

Wood-Pawcatuck Watershed Flood Resiliency Management Plan

Project Steering Committee Kickoff Meeting

March 26, 2015



Wood-Pawcatuck Watershed Association



Meeting Agenda

- 10:00 – 10:05 Welcome and Opening Remarks
- 10:05 – 10:10 Introductions
- 10:10 – 10:15 Steering Committee Roles and Responsibilities
- 10:15 – 11:30 Project Background and Objectives
Wood-Pawcatuck Watershed Overview
Work Plan Review – Project Scope & Schedule
- 11:30 – 11:45 Previous and Ongoing Work in the Watershed
Available Study Reports and Data
- 11:45 – 12:00 Next Steps and Discussion



Project Team – Introductions

- Project Team
 - Wood-Pawcatuck Watershed Association
 - Fuss & O'Neill, Inc.
- Project Steering Committee
 - Municipal representatives from the most heavily-impacted watershed communities
 - State and federal agencies
 - Other organizations



Steering Committee Roles and Responsibilities

- Work with Project Team over Next 18-24 Months
- Local Knowledge and Diverse Expertise
- Consensus Building and Early Buy-in
- Participate in Workshop Meetings
- Review Draft Deliverables



Hurricane Sandy Coastal Resiliency Grant

- U.S. DOI & National Fish and Wildlife Foundation (NFWF) competitive grant program
 - Help communities affected by Hurricane Sandy become more resilient to the impacts of coastal and inland flooding
 - Focus on strengthening natural ecosystems that also benefit fish and wildlife
- NFWF Grant awarded to Wood-Pawcatuck Watershed Association in June 2014 *
- \$720K grant award and \$200K matching funds
- Develop a “Flood and Storm Damage Resiliency Management Plan” for the Wood-Pawcatuck watershed



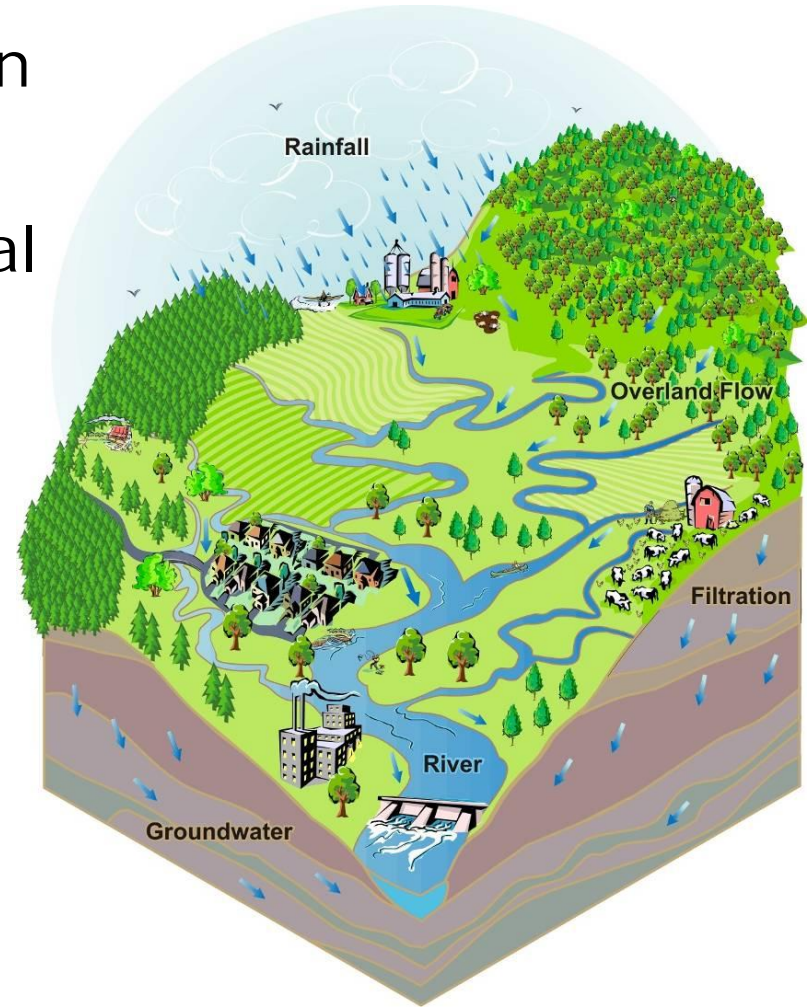
NFWF

*One of 4 projects awarded in CT and 7 in RI



What is Watershed Management?

- Framework for addressing water resource issues within a defined watershed
- Watersheds cross municipal boundaries
- Stakeholder involvement
- Management actions supported by science
- Prioritize limited financial resources



What is Flood Resilience or Resiliency?

A community's ability to plan for, respond to, and recover from floods.



