

# Coastal Watershed Management Planning



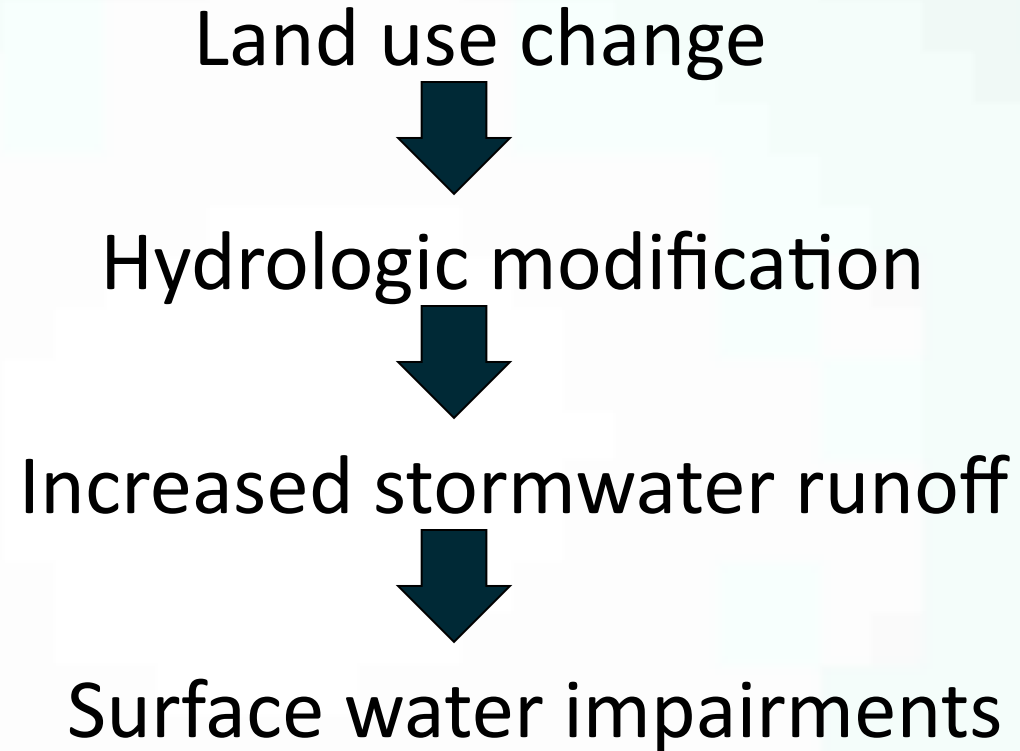
North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*

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# Conventional Land Use and Stormwater Management



# Impacts of Conventional Development and Stormwater Management



# Low Impact Development

## A Smarter Way to Manage Stormwater



# North Carolina Coastal Federation's Stormwater Strategy

- Work in urban *and* rural landscapes
- use low-impact development (LID) techniques
- slow down the flow of stormwater runoff
- reduce the volume reaching surface waters



