



Keene, New Hampshire Climate Adaptation Action Plan Summary Report

PRESENTED BY THE CITY OF KEENE

IN CONJUNCTION WITH ICLEI - LOCAL GOVERNMENTS FOR SUSTAINABILITY



Acknowledgements

The City of Keene gratefully acknowledges the participation and efforts of the following people in this ICLEI pilot program, and in the creation of this plan. Our community is forever indebted to your continued commitment to creating a more sustainable and climate resilient Keene community.

CLIMATE RESILIENT COMMUNITIES COMMITTEE

Michael E.J. Blastos, *Mayor*

John MacLean, *City Manager*

Gary Lamoureux, *Fire Chief*

Arthur Walker, *Chief of Police*

Kürt Blomquist, *Director of Public Works*

Medard Kopczynski, *CBO, Assistant City Manager/Health Director*

James Duffy, *City Councilor*

Tom Wessels, *Professor, Antioch University New England*

Mary Jensen, *Sustainability Coordinator, Keene State College*

Nicolas Bosonetto, *Planner, Southwest Region Planning Commission (former)*

ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

Michelle Wyman, *Executive Director, ICLEI USA*

Megan Jamieson, *Executive Director, ICLEI Canada*

Margit Hentschel, *Regional Director & Climate Resilient Communities Program Director, ICLEI Western State Regional Capacity Center*

Kim Lundgren, *Regional Director, ICLEI Northeast Regional Capacity Center*

Jim Yienger, *Director, ICLEI Policy Institute, Washington, D.C.*

Katherine Jarvis-Shean, *Regional Program Assistant, ICLEI*

PLANNING DEPARTMENT STAFF

Mikaela L. Engert, *Planner*

Jessica Bunker, *Planning Department Intern*



SPECIAL THANKS

Senator Judd Gregg, (R) New Hampshire
Keene City Council

Sarah Ward, *Cheshire Medical Center Public Health Network Coordinator*

Fred White, *Disaster Behavioral Health Response Team Coordinator*

Dave Brown, Kirstin Dow, Josh Foster, Amy Snover, and Cameron Wake, *NOAA-RISA Climate Scientists*

Keene Cities for Climate Protection (CCP) Committee

*Planning
for
climate
change
is about
making
choices.*

Introduction

Keene has a long, steadfast history of climate protection. In April, 2000, the City signed onto the Cities for Climate Protection® Campaign (CCP), administered by ICLEI—Local Governments for Sustainability (ICLEI). Since agreeing to participate in the CCP Campaign, the City of Keene has developed a Local Action Climate Plan to identify ways in which the greater Keene community can assist in lowering greenhouse gas emissions. The City, led by its CCP Committee, has developed processes and implemented projects to ensure that they are on track to meet their greenhouse gas emissions reduction goal of 10% below 1995 levels by 2015. Keene reaffirmed this commitment in its Community Goals of 2003.

Despite the City's commitment to mitigation, the impacts associated with a changing climate area already being felt in Keene. From more frequent and severe flooding, to changes in annual snowfall amounts, to the infestation of non-native plant and animal species, to the increase in total number of high heat index days and more numerous poor air quality days, the City has come to recognize that these changes are ultimately impacting the community's built, natural, and social environments.

To address these changes, the City of Keene has committed to expanding climate protection efforts to include climate adaptation. Over the past year and a half, the City of Keene has engaged in a multi-stakeholder progressive action planning process designed to create a Climate Resilient Community. The Adaptation Action Plan, of which this report is a summary, is the result of that process and provides recommendations for community policies, goals, and targets to improve preparedness in the face of predicted climate impacts. The first step Keene took in this process was to partner with ICLEI and join the Climate Resilient Communities™ (CRC) pilot Program, the first of five U.S. cities to do so.

ICLEI's CRC program helps local governments protect their communities from the impacts and costs associated with predicted climate change by providing adaptation planning processes and links to updated climate science tools. Planning for climate change is about making choices that will affect short- and long-term energy security, food security, air quality, public health, employment, and overall economic welfare. Keene developed a Climate Adaptation Action Plan to provide guidance on how to best assess,



prioritize, and integrate adaptation measures into their existing climate protection efforts. Around the same time that Keene began its initiative, the Climate Impacts Group, the University of Washington, and King County, Washington, were developing *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments*. This guidebook is a great resource for future integration of Keene's Adaptation Plan.