Types of Floods

- Riverine Flooding
 - Overbank flooding, dam failure, ice jams
- Urban Drainage Flooding
 - Stormwater, outdated or under-sized drainage systems
- Coastal Flooding
 - Storm surge, wave action, sea level rise



Flooding in the Wood-Pawcatuck



Pawcatuck River, Westerly, April 2010



Pawcatuck River, Westerly, April 2010



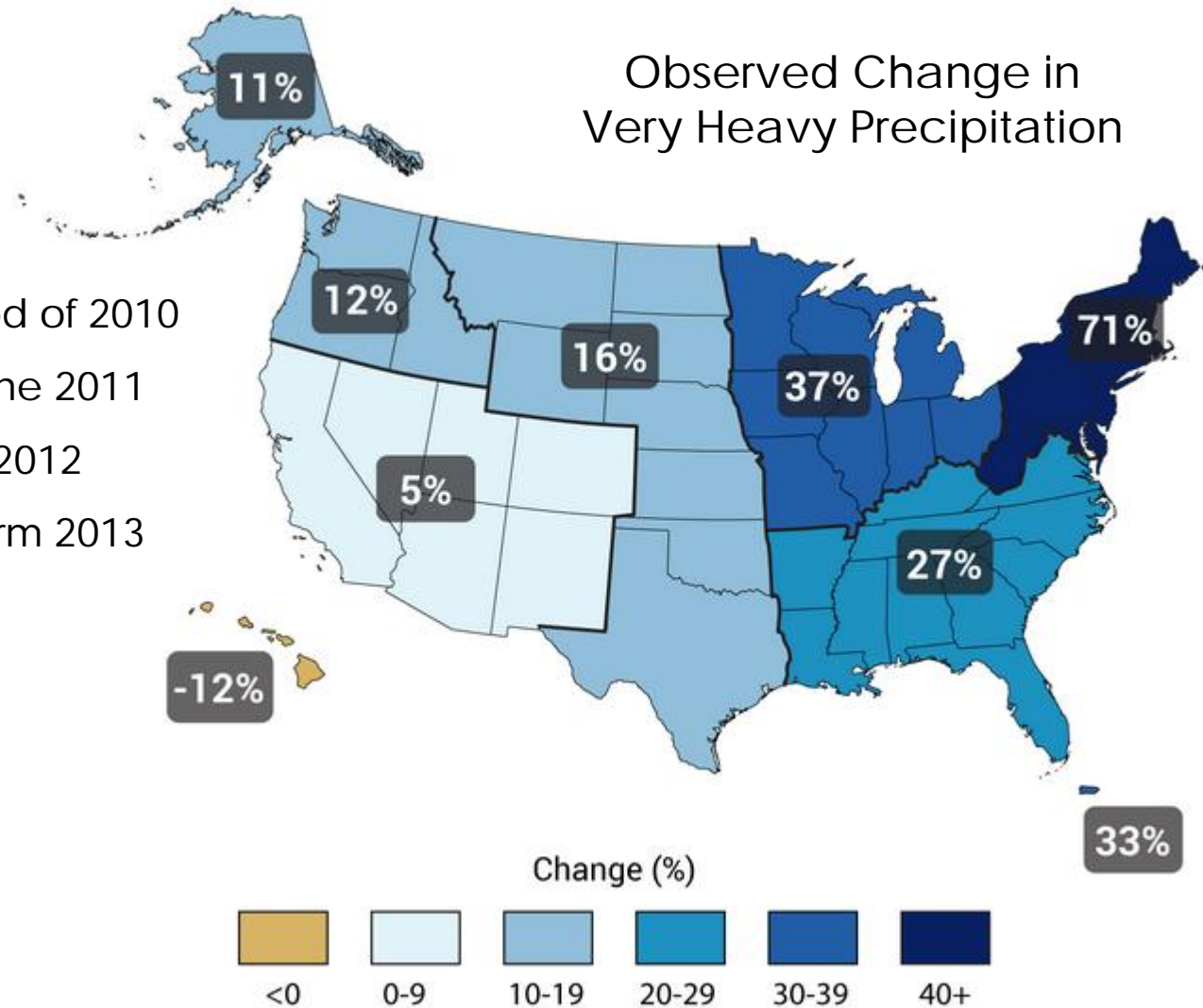
Pawcatuck River, Ashaway, April 2010



Wood River, Hopkinton, April 2010

Photos: Wood-Pawcatuck Watershed Association

- Rhode Island Flood of 2010
- Tropical Storm Irene 2011
- Hurricane Sandy 2012
- Severe Winter Storm 2013
- 2015 Blizzard

