

# New England **Climate Adaptation** PROJECT



## Case Study **Cranston, Rhode Island**

**PRODUCED BY:**

Massachusetts Institute of Technology Science Impact Collaborative  
Consensus Building Institute  
National Estuarine Research Reserve System  
October 2014

## Acknowledgements

This Case Study was prepared by the Massachusetts Institute of Technology Science Impact Collaborative and the Consensus Building Institute, with the assistance of the Narragansett Bay National Estuarine Research Reserve and partners in the City of Cranston. It was produced as part of the New England Climate Adaptation Project, an effort funded by the National Estuarine Research Reserve System Science Collaborative.

Julie Curti from MIT provided guidance for the content and layout of this Case Study. The graphic design and layout were done by Takeo Kuwabara from MIT. NECAP staff took the cover photo.

---

**Lawrence Susskind**

*Principal Investigator, MIT Ford Professor of Urban and Environmental Planning*

**Patrick Field**

*Principal Investigator, Managing Director of CBI*

**Danya Rumore**

*Project Manager and Collaboration Lead, PhD Candidate in Environmental Policy and Planning at MIT and Associate at CBI*

**Toral Patel**

*Report Author, Master of City Planning, MIT 2014*

**Paula Gonzalez**

*Writing Support, Bachelor of Science, MIT 2014*

### **About the MIT Science Impact Collaborative**

The Massachusetts Institute of Technology Science Impact Collaborative (MIT SIC) is a research group focused on developing and testing new ways of harmonizing science, politics and public policy in the management of natural resources and resolution of environmental disputes. MIT SIC's tools and approaches include collaborative adaptive management, joint fact-finding, scenario planning, collaborative decision-making and multi-stakeholder engagement, and the use of role-play simulation exercises.

MIT SIC was established in 2003 with initial support from the United States Geological Survey. Today, the research group has numerous partners and supporters, ranging from the U.S. National Estuarine Research Reserve System to the Dutch research organization TNO. By engaging in community-based action research projects, MIT SIC researchers—including doctoral students, masters students, and faculty from the MIT Department of Urban Studies and Planning—train emerging environmental professionals while simultaneously testing the latest environmental planning methods and providing assistance to communities and policy-makers who seek our help.

Visit the MIT Science Impact Collaborative website for more information: <http://scienceimpact.mit.edu>

### **About the Consensus Building Institute**

The Consensus Building Institute (CBI) is a not-for-profit organization founded in 1993 by leading practitioners and theory builders in the fields of negotiation and dispute resolution. CBI's experts bring decades of experience brokering agreements and building collaboration in complex, high-stakes environments — and possess the deep understanding required to tackle negotiation and collaboration challenges in our practice areas. CBI's Founder, Managing Directors, and many of our Board members are affiliated with the Program on Negotiation at Harvard Law School and the MIT-Harvard Public Disputes Program.

Visit the CBI website for more information: <http://www.cbuilding.org>

### **About the Narragansett Bay National Estuarine Research Reserve**

The National Estuarine Research Reserve System (NERRS) is a network of 28 areas representing different biogeographic regions of the United States that are protected for long term research, water-quality monitoring, education, and coastal stewardship. The reserve system is a partnership program between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. Reserve staff work with local communities and regional groups to address natural resource management issues, such as climate change, non-point source pollution, habitat restoration, and invasive species. Through integrated research and education, the reserves help communities develop strategies to deal successfully with these coastal resource issues. Reserves provide adult audiences with training on coastal and estuarine issues of concern in their local communities. They offer educational programs for students, teachers, decision-makers, and community members. Reserves also provide long term weather, water quality, and biological monitoring as well as opportunities for scientists and graduate students to conduct research in a “living laboratory.”

The Narragansett Bay National Estuarine Research Reserve is located on four islands in the Narragansett Bay and encompasses 4,400 acres of land and water. Habitats within the Reserve include salt marsh, eelgrass beds, rocky intertidal zone, forest, and meadow. The Reserve’s Coastal Training Program serves decision-makers in the Narragansett Bay Watershed, which is comprised of 1,657 square miles in Massachusetts and Rhode Island.

Visit the Narragansett Bay National Estuarine Research Reserve website for more information: <http://www.nbnerr.org>

## Table of Contents

<b>Acknowledgements</b>	<b>2</b>
<b>Executive Summary</b>	<b>6</b>
<b>Introduction and Overview of NECAP</b>	<b>8</b>
<b>Situation Assessment</b>	<b>9</b>
<b>Workshops in Cranston</b>	<b>16</b>
<b>Key Findings</b>	<b>19</b>
Concerns about climate change	20
Confidence in local action	23
Perceived barriers to action	25
Suggested pathways forward	26
Enriched perspective	28
<b>Conclusion</b>	<b>30</b>
<b>Project Staff and Partners</b>	<b>32</b>



## Executive Summary

This report summarizes findings from the New England Climate Adaptation Project's (NECAP) work in Cranston, Rhode Island, from fall 2012 through spring 2014. The project aimed to increase public awareness about climate change risks and adaptation opportunities in Cranston and build support for local adaptation and risk management efforts. To this end, NECAP engaged a diverse set of city residents in a series of workshops between June and December 2013 to test whether role-play simulations could be effective as a public education tool for learning about climate change risks, adaptation, and collective risk management decision-making.

Prior to developing the simulation and running the workshops, project staff conducted a Risk Assessment to establish the range of climate change risks facing the city. They also interviewed key stakeholders in Cranston to determine current perceptions about these risks, adaptation options, and potential barriers to action. These findings were complemented by a public poll of 100 randomly selected Cranston residents to establish a baseline of local opinions about climate change risk and adaptation.

Key findings from the Summary Risk Assessment, Stakeholder Assessment, public poll, workshop before and after surveys, debriefing notes, and follow-up interviews fall into the following categories:

### **1. Concerns about Climate Change**

- The City of Cranston faces a number of climate risks, key among which are increased inland flooding due to more intense precipitation and coastal flooding due to sea level rise and storms surges. These and other risks threaten homes, businesses, and infrastructure in the city; they may also increase the vulnerability of elderly, young, and low-income populations.
- Overall, stakeholders in Cranston expressed concern about these risks. However, the perception of urgency varied widely.
- While concerns about climate change impacts were already high in Cranston, the workshop led to higher levels of concern. It also contributed to a more comprehensive understanding of the issue and resulted in an increased sense of local responsibility.

### **2. Confidence in Local Action**

- The majority of stakeholders in Cranston acknowledged that climate change will likely require concerted adaptation efforts.
- Public and private entities have begun to take adaptive measures to reduce Cranston's vulnerability to climate change impacts.
- The public poll and pre-workshop surveys show that there appears to be little confidence in the ability of Cranston's local government to effectively address climate change risks.
- The workshop increased participants' confidence in the local government's ability to address such risks.

### **3. Perceived Barriers to Action**

- Interviewed stakeholders and public poll respondents identified several challenges to taking action on climate change, including limitations in financial resources, poor intergovernmental coordination, and lack of confidence in the local government.
- Workshop participants identified slightly different barriers to adaptation action: Lack of funding, public support, agreement, and political will were cited as key concerns.

### **4. Suggested Pathways Forward**

- Stakeholders expressed a strong interest in improving public education and awareness about climate change risks.
- Workshop participants frequently identified public engagement and increased education efforts as critical to moving forward with climate adaptation planning. This indicates that collaborative problem-solving approaches may prove useful in Cranston.
- The workshops contributed to increased support for integrating climate change considerations into both short-term and long-term planning.

### **5. Enriched Perspective**

- The role-play simulations increased participants' empathy for other viewpoints and made it easier for them to have difficult conversations about climate change.

## Introduction and Overview of NECAP

The New England Climate Adaptation Project (NECAP) recognizes that climate change poses serious threats to coastal communities, including an increased risk of intensified storms and flooding, sea level rise, coastal erosion, and destruction of infrastructure and coastal properties. To help communities reduce their vulnerability to climate change, the project engaged four coastal New England communities in climate adaptation workshops: Cranston, Rhode Island; Barnstable, Massachusetts; Wells, Maine; and Dover, New Hampshire.

At the Cranston workshops, key stakeholders and community members were invited to participate in a role-play simulation premised on climate risks to a city very similar to Cranston. These games put residents into different roles representing various local constituencies and challenged them to come to a consensus about potential adaptation policy options for the city. The objective was to test this hands-on approach to public education about climate change adaptation and collective decision-making as a way of solving challenging public problems. The project sought to investigate current perceptions about barriers to and solutions for climate change risk management and to test whether widespread use of such role-play simulations could help move a city toward proactive adaptation planning.

NECAP is a collaborative research partnership between the MIT Science Impact Collaborative (MIT SIC), the National Estuarine Research Reserve System (NERRS), the four New England coastal communities, and the Consensus Building Institute (CBI). At the outset of the project, NERRS staff identified potential partner towns to serve as sites. The NERRS partner at the Narragansett Bay Reserve approached Cranston, which had faced devastating damage from flooding in March 2010. Planning staff from the City of Cranston decided the project would be valuable and committed to being partners in support of the research and workshops.

The project was officially launched in August 2012. During the first year, technical climate change experts at the University of New Hampshire produced downscaled climate change projections for the four New England coastal communities mentioned above. These projections provided the best possible scientific estimate of what the future climate will be in each of the partner towns. Projections were produced for temperature, precipitation, sea level rise, and a number of other key climate indicators, including extreme precipitation and extreme temperature events. NECAP staff worked with technical climate change experts and municipal partners to translate these climate projections into a Summary Risk Assessment for each site. Each Summary Risk Assessment broadly explains how projected climate

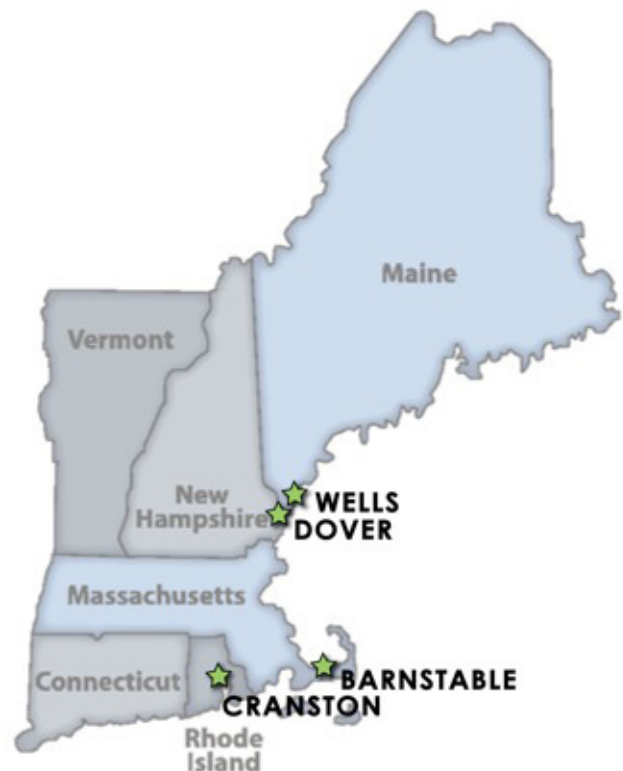


Image 1. New England Climate Adaptation Project towns; credit: NECAP staff



changes could affect the municipality, providing a broad-brush evaluation of key local risks and potential adaptation options.