# North Carolina Coastal Federation's Stormwater Strategy

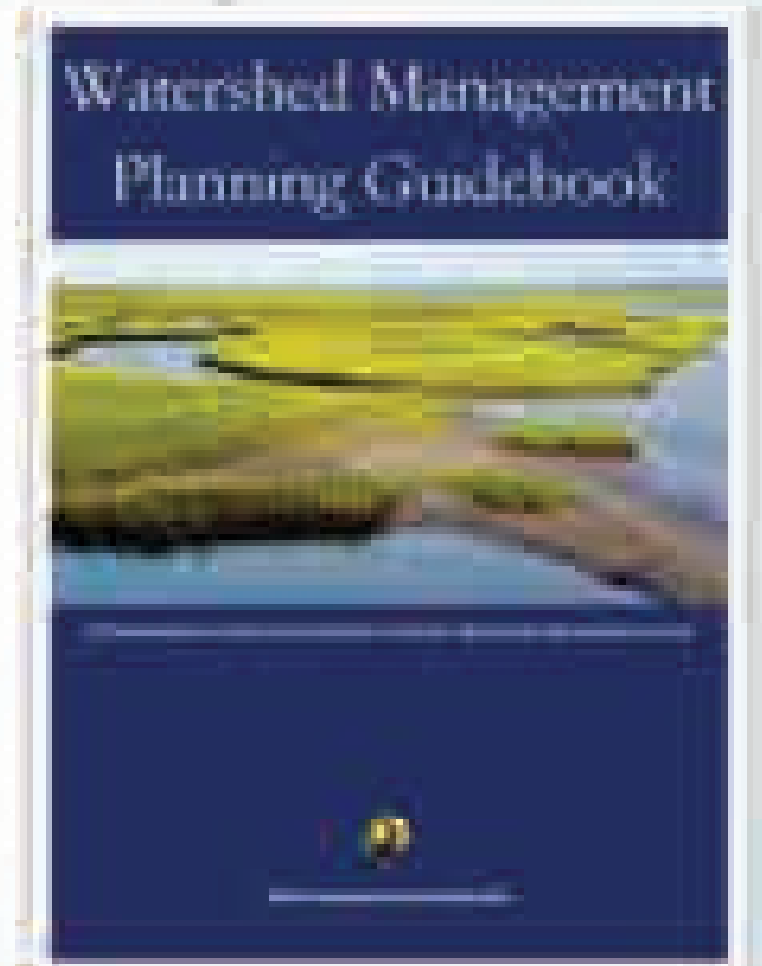
**prevent** stormwater runoff by working with developers and local governments on ways to incorporate and encourage LID  
For *new* developments

**reduce** the volumes of runoff currently impacting our waterways by developing watershed restoration plans and installing on-the-ground LID projects such as rain gardens, infiltration basins, wetlands and swales to catch and infiltrate runoff.

# The Watershed Management Planning Guidebook

- Funded by the EPA North Carolina Coastal Federation developed a Watershed Restoration Guidebook
- Emphasis on coastal stormwater management techniques
- Reducing the volume of stormwater runoff to limit the conveyance from the land to coastal waters
- Framework for local governments and communities to develop plans
- EPA Nine Minimum Elements

[nccoast.org/guidebook](http://nccoast.org/guidebook)



# Rationale for the Guidebook

- 3,573 square miles of legally impaired coastal waters in N.C. in need of restoration
- Novel method of stormwater runoff volume reduction
- Aligned with EPA watershed management requirements





# Guidebook Watershed Restoration Planning Steps

- Set Primary and Secondary Goals
- Assemble Project Team and Develop Public Engagement Plan
- Characterize Watershed
- Evaluate Water Quality Conditions
- Determine Runoff Reduction Targets
- Establish Goals and Objectives
- I.D. Stormwater Reduction Strategies
- Prepare Management Plan and Implementation Schedule

# Assemble Project Team and Develop Public Engagement Plan

## Project Partners

- North Carolina Coastal Federation
- City of Wilmington
- N.C. Division of Energy, Mineral and Land Resources
- N.C. Division of Marine Fisheries, Shellfish Sanitation Section
- N.C. Cooperative Extension
- N.C. Department of Transportation
- UNC Wilmington
- Town of Wrightsville Beach
- AECOM
- WithersRavenel
- NERRS