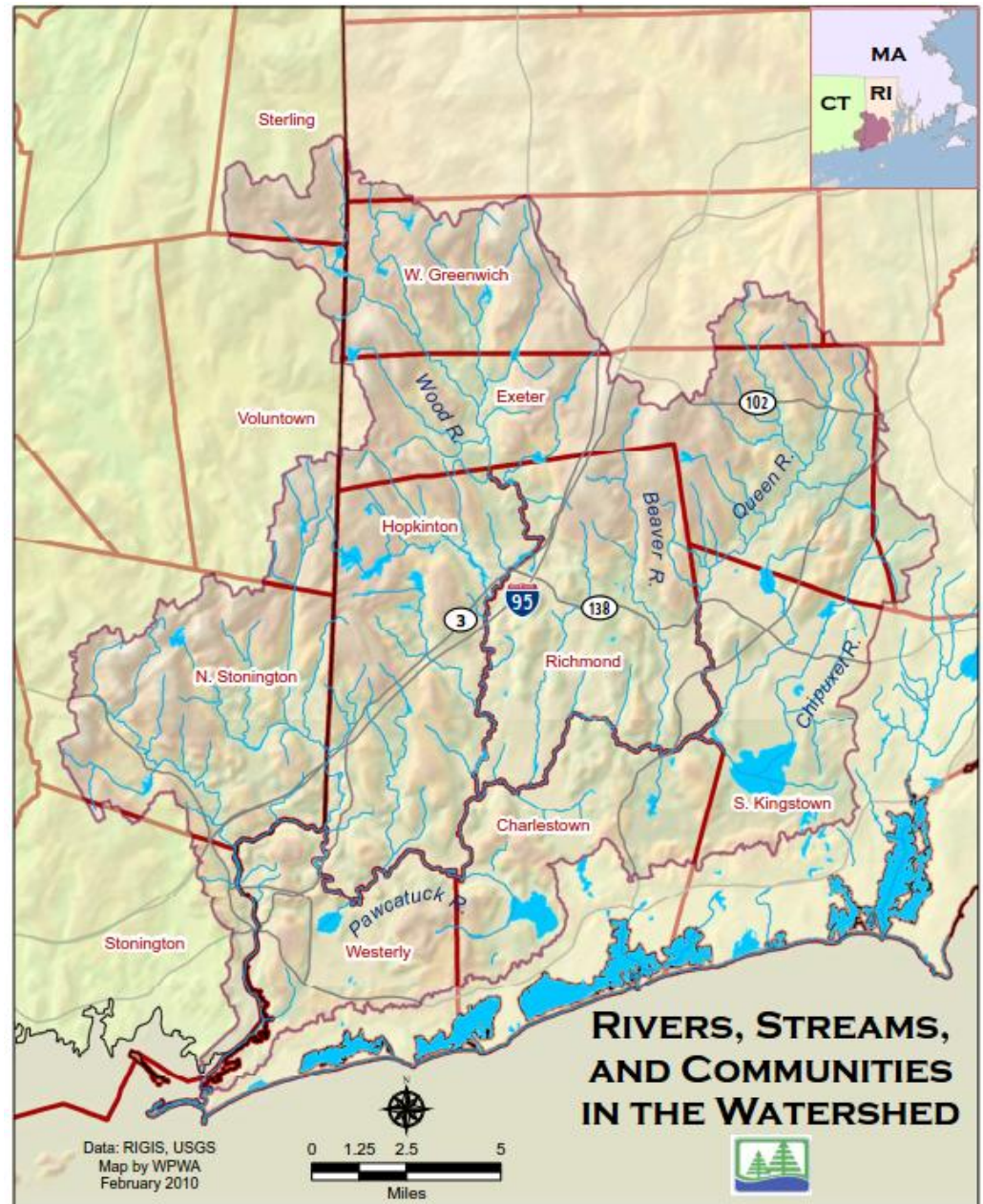


Source: Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009



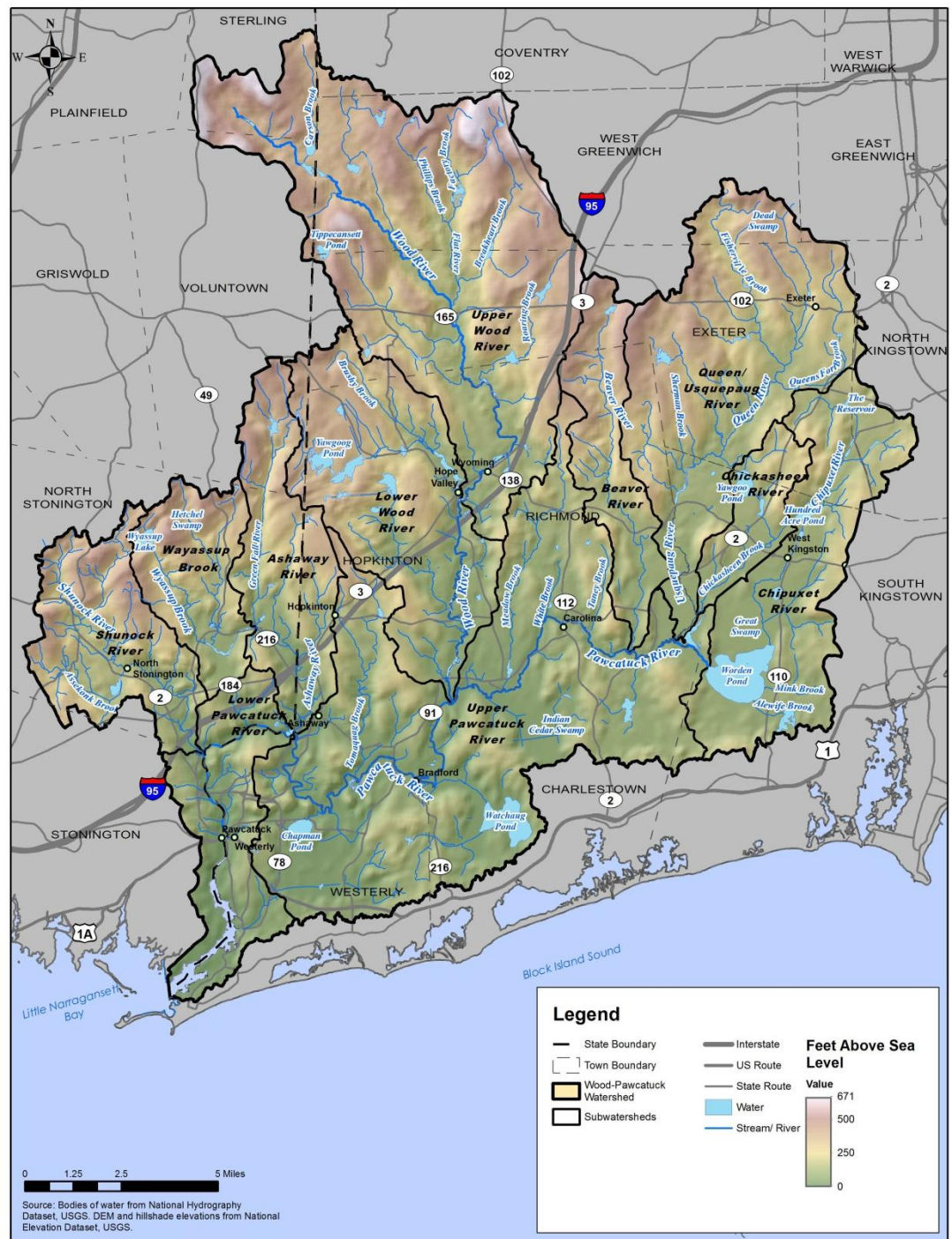
Wood-Pawcatuck Watershed

- 300 square miles in RI and CT
- Major portions of 11 municipalities
- 380 stream miles
- Pawcatuck River Estuary and Little Narragansett Bay



