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Lessons Learned From Six Weeks of
Research on the Response to Irene
in Waterbury, VT



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Introduction

During the summer of 2012, one undergraduate student from Green Mountain College and one graduate student from the University of Vermont (UVM) collaborated with the non-profit relief organization, ReBuild Waterbury, to conduct six weeks of research aimed collecting lessons learned from the response to Tropical Storm Irene in Waterbury, VT. This report details the lessons learned from that research.

Background

Hurricane Irene touched down in New Jersey on August 28th 2011. As the storm continued toward Vermont, it was downgraded from a hurricane to a tropical storm. Despite this, Vermont was perhaps the worst hit state. Spring flooding earlier in the year left Vermont soils saturated and unable to absorb the additional rainfall from Irene. Vermont's geographic features - towering mountains and narrow valleys - swiftly funneled the heavy rain into flash floods. When Irene reached Vermont, she dumped 11 inches of rain in a 24-hour period, overwhelming the White, Dog, and Winooski Rivers and their tributaries. Vermont was left fragmented; at least 13 communities were entirely isolated and without power, 34 state bridges were closed, other bridges were swept away by the raging waters, 500 miles of roadways were closed or impassable, and hundreds of homes and businesses were damaged. Irene produced water levels Vermonters had not seen since the historic flood of 1927 (Galloway 2011). In 1927, Governor John E. Weeks, commented, "Vermonters are not those to be daunted or broken by hopelessness. With unbelievable courage our people reconstruct and rehabilitate and not for a moment did they yield to a spirit of demoralization" (Minsinger 2003, pg. vi). Indeed, as they did in 1927, Vermonters rallied together to help their friends, family, and neighbors rebuild. The town of Waterbury, located in Washington County, VT, exemplified that sentiment.

Research

This community-based research project was a collaborative effort between two non-profits, Vermont Campus Compact (VCC) and ReBuild Waterbury, and students from Green Mountain College and The University of Vermont. The original research questions were developed by staff at ReBuild Waterbury and were further refined through conversations with the students. For the remainder of this report, "we" refers to the collaborative team that worked on this project.

Over the course of six weeks, we designed and administered an electronic survey (63 responses, 38% response rate), conducted eleven in person interviews, and analyzed two months of archival documents (e.g. meeting minutes, news flyers, etc.) to answer the following research questions:

1. What were the key decisions made in Waterbury following Tropical Storm Irene that impact the town's response to the storm?
2. What were the major factors that impacted the overall response to Tropical Storm Irene in Waterbury?

3. What were the major factors that impacted volunteerism and leadership in Waterbury following Tropical Storm Irene?

We then conducted qualitative analysis in the form of thematic coding to identify key themes from the data. Finally, we held a community event to share their results and invite any community members to clarify points or suggest changes and additions to the findings. The results of our study are presented in this report.

Key Decisions Made

Through analysis of interviews, survey responses, and archival documents, we have compiled a list of the general decisions made in the immediate response to Irene that were critical to the response effort in Waterbury. The following decisions emerged as particularly important:

Evacuated, not rescued

At around 9 A.M. on Sunday morning a crew was set up at the fire station to watch how the storm progressed. It seemed like a normal rainy day until 8:00 that night when the Winooski River quickly rose beyond any expectations. Within 30 minutes Fire Chief Gary Dillon sent out crews to evacuate residents in areas threatened by the raging waters. For safety reasons crews did not return to rescue those who chose not to evacuate. This decision saved the lives of residents and fire fighters.

Shut off the power grid

Around this same time Green Mountain Power Corp. shut off the power grid in Waterbury to prevent serious public safety issues. After the water receded the fire department consulted with the Fire Marshal's office and Green Mountain Power to reenergize homes and businesses. The waters rose so high in some homes that it soaked the junction box. This meant the homeowner needed a certified electrician to verify that the house was safe in order for the power to be turned back on. These precautions were taken to protect residents' health and safety.

Opened central community buildings

As the Winooski River and Thatcher Brook rose, forcing residents from their homes, Thatcher Brook Primary School opened its doors as a shelter to those in need. It also served as offices to town officials and fire crews whose office buildings were inundated with water. The School's parking lot served as a volunteer meeting place during the first week; organizers were able to match homeowners in need with willing volunteers. The school gym transformed into a daycare center and the cafeteria served hundreds of meals during the first few weeks.