NECAP project staff simultaneously conducted stakeholder assessments for each partner community. This involved interviewing 15 to 20 key stakeholders in each site to gather their views about climate change risks and adaptation options. Interviewees in Cranston included: local, regional, and state government officials; business owners; environmental organization representatives; science and engineering professionals; educators; and property owners. During the interview process, stakeholders were shown the climate change projections for their city or town and were asked to react to these forecasts. For each municipality, the findings of the stakeholder interviews were anonymized and then used to write a Stakeholder Assessment document. All interviewees reviewed these documents for accuracy and completeness. Each Stakeholder Assessment was then shared with project partners and other officials at each site to inform their planning and public engagement strategies going forward.

Based on the stakeholder and risk assessment findings for Cranston, MIT project staff developed a science-based multi-stakeholder role-play simulation for Cranston. Before running the NECAP role-play simulation workshops in Cranston, they commissioned an independent firm to randomly poll 100 Cranston residents via landline. This poll, conducted in May 2013, established baseline opinions about climate change risk and adaptation in the city.

Between June and December of 2013, the NECAP team ran seven workshops in the Cranston area, engaging 169 residents in the role-play simulation and follow-up debriefings. Participants were surveyed before each workshop began to establish their opinions on climate change risk and adaptation. They were then surveyed again after the workshop to gauge whether the experience had affected their perspective in any way. Approximately four to six weeks later, NECAP staff conducted in-depth follow-up interviews with a subset of participants. The aim of these interviews was to probe more deeply into the longer-term effects of the experience and to see if participating in the workshop had changed people's views about climate change risk and adaptation. A total of 38 follow-up interviews were conducted with Cranston workshop participants.

Key findings from the Stakeholder Assessment, the Summary Risk Assessment, and the initial public opinion poll in Cranston are discussed below in the Situation Assessment section. The Situation Assessment is followed by an overview of the methodology used to develop and run the climate change adaptation workshops in Cranston. The findings from these workshops are discussed in detail in the Key Findings section.

## Situation Assessment

The City of Cranston is located along Narragansett Bay and is part of the Providence Metropolitan Area. It is bordered by the Pawtuxet River to the south and is intersected by the Pocasset and Meshanicut Rivers. A range of riverine, forest, and marine ecosystems are found in the area, which is home to more than 80,000 year-round residents. A number of small and medium-sized businesses support the local economy, which consists primarily of retail, health care, social assistance, and professional, scientific, and technical services. According to the U.S. Census Bureau, the city has a total area of about 30 square miles.

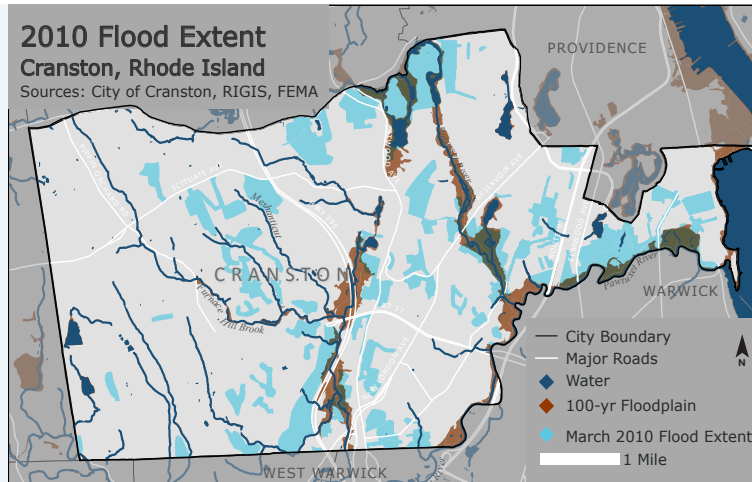


Figure 1. Cranston flood extent in March 2010

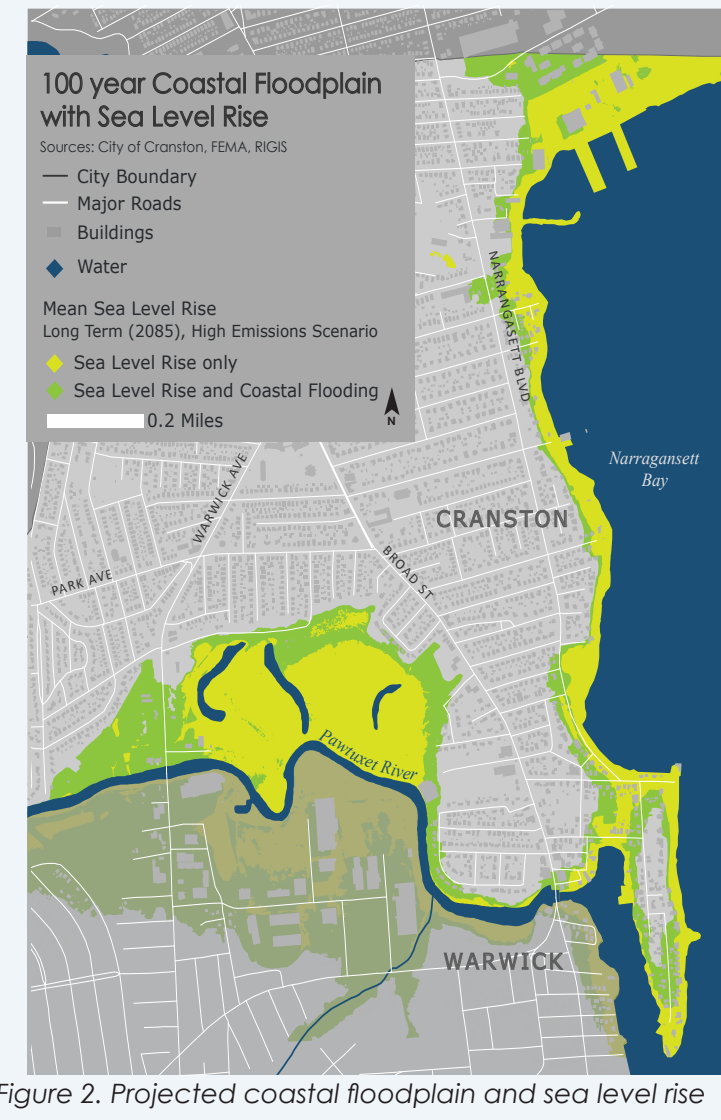


Figure 2. Projected coastal floodplain and sea level rise

The Cranston City Planning Department serves as staff to the City Planning Commission, which is empowered to draft and update the city's Comprehensive Plan and annual Capital Budget. In light of the severe flooding in recent years, the department has a vested interest in climate change adaptation and risk management. Its current adaptation programs include a small buyout program for flood-damaged properties funded by the Federal Emergency Management Agency, a study of building floodwalls on the Pocasset River, and efforts to develop a robust hazard mitigation plan focused on flooding. In participating in NECAP, the City Planning Department was particularly interested in increasing awareness around climate risks in the community.

### Key Findings from the Risk Assessment

The Summary Risk Assessment for Cranston was produced by NECAP staff using local climate change projections for Cranston generated by University of New Hampshire climate scientists. It highlights likely future climatic conditions based on climate change projections for Cranston. In addition, it outlines critical risks and vulnerabilities facing Cranston, as well as opportunities to enhance local resilience. The Summary Risk Assessments for all NECAP partner towns are available in full at [necap.mit.edu](http://necap.mit.edu).

The assessment suggests that one of the key climate-related risks facing Cranston is increased riverine flooding due to more frequent and intense precipitation. In particular, the inland flooding risk is expected to be concentrated along the Pawtuxet, Pocasset, and Meshanticut Rivers. This projection is particularly worrisome in light of the March 2010 floods, which had devastating impacts on the city's homes and businesses (Figure 1).

While sea level rise does not directly influence flood risks in Cranston, the city has a narrow shoreline along Narragansett Bay. The intersection of both a rise in sea level and a flood event caused by extreme precipitation poses a significant risk to development in coastal areas (Figure 2). Cranston already sees more flooding when there is a rain event during high tide, as there is less capacity in the channel due to the tide filling that volume. As the extent of inundation associated with sea level rise increases, the frequency of flooding associated with precipitation events will increase as well. Many homes in the Pawtuxet Neck neighborhood are likely to be exposed to flooding.

The coupling of sea level rise and hurricanes poses an additional threat. At present, the Pawtuxet River is tidally influenced during a Category 3 hurricane all the way up to the Pontiac Mills Dam. However, with 5 feet of sea level rise, the river could become tidally influenced during a Category 1 hurricane or even an astronomical high tide event, which occur approximately twice a year.

These multiple sources of flood risk in Cranston create a number of vulnerabilities. First, sea level rise would expand the current flood hazard area, affecting many more properties. Second, smaller neighborhood streets would be at risk of inundation and damage along the Pawtuxet and Pocasset rivers. In particular, the Pawtuxet Neck neighborhood could lose transportation access if Sheldon Street or Ocean Avenue were damaged or inundated. Third, critical wastewater infrastructure located in low-elevation areas along the rivers is vulnerable to flood damage. Finally, flooding may have differential impacts within the community. Lower-income households and those with limited savings can be especially hard hit by the disruption of employment and the expenses associated with recovering from floods.

