



Sustaining Champions of Climate Adaptation in Coastal Communities: A Northern New England Study

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Editor's note: Alexandra Philip conducted these interviews as part of her 2014 Brian E. Doyle Undergraduate Marine Extension Fellowship. The Doyle Fellowship provides undergraduate students with the opportunity to gain valuable career experience by working with N.H. Sea Grant staff to help individuals and organizations make informed decisions regarding marine resources.

Executive Summary

Project Purpose

The Earth's climate system has undergone significant changes in the past century. Scientists are in agreement that the planet's climate system will continue to change in the coming years, though it is uncertain what the extent of those changes will be. Communities that take proactive adaptive measures can reduce their vulnerability to climate change impacts. As the need for climate preparedness becomes more apparent in coastal communities, local "champions" or leaders have emerged to drive adaptation efforts forward.

The primary objective of this study was to identify the role community climate adaptation champions play in adopting climate adaptation strategies in coastal communities and understand how professional climate adaptation assistance providers can best support these champions. The research goals were to (1) understand the needs of local climate champions; (2) discover who champions consider their allies; and (3) identify major achievements and barriers in adopting climate adaptation strategies.

Process

In the summer of 2014, Alexandra Philip, a N.H. Sea Grant Brian E. Doyle Fellow, conducted 13 semi-structured interviews with champions from coastal communities ranging from northern Massachusetts to southern Maine.

Communities that participated in the study included:

- Amesbury, Mass.
- Dover, N.H.
- Durham, N.H.
- Ellsworth, Maine
- Exeter, N.H.
- Hampton, N.H.
- Newburyport, Mass.
- Newfields, N.H.
- Portsmouth, N.H.
- Rye, N.H.
- Seabrook, N.H.
- York, Maine

Participants included:

- Town and city planners
- Members of the "Storm Surge" organization
- Conservation commission members
- Planning board members
- Environmental planners
- Town administrators
- Community development directors

Key Findings

Nine key findings were developed from interviews with champions. These findings highlight the champions' successes, barriers, motivations and needs. Using this information, professional climate adaptation assistance providers can more effectively move forward with supporting climate preparedness in communities.

- 1. Champions are most concerned about climate impacts on their economies, public safety and infrastructure.**
- 2. Local adaptation projects may help create new champions.**
 - 2.1. Champions become educated about climate change issues primarily through websites and workshops.**
 - 2.2. Champions educate their communities about climate change issues.**
 - 2.3. Most champions have added climate adaptation to their community's master plan.**
- 3. Most champions say greater public awareness is their largest achievement in climate adaptation efforts.**
- 4. Lack of resources is a major barrier for champions in adopting climate adaptation strategies.**
- 5. Champions need projects brought to their community, and also need additional technical support.**
- 6. Champions want additional education and outreach opportunities for their communities.**
- 7. Champions could use additional support from grassroots organizations.**
- 8. Champions need climate adaptation professionals to support their work.**
- 9. Communities without planners need greater support.**

Recommendations

Interviews with climate champions generated eight recommendations for professional climate adaptation assistance providers to begin and promote. First and foremost, there was an overwhelming need for communities to be connected with climate adaptation projects and additional technical and informational support. Champions advised that professional adaptation assistance providers should:

- Continue to bring climate adaptation projects to communities
- Continue professional support following project completion
- Continue to bring local data to communities
- Bring technical professionals into towns

Education may be an important catalyst in climate preparedness efforts in communities, but some towns do not have the resources to meet their education needs. Champions were supportive of work that the New Hampshire Coastal Adaptation Workgroup (NHCAW) had done to educate both communities and community leaders. Champions advised that professional adaptation assistance providers should:

- Continue NHCAW workshops
- Continue to provide education in towns

While NHCAW and other professional climate adaptation assistance providers have done exceptional work collaborating with champions to move forward with climate adaptation efforts, there is room for improvement. Many champions use online resources to educate themselves about climate change efforts and it would be beneficial to promote and enhance climate adaptation websites (such as the NHCAW blog). Further, when asked about their resource needs, some champions requested resources that are already offered by planning commissions. This indicates that leaders in climate adaptation efforts need to be better connected with available resources. Champions advised that professional adaptation assistance providers should:

- Enhance online education tools
- Connect champions with available resources



Introduction

Global Climate Change

The majority of the scientific community is in agreement that the Earth's climate system has been undergoing rapid changes in the past century (EPA 2014). These changes have been apparent and well-documented on a global, national and local scale. Since the 1950s, scientists have observed both oceanic and atmospheric warming, decreases in snow and ice cover, sea-level rise, and an increase in greenhouse gases in the atmosphere (IPPC 2013). As the climate system continues to change, the potential impacts on a global scale become more devastating. The IPCC's most recent report, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, identified increased frequency of extreme weather events and the increased number of threatened species as some of the key risks of a changing climate (IPPC 2014).

Climate Change in the Northeast

Climate change will not be evenly distributed across the globe and some regions will be impacted more significantly than others. The Northeastern United States is home to 64 million people, making the region one of the most densely populated environments in the world (Horton and Yohe 2014). Both urban and rural environments can be found in the Northeast, as well as ecologically significant habitats. The region maintains its natural character through large expanses of forests, grasslands, wetlands, coastal zones and rich marine fisheries (Horton and Yohe 2014). However, its ecological diversity and population density make the Northeast highly vulnerable to impacts from climate change.

The region has already observed significant changes; from 1895 to 2011 the average annual temperature has risen 2°F. In addition, there has been a 70% increase in heavy precipitation events from 1958 – 2010 (Horton and Yohe 2014). New Hampshire has experienced two “hundred-year floods” in the past decade (Clean Air – Cool Planet 2011). Similar to the global distribution of climate change, the impacts in a region are not distributed equally on a state-to-state basis.

The Northeast will continue to experience the impacts of climate change. The region is projected to experience warming between 3°F and 10°F, depending on greenhouse gas emissions. Sea-level rise along most of the coastal Northeast is expected to exceed the global average rise due to local land subsidence (Horton and Yohe 2014). The increases in heavy precipitation events and sea-level rise have the potential to triple the frequency of dangerous flooding that is seen today (Horton and Yohe 2014). Overall, the Northeast will be most threatened by coastal flooding, river flooding and heat waves. Public safety, critical infrastructure and ecosystem health will be put at risk as these changes occur. If communities do not prepare for future weather, the region will endure significant economic, social and environmental costs (Horton and Yohe 2014).

