

## Final Report

<b>Title:</b>	<b>Building Resilience through Community-based Action Research: Identifying Vulnerabilities and Facilitating Change in Rural Mobile Home Parks</b>		
<b>Sponsoring Agency</b>	NIFA	<b>Project Status</b>	COMPLETE
<b>Funding Source</b>	Non Formula	<b>Reporting Frequency</b>	Final
<b>Accession No.</b>	222777	<b>Grants.gov No.</b>	
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<b>Project No.</b>	VT-0057OG	<b>Proposal No.</b>	2009-06123
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<b>Submitted By</b>	Sue Lang	<b>Date Submitted to NIFA</b>	02/03/2015

**Program Code:** 96460**Program Name:** Disaster Resilience for Rural Communities**Project Director**

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**Recipient Organization**

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**Performing Department**

CDAE

**Co-Project Directors**

{NO DATA ENTERED}

**Departments**

{NO DATA ENTERED}

**Non-Technical Summary**

Mobile home parks provide critical affordable housing options for low-income residents in rural areas of the United States. The majority of these parks were built before environmental regulations or land use planning was in place for site evaluation. Consequently, many parks are located in areas vulnerable to natural hazards, such as flooding, where mitigation would have been required if permitted today. The combination of low-incomes, relatively high population densities, and poor site-planning increases the vulnerability of mobile home parks to a wide range of disasters. This research project proposes to investigate one type of low-income community common to rural areas that combines both of these elements, the mobile home park. Ubiquitous across the United States, mobile home parks are also communities, and it is community development through action research that this project seeks to explore and strengthen as a strategy for building resilience amongst some of this country's most vulnerable households. The primary goal of this three-year research proposal is to increase the resilience to disasters of mobile home parks in the rural state of Vermont. Using an action-research approach, disaster resilience for residents will be increased through hazard identification, community organization, emergency planning, and improved coordination between key stakeholders such as resident associations, the emergency management system, affordable housing institutions and governmental agencies. The approach proposed here is to combine risk data tailored to mobile home parks with community organizing and capacity building aimed at developing short, rapid response plans that provide basic plans for managing in the case of severe disturbances. Using statewide and park-scale surveys, integrated into a participatory action research framework, the project will build the capacity of low-income communities to respond to disaster. A database of emergency management information scaled for mobile home park communities will be developed and made available to park residents and owners, as well as municipal officials and the regional emergency management system. A guide for improving disaster resiliency within park communities created for park residents and owners. Strategies to increase participation in emergency management planning by low-income individuals will be explored, addressing a critical need identified in the literature. Anticipated outcomes are heightened understandings of vulnerabilities faced by mobile home parks, and multiple-scale strategies to improve the resilience, sustainability and quality of life for residents living in this affordable housing system. Through the statewide polling we will better understand disaster awareness and preparation practices of Vermonters from all housing types. While the results of the project are intended to benefit mobile home park residents in Vermont, lessons learned through this process will be applicable to planning for mobile home parks generally, and should be of interest to those involved in reducing risk to a range of rural low-income housing communities throughout the United States.

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**Accomplishments****Major goals of the project**