Heat waves are also expected to increase substantially in frequency and severity over the upcoming decades. Extremely high temperatures can damage electricity infrastructure, such as wires and transformers, and cause reliability issues when demand outstrips supply. The very young, very old, and ill are most vulnerable to the health impacts of heat exposure. People who live in substandard housing without good ventilation and those who are unable to afford air conditioning are also susceptible to excessive heat exposure.

Cranston, along with much of New England, may experience a significant increase in drought in the long term. People who rely on groundwater wells in western Cranston may be particularly vulnerable if a drought causes groundwater levels to fall. Drought can also cause crop failures and put a strain on the agricultural activities in western Cranston.

Finally, riverine, marine, and forest ecosystems in Cranston and greater Narragansett Bay are vulnerable to climate change. Warmer temperatures could affect the wildlife in the streams and wooded areas of Cranston, endangering native fish species, for example. Increased ticks and mosquitoes due to warmer and wetter conditions could affect the health of humans and woodland mammals. Beaches may shrink and salt marshes may be inundated due to sea level rise.

Through proactive planning and coordination, the city could potentially reduce its vulnerability and increase its resilience to these risks. Possible adaptation options include a range of structural and non-structural measures, including retreat, insurance, expanded wetlands, engineered approaches, retrofits, efficiency measures, and urban heat island reduction.

## Key Findings from the Stakeholder Assessment

Interviews conducted with 19 Cranston residents representing a variety of stakeholder groups revealed concerns about threats similar to those identified in the Risk Assessment. Stakeholders exhibited wide-ranging levels of concern regarding climate change risks. Interviewees working in the public sector generally conveyed a higher level of concern about climate change impacts than those working in the private sector. The perception of climate impacts as a distant threat appears to have reduced the level of concern for those in the latter group. However, the majority of interviewees acknowledged that climate change may require concerted adaptation efforts. Some were optimistic that people would find ways to adapt with little or no government intervention, while others thought the local government had a key role to play. Several stakeholders mentioned the need for enhanced public education about climate change risk. Some expressed skepticism that public education could be effective, citing the limitations in financial resources needed to make large-scale investments in infrastructure.



Image 2. Cranston flooding; credit: City of Cranston

Many stakeholders were especially concerned about the increased risk of river and coastal flooding due to climate change. River flooding has long been an issue in Cranston. The March 2010 floods in particular caused major damage to homes, businesses, and infrastructure. Stakeholders pointed to areas that have borne repeated damages over the years, including Perkins Avenue, Riverview Terrace, Fletcher Avenue, and Elmwood Avenue. They were also concerned about the potential combination of coastal storms and sea level rise, which could cause both coastal flooding and river flooding. Consequently, most stakeholders said they would like to see proactive

risk management. This is especially true of stakeholders who had been affected by recent flood events or who work in environmental professions.

Interviewees were also concerned about increased variability in precipitation, which could cause disruptive fluctuations between flooding and drought situations. Overall, interviewees expressed less concern about extreme heat, even though climate change projections show up to 10 times more extreme heat days (i.e., days when the temperature reaches over 90 degrees Fahrenheit) per year by the end of the century. Likewise, risks to human health were not a widespread concern among stakeholders, possibly because they have not materialized in Cranston, unlike flood risks.

In addition to listing concerns, many interviewees were able to identify and discuss local activities under way to reduce Cranston's vulnerability to climate change impacts. The City of Cranston is currently updating its Hazard Mitigation Plan, purchasing flood-damaged homes, reducing the vulnerability of its wastewater infrastructure, and partnering with the Natural Resources Conservation Service to study the potential for floodwalls. Policy changes at the state level require



enhanced stormwater management for new development, as well as planning for sea level rise. Other efforts include research on sea level rise impacts and the development of continuity plans for transportation infrastructure. Federal and nonprofit organizations have focused their efforts on floodplain restoration, and the private sector has been making adaptation-related investments.

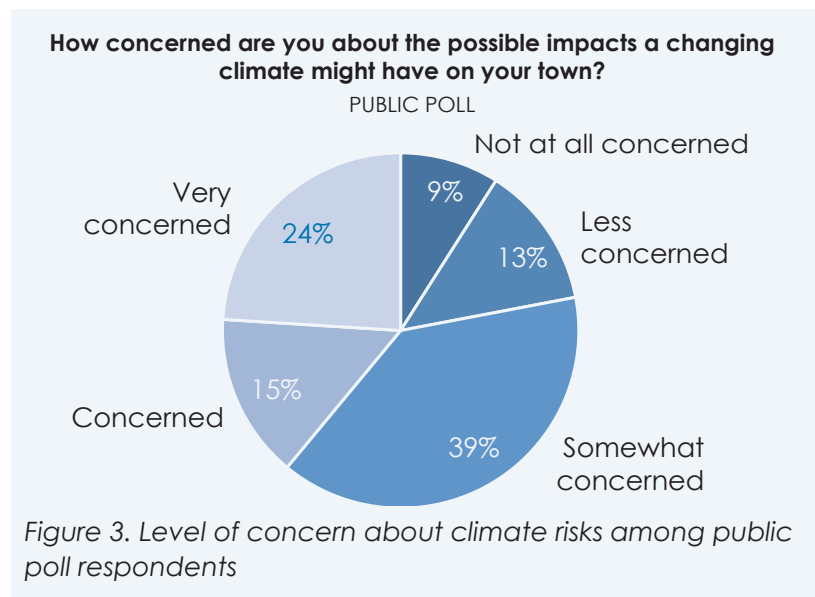
To manage climate risks, several interviewees said they would like to see an increased emphasis on public education and awareness about the issue. They also expressed an interest in improved information on climate risks specific to Rhode Island. While some interviewees thought of adaptation as a disaster response and recovery activity, others working in environmental fields pointed to the need for both structural and non-structural adaptation measures.

Stakeholder interviews revealed a number of challenges to pursuing adaptation action at the local level. Chief among stakeholder concerns was a lack of financial resources and the difficulty of gaining broad public support for managing long-term risks. Stakeholders were also concerned about regulatory barriers. They indicated that working with the necessary constellation of state and federal agencies that have jurisdiction over different areas of environmental risk management may be time-consuming and costly. To address this issue, several stakeholders interviewed pointed to the need for improved coordination between the relevant local, state, and federal agencies. Two stakeholders furthermore suggested that open decision-making processes on climate change adaptation and risk management would be ideal.

### Key Findings from the Public Poll

The independent public poll of 100 Cranston residents conducted prior to the start of the NECAP workshops provides a broader baseline measure for understanding local perceptions about climate change risks, barriers, and solutions.<sup>1</sup>

When asked how often they think about whether a change in the climate could affect their community, 36 percent of poll respondents said, “often.” Another 30 percent said, “every once in a while.” When asked how concerned they were about the possible impacts of climate change on their town, about 78 percent of Cranston poll respondents answered “somewhat” to “very concerned” (Figure 3). More severe storms, ecosystem impacts, and flood risks were the most cited climate-related concerns. When asked about the “riskiness” of climate change, 44 percent indicated the risk was “high” to “very high,” and 40 percent said “moder-

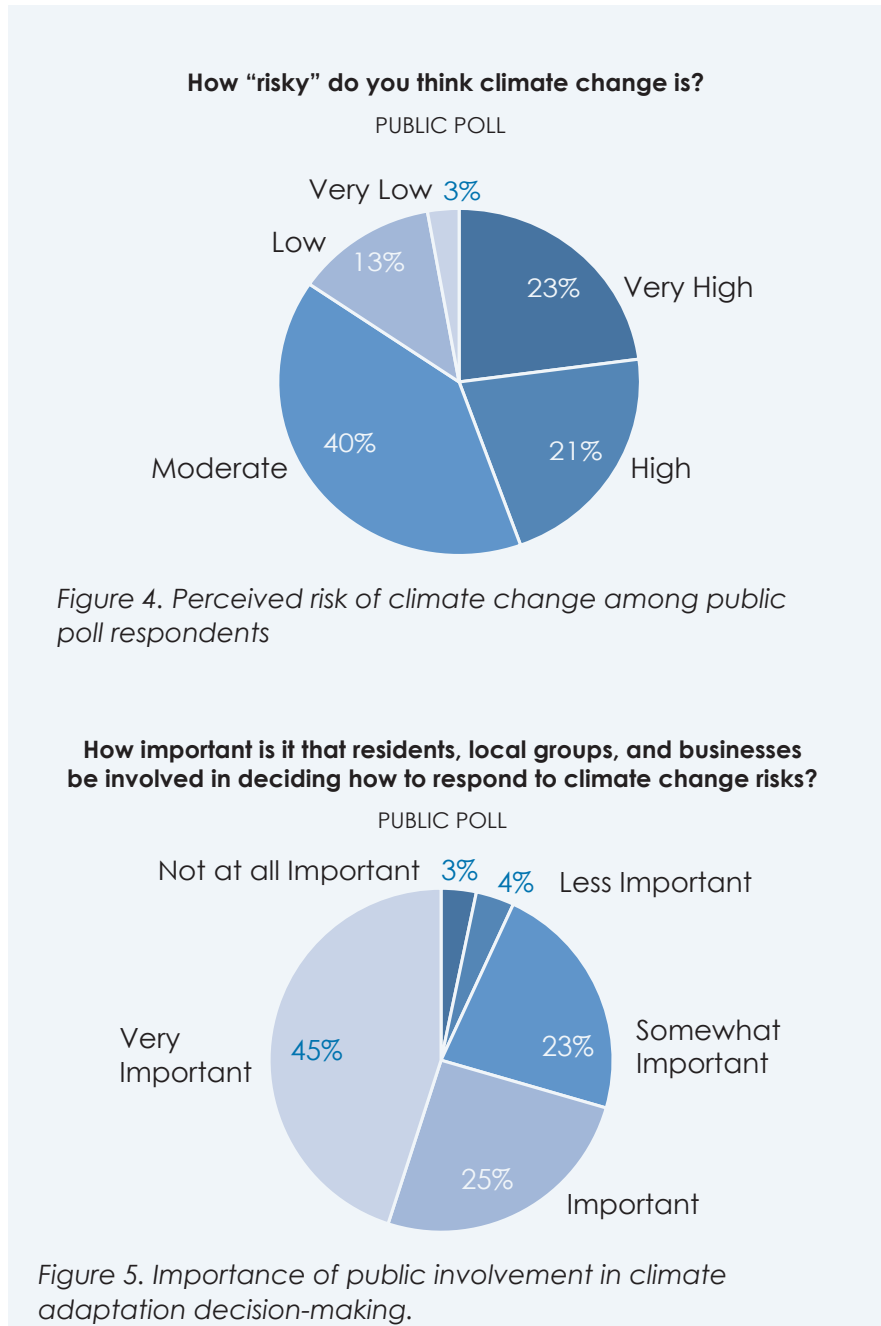


<sup>1</sup> A sample size of 100 people is commonly used for broad-brush public opinion polls and provides for a 10% margin of error, regardless of the population size.

ate.” Only 15 percent said “low” to “very low” (Figure 4). Similarly, 46 percent of respondents said that preparing for climate change should be “significant” or “very significant” in the city’s planning and decision-making over the next 10 years. Taken together, these findings from the public poll suggest that there is a relatively high level of public awareness and concern about climate change risks in Cranston. This contrasts with findings from the Stakeholder Assessment, in which interviewees stated that gaining broad public support on the issue could be a major barrier to action in the city.

