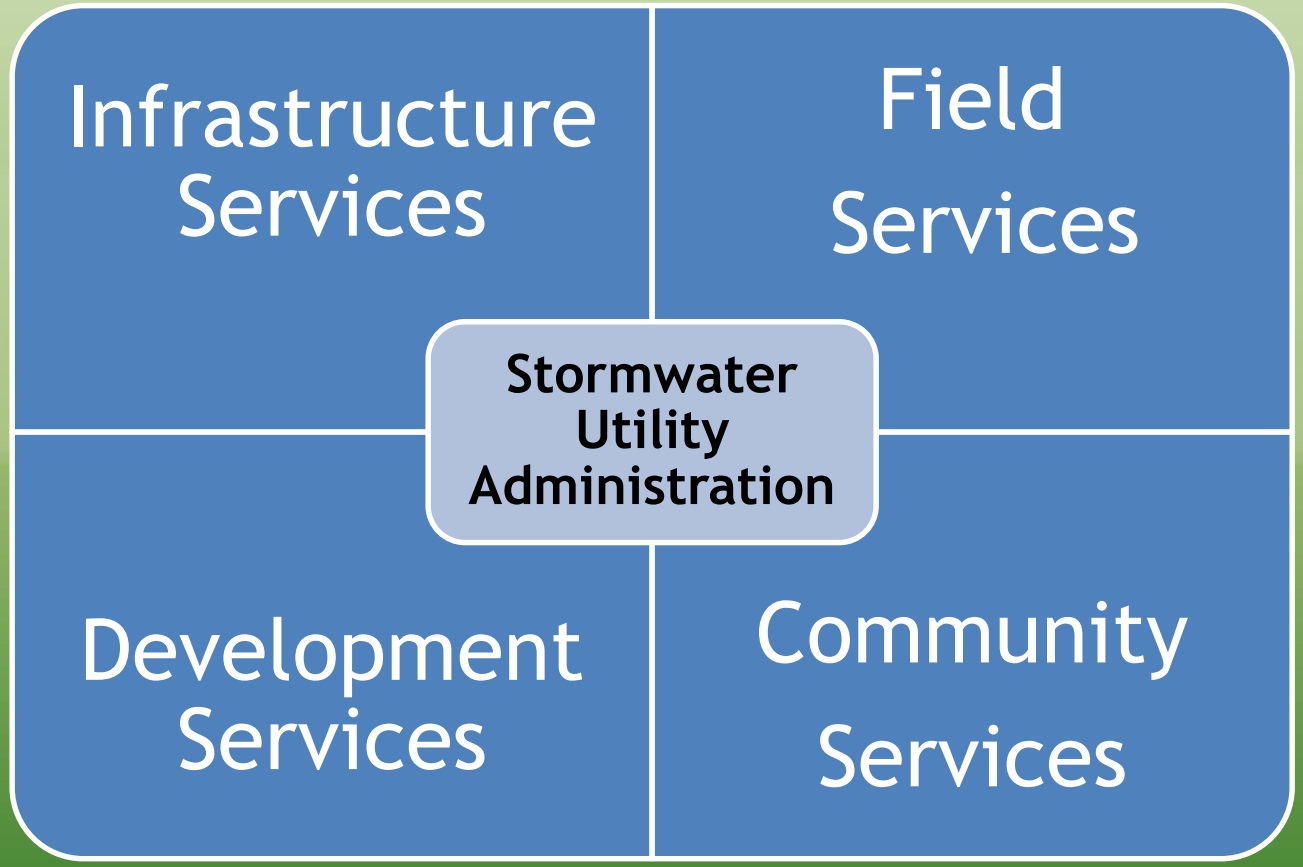

State/Federal
Jordan Lake studies, stakeholder process, rulemaking
Jordan Lake rules adopted
Bolin Creek impaired listing extends to Carrboro
State studies of creek water quality and management
2000
2002
2004
2006
2008
2010
Town
Benthic monitoring begins
Bolin Creek Watershed Restoration Team formed
Bolin Creek geomorphic study
Bolin Creek 319 grants begin
NPDES Permit issued
LUO buffer provisions updated
Chapel Hill forms stormwater utility