For ICLEI, climate preparedness and climate protection—adaptation and mitigation—are equally essential for ensuring community health and quality of life. Cities that have realized financial and public health benefits from reducing global warming pollution also stand to gain from the financial, health, and public resilient benefits of creating a climate resilient community. Mitigation and adaptation can be complementary strategies and ICLEI's CRC program is designed to work in concert with its successful CCP Campaign. Keene, NH was the first city to engage in ICLEI's CRC pilot program.

This summary report represents a snapshot of climate issues and concerns, current climate science, expected climate changes and impacts in the Northeast and New Hampshire, and the City of Keene's short- and long-term goals and targets for adapting to climate change. The purpose of this document is to:

1. Aid Keene's progress in enhancing its resiliency to the impacts associated with climate change as well as with its overall planning protection efforts.
2. Highlight ICLEI's Climate Resilient Communities Program process.
3. Offer an example to other communities to learn from as they embark on their adaptation planning efforts.

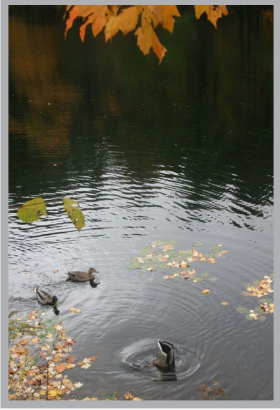
The content of Keene's CRC Action Plan Report was developed by a multi-stakeholder committee consisting of various municipal, community, and regional representatives. This group was supported by ICLEI and the National Oceanic and Atmospheric Administration (NOAA) Regional Integrated Sciences and Assessment (RISA) staff.

The CRC Milestones process is designed to focus on three key community systems: the built, the natural, and the social environments that collectively provide the key services or activities within a community or region. Working within these three systems, there are five key milestones to creating a climate resilient community:

1. Initiate a Climate Resiliency Effort
2. Conduct a Climate Resiliency Study
3. Develop a Climate Resilient Action Plan
4. Implement a Climate Resilient Action Plan
5. Monitor, Motivate, and Re-evaluate

By completing this report, Keene is the first community to complete Milestone Three as a pilot city for ICLEI's Climate Resilient Communities Five-Milestones planning process. What follows are the steps in the process:

Milestone 1



INITIATE A CLIMATE RESILIENCY EFFORT

The first step Keene took in designing their staff working team was to convene a climate adaptation committee (CRC Committee). The committee's purpose was to identify climate change impacts, identify community vulnerabilities and opportunities to those impacts, and establish goals and targets to achieve resiliency. For the City, the CRC Committee consisted of the Mayor, City Manager, department heads, City Council members, representatives from the college community, CCP Committee, Southwest Region Planning Commission, and stakeholders from the public health field. This group was also supported by ICLEI and the NOAA RISA staff.

The initial CRC effort was kicked off with a press event and a two-day training for municipal, community, and regional representatives. ICLEI facilitated the training with the assistance of nationally recognized climate scientists. The goal of the training was to provide the Keene community the latest data on climate science and predicted impacts for the region. The training also provided an opportunity for the CRC Committee to begin to think about sectors and which would be most impacted by a changing climate.

Milestone 2

CONDUCT A CLIMATE RESILIENCY STUDY

In order to put the climate science into action, the next step was to assess the regional impacts predicted in the Keene area.

As temperatures rise around the planet due to global warming, local governments will be the first to confront the impacts of climate change. Weather patterns will bring more powerful natural disasters and make changes to the climate that will require changes in the way cities plan for the future. Over the next 20 years, rising global temperatures will impact the way cities manage land use, energy use, flood control, agriculture, fisheries, water usage, disaster planning, and many other aspects of regional planning.

The City of Keene has experienced the direct impacts forecasted to be a result of climate change—from more frequent and severe flooding, to changes in annual snowfall amounts, to the infestation of non-native plant and animal species, to the increase in total number of high heat index days and more numerous poor air quality days. These changes have ultimately affected the community's built, natural, and social environments.

The CRC Committee utilized this updated information, and their expertise on Keene's existing vulnerabilities, to brainstorm all of the possible impacts associated with these changes. The Committee examined impacts within each environment and developed scenarios for what the impacts could be. This exercise allowed the Committee to develop a significant list of potentially impacted areas that would require action to increase resiliency.