Climate Preparedness in the Northeast

Despite the current climate projections, communities that take proactive adaptive measures can significantly reduce their vulnerability to climate change impacts. The United Nations Framework Convention on Climate Change (1992) defined climate adaptation as “adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change.”

The Northeast is home to many of the nation’s leaders in climate adaptation efforts (Horton and Yohe 2014). Within the region, 10 out of 12 states have released or plan to release statewide adaptation plans (Horton and Yohe 2014). Communities are typically the de-facto implementers of climate adaptation policies. However, because communities have diverse and unique needs, they are likely unable to mobilize climate adaptation efforts due to a lack of overall resources. For that reason, it is helpful to have local leaders or “champions” that assist in driving adaptation efforts forward.

Climate Adaptation Community Champions

In this study, a climate adaptation community champion is defined as an individual who promotes the adoption of climate adaptation strategies at the local level through direct (elected, appointed or volunteer official) or indirect (volunteer or active community member) influences. These champions play an essential role in mobilizing the community around the topic of climate preparedness. As outlined in a study conducted by Devlin-Foltz and Molinaro (2010), policy champions can occur on three levels:

- Level I: Educates self about the issue – a “potential champion”
- Level II: Educates others about the issue – a “new champion”
- Level III: Influences action and change through policy or other means – a “champion”

There is minimal literature regarding the role of champions in climate adaptation policy. While the role of champions has been mentioned in publications regarding policy (Devlin-Molinaro 2010; Allen, Sheate, and Diaz-Chavez 2012), leadership (Meijerink and Stiller 2013; Allman, Fleming, and Wallace 2004), and climate adaptation efforts (Roberts 2008; Martins and Ferreira 2011; Keeley 2012), studies focused solely on the role of champions in climate adaptation efforts seem to be non-existent. The lack of literature is likely because adaptation is a relatively new field and champions are just beginning to emerge in communities. Therefore, this study begins to fill a critical gap in understanding how communities prepare for climate change.

Study Overview

Professional climate adaptation assistance providers are individuals or organizations that aim to support and help communities move forward in climate preparedness efforts. Prominent organizations include the American Society of Adaptation Professionals and locally, the New Hampshire Coastal Adaptation Workgroup (NHCAW).

The N.H. Coastal Adaptation Workgroup (NHCAW) helps communities learn about and utilize existing resources and locate additional assistance to better prepare for climate effects in order to protect their social, economic, human and environmental health.

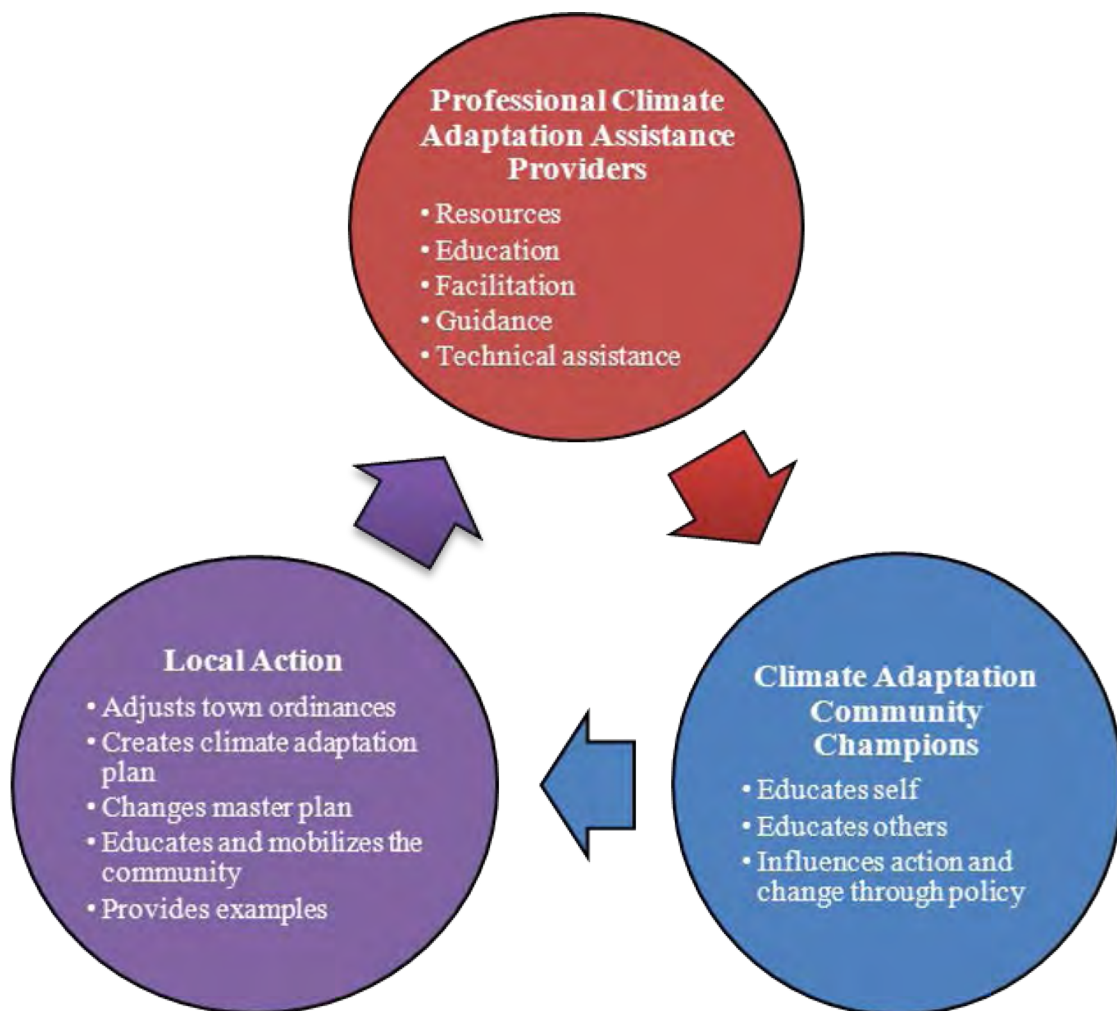


Fig. 1: The relationship between professional adaptation assistance providers, climate adaptation community champions and local action.

The primary objective of this study was to identify the role climate adaptation community champions play in adopting climate adaptation strategies in coastal communities and understand how professional climate adaptation assistance providers can best support these champions. The research goals were to (1) understand the needs of local climate champions; (2) discover who champions consider their allies; and (3) identify major achievements and barriers in adopting climate adaptation strategies.

