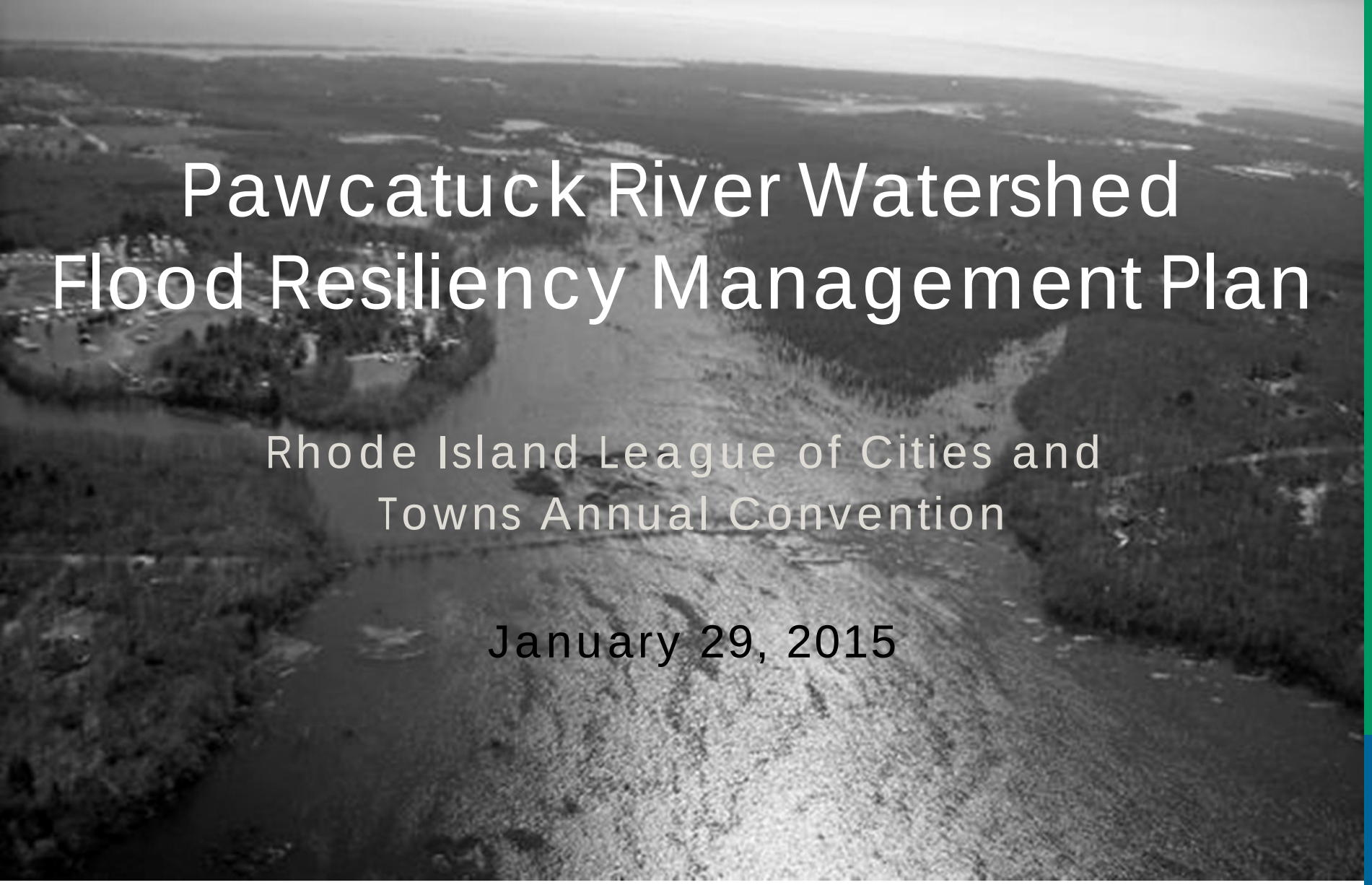

Pawcatuck River Watershed Flood Resiliency Management Plan

Rhode Island League of Cities and Towns Annual Convention

January 29, 2015

NFWF

Wood-Pawcatuck Watershed Association

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What is Flood Resilience or Resiliency?

