

Supporting New England Communities to Become River-Smart

*Policies and Programs That Can Help
New England Towns Thrive Despite River Floods*

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Cover Photo: Confluence of Chickley and Deerfield Rivers, Charlemont, Massachusetts, September 18, 2011.

This photo illustrates some common river flood processes and dynamics, and illuminates factors that influence the extent of damage during river floods.

During Tropical Storm Irene in late August, 2011, the number of new landslides was unprecedented. These landslides contributed a large amount of sediment to the rivers of Vermont and western Massachusetts. Within Massachusetts, damage from Tropical Storm Irene was most severe in the Deerfield River watershed. Yet, damage was not consistently severe throughout the region.

Here, in this photo, the Chickley River enters the Deerfield on the left. The Chickley had swollen enormously, causing tremendous damage in the town of Hawley. It

brought high volumes of water and sediment into the Deerfield. The Deerfield River also flowed far out of its channel, as seen in the light-colored over-wash on the right bank, opposite the Chickley River. Yet structural damage at the confluence of the Chickley and the Deerfield River was limited. Why? For one thing, the river could access its floodplain. The overwash represents an overflow channel through the floodplain, where the river dissipated energy and volume. Structures were built back from the channel. Bridge spans on state Route 2, which was heavily damaged elsewhere, were also large enough here to accommodate flows of water, sediment and debris. The river's access to its floodplain here may have reduced downstream damage, by reducing the power of the river's flow.

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Supporting resilience to river floods through science, policy, and community outreach



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The RiverSmart Communities program combines social and river science, institutional and policy research, and community outreach at the University of Massachusetts Amherst to research and address river floods in New England. It is our vision that river management can restore the environmental integrity of rivers while ensuring that New England communities thrive in a world where floods naturally occur. To make this vision possible, our work aims to help New England's communities become *river-smart*.

A key goal is to offer ideas and tools that can be used by people and groups across New England – land and river managers, riverside property owners, policy makers, government agency staff, community leaders, grass-roots activists, and others – so they can creatively build and advocate for systems that work for their own states and communities.

We encourage your use of our educational and outreach materials to promote sustainable river management in your community, though ask that you credit our work. In this spirit this report is licensed with a Creative Commons license that allows free use of any information or graphics as long as the source is credited.

River-smart: Managing rivers and riverside landscapes, as well as our own actions and expectations, so people and communities are more resilient to river floods. Specifically: reducing flood severity, flood damage, and flood costs by understanding and accommodating the natural dynamics of rivers and river floods.

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Preface

This report aims to help New England's communities and their residents, as well as the governments that serve them, to better deal with and adjust to river floods. It points to practical policy solutions at federal, state and regional levels that can support New England communities to become what we call river-smart.

In considering New England's communities, we focus on the small towns in the region's mountainous areas that are most at risk for damage from river floods. These often have scarce resources and limited ability to access help from the state and federal governments. We also recognize the constraints of government agencies that serve New England communities. Budgets are tight, personnel have been cut, and efforts to make new policy through legislation or rulemaking can face gridlock, opposition, or long, complex administrative processes.

Yet our research has given us hope. We have learned that creative people across the region have figured out ways to make positive change happen. We investigated seven case studies in which people, organizations and governments have, despite challenges, figured out ways to help New England communities become more river-smart.

The first three chapters of the report provide background for policymakers, agency staff, community leaders, and members of the public. Chapter I emphasizes that river floods have been common throughout New England's history, and remain destructive today. Chapter II provides a primer on the science of dynamic rivers, illuminating how and why river floods can be so unexpectedly destructive. It ends with three lessons on how rivers and lands can be managed to minimize and mitigate river flood damage. Chapter III outlines the assistance that New England municipalities need in order to undertake this river-smart management, and summarizes key federal programs that provide some of this assistance. An overview of our case studies shows ways that creative organizations are adding support beyond existing policy.

Building from this background, Chapter IV identifies five policy changes that, with modest fiscal resources and limited regulatory change, can make the most immediate and long-term difference for the future safety and wellbeing of New England communities. Our policy recommendations are:

- 1: Develop Fluvial Hazard Assessments
- 2: Upgrade Vulnerable Stream Crossing Infrastructure
- 3: Support River-Smart Planning and Mitigation
- 4: Provide Outreach and Training on River Dynamics and River-Smart Practice
- 5: Designate, Recognize and Support River-Smart Regional Intermediaries

Our report does not spell out exactly who should take on all these tasks; New England is too diverse in the ways it structures its river and flood management, and in the ways federal, state, regional and local governments share their authorities, to offer such prescriptions. Instead, we offer clear ideas and tools that policy makers, government agency staff, community leaders, and grass-roots activists can use to creatively build and advocate for systems that work for their states and communities. For each recommendation, we provide tangible examples of people, places, and institutions in New England that are already making these things happen – examples that show some of the ways these recommendations can be put into practice.

We intend this summary report to be widely comprehensible and useful to people who care about New England's communities and their abilities to withstand and manage river floods. To make this report more readable, we have included citations only in Chapters I-III. More detailed background, examples, and references for the recommendations and featured case studies of Chapter IV will be provided on the RiverSmart website, <https://extension.umass.edu/riversmart>.