When asked who should be responsible for preparing for climate change, the most common first-stated response in the public poll was the national government (34 percent), followed by individuals (17 percent), and the state government (15 percent). Only 12 percent gave “city or town government” as their first response. This suggests a tendency to see climate adaptation as a national or state issue, or as an individual concern, rather than an issue requiring action from local governments. Conversely, the stakeholders interviewed suggested that an array of government agencies, from local to state to federal, and nongovernment entities have important roles to play in adaptation efforts. This may be attributed to the stakeholders’ relatively higher familiarity with public decision-making processes.

However, it appears that the Cranston poll respondents think community involvement in adaptation decision-making is important. In response to the question “How important is it that residents, local groups, and businesses be involved in deciding how to respond to climate change risks?” 93 percent of residents indicated “somewhat important” to “very important” (Figure 5). This high response rate shows an interest in public participation in local decision-making on climate change planning and policy in Cranston. This corresponds with findings in the Stakeholder





Assessment: Interviewees said that businesses and neighborhoods—especially those located in the most vulnerable areas—should be involved in adaptation efforts.

A slight majority of polled residents expressed support for future-oriented decision-making, with 55 percent of poll respondents agreeing that city leadership should take scientific projections about what the climate may be like in 50 years into account when making decisions today (Figure 6). About 20 percent of polled residents did not agree with this statement, and the remaining 25 percent were ambivalent. The reason for this distribution of responses is unclear from the poll data, but may be related to concerns about the lack of local capacity for handling climate-related issues.

Importantly, the poll identified low levels of public confidence in the city government’s ability to respond to climate change risks (Figure 7). Only 15 percent of those polled expressed confidence that Cranston could effectively respond to these risks. Moreover, while 46 percent of residents felt that addressing climate risks should be a “significant” or “very significant” priority in the city’s planning and decision-making over the next 10 years, only 13 percent thought it actually would be. This gap between desired and expected local government action is not quite as striking in the Stakeholder Assessment, in which interviewees were able to identify adaptation efforts under way in Cranston. The public’s lagging confidence in the local government may stem from a lack of information about planning and decision-making, as well as from concerns about financial constraints.

**When making decisions today, decision-makers in my town should take into account scientific projections about what the climate might be like in 50 years.**

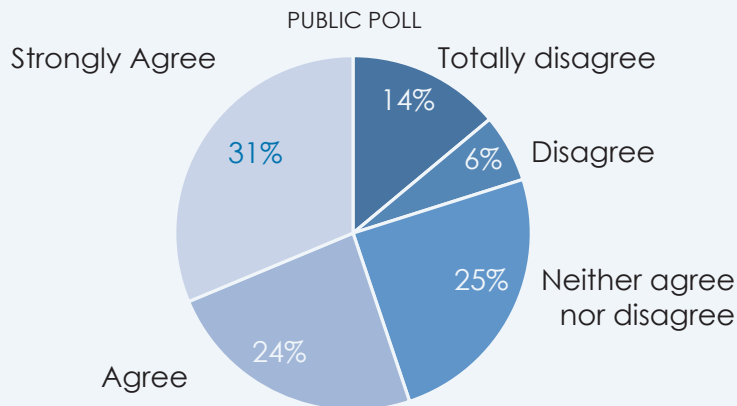


Figure 6. Poll respondents’ agreement with using scientific projections in local decision-making.

**How significant do you think addressing climate change risk *should be/will be* in your town’s planning and decision making over the next ten years?**

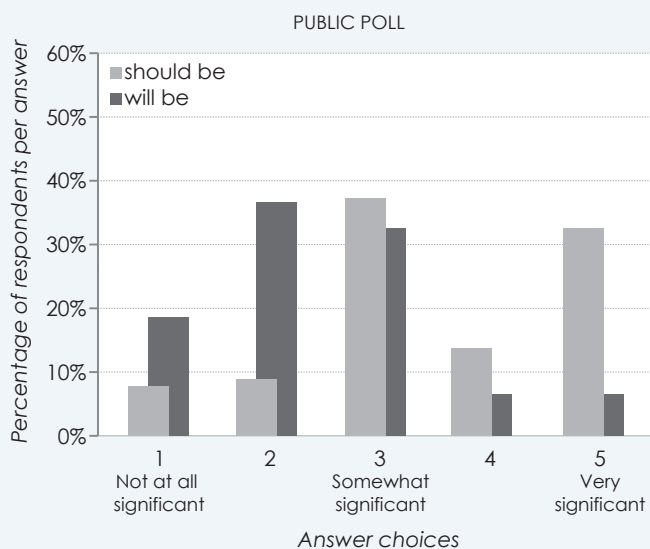


Figure 7. Confidence gap in climate change planning from responses to two questions in the public poll.

## Workshops in Cranston

Based on the findings from the Stakeholder Assessment and Summary Risk Assessment, NECAP project staff developed a tailored role-play simulation for the City of Cranston. This section describes the climate adaptation workshop structure and delivery in Cranston.

### Data Collection

Between June and December 2013, NECAP project staff hosted seven workshops in Cranston and in the neighboring communities of Providence and Warwick. They engaged a total of 169 participants representing a number of stakeholder groups: residents, students, engineering professionals, environmental advocates, local government officials, and state government agency personnel. To recruit these participants, project staff employed a number of techniques to reach out to individuals and groups in the community. They relied heavily on the personal and professional networks of project partners at the City of Cranston Planning Department and the Narragansett Bay National Estuarine Research Reserve. Project staff also attended meetings, posted fliers, and directly contacted community groups, environmental groups, faith-based organizations, and community colleges in the area. They placed advertisements in the local newspaper, the Cranston Herald, as well as through the social networking site Facebook.

#### What should Milton do?

While the nature of the consensus reached at each table playing the Milton game was different, there were a number of common elements. Flood-proofing infrastructure and buildings was almost always identified as a crucial, near-term action. Likewise, the adoption of low-impact development regulations was a component of every agreement. A voluntary buy-back program was conditionally included in several agreements, with stipulations to target the most vulnerable populations. Purchase of development rights appeared less frequently in the agreements, often accompanied by the understanding that such a program would be funded through private funds or federal grants. "Do nothing" was not a component of any agreement.

The workshops took place in the evening, and each lasted approximately two and a half hours. They began with an introduction to the project and the Cranston simulation. Participants were then given 30 minutes to read their game materials. The role-play portion of the workshop ran for one hour, and the final 30 minutes were devoted to an all-group debriefing, during which participants discussed their experiences during the role-play and how they might apply the lessons learned in their own community.

The role-play simulation was set in the fictitious City of Milton, a community very similar to Cranston. It focused on the heightened flood risks expected from increased precipitation and storm surges and from upstream development leading to more stormwater runoff due to the increase in impermeable surfaces. Based on the findings of the Summary Risk Assessment and Stakeholder Assessment, the scenario reflects the main climate threats facing Cranston as well as the political dynamics of Cranston. Project staff intentionally fictionalized the scenario to provide a safe space for participant discussion. During the hour-long role-play simulation, the participants assumed different roles in the city and were tasked with coming to an agreement. Agreement was defined as coming up with a set of ideas to include in Milton's new Comprehensive Plan

that at least five of the six participants could support.

The facilitated negotiation exercise models a facilitated approach to collaborative risk management and illustrates the value of engaging stakeholders in collaborative decision-making. Specifically, it asks participants to imagine how the City of Milton might respond to an increased threat of flooding given limited resources; diverse and conflicting stakeholder interests; and high levels of scientific uncertainty. Participants are asked to consider the impact of everyday land-use decisions and infrastructure investments on their community's economic well-being and ecological stability in the face of climate change risks.

At each workshop, project staff administered surveys before and after the event (referred to as the “before surveys” and the “after surveys,” respectively) to track changes in individual awareness and attitudes toward climate change risks and possible adaptation strategies. They also kept notes from the debriefings to capture people's initial impressions about the workshop and climate change. Four to six weeks after each workshop, project staff conducted in-depth interviews with one-quarter of the total simulation participants (38 people). These interviews were designed to gauge whether the workshops had led to any longer-term changes in participants' understanding of climate change risks, perceptions of the importance of adaptation, beliefs about how their community should plan and prepare for climate change, or willingness to support and/or get involved in adaptation activities as a result of their involvement in the simulation.

### Data Analysis

After the last workshop in December 2013, the MIT research team began analyzing the data that had been collected. All of the surveys were coded for anonymity and entered into a database, making it possible to see participant responses in aggregate and to test for statistically significant shifts between the before and after surveys. Graduate student staff also compared workshop survey data to public polling data to look for any major similarities or differences. They transcribed and coded qualitative interviews, looking for key themes and takeaways. Debriefing notes were similarly organized and analyzed. Data were analyzed for key themes regarding (1) local perspectives about climate change and adaptation and (2) changes in participant perspectives resulting from participation in the NECAP workshops.

