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Case Study: Keene, New Hampshire Leading on Climate Preparedness

INTRODUCTION

In April 2000, as a member of ICLEI–Local Governments for Sustainability USA, Keene, NH, (pop. 22,000), began work on ICLEI’s Cities for Climate Protection campaign (CCP). As part of this effort, Keene developed and published a Local Climate Action Plan (CAP) with goals to lower community greenhouse gas emissions by 10% community wide and 20% internally, by the year 2015. The CAP was officially released in 2004 and was one of the first climate action plans in the state of New Hampshire.



Not long after completing the City’s CAP, severe flooding devastated the City, causing millions of dollars worth of damage. Recognizing that flooding events of this magnitude were only forecasted to get more severe and that there was a strong correlation between increased storminess and climate change, the City decided it was time to start a process to understand how Keene’s climate was changing and how these changes would likely impact the community. The results of their research created a clear impetus to begin formally planning for climate change: more frequent and severe flooding, changes in annual snowfall, infestation of non-native plants and animals, increases in the total number of high heat index days, and additional poor air quality days.

One of the first steps the City took was engaging with ICLEI to determine how best to structure a formal adaptation and resiliency planning process. The timing couldn’t have been more perfect – ICLEI was in the process of unveiling a pilot program to begin analyzing how local communities could begin preparing for climate change. The pilot program, now ICLEI’s official climate adaptation program called the Climate Resilient Communities (CRC) Program, provided the framework for Keene to begin the process of building local resilience to climate change:

1. Conduct local resiliency study (assessing local vulnerabilities and conducting a risk assessment)
2. Set preparedness goals
3. Prioritize preparedness actions and create a preparedness plan
4. Implement the preparedness plan
5. Monitor, evaluate, and re-assess



FORMING A PREPAREDNESS TEAM

To work through the CRC program, Keene convened a Climate Resilient Communities (CRC) Committee, and tasked the team with identifying climate change impacts, uncovering community vulnerabilities and opportunities, and establishing goals and preparedness targets. CRC Committee members included the Mayor, City Manager, department heads, City Council members, representatives from local colleges, members from the City’s existing CCP Committee, representatives of the Southwest Regional Planning Commission, and local representatives of the public health field. The team called on additional advisory support from ICLEI and the National Oceanic and Atmospheric Administration (NOAA) Regional Integrated Sciences and Assessment (RISA) program staff.

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ADAPTATION PLANNING IN ACTION

The CRC Committee's work started with the collection of regional climate change data from NOAA RISA offices, the Union of Concerned Scientists (UCS), University of New Hampshire, and other regional climate groups. The CRC Committee then analyzed how these changes in climate might lead to local impacts. To do this, each CRC Committee member considered their role within the City government, and was asked to identify how the services or infrastructure they managed might be vulnerable to climate change. Through this exercise, the following major sectors were identified as vulnerable:

- Buildings & Development
- Transportation Infrastructure
- Stormwater Infrastructure
- Energy Systems
- Wetlands
- Groundwater
- Agriculture
- Economy
- Public Health
- Emergency Services

One of the main priorities identified by the CRC Committee was increasing the resilience of Keene's built environment to flooding from more frequent and intense storms. While the City's Floodplain Master Plan and Flood Hazard Mitigation Plan specifically state development should be located above the 100-year floodplain, it may soon be necessary to redefine the 100-year floodplain due to changes in local climatic conditions. Specifically, New Hampshire expects to see less precipitation falling as dry snow and more as wet snow or sleet, which leads to more localized flooding and is heavier and threatening to the structural integrity of roofs in Keene.

Additional impacts identified by the City include less consistent weather patterns and large temperature fluctuations, causing additional freeze-thaw patterns that could increase the buckling of roadways. Removing ice on roads from flooding and ice storms requires more manpower, materials, and equipment than snow removal. Moreover, icy roads pose a threat to public safety and could impair emergency response services. Additionally, culvert capacity and the entire stormwater system were discussed as a known, current problem that would likely be exacerbated by changes in climate.



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Moreover, the City identified an increased threat for potential power outages due to severe storms that could bring down power lines or large increases in demand resulting from heat waves. Communication systems are also vulnerable due to a lack of land-line telephone use, dependence on cellular towers, and removal of public pay-phones by telephone service providers. CRC Committee members pointed out that many residents that use land-lines are using electric powered cordless phones that do not function during power outages. It was also noted that flash floods would cause erosion and damage to fragile areas of wetlands and additional floodwater sediment would cause decreased wetland function.

Economic impacts were also considered, finding that sugar maple and other plant species are shifting northward due to their inability to adapt to warmer temperatures. The overall brilliance of fall foliage, dependent on cold weather, could be reduced, subsequently reducing tourist numbers and the revenue generated through tourism. The ski and snowboard industry could face severe financial damage from decreased winter snowfall as well.