Milestone 3

DEVELOP A CLIMATE RESILIENT ACTION PLAN

The bulk of the CRC process was to identify the City's opportunities to enhance its resiliency to a changing climate. The Climate Resiliency Study process described in Milestone 2 and a prioritization exercise allowed the Committee to identify the following list of climate adaptation opportunities and goals. *(For a detailed listing, including targets for each goal, please see the full report, entitled "Adapting to Climate Change: Planning a Climate Resilient Community.")*

Over the next 20 years, rising global temperatures will impact the way cities manage regional planning.

Keene's Climate Resilient Action Plan

SECTOR 1: THE BUILT ENVIRONMENT

Opportunity: Building and Development

Goal A: Reduce the likelihood of structural damage resulting from predicted increases in severe weather events. Includes incorporating design standards; identifying a floodplain; continuing research; and creating educational opportunities.

Goal B: Create, adopt, and implement a City building and energy code that incorporates sustainability, green building materials, and energy conservation principles by 2012. Includes researching other, similar codes; improving conservation standards; gathering input from key stakeholders; and exploring the use of alternative building materials.

Goal C: Make all new development in Keene "green" (i.e., sustainable). Includes building a green building to serve as an example of sustainable building methods; incorporating sustainable stormwater design; and lessening the ecological footprint of municipal and public buildings.

Goal D: Lower the ecological footprint of existing buildings. Includes updating the City code to include green building standards; offering options and incentives in the building and energy code for developers and homeowners; and updating the City's infrastructure standards.

Goal E: Reduce sprawl and promote infill development/redevelopment. Includes developing areas that have infill or redevelopment potential; adopting smart growth principles; revising conservation subdivision regulations; and devising incentives to foster infill development in areas within the City that have been identified as being at low risk for flooding.

Opportunity: Transportation Infrastructure

Goal A: Create alternative route options for movement of goods and people. Includes identifying alternate transportation routes and modes for emergency situations; and incorporating a grid system into future street layout patterns.

Goal B: Design and reconstruct roadways to handle changes in temperature and precipitation as a result of a change in climate. Includes changing design requirements for new or refurbished roadways; and exploring heat- and cold-resistant roadway materials.

Goal C: Provide sustainable transportation mode choices (locally and regionally). Includes identifying and implementing Transportation Demand Management (TDM) techniques; increasing multi-modal trail infrastructure throughout the City; developing a local public transportation system that connects with the regional one; and lobbying policy makers to make changes in transportation policy.

Opportunity: Stormwater Systems

Goal A: Safely and efficiently remove stormwater from the built environment. Includes creating a regional management plan for future stormwater runoff levels; implementing green streets and sustainable infrastructure programs; assessing the need for new culvert capacity in the City; including the reassessment of stormwater infrastructure into the City's Comprehensive Master Plan and Capital Improvement Program; reassessing existing dams; coordinating stormwater, utility, and streetscape improvements to occur in sync with the City's capital improvement schedule for road repairs; and identifying stormwater treatment and management standards.

Goal B: Decrease stormwater runoff and flash flooding. Includes making innovative storm water design requirements (on and off site) part of site plan requirements; adopting a Net Zero Runoff site plan requirement; and identifying areas where increased infrastructure capacity is needed to hold/divert water.



Opportunity: Energy Systems

Goal A: Decrease the ways in which energy supplies could be interrupted. Includes identifying low-risk areas that would allow for the safe burial of existing power lines; and establishing the requirement that new construction builders bury utilities during the construction phase.

Goal B: Increase the resiliency of emergency energy systems. Includes connecting emergency centers with onsite renewable energy sources.

Goal C: Increase municipal and community energy security, use of renewable resources, and overall energy efficiency. Includes providing 50% of municipal and community energy needs locally through local renewable energy resource development; decreasing municipal and community energy consumption by 25% and greenhouse gas emissions caused by the production of energy by 75%; creating a wind assessment specific to Keene and installing a wind generation facility if feasible; incorporating solar hot water heating into 20% of households; incorporating passive solar, micro hydro, geothermal, and micro wind into residential and commercial development and zoning codes; providing training for developers and designers to include technologies such as wind generation, solar, and geothermal into development design; expanding the City's green fleets program; and developing alternative energy supply demonstration projects.