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

Flooding Along Pawcatuck & Wood Rivers

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

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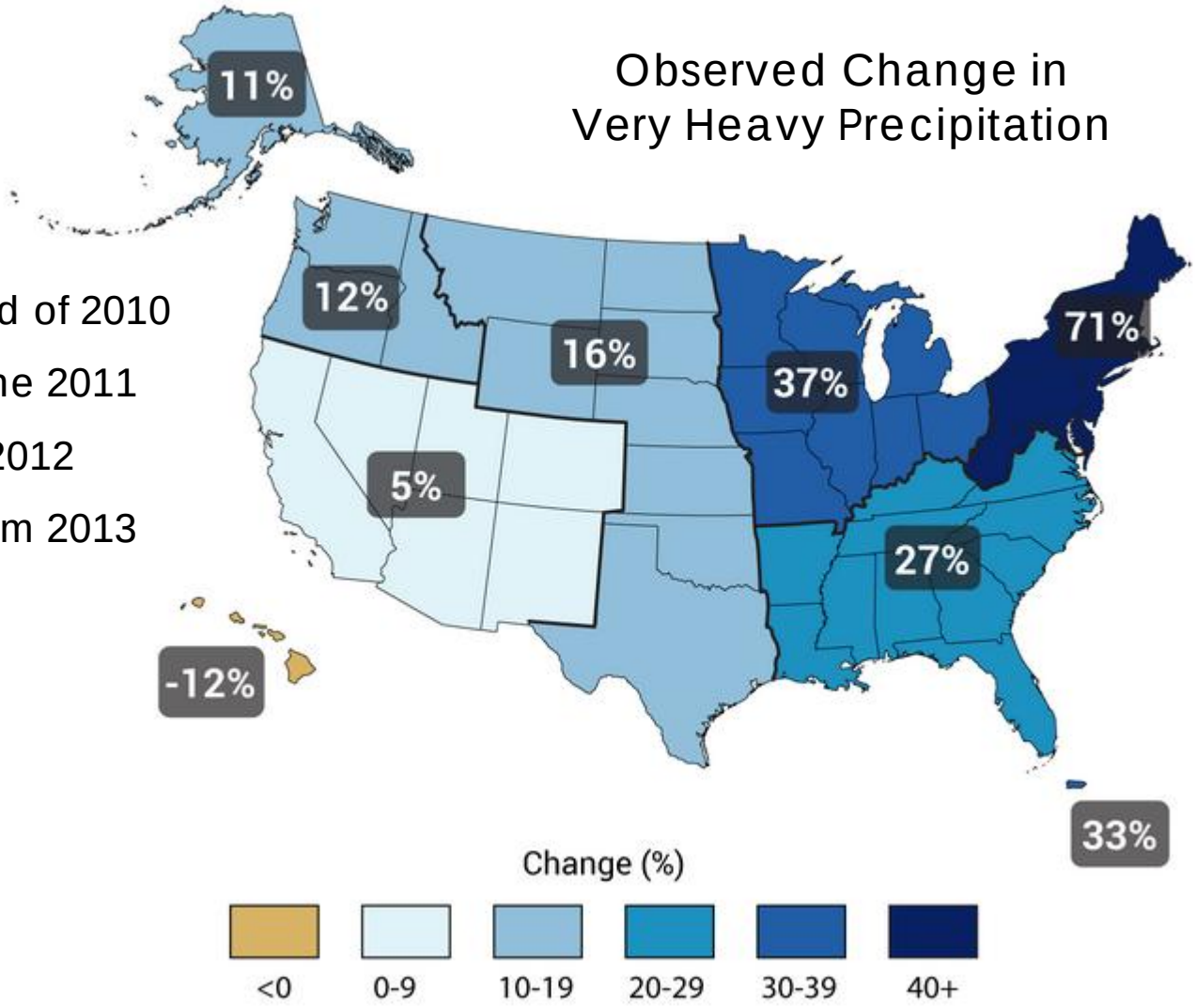
More Frequent Extreme Storms