In the summer of 2014, Alexandra Philip, a N.H. Sea Grant Brian E. Doyle Fellow, conducted 13 semi-structured interviews with champions from coastal communities ranging from northern Massachusetts to southern Maine. Prior to conducting the interviews, Philip was granted permission from the UNH Institutional Review Board (IRB) for the Protection of Human Subjects in Research. As outlined in the IRB consent form, the identity of each interviewee remains confidential.

Communities that participated in the study included:

- Amesbury, Mass.
- Dover, N.H.
- Durham, N.H.
- Ellsworth, Maine
- Exeter, N.H.
- Hampton, N.H.
- Newburyport, Mass.
- Newfields, N.H.
- Portsmouth, N.H.
- Rye, N.H.
- Seabrook, N.H.
- York, Maine

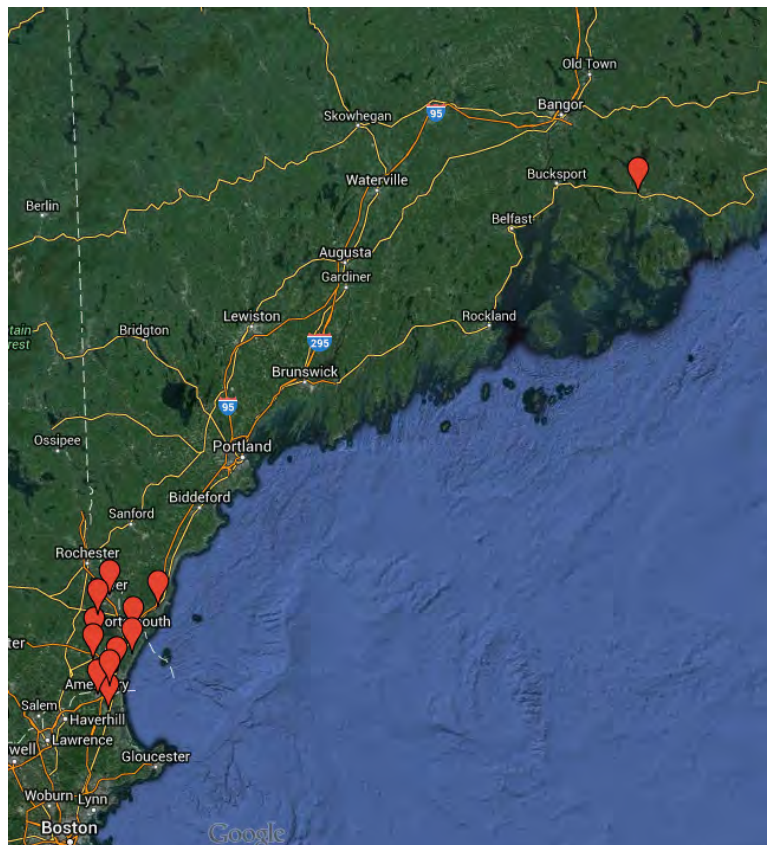


Fig. 2: Towns represented in this study range from northern Massachusetts to southern Maine, with the majority of communities in New Hampshire. The aerial imagery was developed using Google Maps on December 9, 2014.

Participants included:

- Town and city planners
- Members of the “Storm Surge” organization
- Conservation commission members
- Planning board members
- Environmental planners
- Town administrators
- Community development directors

The interviewees were individuals identified as local leaders in climate adaptation by NHC AW. They developed the initial contact list by including people who regularly attended NHC AW events, people involved in projects with NHC AW members, and also by asking the full NHC AW team for suggestions. The “snowball method” was used to develop additional contacts. Using this method, the interviewer prompted the interviewee to think of individuals who they considered to be a “mover and shaker” in terms of climate adaptation in surrounding coastal communities.

Eleven questions were developed for the interviews (Appendix A). The main objective of these questions was to understand the role of each champion in adopting climate adaptation strategies and assess the needs that can be met by professional climate adaptation assistance providers.



Results

In an attempt to represent the interview results, the data were grouped according to similar answers. It is important to note that due to time constraints, not all champions were asked the full 11 interview questions. The starred questions (Appendix A) were asked to all 13 champions.

Finding 1: Champions are most concerned about climate impacts on their economies, public safety and infrastructure

Champions identified sea-level rise (five out of 11), flooding (four out of 11) and the increased frequency of severe storms (five out of 11) as the most relevant impacts that a changing climate could have on their community. These results were similar to the responses found in the Clean Air – Cool Planet Northeast Needs Assessment (2011), which found the top two impacts to coastal communities from a local government perspective were “sea-level rise” and “increased levels of precipitation.”

In addition to these impacts, three out of 11 interviewees mentioned their concern about changing ecosystems, specifically salt marshes, as the local climate changes. In the communities with a significant extent of salt marshes, champions were concerned with losing the storm buffering and nursery capacities that these ecosystems provide. As human activity continues to encroach on delicate habitats, one champion remarked, “At some point we are going to reach a breaking point and something has got to give.”

The champions identified these climate impacts as reasons that adaptation in their community is necessary. They also acknowledged economic and public health and safety benefits as the largest reasons to move forward with climate preparedness. One champion best summarized the benefits of climate preparedness as the following: “Cost, public safety, public health, quality of life, desirability of location, being able to buy and sell homes – the benefits of adaptation occur on so many different levels.”

Some champions were concerned about critical infrastructure, such as wastewater treatment facilities, schools, and even police stations, that are projected to be inundated in the future. Other champions are concerned about the neighborhoods that will be stranded or lost completely if flooding occurs. As one champion said, “With sea-level rise, critical infrastructure for the town is at risk, let alone all the residences and businesses along the water.”

In addition to the human benefits of preparing for climate change, two out of 11 champions mentioned the environmental benefits of adaptation efforts. One town planner said, “Flooding and stormwater management are the most troubling pressing issues, but overall the biggest issue is preserving ecosystems.”

Finding 2: Local adaptation projects may help create new champions

When asked about the reason they became involved in climate preparedness, interviewees primarily identified their participation in a particular project, brought to them by professional climate adaptation assistance providers, as the catalyst for their adaptation work. One champion mentioned that he had been aware of the potential impacts of climate change for some time, but did not make changes in his community until a NHCAW member came to him with the opportunity to become involved in a project.