This project seeks to improve hazard preparedness and emergency response in rural mobile home park communities. Goal 1: Identify vulnerabilities to disasters facing rural mobile home park communities in the State of Vermont, including both physical and socio-economic elements that contribute to vulnerability and compromise resilience. Objective 1.1: Develop and implement a methodology to screen mobile home park communities for physical hazards using GIS and other existing databases. Objective 1.2: Use the 2010 US Census and other databases to screen communities for socio-economic elements that contribute to vulnerability and resilience. Objective 1.3: Develop an index and prioritize the vulnerability of mobile home park communities in Vermont. Objective 1.4: Develop a statewide web-based database of vulnerabilities at mobile home parks that can be used to develop park-scale emergency management and hazard mitigation plans that can be integrated into municipal emergency management plans. Goal 2: Increase involvement of low-income rural residents of mobile home parks in emergency management planning. Objective 2.1: Evaluate resident perceptions of vulnerability to hazards and the EMS by surveying residents at mobile home parks about their perceived risks and constraints to greater involvement in hazard mitigation and resilience planning. Objective 2.2: Develop a disaster mitigation and planning guide for mobile home parks that includes a rapid response emergency management plan template and planning process. Objective 2.3: Involve mobile home park resident associations and owners in completing and evaluating the rapid response plans and planning process. Goal 3: Increase knowledge of disaster vulnerabilities and emergency planning for mobile home park residents and owners, planning officials, local governments, and emergency management officials. Objective 3.1: Assess existing municipal emergency management plans for their approach to addressing vulnerabilities of mobile home parks within their jurisdiction. Objective 3.2: Conduct a statewide survey on awareness of emergency management and resilience strategies. Objective 3.3: Regionally disseminate information about hazards, vulnerabilities and mitigation strategies to stakeholders statewide. Objective 3.4: Implement a statewide process to involve stakeholders and residents in identifying opportunities and barriers to improving resilience in mobile home parks and improving integration into existing disaster management plans. The project will produce manuals on emergency management planning for mobile home parks along with a template for developing park-scale plans. Information for community plans will be available on a web-based database. This is will strengthen the statewide emergency management system by building local capacity and integrating low-income mobile home residents into the system. The project will result in better information about statewide, as well as park-scale understanding how to reduce the likelihood of disaster. Project findings will be disseminated through stakeholder meetings, popular press, websites, journal articles and conferences.

**What was accomplished under these goals?****Goals and Achievements:**

**Goal 1:** Identify vulnerabilities to disasters facing rural mobile home park communities in the State of Vermont, including both physical and socio-economic elements that contribute to vulnerability and compromise resilience.

Objective 1.1: Develop and implement a methodology to screen mobile home park communities for physical hazards using GIS and other existing databases.

Objective 1.2: Use the 2010 US Census and other databases to screen communities for socio-economic elements that contribute to vulnerability and resilience.

Objective 1.3: Develop an index and prioritize the vulnerability of mobile home park communities in Vermont.

Objective 1.4: Develop a statewide web-based database of vulnerabilities at mobile home parks that can be used to develop park-scale emergency management and hazard mitigation plans that can be integrated into municipal emergency management plans.

**Achievements for Goal 1:** A methodology was developed to screen mobile home parks for vulnerabilities. We used GIS, census data, park surveys and other existing hazard databases to assess the relative vulnerabilities of mobile home parks in Vermont. This statewide database is published and in use by the Vermont Department of Housing and Community Development on their website in addition to the project website. The research also resulted in new GIS databases of mobile home parks in Vermont and their relative flood risk. More than 20% of parks had at least one house lot in a flood hazard zone, more than 30% of parks had land in a flood hazard zone, and nearly 12% of all mobile home house lots in parks were found to be located in a flood hazard zone.

The GIS methodology used in the study, as well as the social and public communication issues related to the presentation of public risk data was presented to regional and GIS planners and published in a journal article.

A statewide survey was completed evaluating a representative sample of all residents with regard to their emergency preparedness. A statewide sample of mobile home park residents were surveyed about their awareness and preparation for disaster. One finding, for example, was that only 30% of mobile home park residents reported their home was tied-down, and more than 20% of mobile homes in parks were built before the 1976 HUD code.

A framework for prioritizing mobile home park vulnerability was developed and published in a report for the Vermont Agency of Housing and Community Development. A database of Vermont's mobile home parks and their vulnerabilities including

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flooding, erosion, and infrastructure was built and is currently published on the project website and the Vermont Department of Housing and Community Development website.

**Goal 2:** Increase involvement of low-income rural residents of mobile home parks in emergency management planning.

Objective 2.1: Evaluate resident perceptions of vulnerability to hazards and the EMS by surveying residents at mobile home parks about their perceived risks and constraints to greater involvement in hazard mitigation and resilience planning.

Objective 2.2: Develop a disaster mitigation and planning guide for mobile home parks that includes a rapid response emergency management plan template and planning process.

Objective 2.3: Involve mobile home park resident associations and owners in completing and evaluating the rapid response plans and planning process.