IDENTIFYING PREPAREDNESS ACTIONS

Once a comprehensive list of vulnerabilities to climate change had been identified, the CRC Committee held several meetings focused on identification of specific actions the City or individual departments could take to increase local resilience and/or seize on opportunities embodied within a changing climate. It became evident in these discussions that many of the actions identified to help increase local adaptive capacity, would also assist the City with meeting their greenhouse gas mitigation goals. An all-day “prioritization” workshop held by ICLEI helped Keene’s CRC Committee organize goals, targets, and recommended actions for short, mid, and long term planning horizons. The criteria used to rank potential actions included, “would action”: address impacts to local business, the environment, and the community; support existing initiatives; have a strong influence and high visibility; be easy to implement and cost effective; have both adaptation and mitigation benefits; and have pre-determined or easy to access funding.

From the prioritization exercise, the City identified approximately 35 measures for inclusion in its Preparedness Plan. Some of the measures include:

- Reduce the likelihood of structural damage resulting from increases in severe weather events by encouraging more pitched roofs and design standards, and identifying a 200-year floodplain and preventing future development in that area
- Create, adopt, and implement a City green building and energy code by 2012 that improves energy conservation by 25%
- Incorporate sustainable stormwater design and management techniques into all new development in Keene
- Reduce sprawl and impervious surface that threatens vulnerable natural areas
- Create alternative route options for movement of goods and people
- Develop a regional management plan for stormwater by 2015, through cooperation with the Regional Planning Commissions and all municipalities
- Adopt a Net Zero Runoff site plan requirement
- Identify areas that would allow for safe burial of existing power lines, and coordinate with road improvement projects in the Capitol Improvement Program
- Connect emergency centers with onsite and renewable energy sources
- Create a watershed management plan and protect aquifer recharge areas, to ensure water storage capabilities during drought conditions
- Develop a “Farmer’s Guide” and residential growers guide and increase local food production by 20% within five years
- Establish a scholarship program for people who lose their jobs snowplowing or sugaring and are in need of retraining
- Launch an emergency preparedness public outreach campaign
- Create an Economic Development Coordinator position within the City tasked with increasing the vitality and competitiveness of local business
- Continue efforts to mitigate climate change – thereby reducing the amount that the City will, ideally, have to adapt.

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KEENE TODAY

While Keene's adaptation efforts formally began in 2007, a leap to 2010 shows a City serious about preparing for climate change and leading the national charge in adaptation planning. Today, Keene has undertaken a step very few municipalities around the country (if any) have formally taken: integration of climate adaptation and climate mitigation into the City's Community Vision and Comprehensive Plan! This extraordinary effort demonstrates Keene's commitment to truly institutionalizing climate protection into every day operations.

In addition, Keene's efforts have also created a strong culture in the community around sustainability and climate protection efforts. This has created a sense of ownership in residents and local businesses around the need to both prepare for changes in climate as well as to reduce greenhouse gas emissions that are causing climate change. The City has also passed a hillside development and surface water protection ordinances and is looking to make changes to building codes to require more energy efficiency building stocks. Moreover, the City is also working to integrate climate adaptation concerns into the Capital Improvements Program – using it as criteria to evaluate any new infrastructural planning efforts.

LESSONS LEARNED

Keene's adaptation planning process highlights several important lessons learned. The first is that it's necessary to establish a regular meeting schedule for an Adaptation Committee and/or Preparedness Team, thereby enhancing the likelihood of strong attendance and active participation by team members. Additionally, it's important to have local experts and key stakeholders on your Preparedness Team/ Adaptation Committee to ensure that final efforts have the appropriate support, ownership and political buy-in to succeed.

Keene advises that adequate time be given for the development of an adaptation plan - several meetings may be needed for each task, such as identifying vulnerabilities and potential adaptation actions. Keene also recommends forming a relationship early on with a climate scientist, and appointing them to the team or ensuring they are regular participants in the process. Some communities may not have access to the same level of resources as others, but it is important to try to reach out to local university staff, state planning or department of energy staff, non-profit science organizations, or any other institutions that may assist with understanding of climate science. And, to the fullest extent possible, having local climate information will be more powerful than using regional or national climate data. Working with a local scientist can be the difference between understanding how changes will affect the region versus how changes will affect a given community in the region.

Keene also recommends clearly defining the process in advance, or at least having a general idea of how activities will progress and when to include the general public. Keene kept most of the initial process internal to the City government, but recognizes that in order to move adaptation efforts forward it will be essential to give the public opportunities for review and input. Keene notes that if financially possible, hiring a Sustainability Coordinator would help significantly to streamline the process and ensure appropriate stakeholder buy-in.

One final piece of advice offered by the City: Remember, climate adaptation and climate mitigation are not mutually exclusive. Doing both in tandem can provide numerous benefits and be a more effective use of limited financial and human resources. The importance of integrated adaptation and mitigation is clear in Keene's work: The City's number-one adaptation strategy is climate change mitigation.