Forest and Water Climate Adaptation:

A Case Study for the Ashuelot River Watershed, New Hampshire

The Sustainability Project
Emerson Brook Forest

Model Forest Policy Program
Cumberland River Compact

Foreword

In 2010, the Model Forest Policy Program (MFPP), the Cumberland River Compact, and The Sustainability Project came together to create a climate adaptation plan for the community of Keene, New Hampshire and the Ashuelot River Watershed. It came about because MFPP recognized the critical need for increased local community resilience to address the impacts of climate change by conserving forest and water resources. This case study for the Ashuelot River Watershed climate adaptation plan describes the results of a year of community team effort, deep and broad information gathering, critical analysis, and thoughtful planning. The Sustainability Project took the local leadership role to engage with the Climate Solutions University: Forest and Water Strategies program (CSU) and lead their community toward climate resilience with an adaptation plan that addresses their local climate risks, fits their local conditions and culture, and takes advantage of identified opportunities. This achievement was made possible with the guidance and coaching of the CSU created by the Model Forest Policy Program in partnership with the Cumberland River Compact. The goal of CSU is to empower rural, underserved communities to become leaders in climate resilience using a cost effective, distance-learning program. The result of this collaborative effort is a powerful climate adaptation plan that the community can support and implement in coming years. The outcome will be a community that can better withstand impacts of climate upon their natural resources, economy and social structure in the decades to come.

Acknowledgements

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The team that created the CSU program includes Gwen Griffith, Toby Thaler, Will Paddock, Margy Hall, Todd Crossett, Katie Schmitz-Eulitt, Nancy Gilliam, Dan Schmit, and Jeff Morris.

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EXECUTIVE SUMMARY

In 2009, Model Forest Policy Protection (MFPP) obtained a grant from the Kresge Foundation to help rural underserved communities develop climate adaptation plans with a focus on forests and water resource resiliency. MFPP, in cooperation with the Cumberland River Compact, set up the Climate Solutions University: Forest and Water Strategies program (CSU). In early 2010, CSU selected Keene, New Hampshire as one of six communities throughout the country to participate in a one year learning, active engagement and planning process. The Ashuelot River Watershed Climate Adaptation Plan was the result of Keene's participation in the CSU. This case study describes the planning process.

The CSU followed a four-step process based on *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments.*[1] These steps are:

1. The Community Decides to Take Action and Forms a Team
2. An Assessment Is Conducted of Local Forest, Water, Climate, and Related Economic Vulnerabilities and Opportunities
3. Local Strategies, Recommendations and Action Plans Are Developed
4. The Team Builds Public Support and Prepares for Implementation

The Model Forest Policy Program's CSU has been one of the best climate change initiatives to happen in the Monadnock Region of Southwestern New Hampshire because it "filled in the gaps" of other policy and action planning work to date. This region of New Hampshire has been a leader in the Climate Change response planning. However, prior plans have lacked aspects that address natural resources with specific policy recommendations. We believe that the work accomplished by the Sustainability Project has bridged this gap between assessment and actions and will become a model for the region and state.

We started the process with the mobilization of some of the best organizations, agencies, experts, leaders, and officials we knew would have some influence and make a difference. From this brainstorming exercise we assembled an ad hoc team of advisors to embark on this project that would take us on a through re-evaluation/assessment of our region's forest and water resources in light of climate change. The one consistent thread that we all agreed upon was that it was time to commit to a common message throughout all groups and missions so that a focused message would be delivered to the region.

Through our assessment we learned that, compared to other regions, Southern New Hampshire has some large expanses of relatively intact ecosystems that we wished to preserve. Through

[1] Snover, A.K., L. Whitely Binder, J. Lopez, E. Willmott, J. Kay, D. Howell, and J. Simmonds. 2007. *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments*. In association with and published by ICLEI – Local Governments for Sustainability, Oakland, CA.

decades of hard environmental work, and a commitment to a shared vision it is our hope to not only keep the natural resources intact but to design a future that will ensure this same or better quality into the future.

The structure of the CSU project was well thought out with a blueprint for how to move through this process. The initial commitment from the team members was to share lessons from forest and water protection projects already completed or under way, assist in the evaluation of current resources, identify key landscape regions considered critical to protect, share in future anticipated projects, and help strategize goals for this new policy initiative.

INTRODUCTION

The author and project leader, Tom Sintros, has worked on climate change initiatives for almost two decades and welcomed this new Climate Solutions University by the Model Forest Policy Program as a fresh approach to solutions now and into the future. Tom first received information regarding this grant possibility from The Climate Project. Having worked with Al Gore twice in the past and being trained as a presenter following the release of An Inconvenient Truth, Tom has given more than thirty Climate Change presentations since that time and has consulted with numerous environmental groups. He views this work as being of the utmost importance and plans to continue to work on related aspects of this issue.