Members of a community review potential climate impacts to important municipal infrastructure with members of the N.H. Climate Adaptation Workgroup.

Photo by: Chris Keeley

In addition, five out of 12 champions referenced their background, whether it is personal, educational or work-related, as the reason they became involved with climate adaptation efforts. Some spoke about their concern for their children growing up in a community affected by climate change while others talked about their work in a climate-related field.

The observable changes in weather led four out of 12 champions to become involved in adaptation efforts. One champion remarked, “After every big storm, public works was out there [at a local beach] fixing the sea wall. I started thinking about the pattern of constantly repairing that one spot and wondered if we should really be doing that.”

One individual mentioned education through NHCAW workshops as the primary driver of his involvement in climate preparedness. These workshops educated the champion and gave him an understanding of the importance of adaptation specific to his community.

Finding 2.1: Champions become educated about climate change issues through websites and workshops

Despite their different roles in coastal communities, all champions played a role in moving forward with climate preparedness in their communities. In order to best promote climate adaptation efforts, each champion has educated him- or herself about climate change issues – the most basic level of championship.

Approximately half of the champions specified their primary way to keep current with climate change discussions was through online resources, including town websites, the Storm Surge website (through the Merrimack Valley Coastal Adaptation Workgroup) and the Storm Smart website (through NHCAW). Similarly, four out of 13 champions recognized the importance of email lists in keeping up with climate change issues.

In addition to utilizing online resources, six out of 13 champions attended conferences with topics revolving around climate preparedness held by groups from UNH, The Rockingham Regional Planning Commission (RPC), The New Hampshire Office of Energy and Planning and Antioch University. Four out of 13 champions specifically mentioned the role of NHCAW workshops in keeping them educated on relevant climate change issues. One champion said, “I attend meetings and presentations run by Steven Miller and NHCAW. They do a great job organizing workshops that look at climate change from different aspects.”

Three out of 13 champions also identified their involvement in a specific project as a way they keep educated about climate adaptation efforts. When professional climate adaptation assistance providers bring projects to communities, the projects provide current information to the champion. Using this information, the champions keep updated on the implications of climate change in their community and stay educated about most effective adaptation strategies.

Furthermore, three out of 13 champions stated that having discussions with other people was an important way to keep educated. These discussions included talking with people at conferences, discussing current issues with professional climate adaptation assistance providers and speaking with other champions.

Finding 2.2: Champions educate their communities about climate change issues

Level II champions promote climate adaptation within the community and encourage awareness and support addressing issue. The majority of champions (nine out of 13) have held or hosted lecture series, public forums and/or town meetings around the topic of climate preparedness in their community with the goal of educating others. For example, with the help of NHCAW, one champion held a lecture series around a relevant climate topic that educated the community about the impacts of climate change while promoting support in climate adaptation efforts.

Some champions (six out of 13) have taken their actions a step further and have established or been involved in establishing a workgroup or subcommittee that deals with the topic of climate preparedness in some capacity.

In addition, five out of 13 champions mentioned that updating the town website or newsletter was important in their outreach and education efforts. Online resources provide information at the public's finger tips, providing a simple way to educate people about climate adaptation efforts in their community. One champion said, "I also run the website for the town and am updating the site with information on what we are doing with the current grant funding"

Finding 2.3: Most champions have added climate adaptation to their community's master plan

Level III champions play a role in establishing adaptation plans and/or policies in their community, as well as educating others about the importance of climate preparedness. While not all interviewed champions were classified at the same level, over half of the champions have either added a chapter about climate adaptation to their master plan or included the topic in another section. Most champions identified adjusting the master plan to include their climate adaptation vision as one of the first steps to climate preparedness in their community. One champion stated, "It's been a logical progression in the work that we've been doing – assessing the impacts of climate change in the city and then adopting it in the master plan."

Similar to adjusting the master plan, four out of 13 champions have published other reports providing recommendations regarding climate change to their community. These publications included stand-alone climate adaptation plans, climate change risk assessments, and updating the hazards mitigations plan to include a climate adaptation chapter.

Five out of 13 champions stated that they had made changes, or are in the process of making changes, to town zoning ordinances that related to some aspect of climate change. Some champions encouraged changes in zoning ordinances that related to stormwater management while others are hoping to make changes related to coastal and floodplain building.

Town	Master Plan Action	Status
Amesbury, Mass.	None yet	None yet
Dover, N.H.	Would like to add a Climate Adaptation chapter to the Master Plan, received MIT Climate Change Risk Assessment in March 2014	Interested
Durham, N.H.	Included a Climate Adaptation chapter in the Hazards Mitigation Plan, to be adopted into the Master Plan in 2014	In progress
Ellsworth, Maine	None yet	None yet
Exeter, N.H.	Would like to add a Climate Adaptation chapter eventually; in the process of the Climate Adaptation Plan for Exeter (to be completed December 2014)	Interested
Hampton, N.H.	Natural Resources chapter of the Master Plan includes some discussion of adaptation (prepared by the Rockingham Planning Commission 2009)	Done
Newburyport, Mass.	2014 Master Plan Update draft includes discussions of climate adaptation in the Transportation chapter and Public Facilities and Services chapter (to be adopted Winter 2014-2015)	In progress
Newfields, N.H.	Would like to incorporate adaptation into the Land Use chapter	Interested
Portsmouth, N.H.	Would like to add a Climate Adaptation chapter to the Master Plan; the current Climate Change Vulnerability assessment addresses the need to include adaptation in the Master Plan	Interested
Rye, N.H.	Would like to add a Climate Adaptation chapter to the Master Plan	Interested
Seabrook, N.H.	Master plan includes discussion of climate adaptation in the Natural Resources chapter	Done
York, Maine	Added an "Adaptation to Sea Level Rise" chapter to the comprehensive plan	Done

Table 1: The current status of Master Plan action for each community that participated in this study, as described by the champions and their associated town websites.

Finding 3: Most champions say public awareness is their largest achievement in climate adaptation

When asked about the biggest achievement their community has made in climate preparedness, over half of the champions stated that public awareness and/or public support was their largest accomplishment. One town official was amazed at the changes she had seen in the same town council over the past decade; the members that once had a lack of awareness about climate change are now considering climate change impacts in town projects.

Another champion shared the following story: “We held our annual town meeting and this gentleman stood up out of the blue and said, ‘My wife attended this lecture from Cameron Wake and is concerned about the impacts of climate change on our town. I think the town should find money in the budget to look into climate adaptation.’” The champion continued, “At this point I realized the time was right and I was ready to bring climate adaptation into the public’s eye.”