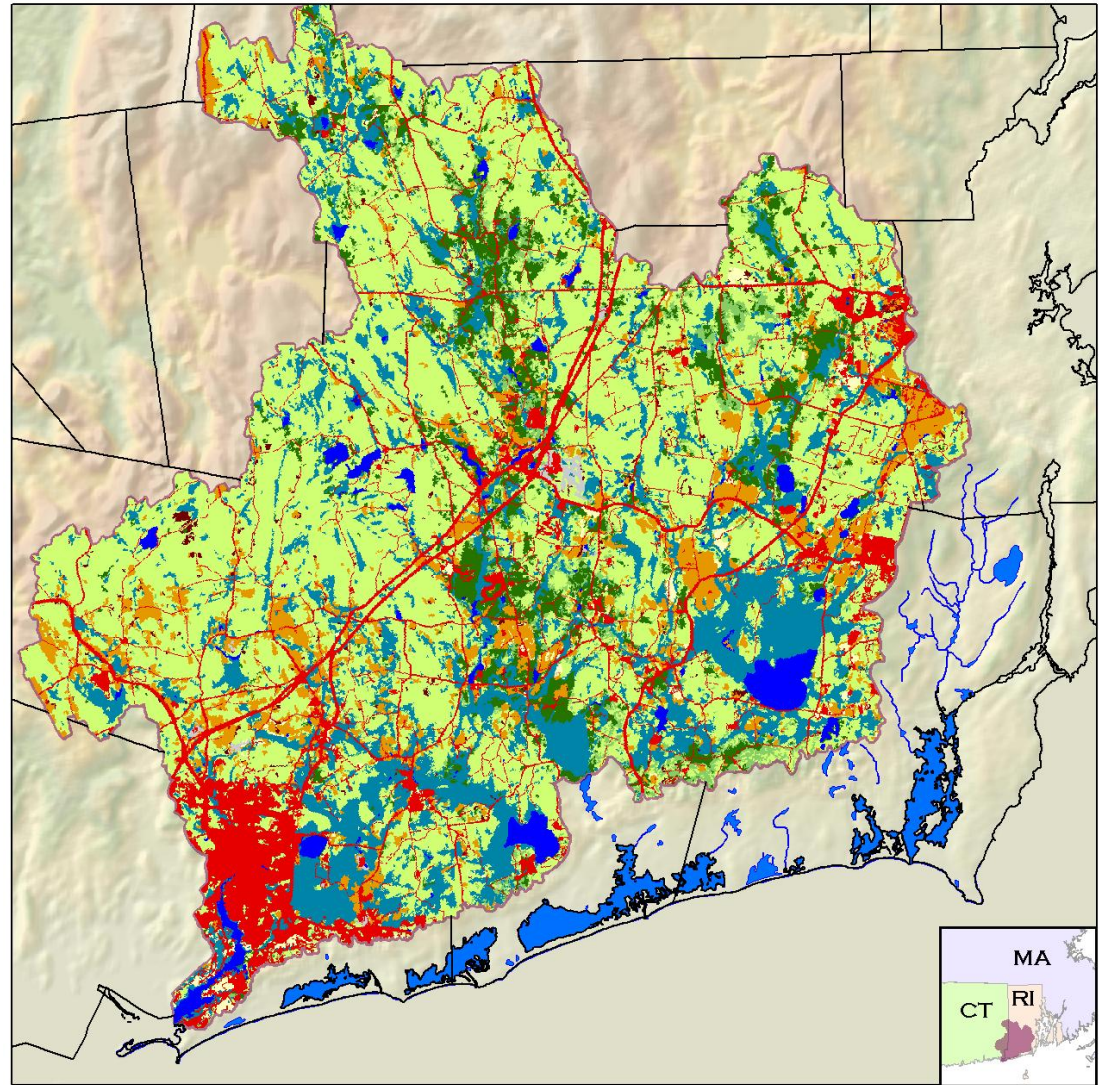
Subwatersheds

- Pawcatuck River
- Wood River
- Beaver River
- Queen -
Usquepaug River
- Chickasheen River
- Chipuxet River
- Ashaway River
- Wyassup Brook
- Shunock River



Wood-Pawcatuck Land Use

- Mostly rural, forested, and agricultural land
- 87% undeveloped
- 75% forested
- Development concentrated in lower watershed and town/village centers

