



Agricultural Resiliency to Severe Weather in the State of New York

Key Findings:

- Agriculture across New York State (NYS) has been significantly affected by severe weather in recent years.
- Individual farmers and farming communities have successfully responded to severe weather challenges.
- Increased integration of agricultural organizations into local emergency plans could improve emergency response and benefit farmers.
- There is room for improvement in information dissemination regarding how to prepare for and respond to a severe weather event.
- Insurance can protect farmers against a number of losses, but the claim process can be confusing and drawn out; a thorough understanding of one's policy is beneficial.

New York State has seen an uncharacteristic abundance of severe weather events in recent years, with significant hurricanes (Irene and Sandy) in 2011 and 2012, as well as the effects of Tropical Storm Lee (also in 2011). These events had catastrophic consequences for many rural communities throughout the state. Additionally, the spring of 2012 brought an unusual combination of early and extreme warmth followed by a late April cold spell, resulting in significant bud freeze that devastated many orchards. The damaging weather continued through 2013 with significant flooding in counties throughout the central part of the state, and into the winter of 2014 with a severe winter storm leaving nearly 88 inches of snow in one week in areas of Western NYS. These severe weather events have impacted NYS agriculture through expenditures on emergency response, disruption of food supplies and services, and loss of property and work hours. Additionally, these events have impacted individual farmers through damages

to infrastructure and crops caused by unpredictable frosts, floods, and droughts.

In response to the challenges associated with responding to and preparing for severe weather, the Empire State Development office funded researchers at Cornell University to undertake a project exploring how farms and farming communities respond to and prepare for severe weather in New York State. The agricultural resiliency project aimed to examine the current status of emergency engagement in agricultural communities across New York, assess how



Collapsed Greenhouse in Western NY from the 2014 Snowstorm

individual producers prepare for severe weather, and identify gaps in the statewide emergency response framework. With a better understanding of how communities respond to and prepare for severe weather, appropriate steps can be taken to improve local response, as well as statewide intervention. The specific goals of this project were to: (1) document the current resources available to agricultural communities that are preparing for or responding to an

extreme weather related catastrophe, (2) assess the capacity for Cornell Cooperative Extension (CCE) programs to aid in emergency response, and (3) develop a severe weather framework that includes prior, during, and post actions to mitigate the impacts of severe weather on agricultural operations and communities

Research Methods

This project utilized focus groups to capture perspectives from farmers, extension educators, and state agency representatives to assess how all three groups plan for and respond to severe weather events. The focus group format was chosen as it promotes open dialogue among participants and allows conversations to be tailored to a specific group of participants. Ultimately, six multi-county regions across Upstate New York were selected to hold focus groups. The selection process was based on a combination of previous weather-related disaster declarations and the significance of agriculture in counties' overall economies. Participants in focus groups were recruited with the help of CCE and NYS Farm Bureau and were open to farmers of any commodity and farm size. In total, seven focus groups were conducted with producers, two with regional extension educators, and one with state agency representatives, to discuss how agriculture in their communities had been affected by severe weather and to identify ways to improve emergency response and preparedness at individual, county, and state levels. The number of participants in each group ranged from 4 to 12. Although discussions were encouraged to vary between groups, all focus groups followed a similar set of prompting questions following the goals of this study.

Dialogue from each focus group was digitally recorded, transcribed, and analyzed using MAXQDA qualitative analytic software. Categories were established based on the prompting questions and centered around 4 basic themes: emergency planning and preparation, emergency communication, post-event recovery issues, and beneficial resources. After coding the transcripts, responses were compared between farmers, extensions educators, and state agency representatives in an attempt to identify areas of discrepancy between the groups.

Emergency Planning Resources

Emergency planning resources were discussed in both the context of physical resources as well as county-wide emergency response programs. When asked what type of physical resources individuals found essential, farmers (particularly dairy farmers) emphasized the importance of having access to a generator that would allow them to operate essential farm equipment in the occurrence of a power outage. Furthermore, farmers throughout the state discussed the importance of having equipment capable of clearing snow in the event that county transportation departments are unable to. Numerous dairy farmers relayed stories of being unable to ship milk due to road closures, and stressed the importance of having a backup plan in place.



An Accessibility Impact of Severe Rainfalls

In addition to discussing physical resources, participants were asked about the perception of county and state emergency response programs. Many farmers viewed CCE as an invaluable resource during an emergency. In fact, depending on the nature of the event, participating farmers were more likely to contact an extension educator than a county-level emergency response representative. This sentiment was often attributed to a sense of confusion about who to contact in county emergency response departments. Many participants suggested that agricultural operations could be better integrated into county-wide emergency response plans, such as implementing specific plans on how to transport prod-

ucts to market during a disaster, what to do with livestock and animals, or establishing a database of all operating farms in a particular area.

On-Farm Planning

The importance of individual preparation was repeatedly emphasized among participating farmers. Although most individual farmers did not have written emergency response plans in place, most felt confident in their ability, and their employee's ability, to deal with severe weather events. That being said, some concern was expressed about how an increase in the frequency or severity of weather events in the future may affect their response capacity. While a written emergency response plan is the most effective way of ensuring an operation is prepared, there are a few simple steps that anyone can take to be more prepared in case of emergency:

- Gather phone numbers for all emergency personnel and post them by a phone
- Gather phone numbers for all utilities; many utilities have an emergency contact number
- Identify and mark main exits, fire extinguishers, and circuit breakers
- Draw a farm site map with clearly marked buildings, roads, and fences
- Make sure that the farm's address is clearly visible from the road
- Think about livestock. What will they do in an emergency? Is there a place for them to go?
- Talk to family members and employees about emergency preparation and planning.