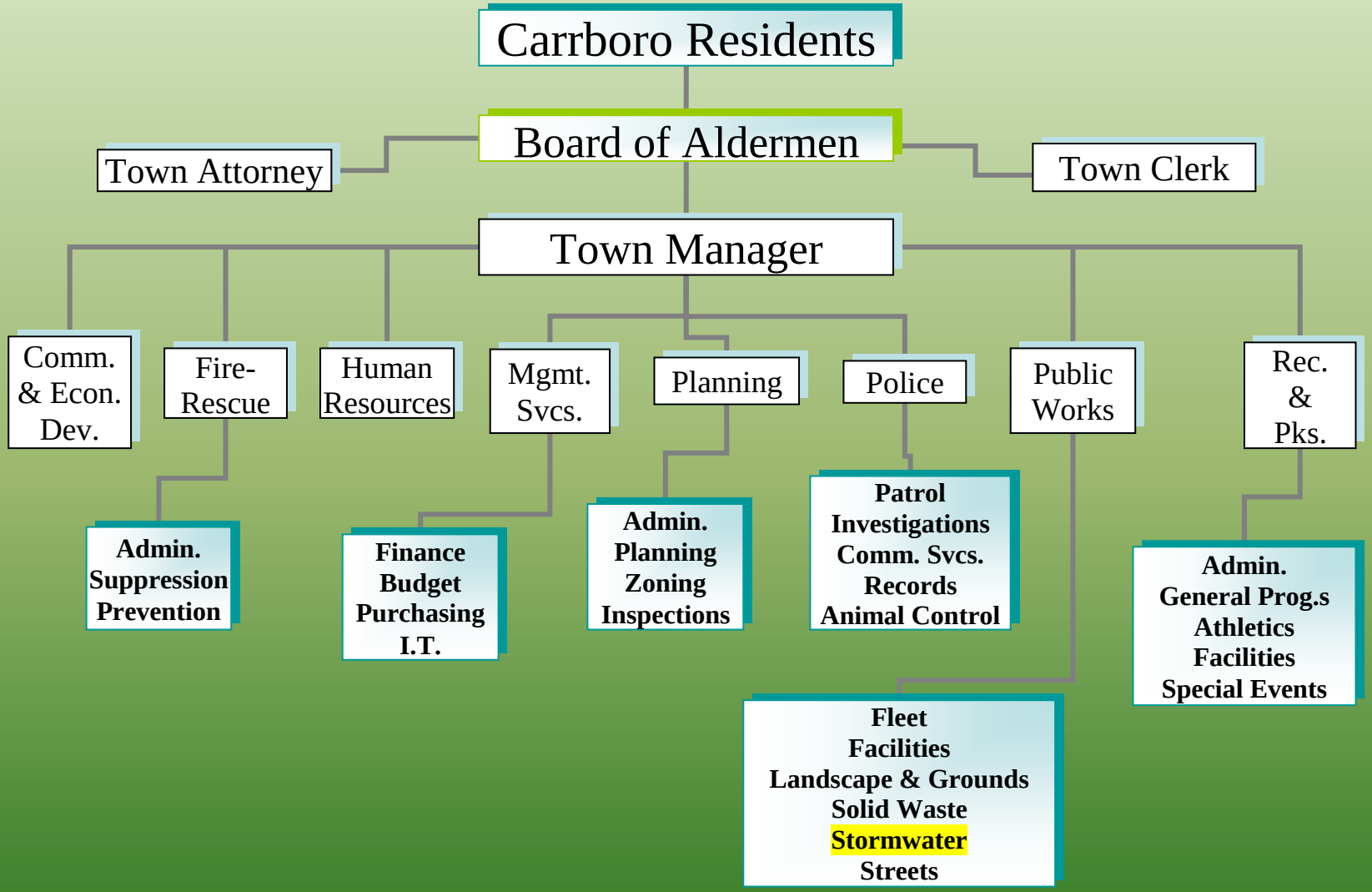
Carrboro's NPDES Permit*

- Public Education and Outreach
- Public Involvement and Participation
- ★ Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- ★ Post-Construction Storm Water Management*
- Pollution Prevention/Good Housekeeping for Municipal Operations