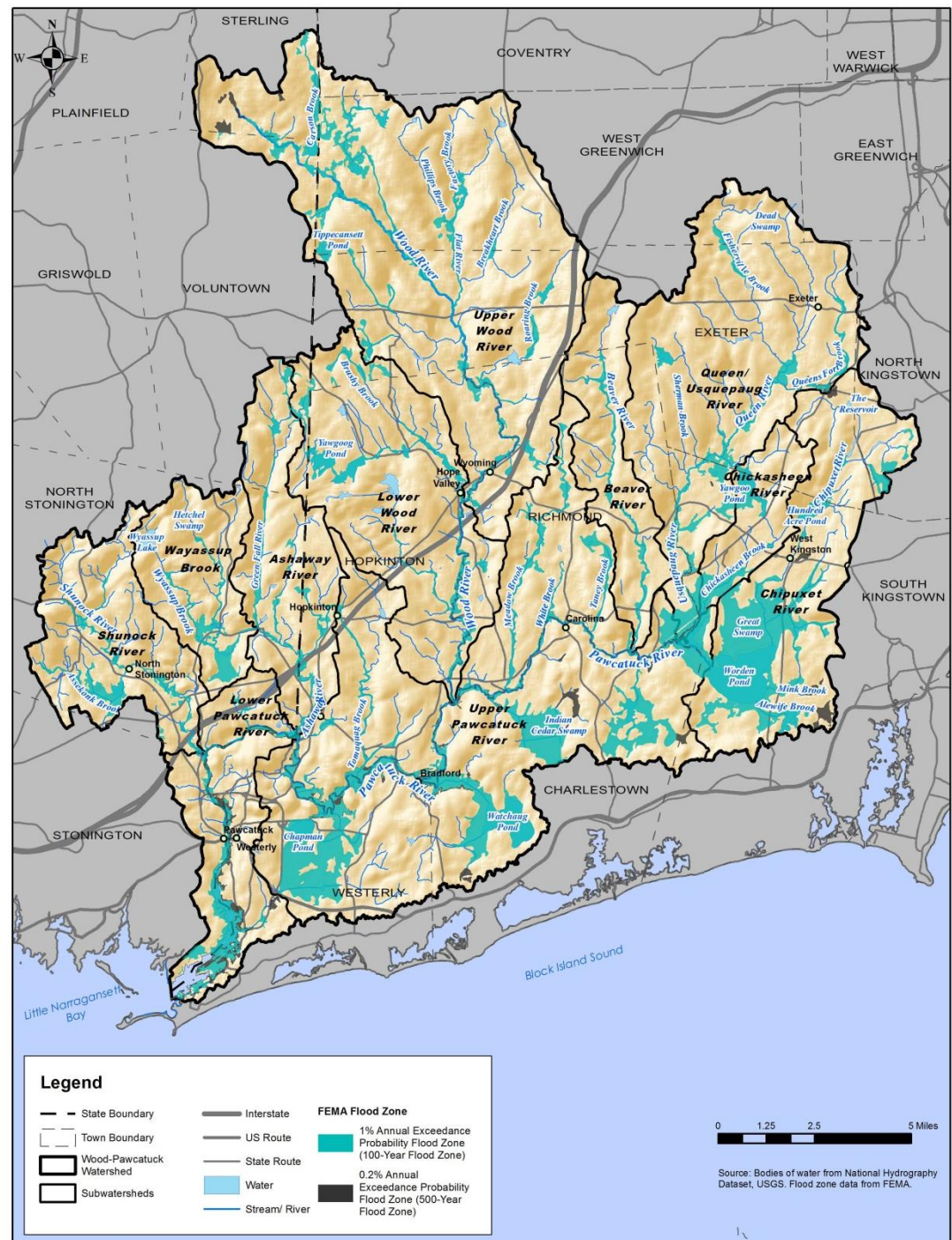


LAND USE



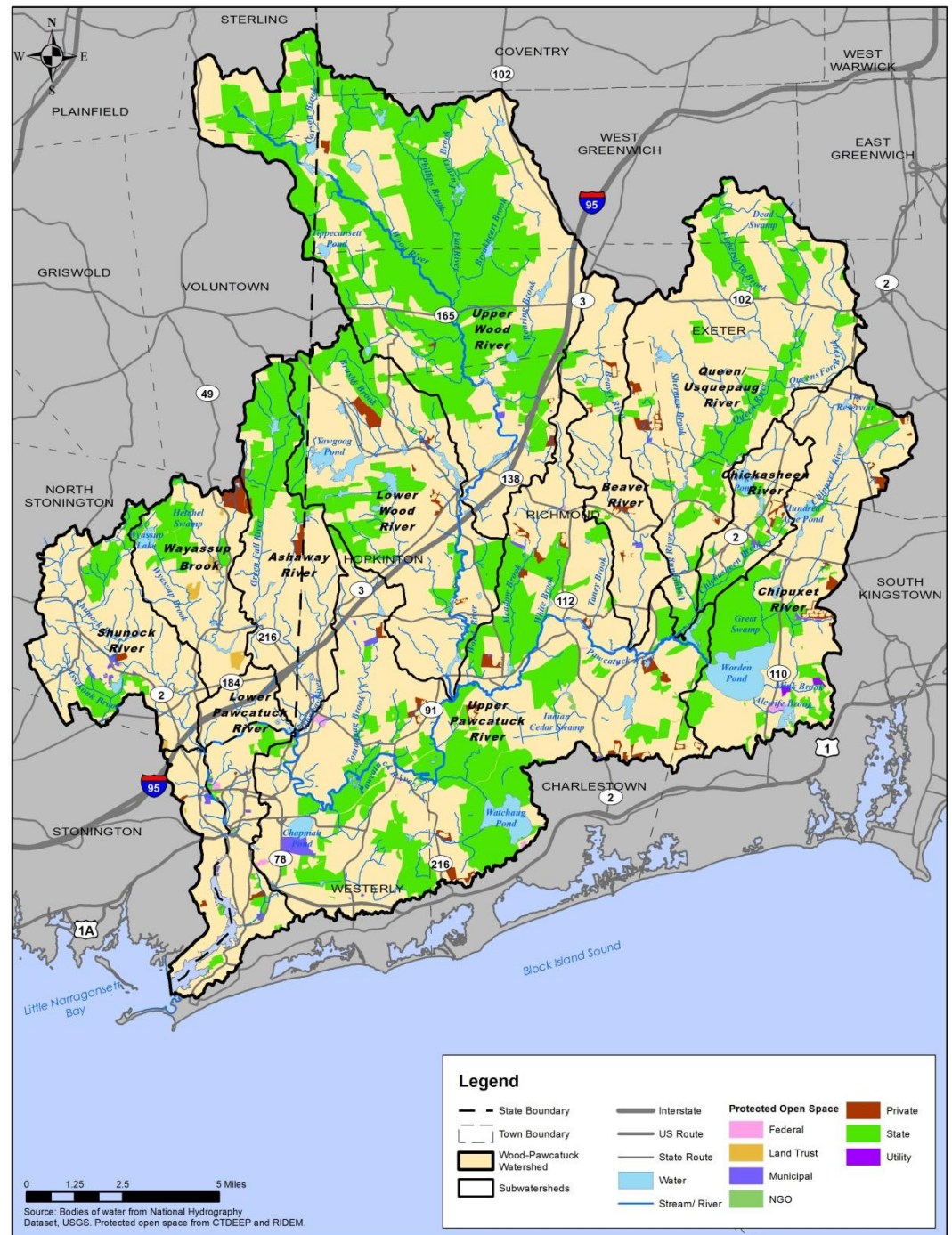
Flooding

- Factors Related to Increased Flooding
 - Floodplain development
 - Channel encroachment (dams, bridges, culverts)
 - Watershed impervious cover
 - Climate change: more frequent and intense storms



Natural Resources

- Habitat and species diversity
- Intact forest
"Borderlands"
- Large wetlands ("Great Swamp")
- High quality surface water except in urbanized lower watershed
- Sole Source Aquifer
- Under Study for Wild & Scenic Designation



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- Legend**
- State Boundary
 - Town Boundary
 - Wood-Pawcatuck Watershed
 - Subwatersheds
 - Interstate
 - US Route
 - State Route
 - Unassessed water
 - Unassessed Streams/Rivers
- Connecticut Assessed Waters**
- Fully supporting for designated uses
 - Fully supporting for some uses, insufficient information for others
 - Impaired for at least one use
 - Attaining all designated uses
- Rhode Island Assessed Waters**
- Attaining some designated uses, insufficient data for others
 - Insufficient data
 - Impaired, but completed TMDL
 - Impairment not caused by pollutant
 - Impaired; requires TMDL
- Source: Bodies of water from National Hydrography Dataset, USGS. Impaired waters from RIDEM and CTDEP.