### Workshop Participants

Of the attendees at the seven Cranston-area workshops, participants were split nearly evenly between male and female. Older residents, defined as 50 years of age and up, comprised just over half of the workshop participants. Forty-five percent of participants identified politically as liberal, 14 percent as conservative, and 36 percent as independent. More than half of the participants had lived in Crans-



Image 3. Cranston workshop; credit: NECAP staff

	PUBLIC POLL		WORKSHOP SURVEYS	
AGE	COUNT	PERCENTAGE	COUNT	PERCENTAGE
29 & Under	8	7.3%	40	26.8%
30-39	23	20.5%	35	23.5%
40-49	27	24.3%	18	12.1%
50-59	24	20.9%	37	24.8%
60+	30	26.9%	19	12.8%
<b>LENGTH OF RESIDENCE</b>				
Less than 1 year	0	0%	9	6.1%
1-3 years	4	3.3%	12	8.1%
3-10 years	20	17.9%	22	14.9%
10-20 years	33	29.4%	30	20.3%
20+ years	56	49.3%	53	35.8%
<b>TYPE OF RESIDENCE</b>				
Year-round	112	99.2%	118	73.3%
Summer	0	0%	2	1.2%
Autumn	0	0%	4	2.5%
Winter	0	0%	4	2.5%
Spring	0	0%	4	2.5%
Holidays only	0	0%	1	0.6%
I am here sporadically	1	.88%	5	3.1%
Other	0	0%	23	14.3%
<b>POLITICS</b>				
Conservative	21	18.8%	20	13.7%
Liberal	25	22.5%	59	40.4%
Independent	54	47.9%	57	39.0%
Other	12	10.8%	10	6.8%
<b>ENVIRONMENTAL GROUP MEMBERSHIP</b>				
No	49	43.4%	94	63.5%
National group	26	22.9%	22	18.2%
Local group	36	31.4%	12	13.5%
Yes, other	3	2.3%	9	4.7%
<b>EDUCATION</b>				
High school graduate (or equivalent)	49	43.4%	30	20.3%
Bachelor's degree (BA, BS, AB, etc)	26	22.9%	48	32.4%
Graduate degree (JD, MA, MSc, PhD)	36	31.4%	62	41.9%
Other	3	2.3%	8	5%

Figure 8. Comparison of public poll and workshop participant demographics

ton for 10 years or more. Year-round residents made up 71 percent of the workshop attendees. Nearly 74 percent of participants had a bachelor's and/or graduate degree, indicating a highly educated workshop population. Thirty-six percent of workshop participants reported belonging to a local or national-level environmental organization.

The Cranston workshop population looks different than the citywide poll of city residents conducted prior to the NECAP intervention (Figure 8). The poll respondents were split somewhat evenly between male (44 percent) and female (56 percent). Almost all of the respondents (99 percent) reported that they were year-round residents in their community. Seventy-nine percent of respondents had lived in the community for 10 years or more, and 38 percent were 50 years of age or older. Fifty percent of respondents identified as political independents, while 23 percent identified as liberal and 10 percent as conservative. Sixty-seven percent of poll participants were not affiliated with a local or national environmental organization. In terms of educational attainment, 43 percent were high school graduates or the equivalent, 23 percent had bachelor's degrees, and 31 percent had a graduate-level degree.

The workshop population trended toward those who were more concerned about climate change than the general population (48 percent versus 39 percent). Similarly, it included a higher number of professionals working in environmental and climate change-related fields. Given that participation in the workshops was a voluntary commitment, project staff expected that people with greater initial concern about climate change would be more likely to attend. Even so, the workshop population was surprisingly similar to the poll respondents in terms of membership in environmental nonprofit groups, as seen in Figure 8. More workshop participants identified politically as liberal than the poll respondents, and fewer identified as conservative or independent. The workshop participants also had higher educational and income levels than the poll respondents, and fewer workshop participants were year-round or long-term residents than those surveyed in the citywide poll.

The purpose of the intervention, however, was not simply to educate people about climate change risks, but also to model a way in which decisions about local adaptation planning could be made collaboratively, even though people have very different values and interests. While the workshop population differed somewhat from the city at large in terms of attitudes about climate change risks and adaptation, this does not interfere with the objectives of the project. Indeed, the people who attended the workshops are probably more likely than Cranston residents in general to get involved in trying to influence local political decisions; thus, project staff hypothesize that engaging this more politically active and concerned crowd—rather than a “representative sample” of Cranston residents—is likely to achieve greater effects on adaptation action.

## Key Findings

The analysis of the Cranston workshop data was guided by two overarching research questions. The first was, “What are the major impacts or effects of the role-play workshop on participants?” This question sought to identify in what ways people changed their thinking as a result of participating in the workshops. The second was, “What did we learn about the attitudes of Cranston residents regarding the management of climate change risks and the possibilities of climate



adaptation?” This question sought to provide a snapshot of the level of public “readiness” and “willingness” to engage in adaptation planning.

Major findings from the Cranston workshop fall into five categories: concerns about climate change; confidence in local action; perceived barriers to action; suggested pathways forward; and the importance of enriched perspective. These are detailed in the sections that follow.

## **Concerns about Climate Change**

**Concern about local climate change impacts was surprisingly high in Cranston prior to the workshop intervention.** In contrast to what those interviewed for the Stakeholder Assessment seem to believe, the public opinion poll data suggest that concern about local climate change was relatively high in Cranston prior to the intervention. Seventy-eight percent of the public poll respondents were moderately to very concerned about the possible impacts of a changing climate on their city. Similarly, 86 percent of workshop participants said they were moderately to very concerned before engaging in the role-play simulation. Moreover, many poll respondents said they consider climate change to be high or very high risk (45 percent), as did a majority of workshop participants prior to the workshop (61 percent). Furthermore, many public poll respondents (46 percent) and the workshop participants (75 percent) said they thought climate risks should be “significant” or “very significant” in their city’s planning and decision-making. This underscores that, despite varying perceptions of urgency, concern about climate change risks is relatively high in Cranston. This was particularly true among those who attended the workshops, likely due to self-selection bias, which had been anticipated.

The high level of public concern about climate change impacts seen in the workshop surveys may be associated with the recurrent flooding in the Cranston area in recent years. The March 2010 floods, in particular, were mentioned in several debriefing sessions and follow-up interviews. The event wrought devastating physical damages to homes, businesses, and infrastructure, along with major economic losses; the flooding appears to have sharpened residents’ awareness of Cranston’s vulnerability to climate-related risks. Follow-up interviewees—many of whom were personally or professionally involved in climate and environmental issues—also suggested that this awareness has been increasing. One of the interviewees, a professor at Rhode Island College and a longtime resident explained, “The general public has a heightened awareness of extreme weather patterns and greater fluctuations, and therefore they’re more interested in the broad issue of climate. You hear the term ‘climate’ talked about in general conversation. This wasn’t the case a couple of years ago.” In part, this trend may be attributed to higher levels of concern and local media coverage of the issue.

**The workshop contributed to significant increases in both concern and urgency regarding climate change risks.** While concern about local climate change risks was relatively high at the outset, the workshops appear to have increased the level of participants’ concern. Among workshop participants, there was a striking, statistically significant shift in the number of people reporting high levels of concern (“concerned” or “very concerned”) about climate change impacts to their city, from 48 percent before the workshop to 74 percent after the workshop. Similarly, there was a statistically significant shift in the number of workshop participants who said they thought their city should do something to address climate change risk in the next 10 years, shifting from 75 percent before the workshop to 83 percent afterward.

Follow-up interviews provided insight into the reasons for and meaning of this shift. Most inter-



viewees mentioned that they had only thought about climate change in broad, abstract terms before the workshop. The role-play simulation appears to have helped participants to understand the implications at the local level. For example, one interviewee involved in the state's wetland permitting program said he had thought about climate impacts at the scale of ecosystems, watersheds, and infrastructure networks, but not in terms of its effects on Cranston. Another interviewee, a doctoral student in environmental sociology, said she had previously thought about climate change risks "more broadly, on a more global scale." She said the workshop made her "more aware of the different options that people are considering to mitigate the risks locally."

It is worth noting that interviewees working in climate-related or environmental fields felt that the workshop generally *affirmed* but did not necessarily *change* their concerns. Even so, the workshop was effective in highlighting the political, financial, and emotional dimensions of the challenge for some of these professionals, whose focus had mainly been on environmental impacts. One lawyer said, "It made me feel more strongly that planning for climate change needs to be a coordinated effort."

Several people interviewed reported not only an increase in concern about climate change risks, but also a heightened sense of urgency about the need for adaptation. This may be related to the presence of a public leader or official at each of the workshops, which appeared to underscore the time and attention being dedicated to the issue by the City of Cranston. In a follow-up interview, a member of the Pawtuxet River Authority admitted he was much more concerned about climate risks after the workshop, in part because he was "a little surprised as to how important, how concerned the city was—to go this far, to have this event." Similarly, another interviewee said, "As research-based as the workshop was, it was meant to say, 'Get ready. Your bosses may have to be making these types of decisions soon.' So I would say that seeing the climate issue in the context of professors from MIT and the Cranston government, for crying out loud, and hosting everyone like that—there's obviously something behind it."

**Workshops helped participants develop a more comprehensive understanding of climate change, its effects on communities, and what adaptation will entail.** One-third of follow-up interviewees mentioned that the workshop had given them a better and broader understanding of climate change and associated issues. A member of Save the Bay and Grow Smart Rhode Island reflected, "It's a much more complex issue than I had really even thought. Everyone is touched by it, but everyone is not looking at all of the issues." Several people noted that the workshop highlighted the ways in which multiple stakeholder views and interests intersect on the climate change issue. A recent graduate shared, "It was very helpful to see how people's understanding of climate change and development varied." Others mentioned that the workshop enhanced their understanding of the barriers to adaptation as well as possible solutions. One local official and coastal property owner said, "It helped me prioritize and see the whole picture of what the city is grappling with." Similarly, an employee for the Rhode Island Department of Environmental Management (DEM) remarked, "You hear about river flooding and people needing to be relocated. That was a big news issue during March 2010. I guess I just didn't see the big picture from the planning perspective before." This theme came up several times in the debriefing sessions, with participants sharing that they had previously not realized "just how complicated decisions are" or the "interconnectedness of the issue—how one stakeholder's interests

affects the others.”