The change in public awareness about climate change, as a result of adaptation projects, town involvement and the media, was encouraging to the champions. The changes in public perception gave the champions a platform to move forward in their adaptation efforts.

Four out of 10 champions said that the success in completing an assisted project was their largest achievement in adaptation efforts. These projects included climate adaptation plans as well as projects mapping the changes in sea-level rise and floodplains. Three out of 10 champions mentioned another success, such as changing town ordinances, building a new sewage treatment plant, or “going green” with the town facilities as their biggest achievement.

Finding 4: Lack of resources is a major barrier for champions in adopting climate adaptation strategies

When asked about the largest barriers in adopting climate adaptation strategies, over half of the champions stated that a lack of resources, specifically funding to begin new adaptation related projects, was a major challenge. Similarly, three out of 10 champions said that a lack of time to complete projects and the many competing priorities in the town were significant barriers as well. One champion called herself a “one-man show,” referring to the amount of work she has to do in addition to leading the charge forward with climate adaptation.

Some champions (three out of 10) stated that while community involvement could be beneficial, some groups of individuals have slowed progress in their community. One champion mentioned that while people had good intentions in her community, their goals clouded their judgment and many became discouraged if change could not occur quickly. She said, “People get passionate and get their blinders on and don’t necessarily see the correct process. I want to make progress with climate adaptation, but I want to do it right the first time and do the correct path so we don’t run into trouble down the road.”

The challenges involving the general public within communities was apparent when six out of 13 champions said that their community approach to climate adaptation was widely varied. One champion mentioned that while he believed most people within his community were concerned about climate related issues, the vocal climate change “naysayers” drowned out the majority voices. However, over half of the champions (seven out of 13) stated that the community reaction to climate preparedness had been positive and had overall been a huge support in adaptation efforts.

Finding 5: Champions need projects brought to their community and also need additional technical support

In terms of resource needs, the majority of champions (nine out of 13) said that access to local data would be useful in their communities. The types of data needed included storm surge data, storm flood information and updated flood maps. The champions who said local data would not be useful were located in communities that had current data. However, most champions who had current data mentioned the need to keep that data current in the future. The two champions who said there was no need for local data in the present or in the future worked in communities that had professionals to provide updated local data.

Eleven out of 13 champions stated that they needed additional technical support for specific projects in town. The primary needs in communities were GIS and mapping professionals (mentioned by seven out of 13 champions), as most communities cannot afford to staff these positions full- or part-time. Four out of 13 champions also said they needed technical writing professionals to help update the master plan, write climate adaptation plans and establish new zoning ordinances. In addition, other champions mentioned the need for technical support in specific, town-related projects such as a stormwater infrastructure assessment.

The most important technical need was unanimously (13 out of 13) the opportunity to participate in specific projects. A highly effective way to engage champions and assist them in community climate preparedness is to bring climate adaptation projects that come with professional and grant support. As one champion said, “If you can bring us the project we can always find someone to take the lead.”



Community members and meeting facilitators discuss their concerns about town assets that may be impacted by climate change. Photo by: Chris Keeley

Finding 6: Champions want additional education and outreach opportunities for their communities

In terms of educational resources, 12 out of 13 champions stated that providing education is useful to their community. A few (three out of 13) champions mentioned that NHCAW members had been involved in workshops or lectures in their community, which they were grateful for. Most champions said there was a need to target the general public in the lecture series, although in some communities education efforts targeting municipal staff and board/council members are still necessary.

Facilitation for public forums was also desirable for six out of 13 champions, who said that holding a public discussion about climate preparedness in their community would be helpful. Four out of 13 champions stated that facilitation services had the potential to be useful, depending on the timing of the forum and how it is used. Three out of 13 champions said that facilitation would not be useful in their community due to lack of interest.

One champion said, “Honestly, we are doing things right if no one comes out to these forums because when you see a lot of people at a committee meeting you know something is going wrong. The more concerned or angry people are, the more involved they are, so a lack of involvement counts as a win.”

When offered the potential for a support group through a peer network or additional networking opportunities, the majority of the champions were uninterested. It was generally stated that there were plenty of networking opportunities at conferences or events, and thus creating a meeting was unnecessary. Some champions commented on the fact that they do not have the time to be a part of a climate adaptation peer network. However, three out of 13 champions said that this would be a useful service for them.

Finding 7: Champions could use additional support from grassroots organizations

Five champions were asked about the potential role for grassroots organizations in their community. Four out of five said that their community could use volunteer support for town-specific projects; for example, going out in rainstorms and checking for overflowing stormwater drains. These champions also mentioned the need for funding for smaller climate adaptation related projects. One champions said that he could not think of a project that would need the support from a grassroots organization.

Finding 8: Champions need climate adaptation professionals to support their work

When asked about the role of allies in their climate adaptation efforts, 11 out of 13 champions said that the work they do would be much more difficult, if not impossible, without the support from their allies. As previously mentioned, most champions are the most involved member in their entire community in terms of climate preparedness and the support of allies seems to play a vital role in their work. Champions mentioned the support of the following NHCAP members by name: Julie LaBranche, Chris Keeley, Amanda Stone and Steve Miller. In addition, champions acknowledged the Rockingham and Strafford Planning Commissions, as well as the University of Maine and UNH as important allies.



*Community leaders often use aerial maps and local knowledge as tools to identify areas that are or could be susceptible to flooding, storm surges or rising sea levels.
Photo by: Chris Keeley*

and possibly less opportunity to become involved in climate adaptation efforts. One champion said, “We don’t have a town planner so that department is sort of a rudderless boat in terms of looking ahead and planning for the eventualities to come.”

Finding 9: Communities without planners need more support

Six of the champions who participated in this study were the town or city planner in their community. The number of planners that are considered local champions speaks to the importance they play in moving forward with community climate preparedness. This also highlights the need for additional support for communities without town planners. The towns without planners likely have less capacity, less direction



Conclusions and Recommendations

Champion Classifications

Following the completion of the interviews, responses were analyzed to categorize interviewees into the following levels of champions:



Fig. 3: This figure represents the three types of champions that were interviewed (Level II, Level II-III and Level III) and shows the number of champions that fell into each category.

Level II champions were individuals who had educated themselves and others about climate change and climate adaptation but had not recommended any plans or policies in their community. In this study, Level II champions were primarily on volunteer boards or groups and did not have the ability to have a direct influence in policy.