The fire station, which had been recently rebuilt, was expressly designed to be flood resilient. One interviewee noted that "if (the) old station had still been here it would have crumbled to the ground." Although the station was initially inundated, it was eventually used as a supply store accepting donations from individuals and businesses in the region (e.g. the Lowe's store in Essex donated several truck loads of fans,

dehumidifiers, gloves and various other needed supplies.) Fire trucks were relocated to make room for the donations. FEMA opened a disaster recovery office in the fire station. When they left, the select board, trustees, and municipal staff moved their offices from the school to the station. The station essentially became a "one stop shop" for residents seeking assistance. The labor swaps and food shelf moved to St. Leo's hall, a building associated with St. Andrew's Parish, and continued operating over the next several weeks. Later, ReBuild Waterbury decided to set up its offices at St. Leo's because it was a place people already recognized as a source for assistance.

Thatcher Brook Primary School, the fire station, and St. Leo's Hall emerged as central locations that provided aid and support to Waterbury. Organizing the response efforts at specific central locations proved to be advantageous. The first week was a time of great confusion, yet everyone in the town knew to go to Thatcher Brook if they needed food, shelter, volunteers or if they wanted to reach out to those in need. This allowed aid to be provided more effectively and facilitated a rapid response effort.

Did not release Marshfield Dam

Green Mountain Power was faced with a difficult decision: whether or not to release water from the Marshfield Dam. Although a controlled release threatened to exacerbate flooding in towns below, a breach in the dam would have been far more catastrophic. The fire chief kept in contact with the safety officer from Green Mountain Power and the public works director throughout the night. The water level came within 10 feet of the top of the 1,100 foot earthen dam (Johnson 2011). Fortunately, the water level remained stagnant and began receding around 2:00 am the next morning. The dam was never released, sparing Waterbury from additional flooding.

Addressed health needs

In the days following the storm, risks to public health became apparent, as many residents were without food, electricity, or running water. Town officials realized that the tremendous amount of trash and debris presented a major health hazard "Instead of having people try to deal with it themselves ... the town just made a decision to order dumpsters and deposit them all over." Waterbury officials reacted immediately, ordering not only dumpsters, but also port-o-potties and street sweepers to alleviate stress and protect public health. Having a landfill so close by allowed the dumpsters to be emptied and returned efficiently. Another imminent issue was mold, which can begin to grow 48 hours after a flood. A "moldicide" task force emerged to help treat affected homes. Although the flood response as a whole was a community effort, dividing up specific tasks such as trash removal and mold treatment allowed them to be resolved more quickly and effectively

Organized feeding stations

Feeding stations were almost immediately set up to provide food to those who were either affected by the flood or volunteering to help. The food shelf operated out of the cafeteria at Thatcher Brook Primary School for the first week. The school eventually

needed to resume normal operations as classes started back up so the food operations were moved over to St. Leo's hall. The fire station also produced food for its own workers however, they did not turn away anyone in need.

Accepted advice and support

Accepting advice and support from outside groups contributed considerably to long-term recovery. After the storm, Waterbury residents did not wait around for government assistance; they immediately began the process of rebuilding and reached out to friends, family, and neighbors in need. They were not, however, reluctant to accept advice from those with experience in disaster relief and recovery. Local leaders welcomed advice and assistance from organizations such as Hope Force International and the Red Cross. The town requested FEMA's presence and worked with them to assess the damage wrought by Irene and to provide assistance to homeowners. Utilizing the knowledge of professional organizations and individuals guided the local leaders toward a successful long-term recovery effort in Waterbury.

Addressed housing needs

FEMA worked to address the housing needs of the community; however our data suggests that not all needs were being met. One interviewee reported that, "FEMA was not flexible... The further from the actual disaster, the more rules there are." To fill the unmet need, volunteers decided to establish a Waterbury Housing Group to provide emergency housing. After canvassing and assessing damaged properties throughout the town, it was estimated there was \$9.7 million worth of damage to over 200 buildings (The Stowe Reporter, 2011). The work started by the Waterbury Housing Group was eventually taken over by ReBuild Waterbury.

Maintained communication

Within the first few days town officials produced and hand delivered daily newsletters that were instrumental in keeping residents up to date with information on where to get help and supplies and how to contact FEMA. They also made frequent announcements on the local radio station, WDEV. Additionally, the municipal government held daily meetings with other leaders to "do a debriefing and see what was happening in the community and see if needs were changing and adapt the next morning." This allowed town leaders to understand how to better meet the needs of the community.