TYMCO
8


State/Federal
Jordan Lake nutrient allocation/Solar Bee studies; NSAB formed; stormwater rules delayed (2x)
Jordan Lake stormwater rules revisited
2010
2012
2014
2016
2018
2020
Town
NPDES permit reissued
319 grants completed
Bolin Watershed Restoration Plan
LUO stormwater volume provision
Caring for Creeks Symposium
Studies of flood/drainage impacts
CIP updates
Stormwater Utility, Enterpise Fund
NPDES permit reissued
FEMA grant application


Infrastructure Services
Field Services
Stormwater Utility Administration
Development Services
Community Services


Carrboro Residents
Board of Aldermen
Town Attorney
Town Clerk
Town Manager
Comm. & Econ. Dev.
Fire-Rescue
Human Resources
Mgmt. Svcs.
Planning
Police
Public Works
Rec. & Pks.
Admin.
Suppression
Prevention
Finance
Budget
Purchasing
I.T.
Admin.
Planning
Zoning
Inspections
Patrol
Investigations
Comm. Svcs.
Records
Animal Control
Admin.
General Prog.s
Athletics
Facilities
Special Events
Fleet
Facilities
Landscape & Grounds
Solid Waste
Stormwater
Streets

Take home…..

- Challenges with impacts to creeks, Jordan Lake and public and private property and infrastructure
- There are related regulatory requirements
  - Additional efforts are needed for NPDES permit
  - Bolin Creek watershed restoration initiative can: help avoid new regulatory burdens, lead by example; and create a restoration (rather than protection) based paradigm
  - Requirements under the Jordan Rules will be revisited within the next two years. Town has identified $4m of capital projects; these have benefits beyond restoring water quality in Jordan Lake.
- New development stormwater requirements exceed minimum state requirements

Take home…

- More capacity and dedicated funding are needed
  - This is why Carrboro is implementing a Stormwater Utility and has formed the Stormwater Advisory Commission
- Next steps/front burner
  - Figure out how much it will cost
  - Outreach and education on why this is needed and what new revenue will provide
  - Adopt a rate structure to collect new/dedicated funding
  - Implement and administer