In addition to individual preparedness, participants emphasized the importance of local communities in responding to severe events. Even individuals from regions that have been severely impacted by extreme events in recent years commended their neighbors and broader communities in banding together to overcome challenges. A participant in Chenango County stated, "In my community we have a farming attitude, everybody cares about his neighbor and that is worth more than anything else", when discussing flooding after Hurricane Irene. In the neighboring county of Schoharie, residents bonded

together to form Schoharie Area Long Term (SALT), a community organization focused on improving local resilience in the Schoharie Valley. While severe weather events are usually followed by a generous influx of invaluable volunteers hoping to help, SALT fills a gap by focusing on long term assistance and planning to those who have experienced disaster.

Emergency Communication

Effective emergency planning requires not only recognizing and anticipating risks associated with extreme weather, but also effectively integrating a number of different organizations, agencies, and stakeholders after an event. This integration requires efficient and effective communication within and across groups at varying scales. When asked about their perception of emergency communication, most participants perceived a fairly strong communication network within their local communities. However, several participants suggested that during a severe weather event, it was often difficult to reach county-level emergency response operations and that it was often unclear who to contact. County emergency response departments were perceived as having well-organized communication mechanisms in place, but the agricultural producers felt disconnected and unable to interact with that network smoothly. Increased awareness of emergency response plan elements would likely be helpful. State agency representatives observed the need for improved communication mechanisms across groups in rural areas, where either cell phone coverage is poor or non-existent. This was echoed by multiple farmers who live in such areas and have had direct experience with inadequate telecommunication networks. This inadequacy hinders notification and response in the event of a disaster, and limits an individual's connectedness to their respective communities.

As mentioned, the importance of CCE in emergency events was repeatedly discussed throughout focus groups. Both local educators and regional team members were identified as being responsive as well as knowledgeable about finding resources and helping producers recover from an event. The NY Extension Disaster Education Network (NY-EDEN), housed under CCE, actively works to link community officials with emergency managers and extension ed-

ucators. However, while some CCE representatives were aware of NY-EDEN, many individual farmers were not. In several counties, Soil and Water Conservation Committee employees were also identified as an invaluable resource for emergency response and planning. However, this is not to say the two groups were exclusive. The dynamics varied between counties with certain areas relying more heavily on CCE and others on SWCC for emergency response and planning. Multiple participants suggested that it may be beneficial for local CCE offices to work with county emergency planning offices to develop key contacts for agricultural stakeholders when responding to emergencies, perhaps through NY-EDEN.

Insurance

Insurance (for crops and property) was another mechanism for dealing with severe weather that was discussed in the focus groups. Many producers utilized traditional crop insurance programs, however others did not see the value compared to cost or time involved and others have transitioned into self-insurance models. Participants expressed frustration regarding the process and characteristics of crop insurance, as some of the policies seem to be designed for Midwestern agriculture. Alternative programs that align with agriculture and weather patterns of the Northeast may be more appealing to growers, may be more accurate for the crop insurance companies, and could ultimately become strong risk management tools. Related to crop insurance, many participants also stressed the importance of maintaining good 'on the farm' records, and an annual inventory of animals, crops, and equipment, which could be very helpful after a disaster during insurance or cost recovery efforts. Although many farmers understand this and have their own systems in place, tools to aid in this process would likely be beneficial, as they would effectively help to 'streamline' insurance claims.

Conclusions and Recommendations

In short, many farmers and farming communities in New York State seem to have met the challenges associated with severe weather events without sustaining too much long-term damage to their operations. There was a consensus that individuals and communities that have already experienced a severe weather event were better prepared for the next event. However, respondents expressed frustrations with a few components of the emergency response networks: (1) cell reception in many rural parts of the state is inadequate, hindering communication and information transfer; (2) it is often unclear to respondents who to contact in an emergency; (3) and that agriculture could be better incorporated into emergency response frameworks. Future research could focus on examining specific community emergency response plans to quantify the capacity of both localities and statewide organizations to respond to severe weather emergencies.

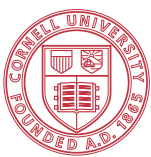
This project was funded by **Empire State Development**. (DED Contract # C004828)

This brief was drawn from an unpublished Empire State Development report by **Jeff Perry** and **Trevor Partridge**

Trevor Partridge (tfp23@cornell.edu) is a graduate student in the field of horticulture. His research is broadly centered around climate change and agriculture.

Jeff Perry (jap255@cornell.edu) is a Senior Lecturer in the field of horticulture. His work focuses around agricultural education and emergency response.

Photo Credits: Mark Zittel and Anja Timm



Cornell University



Empire State Development

CICSS Research & Policy Briefs are a publication of the Cornell Institute for Climate Smart Solutions (CICSS). These publications are free for public reproduction with proper accreditation. For more information on CICSS, our programs, and other publications, please visit: climateinstitute.cals.cornell.edu. Cornell is an equal opportunity, affirmative action educator and employer.