- 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

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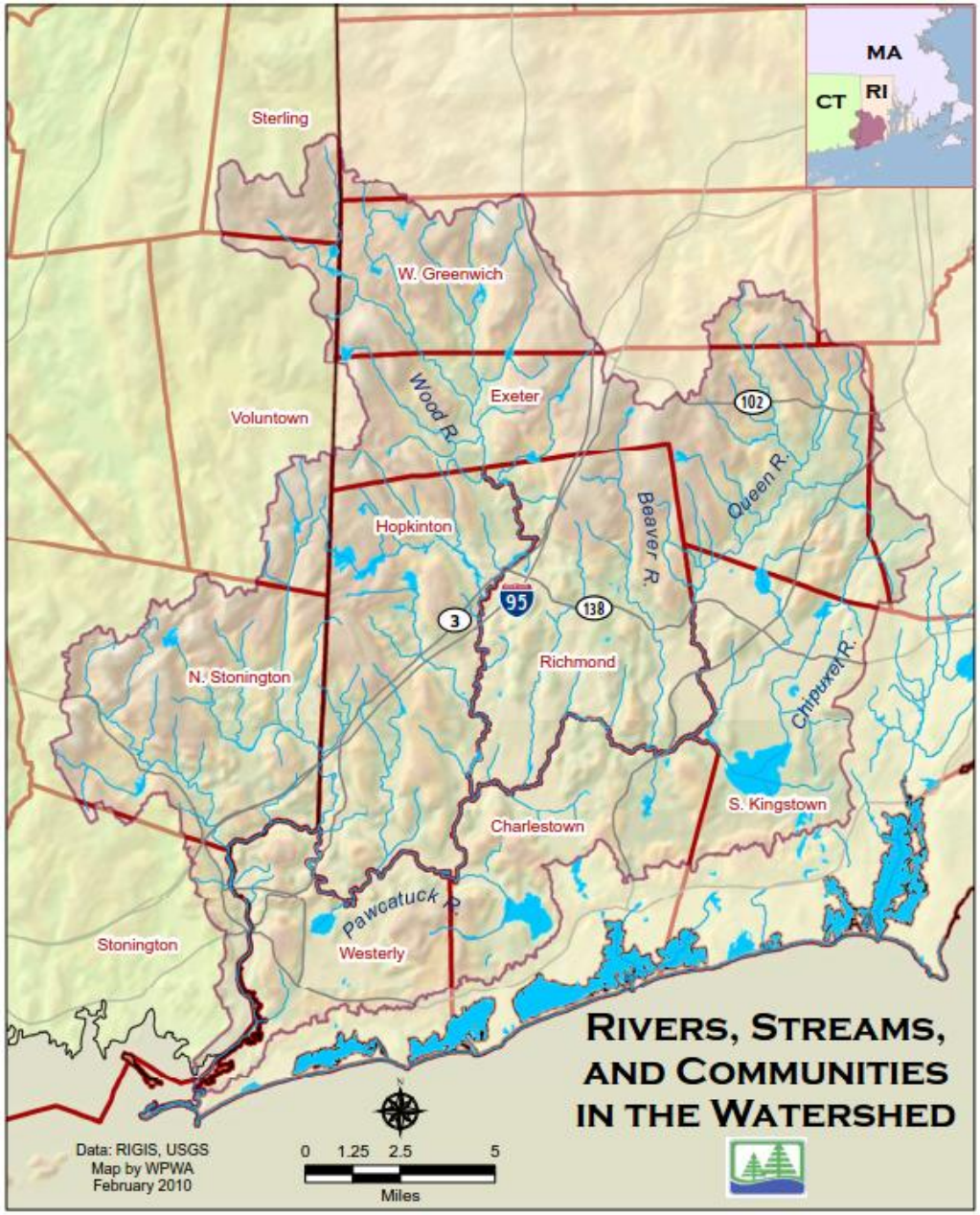
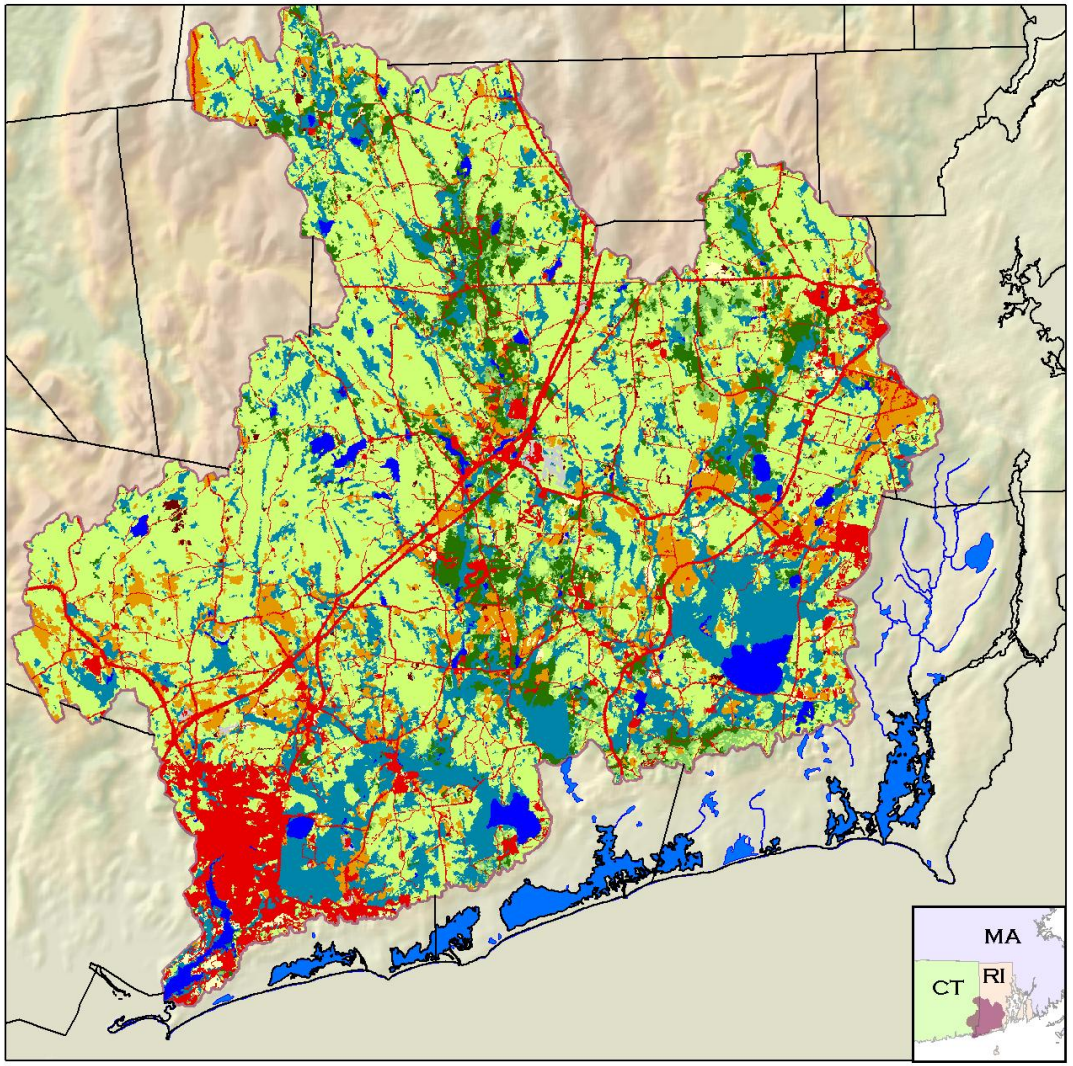
Pawcatuck River Watershed