Goal D: Engage energy providers to enhance local renewable generation opportunities. Includes encouraging the state to increase the amount of renewable energy produced in the state and to keep that energy in the state; and providing incentives for the development of renewable energy resources.



SECTOR 2: THE NATURAL ENVIRONMENT

Opportunity: Wetlands and Sub-surface Waters Protection and Management

Goal A: Increase the protection of existing and future wetlands to maintain the ability of these systems to naturally recharge aquifers and decrease stormwater run-off. Includes developing a wetlands management strategy; identifying the hydrologic areas; incorporating wetland and sub-surface waters protection into the comprehensive master plan; and updating all relevant City standards to consistently support the protection of wetlands and sub-surface waters.

Goal B: Educate the public about wetland protection as a climate adaptation strategy.

Includes developing a guide for homeowners, developers, architects, etc.; devising a public outreach campaign/presentation; and incorporating wetland education into Earth Week and Community Planning Month activities.

Goal C: Increase Keene's water storage capabilities in the face of drought conditions. Includes creating a watershed management plan; protecting aquifer recharge areas; and devising greywater storage and reuse systems to recycle and utilize water resources more efficiently.

Opportunity: Fauna and Flora

Goal A: Integrate into recently published state wildlife action plan. Includes aligning City policies to support goals of New Hampshire wildlife action plan.

Goal B: Protect habitats and migration routes. Includes identifying potential animal migration routes, and coordinating installation of crossing route protection infrastructure; developing a habitat protection program; and establishing conservation-related standards for rural development.

Goal C: Devise land use regulations to preserve forests. Includes requiring sustainable forest management plans for all commercial logging conducted in the City; and creating a ban on clear-cutting existing forested areas for building lots in the City, and standards for preparing a forested site for development.

Opportunity: Agriculture

Goal A: Increase Keene's food security. Includes developing a food security plan for Keene, and incorporating it into planning efforts; creating a local food security baseline, and increasing local food production by 20%; and identifying and protecting prime agricultural soils.

Goal B: Research and identify what crops will be productive in the region with a warmer climate and changing soil composition. Includes identifying research currently underway; and developing a "Farmer's Guide" and a residential grower's guide to identify appropriate crops.

Goal C: Encourage value added economic activities for agricultural products. Includes developing a micro/incubator business program focused on agriculture and value-added agricultural products; creating wood processing opportunities locally; creating co-generation opportunities locally; developing a downtown food co-op; linking local farmers with food-related businesses within the community; and devising a public education campaign to link the public with establishments that support local farms.

SECTOR 3: THE SOCIAL ENVIRONMENT

Opportunity: Economy

Goal A: Create support services for people who lose their jobs (e.g., snowplowing, sugaring) as a result of climate change. Includes establishing retraining, scholarship, and loan programs; and preparing for possible in-migration of affected coastal populations.

Opportunity: Public Health

Goal A: Increase public awareness about the public health implications of climate change, including risks and the need for emergency preparedness. Includes providing public education on mosquito and tick protection and disease prevention, emergency preparedness, and how to handle flood emergency situations; identifying various vector control methods and policies to apply those methods; and anticipating the arrival of new vectors and associated diseases, and identifying alternative methods to control or eradicate those vectors.

Goal B: Train and Educate Emergency/Human Services/Public Health officials and workers. Includes establishing training programs for public health workers to deal with the emotional aspects associated with loss of life and property caused by extreme weather events; and establishing a support system to identify and manage emergency worker burnout.

Opportunity: Emergency Services

Goal A: Improve the reliability of emergency communications during severe weather events. Includes taking an inventory of the telephone land-line availability in local businesses and private residences; and identifying community communications vulnerabilities and options.

Goal B: Increase community communication for emergency events. Includes devising and coordinating a county-wide system to communicate emergency information; addressing loss of cellular service and identifying means of communication that can be used when conventional systems are down; and identifying a process and/or chain of command for communication.

Goal C: Increase the ability of the public to respond/recover from extreme weather events. Includes increasing public awareness of extreme weather event resources; designating convenient, reliable shelters for extreme weather events; creating excessive-heat/cold weather emergency policies; establishing a Reverse 911 automated call-back system; establishing how to create and then disseminate information to the public for new extreme-weather related emergencies; identifying a waste management program for debris; identifying distribution points for life-essential goods and services; and creating programs to provide assistance beyond the event.