Champions classified as Level II – III were individuals who were in the process of adopting climate adaptation policies or plans in their community, but these plans had not yet been implemented. For example, most Level II-III champions (two out of three) hope to add a chapter to their town’s master plan in the future.

Level III champions were leaders who had implemented some plan or policy related to climate preparedness in their community. For example, some Level III champions had adopted a climate adaptation chapter in their master plan, while others had established new zoning ordinances that related to climate preparedness.

In this study, no Level I or “emerging” champions were interviewed. Level I champions are individuals who are educating themselves on climate change related issues but are not yet sharing their knowledge about climate preparedness with others. For that reason, identifying Level I champions in communities can be difficult and working to find these individuals was beyond the scope of this study. Identifying these individuals in the future would be a valuable exercise because Level I champions have the potential to become Level II or Level III champions with the proper support from groups like NHCWA.

What Champions Need

Champions need human, technical and financial resources. They typically lack the range of supports needed to move climate preparedness efforts forward on their own. Specifically, it appears that bringing projects to communities plays a crucial role in creating and sustaining climate adaptation community champions.

Projects

The most important need that champions identified is for additional climate preparedness projects that come with human, technical and financial support. The support from climate adaptation assistance providers in conjunction with these projects seems to be extremely valuable to champions; champions considered the people and organizations who brought projects to their community as allies in their climate adaptation efforts. In addition, most champions mentioned that a specific project led to their involvement in climate adaptation effort.

Public education and outreach

As previously mentioned, the majority of champions said that their community could benefit from additional education in climate related topics. Currently, most of NHCAP's education efforts are targeted at municipal staff and volunteer board/commission members in towns, but champions stated that education for the general public would be most useful. However, some champions did say there was still a need to educate municipal staff, board/council members and emergency response professionals within their town.

Technical support

Nearly all champions said that they needed technical support for specific projects. More specifically, champions needed GIS, mapping and technical writing professional in their communities. The need for these professionals is a result of the fact that most towns cannot afford to hire additional staff but the champions continue to need additional support. Champions are often a "one-man show" and cannot afford to spend their time solely on climate adaptation related projects, and bringing technical support into their communities would reduce their workload.

The Importance of Climate Adaptation Community Champions

The majority of champions interviewed were leaders promoting climate preparedness in their communities. Most champions could not identify anyone in their community who they considered to be an ally in their efforts; allies were primarily third-party professional climate adaptation assistance providers.

The apparent lack of multiple climate adaptation champions in communities highlights the importance of having at least one champion. It seems that a town with a champion in climate preparedness has the ability to make significant advancements in climate preparedness compared to a community that does not have a key individual promoting the issue. It is clear that champions play an essential role in adopting and promoting climate adaptation strategies at the local level.

Recommendations for Assistance Providers

Recommendation #1: Continue to bring climate adaptation projects to communities

The NHCAW members have done an exceptional job at connecting champions in local communities to projects relating to climate adaptation. Overall, champions referenced their involvement in specific projects as the primary reason they became involved in adaptation efforts. For this reason, bringing specific projects to a community creates an opportunity to both create champions, who may not have moved forward with the issue on their own, and sustain champions who need additional support. Bringing specific projects to communities is essential to moving forward with local coastal climate adaptation efforts.



Community members examine a map of their town to determine what people, infrastructure, and natural resources might be vulnerable to the impacts of climate change. Photo by: Chris Keeley

projects to their community as allies in their climate adaptation efforts. It is essential that there is continued support following the completion of projects, whether it is through weekly calls or bi-annual visits. This support will not only help the project maintain endurance but will sustain the champions' efforts in climate adaptation.

Recommendation #3: Continue to bring local data to communities

Many champions acknowledged the work done by NHCAW members in providing their community with current local data. Some of the data included mapping of future sea-level rise, salt marsh mapping and future flood-plain mapping. Champions shared this data with their communities, making a compelling case for adaptation efforts as citizens can visibly see the areas of potential impacts in their town.

In communities where the term "climate change" is still taboo, the need for scientific data is greatest. One champion mentioned that he is not sure if climate change is occurring, but said that he wasn't in a place to argue with science. Because compelling data was presented to him he felt obligated to prepare for potential impacts, whether or not he believed in climate change. A likely way to move forward with adaptation efforts in these communities is to show the public the need for climate preparedness through scientific reports.

Recommendation #2: Continue professional support following project completion

A study conducted by Debra Roberts (2008) found that when communities in South Africa were given funding for climate change-related projects, they lost momentum following the completion of the project and no further progress was made. Similarly, when professional support was provided with specific projects but left following the project's completion, their work would not be continued. However, when a professional support provider came into a community and provided support during and following a Clean Development Mechanism project, the project was successful long-term.

These results apply to local climate adaptation community champions in New England as well; champions considered the people and organizations that brought

Recommendation #4: Continue NHCAW workshops

One of the primary ways for champions to educate themselves was by attending workshops. More than half of the champions mentioned the role of a conference or lecture series in their education. Champions also mentioned the essential role conferences play in networking with their peers in other communities. In addition, in communities where NHCAW or NHCAW members have played a role in organizing workshops, the champions were extremely supportive of the work that had been done. The continuation of NHCAW workshops and conferences will support champions and community education efforts.

Recommendation #5: Continue to provide education in towns

Nearly all of the interviewed champions said that education in their community is a useful service, and the champions that have already had education efforts targeted in their community were very responsive to services.

Currently, the majority of NHCAW education efforts are targeted at municipal staff in towns, but champions stated that education for the general public would be most useful. While some champions did say there was still a need to educate municipal staff, select board members, council members and emergency response professionals within their town, it is recommended that education efforts begin to shift towards the public.

Recommendation #6: Bring technical professionals into towns

Nearly all champions stated the need for additional technical support in their towns. The primary needs were GIS and technical writing professionals to help look at changing floodplains, salt marshes, and sea-level rise as well as assist with writing the master plan and/or town ordinances. In addition, champions needed technical support for specific projects. For example, some communities needed assistance assessing the current stormwater infrastructure in communities, assessing the health and future projections of salt marsh communities or extending current projects into a second phase.

Recommendation #7: Enhance online education tools

Over half of the interviewed champions mentioned the use of online resources as a primary way they keep current with climate adaptation efforts. Because of the importance of online resources, it would be beneficial to better advertise the Storm Smart website and the NHCAW blog, both of which are useful tools for champions. It may also be useful to develop a NHCAW Facebook page; over 1.3 billion people frequent the social media site (Statistic Brain 2014) and adding a page would be an easy way to spread information to champions.