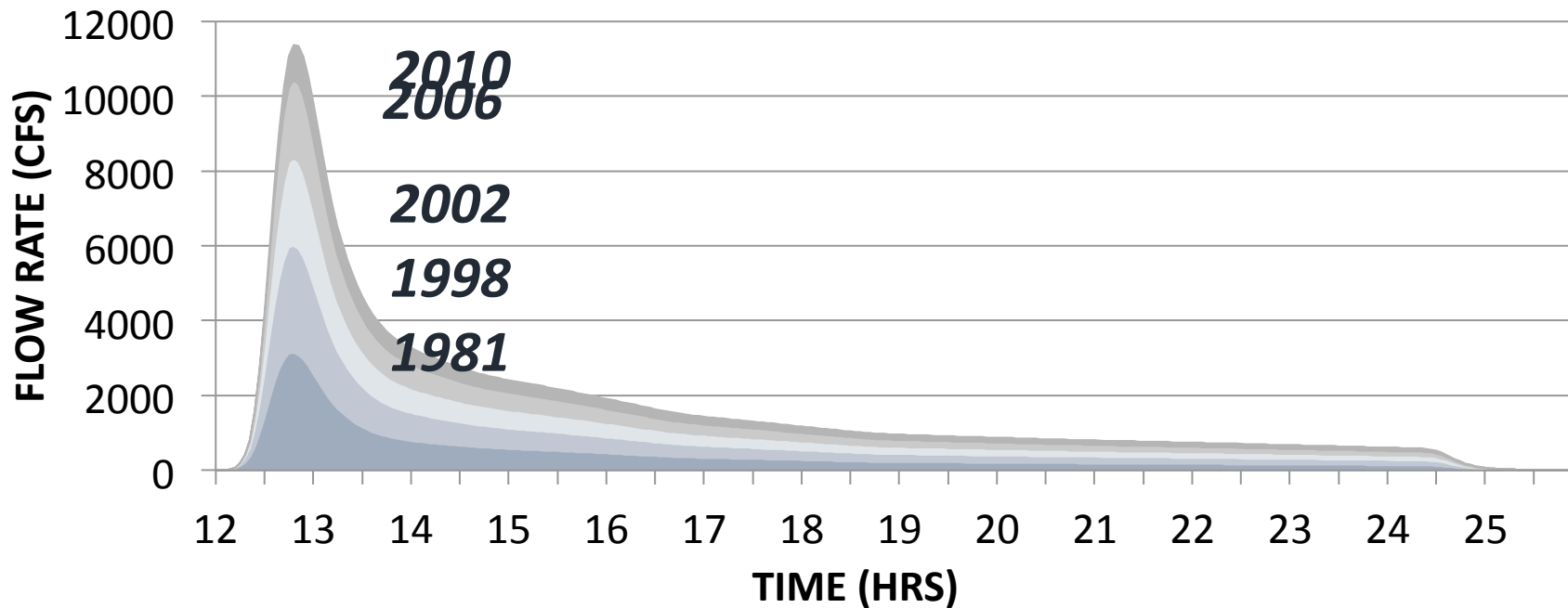


# Characterize Watershed Evaluate Water Quality Conditions

1. Set:
  - Primary goals
  - Secondary goals
2. Incorporate indicators:
  - Fecal coliform
3. Delineate watershed boundaries:
  - 12 digit Hydrologic Unit Codes (HUC)
  - My Waters Mapper (<http://watersgeo.epa.gov/mwm/>)
  - USGS Stream Stats – smaller than 12 digit HUC ([http://water.usgs.gov/osw/streamstats/north\\_carolina.html\\_](http://water.usgs.gov/osw/streamstats/north_carolina.html_))



# HEWLETTS CREEK WATERSHED 1-YR STORM HYDROGRAPHS



**Legend**

- Subdivisions
- Waterways
- Stream Lines
- QA Classification**
- Class 1
- Class 2
- Class 3
- Class 4



**Scale**

0 100 200 Feet



# Identify Stormwater Reduction Strategies

Low Impact Development Focused and Targeted on Public and Private Properties:

- Engineered Infiltration
- Disconnected impervious surfaces
- Curb Cuts
- Disconnected downspouts
- Permeable pavements
- Bio retention (rain gardens)



# Model Stormwater Plan:

## The Bradley and Hewletts Creeks Watershed Restoration Plan

### Goals of Voluntary Plan

- Turn back the clock on water pollution
- Restore shellfish harvesting
- Prevent swimming advisories (WB)
- Remove from State's impaired list
- Position Community for funding