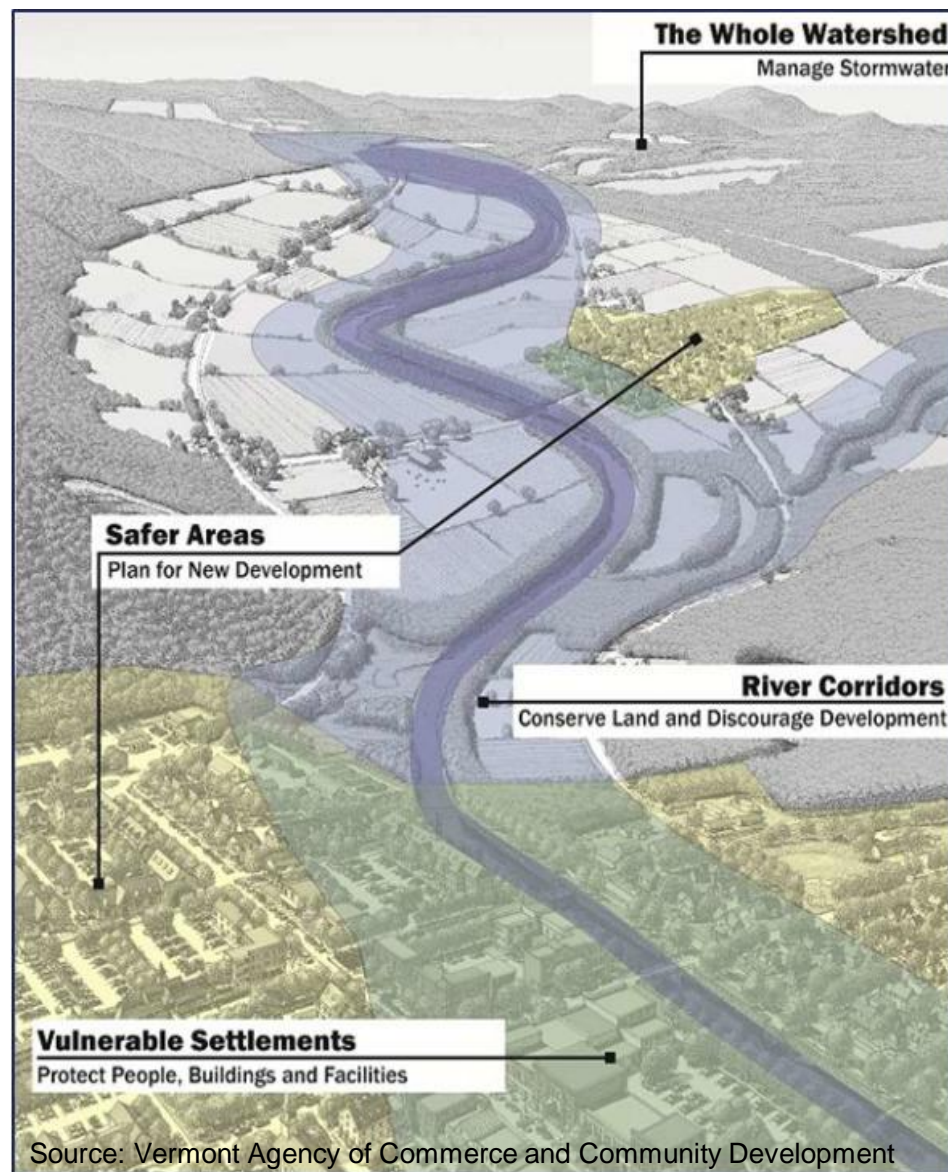
Project Goals

- Assess the vulnerability of the Wood-Pawcatuck Watershed to floods and storm-related damage
- Develop a watershed-based management plan to enhance flood resilience and strengthen natural ecosystems (water quality, species, habitat)



Watershed Approach to Flood Resilience

- **River Corridors:** Conserve land and discourage development along river corridors (floodplains and wetlands)
- **Vulnerable Settlements:** Protect people, buildings, and facilities to reduce future flooding risk
- **Safer Areas:** Plan for new development in areas that are less vulnerable to floods
- **The Whole Watershed:** Implement stormwater management to slow, spread, and infiltrate runoff



Project Scope of Work

1. Baseline Watershed Assessment
2. Watershed Technical Evaluations
3. Management Plan Development
4. Stakeholder and Community Involvement



Baseline Watershed Assessment

- Document existing watershed characteristics
- Don't reinvent the wheel - integrate and build upon extensive previous and ongoing work in the Wood-Pawcatuck Watershed
 - Risk MAP Project (USGS and FEMA)
 - Pawcatuck River Flood Risk Feasibility Study (USACE)
 - RI River & Stream Continuity Project (RI RC&D)
 - Pawcatuck Dam Removals (NOAA, NRCS, TNC, USFWS)
 - Wild & Scenic Reconnaissance Survey (NPS)
 - Water Quality Basin Planning (RIDEM)



Watershed Technical Evaluations



Stream Geomorphic Assessment

- Geomorphic assessment of rivers and streams
- Protocols adapted from Vermont
 - Phase 1 Assessment (screening)
 - Phase 2 assessment (detailed field assessment – 38 stream miles)
- Fluvial Erosion Hazard Mapping
- River corridor planning recommendations and design concepts

Geomorphic Assessments

- What are the physical processes and features that characterize a stream and its watershed?
- How do human activities influence these processes?
- Which of these processes and features present high erosion and flood hazard risks to human investments?