Recommendation #8: Connect champions with available resources

Most champions mentioned the need for technical resources such as GIS professionals and technical writers. Many regional planning commissions currently offer these services, but it appears that champions are not being connected with these resources. It would be beneficial for regional planning commissions to better advertise these resources and for NHCAW members to publicize these resources at events.

In addition, one champion asked for data about rain events in terms of reoccurrence in her community – information that the state has not provided. While this information is available online, it is not useful unless champions can be connected with it. Climate adaptation assistance providers need to find a more effective way to connect local champions with the information and assistance that is currently available.

Opportunities for Additional Research

How can we create new champions?

This study focused on meeting the needs of current champions but did not address the question, “How can we create new champions?” It appears that bringing new projects to communities provides an opportunity to create new champions who may not have become involved otherwise. Further research on this topic is essential, considering the important role champions play in moving forward with local climate adaptation efforts.

How can we support emerging (Level I) champions?

Assessing the role of emerging champions was beyond the scope of this study, but additional research on this topic may be valuable. Level I champions are individuals who have shown the potential to promote climate adaptation by educating themselves about the issue. It is vital to both identify and to better support emerging champions in communities.



Community members are concerned about the effects of severe weather and climate. They welcome opportunities to learn more and assistance to figure out what they can do about it. Photo by: Chris Keeley

document of a community’s vision and their priorities for the upcoming years. If the master plan is adjusted, does that lead to adaptation strategies being implemented on the ground? If the master plan is not adjusted, does it become more difficult to move forward with adaptation efforts? How difficult is it to change a master plan? Supplementary research addressing these questions and looking at the importance of adjusting a town’s master plan may be useful.

How can we best meet the new education needs?

As education efforts slowly shift from a municipal focus to a public focus, the questions emerge: How can we best meet the new educational needs? What is the best way to engage and educate the general public? Should the public educational efforts be action- or issue-based? A study looking at the most effective, highly attended public conferences and forums would be advantageous.

What is the role of the master plan in adaptation efforts?

Many champions identified the importance of adjusting the master plan to include their climate adaptation goals prior to moving forward with their climate preparedness efforts. Master plans serve as a written



Assessment of the Study: Personal Reflections

Throughout this research I have learned that champions, while similar in their needs, can best be assisted on a community-by-community basis. To most effectively provide support to a champion, initial consultations would be beneficial. I also found the differences in paid municipal staff champions and volunteer champions to be interesting. The primary driver for climate preparedness for the volunteer champions was to protect future generations and ensure public safety. The paid municipal staff champions looked at the issues specific to their communities and ranked public safety and economic costs as their primary reasons to move forward with adaptation efforts.

In my reflections, one interesting trend I noticed was that most champions were over the age of 40; although the issue of climate adaptation should be very important to younger generations – those in their 20s or 30s – there are very few young people who have decision-making roles in their community. More could be done to draw younger people to becoming engaged in addressing the issues that they will inherit, whether it be offering baby-sitting services at events or broadcasting town meetings on TV.

It would be beneficial to continue this study on a larger scale; while I found compelling trends from my research, I was only able to interview thirteen community champions. The sample group consisted of volunteers and paid municipal staff; no selectmen, city council members, businesspeople or public health officials participated in this study. Thirteen individuals are simply not enough to gain a full understanding of the needs that climate adaptation community champions have. A cost-effective way to reach a larger geographic audience (i.e., all of New England) and more diverse audience would be to develop and conduct a survey to send out to coastal community champions in the selected region.

While I recognize this study could be continued, I hope this research is useful for professional climate adaptation assistance providers and helps them to understand the best ways to provide assistance to local climate adaptation community champions.

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Appendix A: Climate Adaptation Champion Interview Questions

*1) What comes to mind when you think of climate change adaptation? The reason I ask is because sometimes communities are preparing for climate change without realizing it and climate adaptation can come in many different forms and at different stages.

*2) Have you started to do things differently in your community to prepare for climate change?

For example:

- Are you learning about changing climate conditions and its effects?
- Are you involved with helping to establish subcommittees or work groups related to this topic?
- Are you helping to change plans or policies to account for current or projected climate conditions?

3) What sparked your interest and led to you becoming involved in climate preparedness in your community?

4) What do you think are the main reasons your community should be preparing for climate change?

Clarifying Question: What changing climate conditions are you most concerned about: sea-level rise, changes in floodplains, more severe storms? Why do you think your community should be preparing: economic costs, vulnerable infrastructure, damage to ecosystems, threats to public health and safety?

- What do you see as the benefits of preparing?

5) What do you consider the most important advancement(s) your community has made toward preparing for the impacts of climate change since you've been involved?

6) What do you consider the biggest challenge(s) to your community making more progress with climate change preparations since you've been involved?

*7) What has surprised you the most about your community's approach to preparing for climate change during your involvement?

Clarifying Question: For example, is preparing for climate change a priority in your community or not on the radar? has it been easier or harder than you thought to make progress on this topic?

*8) How could professionals who are helping communities adapt to climate change (for instance, members of NHCAP) better support you and your community? For example, by providing education, information or access to local data, facilitation for public forums, opportunities to participate in specific projects, technical support for specific projects, networking opportunities or support through a peer network?

Clarifying Question: What is the most useful service on this list? Are there things these organizations offer that are not useful to you?

- 8a. Just honing in on the idea of the peer network: Do you think it would be useful for people in positions like you to meet up, discuss ideas and provide support? How often would this be helpful to you?
- 8b. Do you see a role for grassroots groups (local NGO) to support climate preparedness in communities? Can you give me some examples of how such groups or volunteers could help?
- *9) Is there someone (or multiple people) you consider a partner or ally in your efforts?
- What would be different about your community involvement with climate adaptation if this person (these people) were not doing what they do?
- 10) Who else should I talk to? Who are the “movers and shakers” in regards to adopting climate adaptation strategies in this town or surrounding towns?
- 11) Is there anything else you want to share?
- *Questions that all 13 champions were asked.

