

# A Tale of Two Storms:

## Assessing Urban and Rural Differences in Recovery Efforts Following Hurricanes Michael and Irma

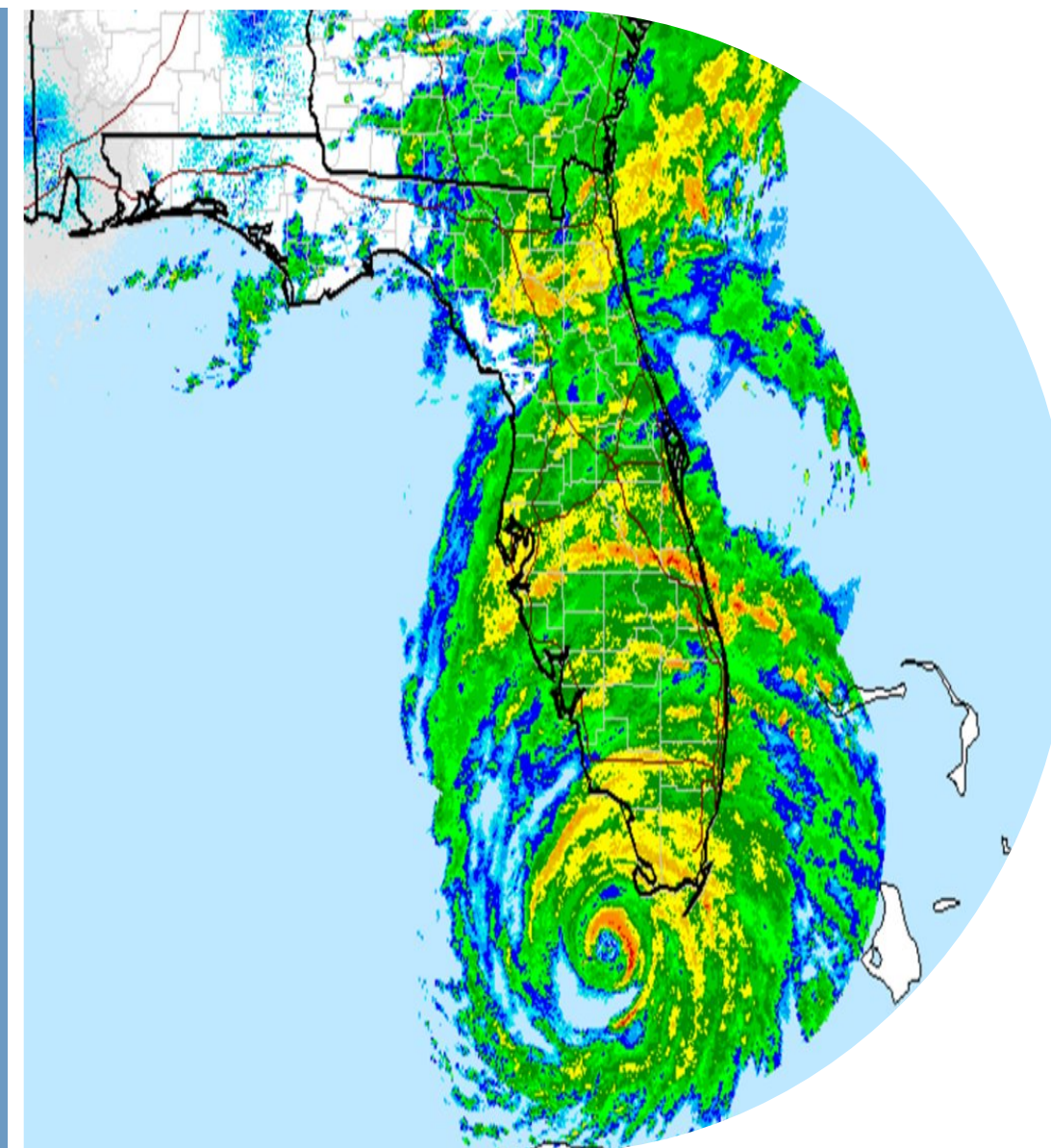
By Angela B. Lindsey Ph.D., University of Florida

### Introduction

While in terms of intensity, duration, and path Hurricane Irma and Michael were very different storms, both heavily impacted Florida's population and recovery efforts are still underway. By looking at the response efforts made by UF/IFAS in conjunction with other partner organizations in the State Agricultural Response Team (SART) such as the Florida Department of Agriculture and Consumer Sciences (FDACS), UF/IFAS and the state as a whole can better prepare for the next major hurricane event. It is also important to look at the difference in recovery efforts between rural and urban area and potential underlying causes for these differences.