Bridge, Culvert & Dam Assessment

- Assessment of hydraulic structures in the watershed
- Bridges and Culverts
 - Conveyance capacity and flooding/erosion potential
 - Aquatic connectivity
 - Build on work by USGS, FEMA, USACE, and RI RC&D
- Dams (over 100 in watershed)
 - Flood/erosion damage potential due to breach or failure
 - Dam removal and fish passage feasibility



Arcadia Road Bridge, Wood River, March 2010



Blue Pond Dam Breach, Rockville, RI, March 2010



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- LANDSCAPED MEDIAN
- PERVIOUS PAVEMENT AT INTERSECTIONS AND ON-STREET PARKING BAYS
- CURB CURB
- BIORETENTION FOR STORMWATER BASIN AT BULE-OUT



Natural Resources Inventory

- Riparian Corridor and Floodplain Wetlands
 - Restoration and preservation opportunities
- Desktop Screening Evaluation
 - Identify wetlands in the watershed that provide flood protection function
- Field Evaluation of Selected Wetlands
 - Assess principal functions of wetlands
 - Identify site-specific restoration/preservation opportunities



Potential Desktop Analysis Screening Criteria

- Watershed size, slope, topography, vegetation, and impervious cover
- Wetland storage volume and outflow rate
- Wetland class
- Proximity to bridges, dams, roads
- Area of wetland within floodplain
- Downstream floodplain development



Land Use Regulatory Review

- Review of land use policy documents
- Municipal Plans
 - Comprehensive Plans
 - Hazard Mitigation Plans
- Regulations and Ordinances
 - Planning, zoning, subdivision, wetlands, stormwater, floodplain, erosion and sediment control

Potential Regulatory Approaches

- Fluvial Erosion Hazard zoning overlay districts/regulations
- Riparian corridor/buffer regulations
- Flood resiliency design standards for municipal and private projects
- Adoption and enforcement of disaster-resistant building codes
- Procedures for expedited permitting of repairs and reconstruction after emergency flood events for work which meets resiliency standards
- Requirements or incentives for the use of GI/LID for new development and redevelopment
- Removal of regulatory impediments to the use of GI/LID
- Modified regulations to reduce impervious cover
- Updated design rainfall amounts



Watershed Plan Development

- Collaborative Process with WPWA and Project Steering Committee
- Identify and Evaluate Alternative Management Strategies
- Workshop Meetings
 - Steering Committee
 - Community
- Project Website
- Municipal Training and Outreach

Potential Management Alternatives

- Land use regulatory controls
- Active restoration
 - Elevating and flood proofing structures
 - Dam removal
 - Aquatic connectivity obstruction removal
 - Bridge and culvert retrofits and replacements
- Passive restoration
 - Riparian buffer restoration and protection
 - Stream bank stabilization
 - Corridor easements
- Reach-scale river restoration
- Green infrastructure stormwater management
- Repurposing dams for flood storage and other objectives
- Wetland and habitat restoration
- Related water quality mitigation



Wood-Pawcatuck Information Gathering

- Information and Data Sources
 - *See handout*
- Specific Areas of Flooding and Local Concerns
 - Municipalities
 - Private land owners
 - Risk MAP Discovery Process
 - USACE Flood Risk Feasibility Study



Watershed Plan Questionnaire

- Early input from Stakeholders
- Desired outcomes
- Specific areas of flooding and local issues
- Ongoing flood mitigation projects and initiatives
- Email, web, paper copy

**Wood-Pawcatuck Watershed Flood Resiliency Management Plan
Questionnaire**

Name: _____ Organization: _____

Position: _____ E-mail: _____

Phone: _____ Cell Phone: _____

Street Address (for mailings): _____

1. What are your top five (or more) concerns/issues/priorities regarding the Wood-Pawcatuck Watershed (e.g., flooding, water quality, habitat, recreation, drinking water supplies, climate change, economic development, other)?

1. _____

2. _____

3. _____

4. _____

5. _____

2. What would you most like to see as outcomes of the Wood-Pawcatuck Watershed Flood Resiliency planning effort?

3. List specific areas of flooding (riverine and urban drainage) and flood-related issues of concern in your community, or indicate where this information can be found if already described in existing documents.



Project Schedule

Project Kickoff	February 2015
Steering Committee Formation	March 2015
Steering Committee Meetings (tentative):	
Project Initiation Meeting	March 2015
Progress Meeting #1	May 2015
Progress Meeting #2	November 2015
Progress Meeting #3	April 2016
Baseline and Technical Assessments	March – December 2015
Plan Development	January – October 2016
Community Meetings	Winter 2015/2016
Municipal Training	Fall 2016



Project Contacts

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