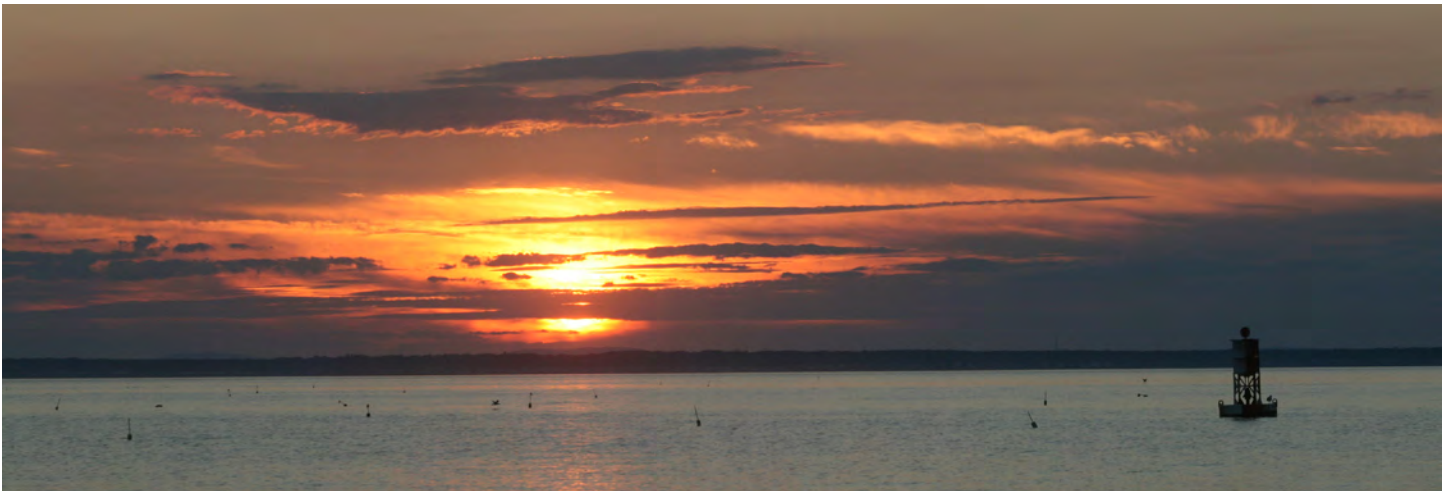
Appendix B: Climate Adaptation Efforts in Participating Communities

Town	Gather Info (Research and Assessment)	Build Capacity (Efforts to Increase Human, Technical or Financial Capacity)	Modify Planning	Change Regulations or Policies	Implement a Practice or Project
Storm Surge (Merrimack Valley Coastal Adaptation Workgroup)	N/A	<ul style="list-style-type: none"> Planned “Rolling the Dice with Big Storms” in Newburyport Held speaker series on climate change and adaptation New project for local artists to promote climate adaptation throughout their work Panel on climate preparedness in Newburyport Published articles in Newburyport Daily News and Newburyport Current about Plum Island, global warming and sea level rise 	N/A	N/A	N/A
Dover, N.H.	Participated in a research project about encouraging public dialogue on adaptation (MIT led)	<ul style="list-style-type: none"> Encouraging public dialogue on adaptation through role play project (MIT-led) Updating town website with relevant info 	Interested in adding a climate adaptation chapter to Master Plan	N/A	N/A
Durham, N.H.	Wrote a climate adaptation chapter in the Hazards Mitigation Plan	<ul style="list-style-type: none"> Hosted workshops about climate adaptation Put out information in “Friday Updates” Involved leadership team in writing the chapter on climate adaptation 	Preparing to add a climate adaptation chapter to Master Plan	N/A	N/A
Ellsworth, Maine	Project with the University of Maine and ME Sea Grant to look at culverts and stormwater infrastructure	<ul style="list-style-type: none"> Hosted education events with UME Post information about weather changes on Facebook 	N/A	Changed zoning ordinance to allow more density to zoning areas to reduce urban sprawl	N/A

Town	Gather Info (Research and Assessment)	Build Capacity (Efforts to Increase Human, Technical or Financial Capacity)	Modify Planning	Change Regulations or Policies	Implement a Practice or Project
Exeter, N.H.	Participating in UNH Climate Adaptation Plan for Exeter (CAPE) Project	<ul style="list-style-type: none"> Created a citizens working group Hosted workshops about climate adaptation 	Developing a climate adaptation plan through the CAPE project	N/A	N/A
Hampton, N.H.	Participated in PREP project using COAST to look at the impacts of communities from coastal storms	<ul style="list-style-type: none"> Keep the town website current with relevant information Created demonstration project (rain garden at the town library) 	Working to update ordinances to more effectively deal with sea-level rise	Wrote a warrant article changing zoning to reduce impervious surfaces	N/A
Newfields, N.H.	Involved in WISE project that looks at integrated watershed management and addresses storm water management	<ul style="list-style-type: none"> Hosted events (run by Chris Keeley) about climate change adaptation Held generic workshops on Master Planning addressing some weather related issues 	Interested in including climate adaptation into their Master Plan under the Land Use chapter	Established stormwater regulation plans and policies	N/A
Portsmouth, N.H.	Developed Climate Change Vulnerability Assessment with funding Gulf of Maine Council (through NOAA funding)-worked with UNH and RPC	<ul style="list-style-type: none"> Using the grant money for outreach initiatives (walking tour of vulnerability assessment) Host workshops involving vulnerability assessment 	Preparing to add a climate adaptation chapter to Master Plan	N/A	N/A
Rye, N.H.	Participating in Tides to Storms project	<ul style="list-style-type: none"> Host a four-part public engagement and education event 	Preparing to add a climate adaptation chapter to Master Plan	N/A	N/A
Seabrook, N.H.	Involved with PREP project using COAST to look at the impacts of communities from coastal storms	<ul style="list-style-type: none"> Have conversations with the civic association and village district to discuss what climate impacts are affecting them 	Updated Master Plan to include climate adaptation	N/A	N/A

Town	Gather Info (Research and Assessment)	Build Capacity (Efforts to Increase Human, Technical or Financial Capacity)	Modify Planning	Change Regulations or Policies	Implement a Practice or Project
York, Maine	Worked with the Southern Maine Regional Planning Commission and Maine Geological Survey to address adaptation to sea level rise	<ul style="list-style-type: none"> • Keep the town website current with relevant information • Held town meetings addressing the adaptation chapter, some of which were televised 	N/A	Included an “Adaptation to Sea Level Rise” chapter in the comprehensive plan	N/A

Note: The table above describes some of the progress communities represented in the study have made in climate preparedness as described by the interviewees. It does not represent all that has been accomplished in those communities.



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