Formed ReBuild Waterbury

Within a month after Irene members of Revitalizing Waterbury, town leaders, and various volunteers met to discuss forming a local, non-profit, long-term recovery group to assist with the recovery effort. The organization, later named ReBuild Waterbury, was tasked with helping residents get back into their houses, bringing back businesses, and funding and organizing rebuilding projects. This took pressure off the municipality; one interviewee reported, "You could just hear a collective sigh of relief on the part of the town officials that, okay, it's not going to be just us. We're going to get some help." This decision allowed the town to focus more attention on other pressing issues such as

stimulating the economy, ensuring the state offices return, zoning, and relocating municipal offices. Several interviewees indicated that not only the decision to form ReBuild Waterbury, but to form it so quickly hugely impacted the recovery effort. ReBuild Waterbury has continued to work for several months to help bridge the gap between the cost to rebuild and the assistance provided by insurance and FEMA

Factors Influencing Response

In addition to the intentional key decisions made, we identified five underlying factors that appear to have influenced the response effort: emergence of volunteers and leaders, lessons learned from other communities, intact town infrastructure, pre-existing social capital, and frequent and effective communication. These factors emerged from the interviews, survey responses, and archival documents as critical to the response effort in Waterbury. Member checking confirmed the importance of each factor. We discuss each of them below.

Emergence of volunteers and leaders

Our data demonstrates that Waterbury experienced an outpouring of support after Tropical Storm Irene in the form of volunteerism. This created an able and willing workforce to take on tasks like serving meals, cleaning out flooded homes, and finding emergency housing for those in need. Both the number of volunteers and number of hours put in by individuals (in some cases more than 80 hours in the first week) allowed for a great deal of work to be accomplished without cost to the town municipalities or to flood-affected individuals.

Additionally, a core group of leaders emerged through the response effort. These leaders provided a structure to the response effort, made important decisions (see previous section on key decisions), prioritized important tasks, established means of regular communication (discussed below), funneled volunteers to appropriate work sites, and provided overall coordination of people and organizations involved with the response effort.

It is clear from the data that both the outpouring of volunteers and the emergence of skilled leaders positively impacted the response effort by providing a focused, structured, volunteer workforce. We identified three factors that influenced this emergence of volunteers and leaders: sense of responsibility toward one's neighbors, officially held positions, and freedom to get involved.

Sense of responsibility toward one's neighbors.

Interviews and open-ended survey responses revealed that people felt they *needed* to get involved with the response effort. This is typified by comments like, "I had to" and "These were my people and they needed me." During the member checking event, community members identified this sentiment as "sense of responsibility toward one's neighbor." In other words, people's sense of obligation toward each other motivated them to step up as either volunteers or leaders in the response effort. Specifically, this

sense of responsibility compelled people to call out of work to volunteer with the response, to donate goods, to open their homes to flood-affected people for meals, showers, or to do laundry, and to share resources like sump pumps and generators.

Officially held positions.

Our data suggests that officially held positions engendered a sense of obligation to get involved. Several interviewees reported that they stepped into leadership roles in the response effort because they already held leadership roles in the community and, as such, they felt it was their job to do so. For example, two interviewees reported that they took on leadership roles in the response effort because they felt like it was their duty as member of the select boards. Data indicates that, since these individuals already held leadership roles in Waterbury, they were able to effectively lead the response effort and make key decisions without stepping on anyone's toes or eliciting questions about their authority.

Freedom to get involved.

Survey responses and interviews revealed that many of the volunteers and leaders were able to get involved in the response effort because they had support and flexibility in their personal and/or professional lives. Their homes and business were not affected by the storm, they were self-employed or otherwise able to take time off a work, and/or they had supportive spouses, families, and/or child care. Interviewees reported that these factors greatly impacted their ability to get involved with the response effort.

Lessons learned from other communities

Interviews and archival documents showed that Waterbury was able to draw on lessons learned from other disaster-affected communities following the storm. In particular, representatives from Hope Force International, FEMA, and the Salvation Army provided insight and guidance that informed the decision making process in Waterbury. The availability of these lessons was, to some extent, serendipitous; interviews revealed the Hope Force International arrived in Waterbury on their way out of the state, after they had been told they were not needed by other Vermont communities. The director of the organization reported in an interview that the group only stopped in Waterbury on a whim. This is remarkable given that interviews with town leaders indicate that advice from Hope Force International proved to be a valuable resource for the town.