Some of the regional groups and initiatives that we have been involved with to date include a founding board member of the Cities for Climate Protection in Keene, Clean Air Cool Planet, the Carbon Coalition, the Nature Conservancy, the Monadnock Conservancy, Friends of Open Space, Southwest Region Planning Department, New Hampshire Fish and Game, The Department of Forest and Lands, the Society for the Protection of New Hampshire Forest, Ashuelot Valley Environmental Observatory, Harvard University Center for the Environment (HUCE) in conjunction with the Annenberg Group (The Habitable Planet), and numerous towns, cities and universities. This partnership seemed to be one more logical step to continue with meaningful work regarding climate change education.

Tom Sintros served as project leader on a volunteer basis, in addition to full-time work in public education. Rather than apply through his school district in the Monadnock Region, he decided to apply through The Sustainability Project of the Emerson Brook Forest, a grass roots organization for the protection of natural resources in the area over the last two decades. The Sustainability Project supported his work as project leader by providing policy and editorial support, as well as a base in the community's conservation history.

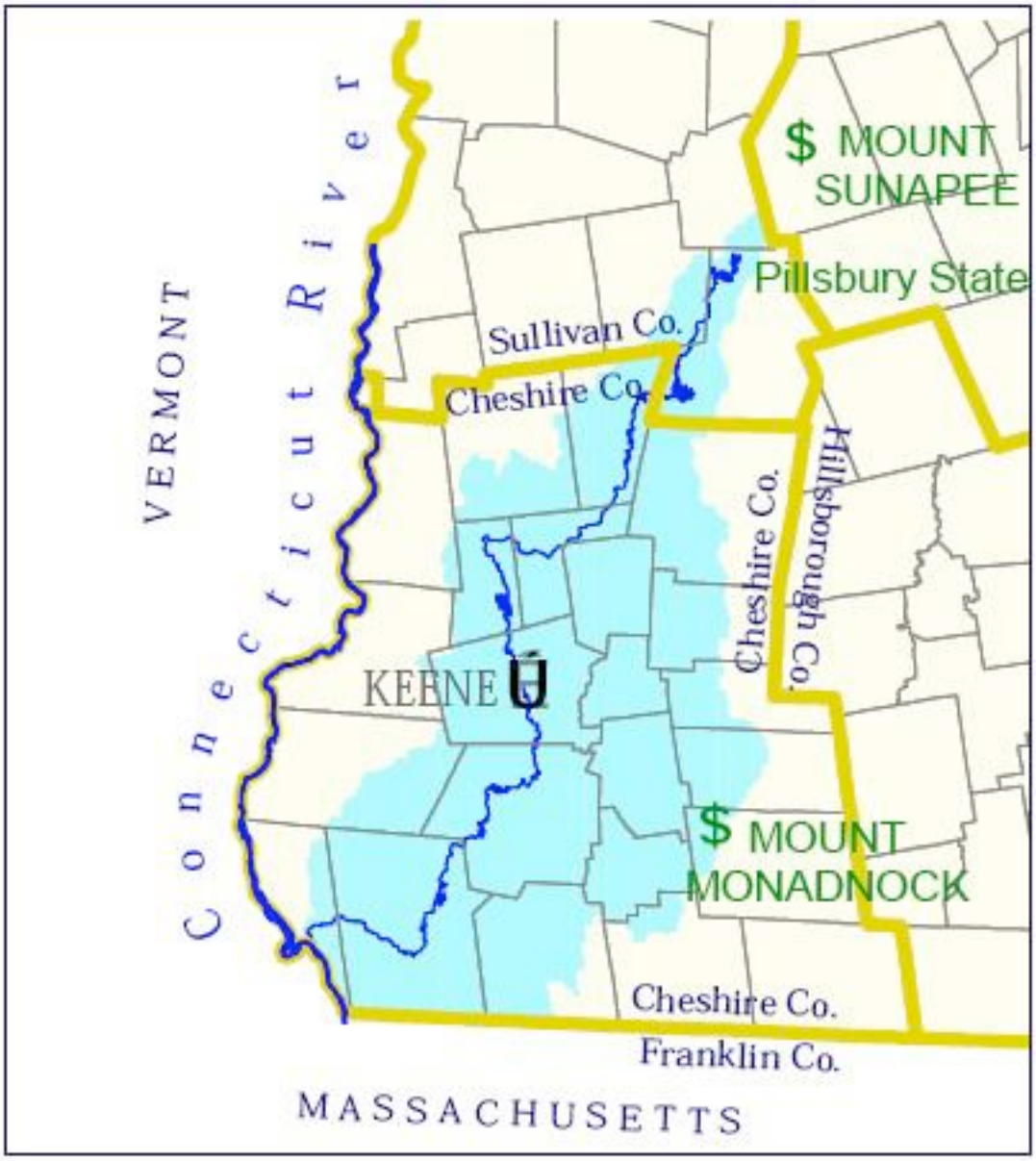
COMMUNITY CONTEXT

The Ashuelot River Watershed, a major tributary of the Connecticut River, lies almost wholly within the boundaries of Cheshire County, located in the southwestern corner of New Hampshire. The regional population is approximately 75,000 – 80,000, in thirteen towns and the city of Keene. The economy of Cheshire County has some small manufacturing industries but is predominantly a service economy with a strong focus on outdoor recreation.