- 300 square miles in RI and CT
- Portions of 15 municipalities and Narragansett Tribe
- 380 stream miles
  - Pawcatuck R.
  - Wood R.
  - Beaver R.
  - Queen R.
  - Chipuxet R.



Pawcatuck River Watershed

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



LAND USE

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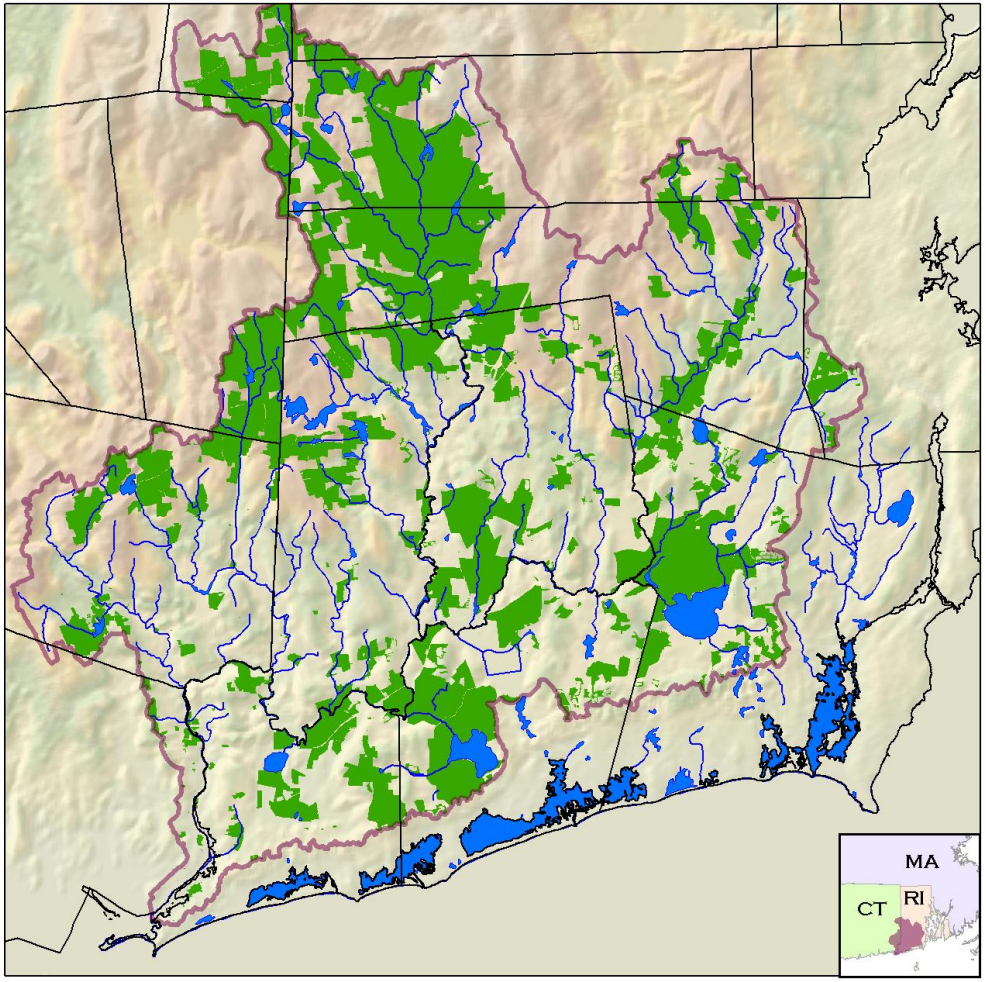
Pawcatuck River Watershed

- High Quality 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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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 Pawcatuck River watershed

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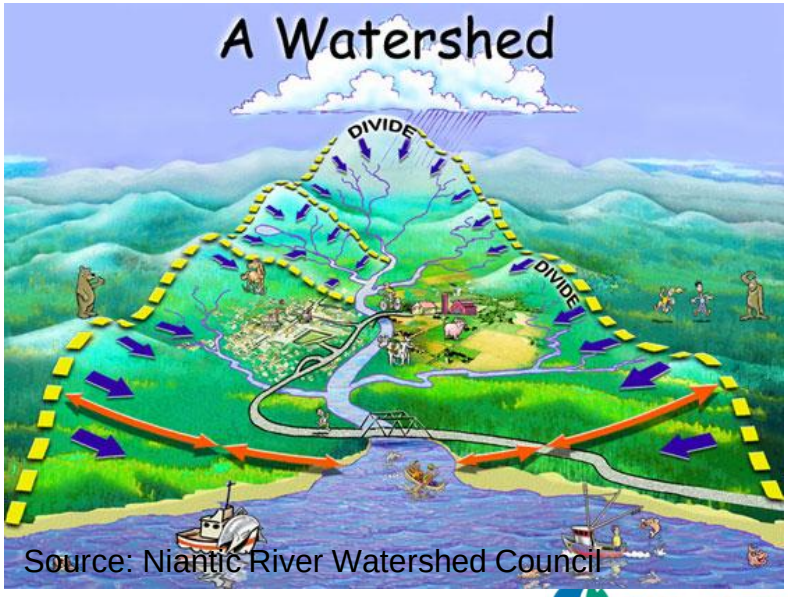
Project Goals

- Assess the vulnerability of the Pawcatuck River 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)