# Implementing the Bradley and Hewletts Creeks Watershed Restoration Plan



# Implementing the Bradley and Hewletts Creeks Watershed Restoration Plan

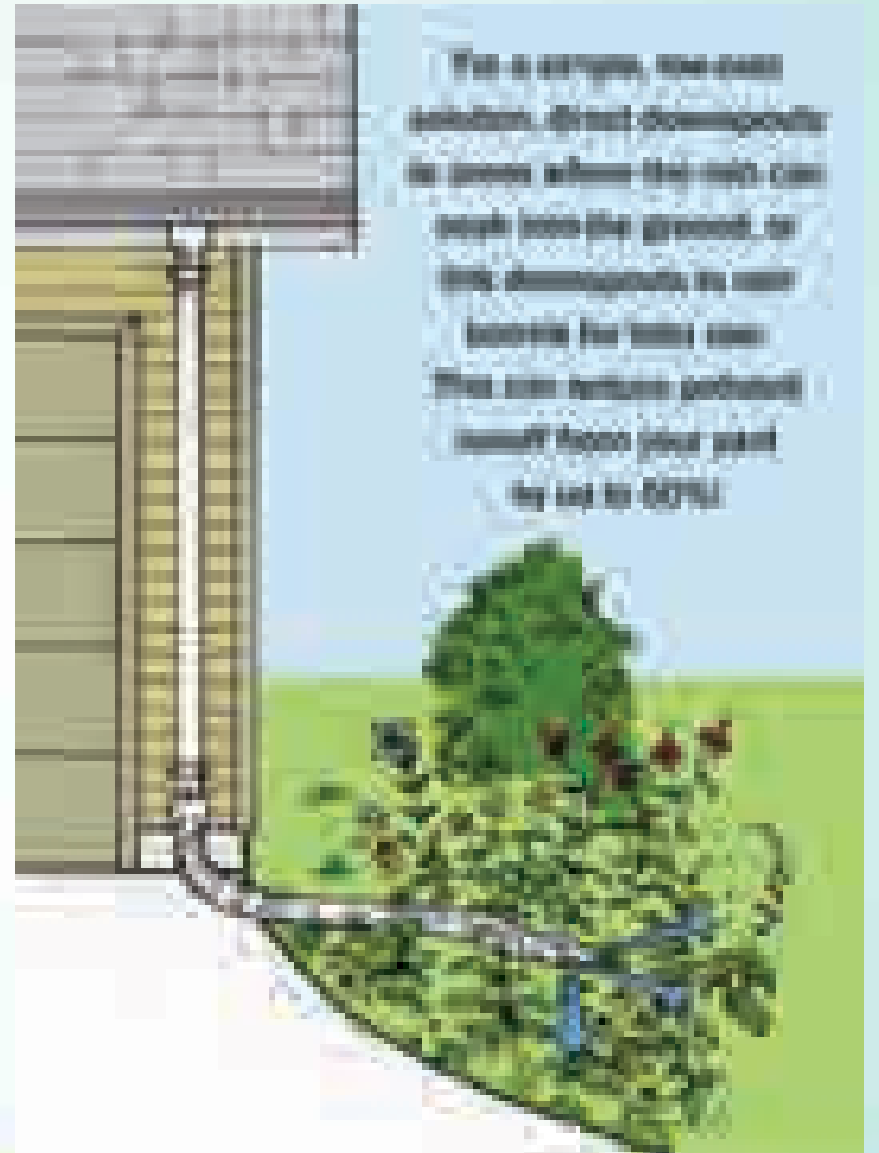
## Proven Strategies

- Monitoring results show 50-90% reduction in stormwater volumes (reducing pollutant loads).





# Small Steps Can Make A Big Difference



# Iula Street, Wrightsville Beach



# Iula Street, Wrightsville Beach



# Iula Street, Wrightsville Beach



# Iula Street, Wrightsville Beach



Project serves as model and leads to the development of a guidebook for coastal communities

[nccoast.org/resources/special-publications/  
watershed-restoration-planning-guidebook](https://nccoast.org/resources/special-publications/watershed-restoration-planning-guidebook)