OVERVIEW OF CLIMATE RELATED CHANGES

The City of Keene, Southwest Region Planning Department, the University of New Hampshire, the Department of Environmental Services and other related organizations have, over the years, prepared a historical and current climate

analysis and have made model projections for the expected impacts into the future. The Sustainability Project used these reports along with more recent evidence to establish an understanding of climate change and how it will influence the natural resources of the watershed.



Summary of Climate Related Changes

Temperature: Cheshire County has warmed about two to three degrees over the last century and is expected to increase another two to three degrees by the end of this century. Winter temperatures have increased slightly overall and summer temperatures have seen extreme heat events with several days above ninety-five degrees. Winter temperatures have shifted to more cold days before the end of the year but with generally warmer days from January on, which used to be the coldest months historically. Warmer spring temperatures have moved in sooner than before.

Precipitation: Total precipitation has remained relatively consistent over a yearly average during the last century but has come in more extreme events, with two to three 250-year flood events occurring in a matter of five years. Snow has decreased but the episodes of ice storm events have increased by noticeable amounts. Short but more frequent drought events have also increased as well.

Stream Flow: Regional hydrographs have shown some minor yearly changes but have definitely indicated major fluctuations compared to past records.

Local Observations: Over the course of this project, team members and other advisory groups have identified many changes related to climate change, including:

- More intense weather events
- Season "shifting"
- Increased overall temperatures
- Irregular hydrological measures
- Reduced snow cover with earlier spring runoff and ice-outs
- Early migratory wildlife sightings
- Increased invasive species, pest and disease

COMMUNITY IMPACTS AND VULNERABILITIES

The Sustainability Project ad hoc team identified many areas of impact but focused on three main areas, forest, water and aspects of economics that were directly or indirectly related to the previous two.

Summary of Ashuelot River Watershed Vulnerabilities

Forest:

- Increase loss of forest/tree cover due to development
- Increase of disease, pest and invasive species
- Reduced overall forest health
- Reduced extractive reserves, maple sugar products, etc.
- Early seasonal leaf changes with reduced vibrancy
- Increased riparian damage from extreme stream flow events
- Reduced carbon sequestration
- Reduced wildlife corridors

Water:

- Increased storm/flood events
- Reduced snow-cover

- Reduced ice/lake coverage
- Irregular hydrologic systems
- Earlier spring run-off

Economics:

- Early mud seasons, reduced forest products
- Reduced ski days
- Reduced recreation and related economic activities
- Extreme weather event cost
- Reduced maple sugar harvest

SUMMARY OF 4 STEP PROCESS TO DEVELOP A CLIMATE ADAPTATION PLAN

Step 1: Deciding to take action and building a team

The Sustainability Project has worked to preserve area forests and maintain their provided ecosystem services. The CSU program presented itself as an opportunity to build on previous plans.

Putting a team together proved to be a relatively easy task due to the experience and past connections members of the Sustainability Project had cultivated over the last two decades. Representative members of all regional and state environmental organizations were contacted via email, phone and in person. The response was overwhelmingly positive and while some were unable to fully commit to being active board members, all were willing to be available on an advisory capacity.

We quickly assembled a team of twenty-eight individuals from the following organizations:

- City of Keene Planning Department
- Southwest Region Planning Commission
- Monadnock Conservancy
- The Nature Conservancy
- Clean Air Cool Planet
- Army Corp of Engineers
- State Department of Environmental Services
- UNH Cooperative Extension Service
- Society for the Protection of New Hampshire Forest
- Ashuelot River Local Advisory Council
- Antioch University
- Andora Forest

- Vision 2020 Organization (Dartmouth-Hitchcock/Cheshire Medical)

Team meetings were held monthly with some special meetings called to address specific assessment needs. Members of the team also presented at state and regional climate change events and became one of the six state models for regional adaptation initiatives. Materials from the CSU were used as a template with adjustments for a more local perspective.

In retrospect, there could have been more representation from local business leaders, public officials and town selectpersons or conservation commission members. To adjust for this aspect of team building "weakness" we have structured an offer to provide continuous education to these underrepresented groups as the plan is implemented.