Source: Niantic River Watershed Council

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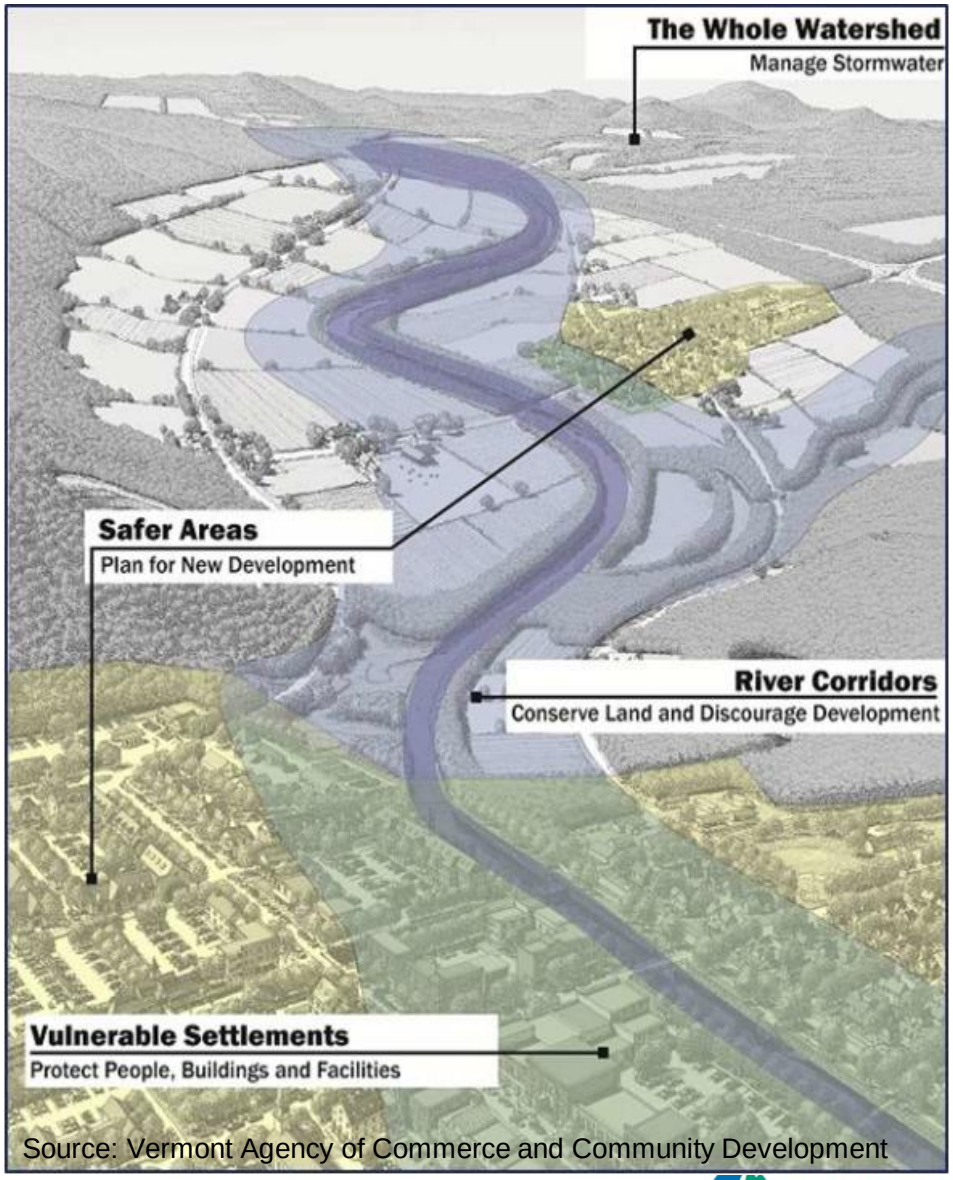
Watershed Approach to Flood Resilience

- 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 and encourage new development in areas that are less vulnerable to floods
- The Whole Watershed: Implement stormwater management to slow, spread, and infiltrate runoff



Source: Vermont Agency of Commerce and Community Development

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Project Elements

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

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Baseline Watershed Assessment

- Document existing watershed conditions
- Don't reinvent the wheel - integrate and build upon extensive previous and ongoing work in the Pawcatuck River watershed
  - RiskMAP 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

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Stream Geomorphic Assessment

- Assessment of 38 miles of rivers and streams
- Protocols adapted from Vermont
- Fluvial Erosion Hazard Mapping
- River corridor planning recommendations and design concepts

Source: VT DEC

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?

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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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Green Infrastructure Assessment

- Identify Opportunities for Green Infrastructure
  - Enhance resiliency
  - Provide water quality and ecosystem benefits
- Types of Green Infrastructure
  - Stormwater management/LID
  - Wetland and floodplain restoration
- Retrofit Inventory and Concept Designs

Watershed Plan Development

- Collaborative Process Led by WPWA and Project Steering Committee
- Identify and Evaluate Alternative Management Strategies
- Workshop Meetings
- 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

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Project Schedule

Project Kickoff	February 2015
Steering Committee Formation	February 2015
Steering Committee Meetings	Spring & Fall 2015
Baseline and Technical Assessments	March – December 2015
Plan Development	January – October 2016
Community Meetings	Winter 2015/2016
Municipal Training	Fall 2016

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Questions?

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