

Building Resilience at the Watershed Scale

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Background/Objectives. The Charles River Climate Compact (CRCC), a consortium of watershed communities, was founded by the Charles River Watershed Association (CRWA) in 2019 to discuss shared challenges and opportunities for climate adaptation. The northeast is projected to see a considerable increase in extreme rain events as a result of climate change which will lead to more flooding, and potential loss of life and property. Municipal leaders regularly make decisions that will change the local landscape for decades to come but they had no reliable information about the potential local impacts of flooding. The CRCC identified the need for a watershed model that demonstrates freshwater flooding impacts as a necessary tool to assist municipal staff in protecting their citizens, especially vulnerable populations, and to engage residents and businesses in enhancing climate preparedness and resilience. Another key objective of this project was undertaking a stakeholder process to bring consistency across watershed communities on how they are planning and governing for expected climate impacts, thus promoting a more comprehensive and synergistic approach in a region with a high level of interconnectedness but also strong local control.

Approach/Activities. Weston & Sampson and Charles River Watershed Association developed a watershed-wide hydrologic/hydraulic (H/H) model to forecast future flooding impacts expected from climate change and assess the benefits of possible large-scale nature-based solutions to set the stage for their implementation. The project provides data for communities within the Charles River watershed about areas vulnerable to flooding under future climate scenarios. Communities can use this data to develop new policies and regulations designed to prevent flooding of existing and future development. Additionally, while many communities are moving forward with nature-based adaptation solutions within their own communities, large scale solutions are likely to be more complicated and potentially more expensive to implement. The Charles River watershed H/H model has been used to assess the impact of large-scale nature-based adaptation solutions for their ability to mitigate flooding at the regional scale, as well as mitigating local flood hazards. Furthermore, these solutions may be primarily located within one or two communities while the benefits are felt by many more communities.

Results/Lessons Learned. Flood resiliency needs multi-jurisdictional efforts that are comprehensive and synergistic. To mitigate the impacts of flooding anticipated in the watershed, bold and coordinated action will be required. The infrastructure investments and policy changes required will be significant and planning needs to begin now.