**Achievements for Goal 2:** The project led to the development of an emergency planning template and planning process for mobile home parks to increase the resilience to disaster. These templates were used to prepare two representative mobile home parks to participate in the 2014 statewide catastrophic emergency planning exercise. The two parks, one large (>100 homes) and one small (14 homes) used the plan in a table top exercises and then a full-scale field exercise. These exercises were conducted in partnership with Vermont Emergency Management.

**Goal 3:** Increase knowledge of disaster vulnerabilities and emergency planning for mobile home park residents and owners, planning officials, local governments, and emergency management officials. Objective 3.1: Assess existing municipal emergency management plans for their approach to addressing vulnerabilities of mobile home parks within their jurisdiction. Objective 3.2: Conduct a statewide survey on awareness of emergency management and resilience strategies.

Objective 3.3: Regionally disseminate information about hazards, vulnerabilities and mitigation strategies to stakeholders statewide.

Objective 3.4: Implement a statewide process to involve stakeholders and residents in identifying opportunities and barriers to improving resilience in mobile home parks and improving integration into existing disaster management plans. The project will produce manuals on emergency management planning for mobile home parks along with a template for developing park-scale plans. Information for community plans will be available on a web-based database. This is will strengthen the statewide emergency management system by building local capacity and integrating low-income mobile home residents into the system. The project will result in better information about statewide, as well as park-scale understanding how to reduce the likelihood of disaster. Project findings will be disseminated through stakeholder meetings, popular press, websites, journal articles and conferences.

**Achievements for Goal 3:** Project staff evaluated existing municipal emergency plans for inclusion and recognition of mobile home parks and related vulnerabilities in their plans, finding that less than 20% of municipalities with mobile home parks included those parks in their emergency plans.

A publically available website was developed for the project that includes mobile home park maps, park profiles, a summary of park demographics, and emergency management templates to assist parks increase their resilience to disaster.

This project resulted in 1 journal article, 1 state report, 2 websites and databases on mobile home park vulnerabilities, 12 conference presentations, workshops and trainings for 4 local emergency planning committees (LEPC's) and 4 presentations by two project staff to House and Senate committee of the Vermont Legislature that contributed to the adoption of new law increasing the safety and resilience of mobile home park residents in Vermont. Additional public communication about the project, the vulnerability of mobile home parks, and the importance of building resilience to disaster was accomplished through multiple public television and public radio presentations. We also found mobile home park planning committees disseminating information about the project through their local newsletters. Two additional journal articles are being prepared, the first documenting the process and lessons learned from implementing emergency planning processes in mobile home parks, and the second reporting on a study of waste management issues related to mobile homes destroyed during disaster. An outcome of the project has also been increased awareness of vulnerabilities related to older mobile homes, particularly their low-energy efficiency. This, combined with the results of our analysis finding many of these homes located in areas prone to flooding resulted in a statewide and multi-agency committee looking to improve the quality of this housing. Project staff are members of this committee and have contributed research findings from this project to this committee.

#### **What opportunities for training and professional development has the project provided?**

Three project staff, including the PI, the project coordinator and the primary project partner attended and received training in the Department of Homeland Security Exercise and Evaluation Program at both the basic and advanced levels. One project member also attended the Vermont Emergency Management's training on facilitation, and all three were trained by Vermont Emergency Management in the design, conduct and control of both table top and field emergency planning exercises.

#### **How have the results been disseminated to communities of interest?**

To ensure that mobile home park residents received the results of this project, staff met directly with mobile home park residents through in-park meetings, and gave presentations to groups of mobile home park and affordable housing residents. For one presentation we asked one of the mobile home park leaders who was active in the emergency planning exercises to join us as a co-presenter, with very positive results. Project partner CVOEO includes materials created from this project in

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outreach efforts directly with mobile home park residents.

Data and results from the project have also formed the basis for several undergraduate courses taught at the University of Vermont during the project period.

Project findings were presented to the Vermont legislature, along with a substantial report, contributing to new legislation to reduce risk and increase the resiliency of mobile home park residents.