This comprehensive understanding of climate change and adaptation may have contributed to the above-discussed statistically significant increases in workshop participants' concern about possible climate change impacts to their city and the associated support for incorporating climate change risk into everyday local planning and decision-making over the next 10 years.

**The workshop contributed to a greater focus on local responsibility for taking action.** In the public poll, when asked who should be responsible for preparing for possible climate impacts, 34 percent of respondents said the national government and 15 percent said the state government as their first response. Only 12 percent said the local government. This suggests many Cranston residents do not believe the local government has the primary responsibility in preparing for climate change risks.

The workshop sample expressed a somewhat different opinion about who should take responsibility.<sup>2</sup> Before the workshop, when asked to select up to three options, participants most commonly identified the city and the state governments as responsible for taking action (26 percent for each), followed by the national governments (19 percent). This difference between the workshops and the public poll might stem from the higher proportion of workshop participants who worked in climate-related fields or public administration relative to the proportion in the general public. However, the number of people who considered the local government responsible for adaptation was still low.

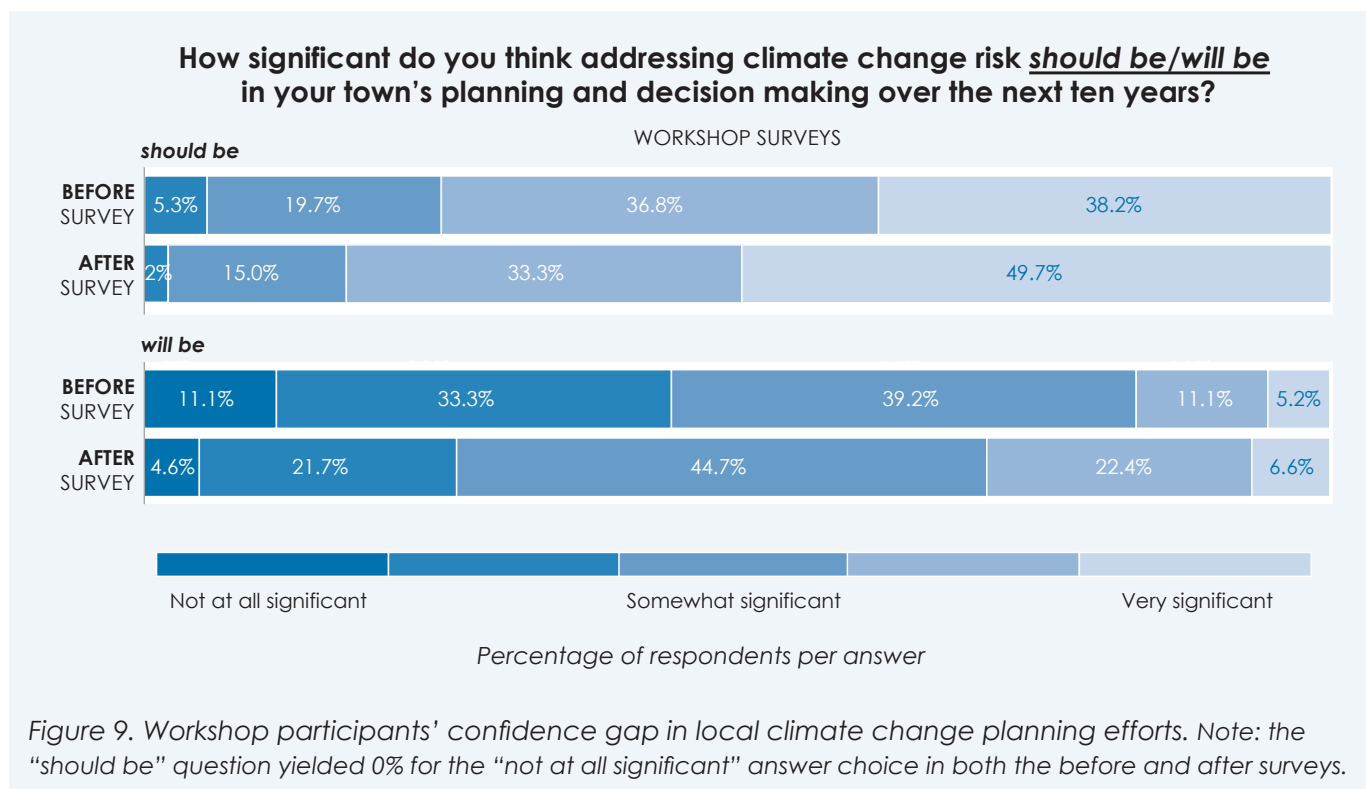
After the workshop, there was a statistically significant shift toward identifying local-level entities—including neighborhoods and businesses—as responsible for preparing for the possible impacts of a changing climate. City government was the response given most frequently (30 percent) followed by the state (22 percent) and national government (12 percent). More people also named neighborhoods and businesses as responsible parties (from 12 percent to 20 percent). Overall, these shifts suggest that participation in the workshops increased people's sense of local responsibility for preparing for climate change risks. The role-play simulation appears to have effectively made climate change salient by emphasizing local climate change risks and possible interventions at the city level.

The in-depth interviews support this finding. Nearly all the workshop participants who were interviewed listed various city departments as parties that should be involved in preparing for climate change. Approximately one-fifth of interviewees, moreover, said that city governments should play a key role in addressing climate impacts—in large part because they understand local needs and challenges the best. An employee for the DEM articulated this sentiment as follows: “It seems that cities and towns should be taking a lead on these things [climate change adaptation planning and implementation]. They understand the needs of their communities and are responding to complaints on a daily basis.”

Several interviewees said it was important to focus attention on the local level because that is where adaptation action can actually take place. One interviewee said, “The focus needs to be on city operations.” He offered specific examples of integrating low-impact development measures into new construction and updating building codes. In a number of debriefing sessions, participants emphasized the importance of local action. For example, one partici-

---

<sup>2</sup> Due to differences in survey design, the NECAP project staff was unable to directly compare the public poll responses to the workshop survey responses. The public poll reports only which option respondents stated first, even when people listed two or three options. The workshop surveys, on the other hand, allowed participants to select up to three options, all of which were recorded.



pant said, "Local communities have to confront climate change in a real way," while another stressed the importance of considering various sub-groups in the city in climate adaptation planning.

## Confidence in Local Action

**Confidence in the local government to address climate change risks appears to be low in Cranston.** The public poll demonstrated some skepticism among Cranston residents regarding the local government's ability or willingness to make climate change adaptation a priority. Only 17 percent of poll respondents said that they were "confident" or "very confident" that the City of Cranston would be able to respond effectively to climate risks. Among workshop participants, confidence in the local government was even lower: 9 percent said that they were "confident" or "very confident" before the workshop, compared to 45 percent who said they were "not confident" or "not at all confident."

The reservations about the local government's capacity seem related to a "confidence gap" that the data revealed (Figure 9). In both the public poll and workshop surveys, a majority of people indicated that they would like their local government to plan for climate change risks but were not confident that it actually would do so. While 46 percent of public poll respondents said they thought addressing climate change risks should be significant in the city's planning processes over the next decade, only 13 percent thought it actually would be significant. The gap between concern and confidence is even more striking among workshop participants: While 75 percent surveyed before the workshops thought that addressing climate change risks should be a significant priority in Cranston, only 16 percent were confident that it actually would be.

This finding may be linked to dissatisfaction with the local government's strategies for addressing flood risks in recent years. One follow-up interviewee remarked that Cranston's current efforts "mostly put Band-Aids on things." A local realtor explained, "If flash flooding and stronger storms are really going to be more common, we should incentivize developers to build stronger or more resilient systems. ... This would be a massive change of concept, involving bureaucracies, planners, etc. But I don't see the City of Cranston being that interested in incentivizing these types of projects."



Image 4. Cranston workshop; credit: NECAP staff

Several interviewees noted that the City of Cranston is risk-averse and tends to favor the status quo. They indicated this attitude is problematic given the need for a more transformative approach to climate change adaptation. As one Rhode Island Department of Health employee said, "There's an older group of folks that kind of run the town, and I don't see a lot of real progressive interest in trying to do things differently." A couple of other interviewees voiced similar opinions, suggesting that Cranston's approach to flood risk management is "old-fashioned." A member of the West Bay Land Trust in Cranston provided a telling example: "After the 2010 flooding, they approved a Stop & Shop right alongside the river, in the floodplain. They paved it over and put this massive building out there. The Shaw's right across the street had flooded out. It made no sense whatsoever. ... That's the kind of thinking that goes on in Cranston. It's frustrating."

Finally, the low levels of confidence in local government may relate to concerns about capacity. Several follow-up interviewees mentioned the manifold pressures facing the City Planning Department from different community groups. In a couple of the debriefing sessions, workshop participants noted more broadly that local governments face major constraints in technical and financial capacity, as well as limitations in leadership and information. These constraints make it difficult for Cranston and other cities and towns to effectively undertake climate adaptation planning.

**The workshop increased participants' confidence in the local government's ability to take action.** The role-play simulation increased both belief that the city should act and confidence that the city will act to address climate change risks. The number of participants who thought that climate action should be a significant priority increased slightly after the workshop, from 75 percent to 83 percent. Furthermore, the number of participants who were confident that it actually would be a significant priority in their city increased dramatically after the workshop, from 16 percent to 29 percent. Both of these increases were statistically significant.

These increases in confidence may be attributed to the workshop's focus on the possible range of action that could be taken at the local level. In a couple of debriefing sessions, workshop



participants discussed how the role-play simulation had highlighted the “menu of options” available to local governments in addressing climate change risks. This theme came up in the follow-up interviews as well: Several interviewees noted that the workshop focused attention on what actions could be taken at the local level. One interviewee said, “I walked away from it a little more hopeful that planners were maybe using a range of different techniques, and that maybe more people than I was aware of were taking it seriously from more than an engineering perspective. ... It sounds like they really are considering things from all angles.” Several other participants indicated a similar increase in optimism that efforts were already being made or could be made locally. To some interviewees, the city’s involvement in the NECAP signaled that it considered the climate change issue “immediate and important.” One interviewee even said he was “impressed with the concern the city has to pursue this project.”