TOWN OF CARRBORO
NORTH CAROLINA

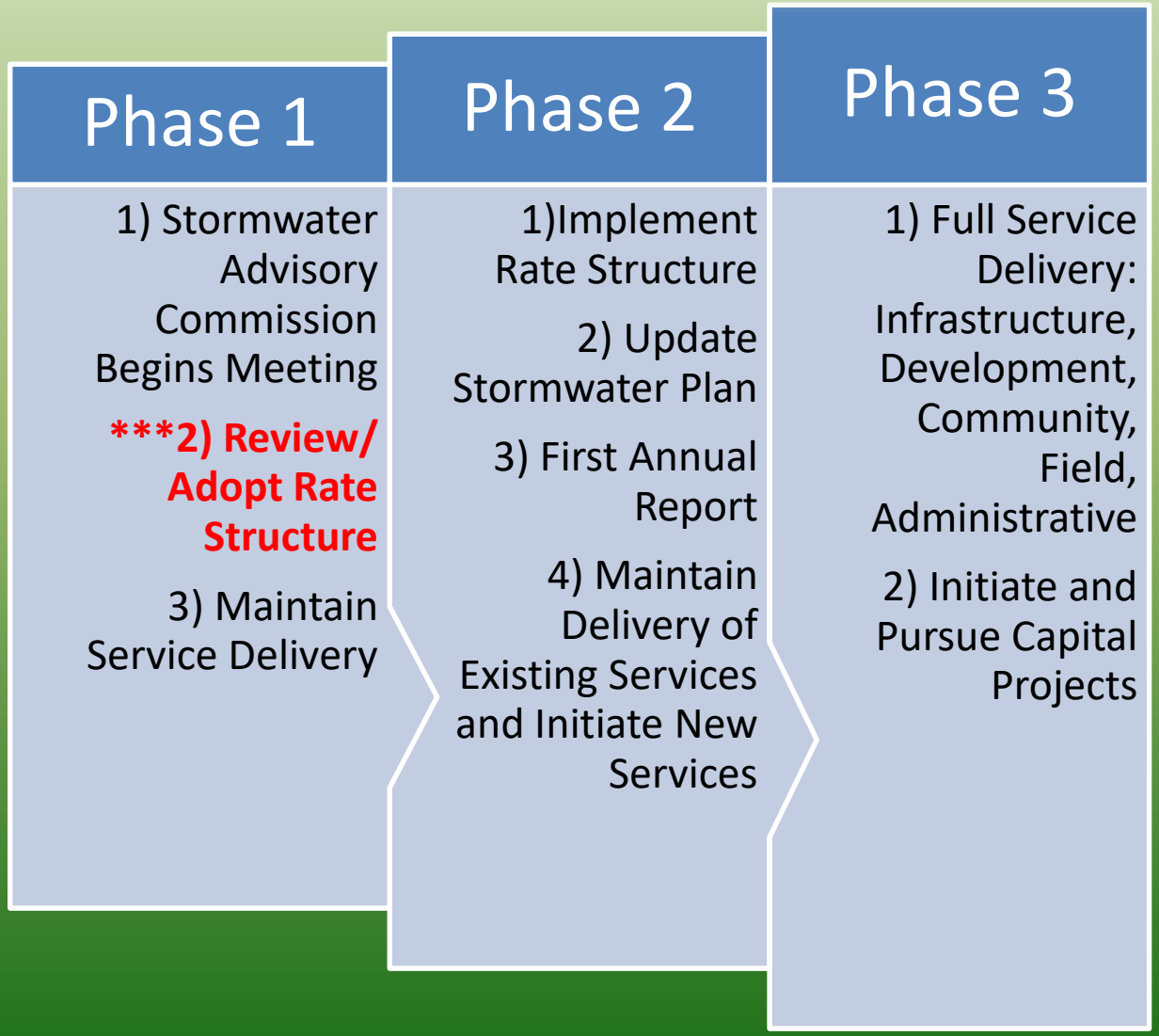
STORMWATER UTILITY RATE STUDY

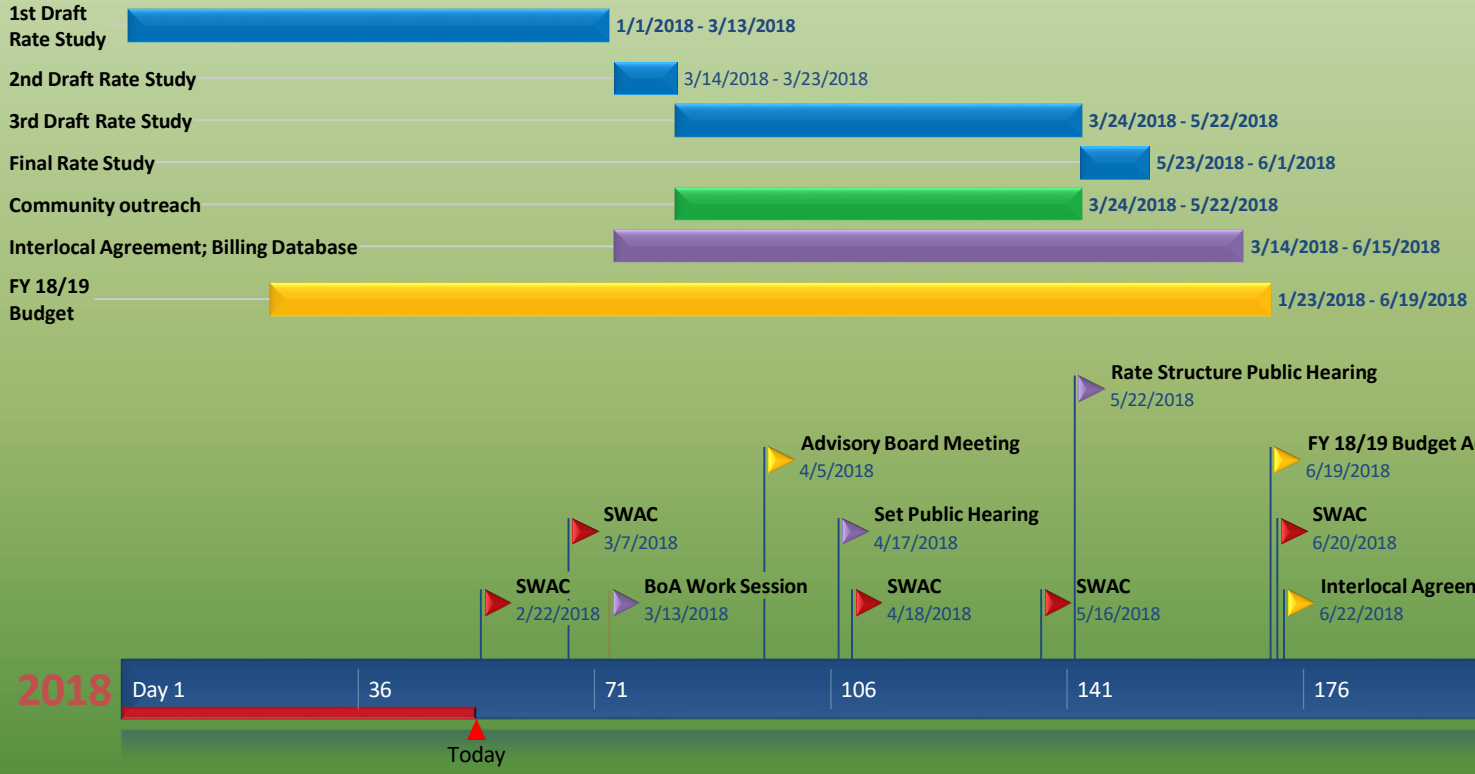
MARCH 2, 2018

BOARD OF ALDERMEN
LYDIA LAVELLE, MAYOR
BETHANY CHANEY, ALDERMAN
BARBARA FOUSHEE, ALDERMAN
JACQUELYN GIST, ALDERMAN
RANDEE HAVEN-O'DONNELL, ALDERMAN
DAMON SEILS, ALDERMAN
SAMMY SLADE, ALDERMAN

STAFF
DAVID ANDREWS, TOWN MANAGER
ARCHE MCADOO, FINANCE DIRECTOR
JOE GUCKAVAN, PUBLIC WORKS DIRECTOR
RANDY DODD, STORMWATER UTILITY MANAGER

2-5 year timeline




1st Draft Rate Study
1/1/2018 - 3/13/2018
2nd Draft Rate Study
3/14/2018 - 3/23/2018
3rd Draft Rate Study
3/24/2018 - 5/22/2018
Final Rate Study
5/23/2018 - 6/1/2018
Community outreach
3/24/2018 - 5/22/2018
Interlocal Agreement; Billing Database
3/14/2018 - 6/15/2018
FY 18/19 Budget
1/23/2018 - 6/19/2018
Rate Structure Public Hearing
5/22/2018
Advisory Board Meeting
4/5/2018
FY 18/19 Budget Adopted
6/19/2018
SWAC
3/7/2018
Set Public Hearing
4/17/2018
SWAC
6/20/2018
Revenue collection begins
9/1/2018
SWAC
2/22/2018
BoA Work Session
3/13/2018
SWAC
4/18/2018
SWAC
5/16/2018
Interlocal Agreement/Billing Database
6/22/2018
2018
Day 1
36
71
106
141
176
211
2018
Today

QUESTIONS