This project resulted in 1 journal article, 1 state report, 2 websites and databases on mobile home park vulnerabilities, 12 conference presentations, workshops and trainings for 4 local emergency planning committees (LEPC's) and 4 presentations by two project staff to House and Senate committee of the Vermont Legislature that contributed to the adoption of new law increasing the safety and resilience of mobile home park residents in Vermont. Additional public communication about the project, the vulnerability of mobile home parks, and the importance of building resilience to disaster was accomplished through multiple public television and public radio interviews or presentations. We also found mobile home park planning committees disseminating information about the project through their local newsletters.

#### What do you plan to do during the next reporting period to accomplish the goals?

{Nothing to report}

#### Participants

##### Actual FTE's for this Reporting Period

Role	Non-Students or faculty	Students with Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	0.1	0	0	0	0.1
Professional	0.3	0	0	0	0.3
Technical	0	0	0	0	0
Administrative	0	0	0	0	0
Other	0	0	0	0	0
Computed Total	0.4	0	0	0	0.4

#### Student Count by Classification of Instructional Programs (CIP) Code

{NO DATA ENTERED}

#### Target Audience

There were different target audiences for this project period depending on the particular activity. Target audiences for mobile home park planning activities included mobile home park residents, mobile home park owners and emergency management directors. Presentations on research related to the project targeted emergency management directors, local emergency planning committee members, regional planners, non-profit and government housing agencies and police, fire and emergency medical service responders.

#### Products

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Published	2014	YES

#### Citation

Baker, D., S. Hamshaw, K. Hamshaw. (2014) Rapid Flood Exposure Assessment of Vermont Mobile Home Parks Following Tropical Storm Irene. Natural Hazards Review. 15:1, 27-37

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<b>Type</b>	<b>Status</b>	<b>Year Published</b>	<b>NIFA Support Acknowledged</b>
Conference Papers and	Published	2014	YES

**Citation**

Baker, D., Hamshaw, K., Lowry, D. (2014) Role of Emergency Management in Mobile Home Parks. Presentation to the International Association of Emergency Managers. San Antonio, TX. Nov. 17, 2014

<b>Type</b>	<b>Status</b>	<b>Year Published</b>	<b>NIFA Support Acknowledged</b>
Conference Papers and	Published	2014	YES

**Citation**

Baker, D., Hamshaw, K., Woodward, S. (2014) Lessons from Vermont's CAT2 for Emergency Preparedness for Mobile Home Park Communities. Presented at the Vermont Emergency Management Conference. Fairlee, VT Sept. 18, 2014

<b>Type</b>	<b>Status</b>	<b>Year Published</b>	<b>NIFA Support Acknowledged</b>
Conference Papers and	Published	2014	YES

**Citation**

Hamshaw, S. and Baker, D. (2014) Access To, and Use Of, Maps in Community Planning. Presented at the Vermont GIS Mapping Forum. Colchester, VT June 11, 2014

<b>Type</b>	<b>Status</b>	<b>Year Published</b>	<b>NIFA Support Acknowledged</b>
Conference Papers and	Published	2014	NO

**Citation**

Woodward, S, Furman, D.,(2014) Operation Burning House: Community Emergency Planning. Presentation at the Resident-Controlled Housing Coalition. Champlain Housing Trust. Burlington, VT. April 12, 2014

**Other Products****Product Type**

Databases

**Description**

Publicly available Mobile Home Park Risk Assessment Tool – Available on the Vermont Dept of Housing and Community Development website: [http://accd.vermont.gov/strong\\_communities/housing/mobile\\_home\\_parks](http://accd.vermont.gov/strong_communities/housing/mobile_home_parks)

**Product Type**

Databases

**Description**

Publicly available website and database with resilience planning tools for mobile home parks and detailed Vermont mobile home park specific information: <http://www.uvm.edu/~cdaemhp/?Page=MHPdata.html&SM=datasubmenu.html>

**Product Type**

Audio or Video

**Description**

Baker, D. (2014) Radio Commentary: Resilience and CAT2:Vermont's Catastrophic Planning Exercise. Vermont Public Radio, Colchester, VT May 29, 2014

**Changes/Problems**

United States Department of Agriculture  
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{Nothing to report}