## **Perceived Barriers to Action**

**Perceived challenges to climate action in Cranston relate to lack of funding, public support, agreement, and political will.** The workshops provided a snapshot of the barriers and challenges Cranston faces in responding to climate change risk. One after survey question asked, “If the climate is changing, what is most likely to prevent your community from taking action?” According to the results, lack of financial resources, public support, agreement, and confidence in effective local action are perceived as the major challenges to climate action.

Participants were primarily concerned about the financial resources that might be required for addressing climate change risks. In one follow-up interview, a participant working for the City of Providence said that the role-play simulations “put a magnifying glass on the costs associated with things, you know, that this town would need to do to protect itself.” A couple of other interviewees noted that local governments are already “hamstrung” in terms of funding. The debriefing sessions highlighted similar concerns, suggesting that addressing climate risks would need to be made an explicit priority by city leadership before substantive action could be undertaken.

Lack of public support for adaptation poses another major challenge, according to the after workshop survey responses. One reason for this could be a limited understanding of the risks and urgency of climate change impacts, as several interviewees highlighted. “People have a very short memory [in regard to climate impacts]. So the issue has to constantly be out there to remind them,” according to an economic development official for the City of Cranston. Likewise, a landscape architect noted, “People tend to really only pay attention when it directly affects them.” Other related reasons that frequently emerged in the follow-up interviews include the prevalence of misconceptions about climate change, narrow-mindedness, and inadequate awareness of climate issues among decision-makers and the general public. Interestingly, however, project staff found relatively high levels of concern about climate risks among Cranston residents in the public poll. It appears that the perception of insufficient public support and awareness regarding climate action may not accurately reflect reality.

Lack of agreement about what to do to manage climate change risks also ranked high among the barriers to action cited in the after survey. One interviewee attributed this to Cranston’s inefficient processes for public engagement, which results in “fighting at City Hall, but not much action.” Another interviewee shared, “The current process is a kind of free-for-all. You have members of the public making comments whether they’re pertinent or not.” Concerns about lack of agreement might also be attributed to the wide diversity of interests in Cranston. One local resident who attended a workshop remarked, “There are a lot of different types of communities, districts, and zones in this town—from shore-side, to commercial, to residential, to rural. That’s

something you don't find in a lot of towns, even in Rhode Island." Interestingly, the difficulty of arriving at a consensus came up in almost all debriefing sessions. Although 21 out of 23 tables ultimately reached an agreement during the role-play simulations, participants felt that finding common ground in a real-world context would be much more complex and challenging.

Finally, workshop participants commonly identified lack of political will as a major barrier in the after survey. "Cranston has been notoriously set in its ways," said a member of the West Bay Land Trust in a follow-up interview. Many interviewees mentioned an unwillingness of the City of Cranston to make the fundamental changes to policy and planning that might be required to effectively address climate change risks. A few people ascribed this unwillingness to the difficulty of incorporating long-term climate risks into short-term planning and decision-making processes. Several also pointed to the currently "siloed" approach to decision-making that considers issues in isolation, as well as to inadequate communication between different sectors and levels of government. Participants suggested that greater stakeholder involvement in decision-making processes would be useful for addressing climate risks, as would increased coordination between government agencies.

### **Suggested Pathways Forward**

**The workshop contributed to increased support for integrating climate change considerations into city planning.** While there was already a high level of support among participants for taking local action now, the workshops increased this support. In response to the question "What do you think local decision-makers should do now to address climate change, if anything?" 71 percent of participants surveyed before the workshop selected the option "Change the way everyday planning and infrastructure decisions are made to address climate change." There was a statistically significant increase in support for this option to 79 percent after the workshop. Furthermore, the before and after surveys all indicate a desire among workshop participants for the city to plan for the long term. When asked whether they agree with the statement "When making decisions today, decision-makers in my town should take into account scientific projections about what the climate might be like in 50 years," 81 percent of workshop participants expressed support before the workshop (as did 55 percent of polled Cranston residents). Importantly, there was a statistically significant increase in support for using scientific projections after the workshop, with 92 percent expressing support. Correspondingly, there was a statistically significant decrease in the proportion of workshop participants who preferred a reactive "wait-and-see" approach to managing climate change risks, dropping from 6 percent before the workshop to less than 1 percent afterward.

The follow-up interviews and debriefing sessions offer some explanations for the increased support for integrating climate change considerations into city planning. First, frustrations with old approaches to flood risk management voiced by several interviewees may have contributed to the support for a proactive approach. Illustratively, one interviewee said, "We have to figure out some better way. We can't just keep expecting that we're going to get funds from the federal government to help us. That's what we've been doing after these big natural disasters." Recent experiences of severe flooding were mentioned in most of the debriefing sessions, with particular emphasis on the need to avoid such devastating impacts in the future. Additionally, a number of workshop participants reported an improved understanding of possible ways to manage climate change risks, which may have boosted support for incorporating climate change planning into everyday decision-making. A wildlife ecologist reflected, "I'm still not hopeful about general public willingness to change its habits to slow or stop climate change ... but I am more



hopeful about communities, in general, trying to prepare as best they can using a range of different tools.”

**People want to have a say in adaptation decision-making.** Inclusive decision-making processes and stakeholder engagement are widely desired in Cranston. Seventy percent of public poll respondents think it is “important” or “very important” for residents, local groups, and businesses to be involved in decision-making around climate adaptation. Similarly, 78 percent of participants before the workshop and 83 percent of participants after the workshop indicated support for this option.



*Image 5. Cranston flooding; credit: City of Cranston*

The follow-up interviews reinforce this desire for stakeholder engagement. Nearly half of follow-up interviewees suggested that “everyone” should be involved in addressing climate impacts. Several of those interviewed admitted that public participation was a perpetual challenge, but noted that engagement was critical to finding successful solutions to complex planning issues. One interviewee, an employee at the Rhode Island Department of Environmental Management, said, “Coming together with folks at the workshop reminded me of the importance of that—of the need to focus on bringing stakeholders to the table and getting as much discussion as possible.” In a similar vein, participants brought the issue up in several debriefing sessions, pointing to the value of dialogue between stakeholder groups. One participant shared, “Getting a diverse group together for discussion breaks down barriers.”

The workshop appeared to increase participants’ beliefs in the importance of stakeholder engagement in decision-making processes. When asked who should help to make decisions about the city’s response to climate change, 19 percent of participants identified local businesses, homeowners, and residents before the workshop. There was a statistically significant shift after the workshop, to 24 percent.

As one longtime Cranston resident noted in a follow-up interview, the high stakes around climate risk management require broad support and involvement from the general public: “Any time important decisions need to be made concerning a considerable amount of public funding, and things that are going to extend out over multiple generations, long term—really deep-seated programs that are going to take a considerable amount of time and transcend jurisdictions and political terms—you need to make sure everybody is on board and that nobody is being pushed aside or feels like their voice doesn’t count.”

**A collaborative problem-solving approach could help fill a perceived gap in structured tools for public engagement in Cranston.** Given the strong support for stakeholder engagement in decision-making processes around climate change, a collaborative problem-solving approach might be well received in Cranston. Indeed, over half of the follow-up interviewees remarked that some form of a “consensus-building” process would be an appropriate and effective way to address climate-related planning issues. According to some interviewees, such a structured

approach to public involvement would improve upon the current perceived “free-for-all” environment. One interviewee, a planner at the Rhode Island Statewide Planning Program, commented, “I think it’s a very thoughtful way to figure out who needs to be in the room. While it’s time-consuming and resource-intensive, it is a process that has a lot to offer.”

However, workshop participants expressed major concerns about the feasibility of a collaborative problem-solving approach. In response to an after survey question asking “Do you think your city should use a decision-making process like that modeled in the exercise to reach agreement about how your town should respond to possible climate impacts?” over 40 percent said yes but did not expect such a process to happen soon. Several interviewees thought that financial constraints and political unwillingness in Cranston would deter such an approach. Others, particularly those in public administration, noted that the “real world” introduces even greater complexity than was present in the simulation, which can bring discussions to a stalemate. A couple of interviewees suggested that stakeholders do not always have equal votes or decision making power in real life.

**Need for increased public education and awareness.** Workshop participants who were interviewed expressed a strong desire for public education and awareness about climate change issues. Over one-third of follow-up interviewees emphasized the need to educate both local decision-makers and the general public. They felt that increased awareness would inspire residents to take more responsibility and initiative in addressing climate impacts. Indeed, almost half of those interviewed reportedly attended a workshop because of a desire to learn more about climate change risks and community action. Several interviewees said education could not only empower stakeholder groups to participate in decision-making, but could also ensure public support for climate action. In one debriefing session, a workshop participant stated, “It pays for everyone to be educated and informed on the topic. It makes it easier to communicate fluidly with each other.”

At present, there appears to be a lack of such educational opportunities in Cranston, according to some interviewees. One Rhode Island College professor remarked, “There has not been a forum for formal dialogue that acknowledges the dimensions of climate change, helps to articulate the seriousness of the problem, gets people to focus on possible and necessary solutions, and to think about imperatives and timelines.” A couple of other people suggested that public education efforts should target younger audiences. “You have our future decision-makers in that generation that will be impacted more than we are by climate change,” said an environmental advocate at Save the Bay.

## **Enriched Perspective**

**Role-play can be an effective tool for public education about climate change.** One of the major benefits reported by Cranston workshop participants was that the role-play simulation helped them think about climate change through the eyes of others. In the workshop debriefings, on the surveys, and in follow-up interviews, participants discussed how the simulation enriched their perspective, and the many benefits associated with this, including increased empathy, better understanding of different people’s stances, and more ease with difficult conversations. These findings indicate that climate adaptation-themed role-play simulations can help people appreciate opinions different from their own.

A large proportion of workshop participants said they found the role-play simulation to be in-

formative and thought-provoking. At least 20 percent of workshop participants offered optional write-in comments on the after survey about enriched perspective, noting that the role-play simulation demonstrated the importance of understanding other people's viewpoints. This theme also came up in the debriefings at the end of all seven workshops.