Intact town infrastructure

Although Waterbury did experience some infrastructural damage from the storm, interviews and member checking revealed that the relative lack of damage to roads, bridges, and municipal buildings allowed to the town to focus on the needs of individuals. During member checking, one participant reported that the "hardest days" were ones when resources had to be diverted from cleaning out homes to go fill sink holes in the road; these days were not only more difficult to organize, but also emotionally difficult because resources were denied to individuals in need.

Additionally, the lack of damage to three key buildings, Thatcher Brook Primary School, the Fire Stations, and St. Andrew's Church, allowed the buildings to be used as a shelter and meeting place, an information hub and supply store, and meal distribution center, respectively. The availability of these three buildings provided secure, central locations for the response effort. Finally, the lack of damage to roads meant that people were able to get around town and participate in the response. It also meant that the town was not cut off from the rest of the state; supplies and people could move in and out of Waterbury easily.

Pre-existing social capital

Data revealed that the response effort in Waterbury was both well organized and relatively conflict free. Interviews and member checking indicated that pre-existing social capital contributed to those conditions by allowing leaders and volunteers to collaborate smoothly. Social capital refers to stocks of networks, norms, reciprocity, and trust that exist between individuals and/or groups. In Waterbury, many of the leaders and volunteers reported having pre-existing networks with their fellow responders; they had worked with them before on other, sometimes contentious, town issues, like building a new fire station. They were familiar with their working styles and they trusted them to follow through on their commitments. Individuals could leverage these relationships to get work done (e.g. one interviewee reported calling someone he knew in town with heavy machinery to come work on a flood-affected individual's home), and could collaborate more effectively because they knew what to expect from their collaborators.

Frequent and effective communication

Frequent and effective communication played an important role in the response effort in Waterbury. As previously mentioned, response leaders decided early on to utilize flyers to update community members about the state of the town, the current issues and needs, and the response effort in general. These daily flyers kept people informed and up to date, and let people know who to contact if they needed assistance or wanted to get involved. Similarly, frequent and effective communication between those in leadership positions was critical. Daily meetings at the same time and place allowed people a regular forum to check-in, give updates, and get organized about the response. Good communication among and between all parties allowed for centralized, organized, and effective response.

Conclusion: Things that worked

When Irene tore through Vermont the residents of Waterbury launched a response to rebuild their community. This research has collected the key lessons learned from that response effort in an effort to help inform future disaster response in Waterbury and other communities. Although no two communities are alike, we feel there is information gleaned from Waterbury that is transferable to other communities. We discuss five recommendations for communities faced with a disaster below:

- Choose a central meeting place, time, and day, and use it regularly: In Waterbury, the Thatcher Brook Primary School was used for regular meetings every day at 3pm. Other communities may not need daily meetings, or may need to hold two or more meetings per day. What's important is to choose a central, safe, and easy to access location at which to hold frequent meetings to ensure regular communication.
- Select a form of mass communication and use it regularly: Hand-delivered paper flyers and updates on the local radio station provided regular communication in Waterbury. Choose a form of communication that people can access easily and use it regularly to update community members about the response effort in your community.
- Maintain regular and open communication with surrounding communities and organizations: Decision made in neighboring communities and by local organizations (both non-profits and state agencies) can affect the response effort in your community. Maintaining open and regular communication with surrounding communities and organizations will contribute to collaboration on a larger scale.
- Embrace collaboration: In Waterbury, pre-existing social capital contributed to effective collaboration. Not all communities have high stocks of pre-existing social capital, but effective collaboration will still be important. Stressing the importance of collaboration within and with outside organizations and addressing challenges early will help the response effort run smoothly.
- Prioritize needs: Every community is different and so is every disaster. In Waterbury, the needs of affected individuals rose to the top of the priority list. The needs of your community will depend on a myriad of factors. It is important to identify and prioritize both critical and emergent needs and address them accordingly.

Through our research, we have found that these five recommendations worked well in Waterbury. We believe that other communities may also benefit from following them. We also feel the story of the response to Tropical Storm Irene in Waterbury, which we've attempted to summarize in this report, can be useful for other disaster affected communities. We hope that this report can be used as a tool to inform and improve future disaster response efforts.

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