Step 2: Assessment process and findings

This part of the process proved also to be less difficult than anticipated since numerous documents have been produced over the last decade that address many of the needed forest and water assessment issues. The core of information from these documents gave us a strong base on which to build. Members of the team then conducted personal interviews of engineers and other agency personnel to update and supplement existing information. Forest data proved to be the most difficult since there were too many different sources and inconsistent reporting frameworks. This issue helped drive one of our main goals of the action process, to create a common reporting standard for the forest industry in New Hampshire.

Economic information came from the state Department of Environmental Services and Department of Resources and Economic Development.
Much of this data and assessment information was state-based but had direct connections to the economy of the southwestern region.

We learned much about the region including:

- Public vs. Private land holdings
- Conservation initiatives planned
- Forest coverage data and overall health
- Water quality data and concerns
- Economic concerns
- Hazard events and cost
- Forest health concerns
- Forest practices

The assessment piece was completed through direct communications with many organizations both local and state. (Keene Planning Department, SWRPC, SPNHF, UNH Coop Ext. Service, Hubbard Brook Forest Research Center, local land trust, the Nature Conservancy, etc.)

The main challenges we encountered during the assessment piece were getting full engagement from the forest industry and related groups. Forest policy is a difficult issue in any state but New Hampshire has a long-standing history of very effective forest industry advocacy in state policy making. Any engagement from groups "outside" the logging family seems to be perceived as obstacles to their profession and income. The up side of this initiative is that members of our team carried our messages and concerns for improved forest practices.

While specific policy changes may be far away, many concerns were adopted into the formation of new "best management practices." Part of the future implementation efforts will be addressing this particular issue. One possible avenue we will pursue is an indirect approach through the state Department of Fish and Game's Wildlife Action Plan (WAP). They have embraced our work and we were the only "out of agency" group to be invited to a major forum to revise the WAP base on climate change findings. This "habitat" approach may be the best vector to make inroads into the insular world of New Hampshire (and New England) forestry. It is our plan to continue to cultivate these relationships. Beyond this "setback" in the realm of forest information, all other parties were in full cooperation with all our requests and work.

Step 3: Strategy development and action plan

The plan template provided by the CSU project was a good basic structure for organizing the information. Our team could have utilized it better. Looking at other formats or templates might have been helpful. While many team members contributed to the collection of assessment information, it would have been helpful if more had been involved in the organizational structuring and preparation of the final report.

For this step we tried to create a document that could be unique and stand on its own but one that did not duplicate much of the work that had been done by other organizations. Keene had already produced a Climate Action Plan, a Greenhouse Gas Emission Inventory and most recently a Climate Adaptation Plan. It was apparent to us that there was a need for more specific action recommendations regarding natural resources protection, mitigation and adaptation to move toward a more climate resilient community.

Our strategy involved an extensive review of these already adopted documents, interviews of the authors of the works and discussion regarding the goals of these reports. It became apparent that only some of the proposed actions identified and suggested had become part of policy and that many had not been acted on to date. That fact helped inform our direction to move forward on two fronts. First, we created specific goals that were similar to ones unmet from prior plans, for the purpose of assisting in the implementation of them, and second, we created new goals to address newly identified policy issues.

We then had numerous, smaller team meetings to tease out and clarify the most pertinent and achievable goals that we could. We invited team members with strong goal-based experience, such as the regional planners and land trust personnel. We wanted the goals to be realistic and that would make sense to all communities along the watershed.

The outcomes of the planning process resulted in identification of a number of specific goals for implementation in coming years, including:

1. Establish a uniform reporting and database system for timber harvest to inform better forestry governance.
2. Use education and improved riparian rules to substantially increase stream buffers (with a target of 20% improvement).
3. Increase tree canopy by 10% in the watershed over the next five years.
4. Use a variety of governance and education mechanisms to improve wetland and steep slope conservation.

Step 4: Implementation

The main implementation activities for this climate action/adaptation plan are focused on outreach with targeted educational tools. We have been asked to deliver numerous presentations to city council members, local conservation commissions, land trust boards and state adaptation subcommittees. It is expected that these efforts will lead to improved governance decisions; through these presentations policy makers will be better informed to move forward with specific climate adaptation actions that include forest and water protection. The result will be an increase in community resiliency.

CONCLUSION

The Keene CSU team views this assessment exercise and the resulting action/adaptation plan as just the beginning of our work. As with the many-referenced climate action document already created, it has become quite obvious that the creation of a document of this nature does not get the job done. Much work, especially around education, and structuring a strong regional support network in the coming year will be crucial to achieving plan goals.

It is our intent that a strong outreach strategy will create this alliance and also help inform us of new goals that may give greater meaning to the ones already adopted from this process.

We have already started by organizing our first public presentation/forum in conjunction with the Cold River Society and Hubbard Brook Research Center in Walpole NH, on February 3, 2011. This represents the first of many implementation activities to come.