*Image 6. Cranston workshop; credit: NECAP staff*

Many of those interviewed noted that the exercise helped them to understand the rationales of various stakeholder groups, as well as how one group's interests can affect others. Since workshop participants were obliged to articulate the views of their assigned characters when playing the simulation, the role-play clarified the motivations of divergent positions on climate change. Overall, this contributed to an increased empathy for the views of others. Similarly, at least half of the workshop participants interviewed thought that role-playing underscored the complexity of the climate issue because it required them to consider multiple social, economic, political, and environmental dimensions. In one debriefing, participants discussed how the role-play simulation highlighted the "human element" of the climate change issue, a reference to the emotions and personal stakes involved in various choices.

For some interviewees, moreover, the role-play simulation shed light on the nuances of how different stakeholder groups view climate change. It appears that many people had assumed that others were either staunchly opposed to or fully in support of taking action on climate change. An interviewee reflected, "One of the most profound impacts of the workshop was understanding the spectrum of opinions, which I had expected to be bifurcated or polarizing."

The role-play also made challenging conversations about climate change risk and adaptation easier for some participants. Since the exact level of risk cities and towns face is unknown, and some adaptation options are controversial, discussing climate change adaptation can be difficult. Role-play can make these conversations easier. Indeed, several interviewees noted that it was "liberating" to play a role different from their role in real life; they saw the benefits of creating a "non-threatening" fictional scenario to prompt open discussion. Participants made similar observations in almost all of the debriefing sessions.

Some workshop participants, conversely, were critical of the role-play simulation. In a number of debriefing sessions, at least one or two participants shared that they felt "a little constrained" by the instructions for their role. Participants were more vocal in their criticism during the follow-up interviews. About one-fifth of those interviewed suggested that the exercise was too scripted, the roles too rigid, and the possible range of viewpoints flattened. One former businessman, who is now a smart-growth advocate, said, "I felt like I was being forced too far into a role of pro-business, anti-everything else. I don't think the business realm is that black and white." Several interviewees suggested that the simulation should be adjusted to allow for more flexibility and input from the participants.

Even so, the NECAP workshop intervention in Cranston highlights the potential of role-play simulations to help residents think about planning in the context of climate change. This perspective-enriching exercise can help lay important groundwork for collaborative planning efforts in coastal communities.

## Conclusion

These findings provide insight into Cranston-area residents' opinions regarding the local management of climate change risks and adaptation options. They also indicate that role-play workshops can raise public concern about climate change risks and positively affect public attitudes about taking local action.

NECAP research shows that people in the Cranston area are more concerned about climate change risks than city stakeholders perceived. This high level of concern, however, is coupled with a confidence gap between what residents think the city government should do and what they think it actually will do to address climate risks. Moreover, the majority of city residents said they felt stakeholder engagement in decision-making processes is important in managing climate risks and pursuing adaptation strategies. They also tended to see financial costs and the challenge of differing priorities around adaptation as the main barriers to moving forward in Cranston. Lack of political will was cited as another potential barrier. Even so, many people wanted to see climate change considerations incorporated into the daily work of city government.

The workshop findings demonstrate that role-play simulations have the potential to address many of the issues raised by Cranston-area residents. Workshop survey data and follow-up interviews show that the role-play simulation increased concern about climate change risks as well as raised interest in local adaptation strategies to address such risks. The workshops also narrowed the confidence gap between what people hoped their government would do and what they actually thought it would do to address climate change risks in their city. The simulations contributed to an increased understanding of alternative perspectives on climate change, helping to pave the way forward for city residents to engage in difficult conversations about how to address climate change locally. They also increased interest in public participation and in taking a collaborative problem-solving approach to managing flood risks and other climate-related issues in the Cranston area. Furthermore, many city residents expressed a need for more public education about climate change to enable and inform discussions.

Based on these findings, the City of Cranston might consider taking several steps to work toward adaptation. First, the time may be ripe to initiate steps to incorporate climate change into everyday planning and decision-making, particularly with regard to hazard mitigation planning. The recent memory of the March 2010 floods could help generate public support and the political will to undertake major climate adaptation measures. Second, the city should focus on public education to engage more residents in difficult discussions about managing climate risks. It is clear that there is already a desire for more information among those who attended the workshops. By equipping the public with information, as well as demonstrating realistic and effective pathways forward, the city can empower stakeholders and the public to participate in public decision-making processes. Third, building on the momentum of the NECAP workshops, the City of Cranston might consider setting up a collaborative problem-solving process with key stakeholders to discuss "real-life" adaptation strategies. This way, the city could identify priority



adaptation projects and have them “shovel-ready” if and when sources of funding become available. Finally, the city should coordinate its climate adaptation planning efforts with neighboring jurisdictions along the Pawtuxet River in order to maximize available resources and avoid making ineffective or “mal-adaptive” investments. On a related note, it should work to build closer working relations with the relevant agencies in state government. These can prove instrumental in accessing valuable technical expertise and possible financial assistance from higher levels of government for developing and implementing adaptation strategies.

These findings have important implications for other cities and towns in Rhode Island and across New England. In Cranston and the three other NECAP partner communities, there appears to be more concern about climate risks than initially presumed. In places where this concern has been relatively latent, there appears to be broad support for investing in education and awareness campaigns to empower stakeholders to initiate and participate in conversations about climate change. These conversations, if appropriately structured, can constructively contribute to the public decision-making process needed to develop local adaptation strategies. This project demonstrated the effectiveness of role-play simulations not only in starting these conversations, but also in increasing participants' support and confidence for taking local action.

## NECAP Project Staff and Partners

### Project Management

.....  
**Lawrence Susskind**, Principal Investigator, MIT Ford Professor of Urban and Environmental Planning

**Patrick Field**, Principal Investigator, Managing Director of CBI

**Danya Rumore**, Project Manager and Collaboration Lead, PhD student in Environmental Policy and Planning at MIT and Associate at CBI

**Carri Hulet**, Project Advisor, Senior Associate at CBI

### NERRS Partners

.....  
**Tonna-Marie Surgeon-Rogers**, Coastal Training Program Coordinator, Waquoit Bay Reserve, Massachusetts

**Kate Harvey**, Coastal Training Program Assistant, Waquoit Bay Reserve, Massachusetts

**Jennifer West**, Coastal Training Program Coordinator, Narragansett Bay Reserve, Rhode Island

**Steve Miller**, Coastal Training Program Coordinator, Great Bay Reserve, New Hampshire

**Chris Keeley**, Coastal Training Program Assistant, Great Bay Reserve, New Hampshire

**Christine Feurt**, Coastal Training Program Coordinator, Wells Reserve, Maine

**Annie Cox**, Coastal Training Program Associate, Wells Reserve, Maine

**Mike Mahoney**, Coastal Training Program Intern, Wells Reserve, Maine



## **Municipal Partners**

.....  
**JoAnne Buntich**, Director, Growth Management Department, Town of Barnstable, Massachusetts

**Elizabeth Jenkins**, Planner, Town of Barnstable, Massachusetts

**Jason Pezzullo**, Principal Planner, City of Cranston, Rhode Island

**Peter Lapolla**, Planning Director, City of Cranston, Rhode Island

**Steve Bird**, City Planner, City of Dover, New Hampshire

**Chris Parker**, Director of Planning, City of Dover, New Hampshire

**Jon Carter**, Town Manager, Town of Wells, Maine

**Mike Livingston**, Town Engineer, Town of Wells, Maine

**Jodine Adams**, Code Enforcement Officer, Town of Wells, Maine

## **Analytics Support**

.....  
**Ella Kim**, Analytics Manager, PhD candidate in Environmental Policy and Planning at MIT

**Tijs van Maasakkers**, Analytics Manager, PhD in Environmental Policy and Planning from MIT

**Ezra Glenn**, Analytics Advisor, Lecturer in the MIT Department of Urban Studies and Planning

## **Consultants**

.....  
**Paul Kirshen**, Climate Change Adaptation Consultant, Research Professor in Civil Engineering at the University of New Hampshire

**Cameron Wake**, Climate Change Adaptation Consultant, Research Professor in Earth Sciences at the University of New Hampshire

**Ona Ferguson**, Stakeholder Assessment Consultant, Senior Associate at Consensus Building Institute

**Michal Russo**, Risk Assessment Support, PhD Student in Water Diplomacy at Tufts University

**Graduate  
Research  
Assistants**

.....  
**Casey Stein**, 2012-2014 Research Assistant, Dover Coordinator, Graduate of the Master of City Planning program at MIT

**Toral Patel**, 2012-2014 Research Assistant, Cranston Coordinator, Graduate of the Master of City Planning program at MIT

**Katie Blizzard**, 2013-2014 Research Assistant, Barnstable Coordinator, Master of City Planning student at MIT

**Julie Curti**, 2013-2014 Research Assistant, Wells Coordinator, Master of City Planning student at MIT

**Lisa Young**, 2013-2014 Research Assistant, Project Management Assistance, Master of City Planning student at MIT

**Katherine Buckingham**, 2013 Research Assistant, Graduate of the Master of City Planning program at MIT

**Zachary Youngerman**, 2013 Research Assistant, Graduate of the Master of City Planning program at MIT

**Jessie Agatstein**, 2012-2013 Research Assistant, Barnstable Coordinator, Graduate of the Master of City Planning program at MIT

**Melissa Higbee**, 2012-2013 Research Assistant, Cranston Coordinator, Graduate of the Master of City Planning program at MIT

**Erica Simmons**, 2012-2013 Research Assistant, Wells Coordinator, Graduate of the Master of City Planning program at MIT

**Undergraduate  
Research  
Assistants**

---

**Rebecca Silverman**, 2012-2014 Research Assistant, MIT

**Paula Gonzalez**, 2013-2014 Research Assistant, MIT

**Elizabeth Berg**, Spring 2014 Research Assistant, MIT

**Kaylee Brent**, Fall 2013 Research Assistant, MIT

**Priyanka Chatterjee**, Spring 2013 Research Assistant, MIT

**Tiffany Chen**, Fall 2013 Research Assistant, MIT

**Anthony McHugh**, Spring 2014 Research Assistant, MIT

**Jordan Mlsna**, Fall 2013 Research Assistant, MIT

**Madeline O'Grady**, Fall 2013 Research Assistant, MIT

**Fiona Paine**, Spring 2014 Research Assistant, MIT

**Tiana Ramos**, Spring 2013 Research Assistant, Wellesley College

**Emily Thai**, Spring 2014 Research Assistant, MIT

---

New England

**Climate Adaptation** PROJECT