Goal D: Continue to train and educate staff and the public regarding current and future diseases and associated vectors. Includes increasing special funds for training, monitoring, and education.

Opportunity: Promote a Local Climate Appropriate Economy

Goal A: Support environmentally sustainable businesses and economy. Includes rewriting zoning code and land development regulations; providing incentives for businesses to locate in Keene that produce sustainable and environmentally friendly products or that utilize sustainable principles in their production processes; and creating an Economic Development Coordinator position within the City.

Goal B: Increase the vitality and competitiveness of local business. Includes identifying economic development policies and goals that incorporate sustainability, and seeking out businesses that meet those goals; supporting business incubators to bolster local business development that provides “niche” services or products that are environmentally friendly; providing assistance in the creation or identification of markets for sustainable businesses or their products; creating a media package that invites target companies to locate in Keene and highlights Keene’s commitment to the environment and sustainability; and creating a way-finding system to increase ease of movement and access to key areas of the City via alternative transportation modes.

Opportunity: Food Security

Goal A: Support local agricultural economy. Includes taking inventory of, mapping, and updating existing farms; increasing local food production by 20% within five years of establishing a baseline of community food production; doubling the size and number of community gardens; protecting 10% of unprotected lands; identifying plants that will be compatible with future projected climate and soil conditions; educating the community about the relationship between food production and greenhouse gas emissions that contribute to global warming; providing the local farmers’ market with a permanent space; coordinating City events with farmers’ market days; and discouraging the development of open space areas that could be utilized as agricultural land.



*By engaging
in future
partnerships,
the City
can help
strengthen
the ability
to move
forward as a
community.*

Milestone 4

IMPLEMENT A CLIMATE RESILIENT ACTION PLAN

Based on the Committee meeting discussions and the results of the whole process, the CRC Committee recommends the following steps for the City to initiate to successfully begin the implementation of its climate adaptation planning efforts:

1. To highlight the need for integration among mitigation and adaptation efforts, the City should formally recognize this document and the CCP Action Plan as the City's "Climate Protection Plan."
2. Allow for public input about climate change and sustainability in the comprehensive master planning process and include all relevant portions of this plan in the comprehensive master plan, as the City's guiding document.
3. Devise a financial strategy to support the creation of a Municipal Sustainability Coordinator position.
4. Create an internal team within the City government to spur departmental integration and implementation of adaptation measures.
5. Further prioritize and assess actions to pursue first, costs for implementation, and funding sources.

Milestone 5

MONITOR, MOTIVATE, AND RE-EVALUATE

While this document is intended to support and inform the City's land use planning, policies, growth and development, capital improvement program, and planning decisions for the next decade, it is also meant to be flexible in meeting the changing needs and desires of the community. Any current and all future planning efforts and City policies should incorporate and refer to this document when they are updated to ensure continuity in purpose and to ensure that these goals are carried forward. More importantly, the community has an opportunity to provide input and guidance about climate change and sustainability in general, as well as to include all relevant portions of this plan into the City's comprehensive master planning process.

In addition, Keene has a history of collaborating with the public school system and institutions of higher learning by providing educational programs that have demonstrated an increased sense of environmental stewardship among students and educators. By engaging in future partnerships that provide educational tools and opportunities that focus on facilitating climate adaptation efforts, the City can help strengthen the ability to move forward as a community in realizing, and building from, all the goals described in this plan.



Conclusion

The City of Keene is already practicing many climate protection strategies. Much of this document lays the foundation for Keene to move forward with a public process and further refinement of its climate change and overall sustainability goals. Another important process Keene is preparing for is a comprehensive master plan update, wherein the community, City, and other local and regional stakeholders will play a major role in setting the course for Keene's future. This document should be utilized in that process and incorporated accordingly into the comprehensive master plan in order to coordinate policy, make land use decisions, identify capital improvement projects, and establish funding priorities. It provides the framework to ensure current—and future—preparedness strategies in the face of climate change.



FOR MORE INFORMATION:

ICLEI - Local Governments for Sustainability

436 14th Street, Suite 1520

Oakland, CA 94612

510.844.0699

www.iclei.org/us