### Hurricane Irma

- Made landfall twice on 9/10/2017
- Category 4 in the Keys; Category 3 at Marco Island
- Second most powerful storm in velocity & duration
- Hurricane winds covered 80 miles; tropical storm winds 400 miles, entire state included in FEMA Major Disaster Declaration but South Florida was most heavily impacted
- 30 out of 67 counties impacted considered rural (per 2010 US Census)
- 54 counties ordered evacuation, 7,000 shelters
- 6.7 million homes without power
- 84 related deaths
- \$60 Billion in costs – one of costliest storms in country



### Urban & Rural Recovery

Factors that impacted differences in **RURAL** recovery included:

- Short-lived media attention
- Lack of national stakeholders with vested interest
- Unable to rely on impacted urban counties for assistance
- Heavy agricultural losses made for larger portion of their economy
- “community in crisis that was interrupted by a disaster”
- Less resources

Factors that impacted differences in **URBAN** recovery efforts included:

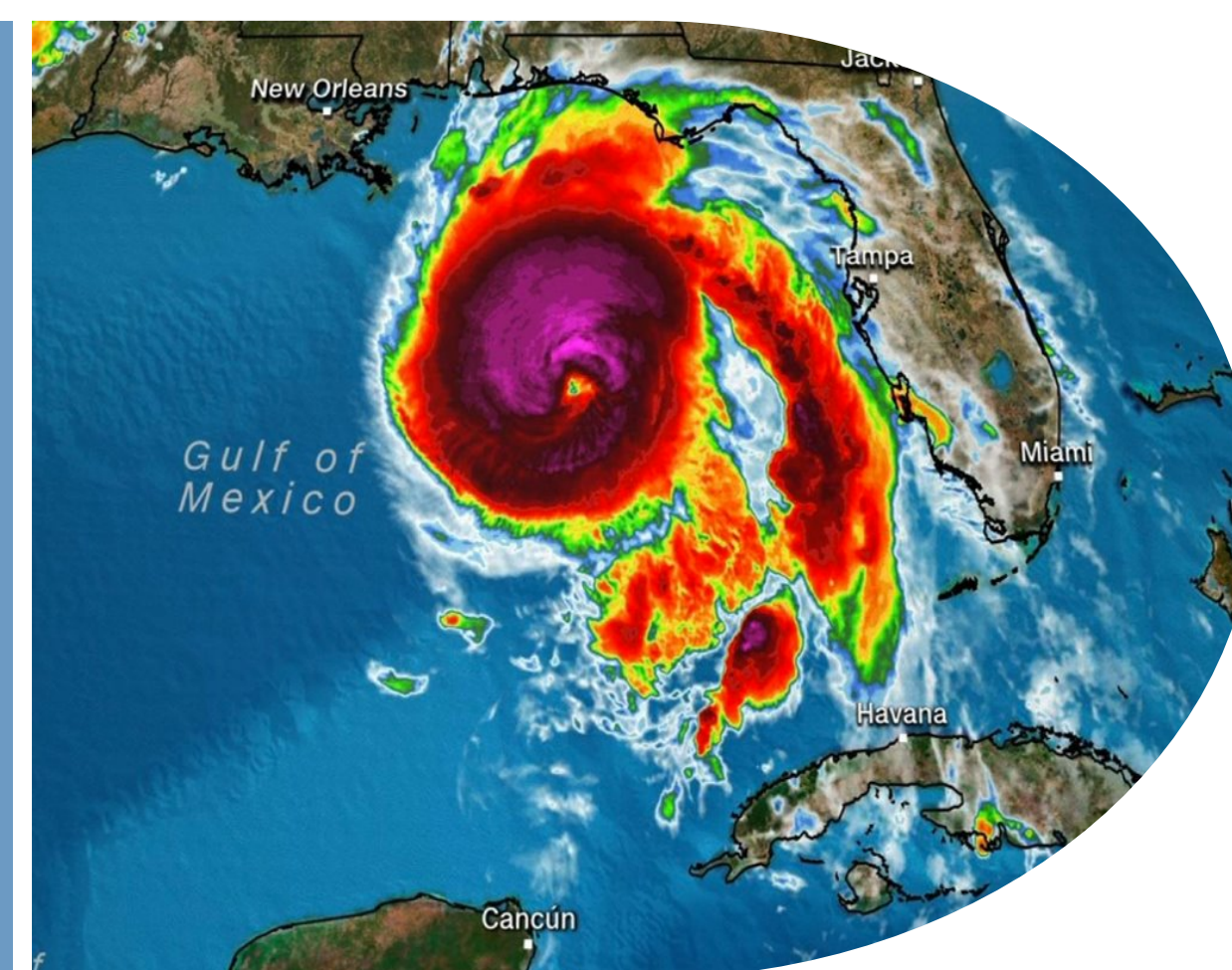
- Increased attention from the media
- Greater area impacted
- More people impacted
- Greater economic diversity
- More resources
- Focus on tourism

### Conclusion

Florida communities are continuing to recover after both Hurricane Irma and Hurricane Michael. Those areas hit hardest by Hurricane Michael will be in recovery for a long time. However, by looking at the differences in recovery efforts, we can better understand how best to help both rural and urban communities and tailor our work to best meet the needs and gaps within these communities. Some ways that UF/IFAS will adapt its recovery efforts moving forward include updating COOP plans on an annual basis, creating assessment standard of operations for assessments, a plan in place for providing internal assistance to our own impacted members, and the potential for each county to stockpile supplies and/or disaster funds throughout the year.

### Hurricane Michael

- Made landfall on October 10, 2018 in Mexico Beach, FL
- Maximum sustained winds of 160 mph, recently upgraded to Category 5 Hurricane
- Strongest hurricane on record to make landfall in FL Panhandle
- 4th most powerful hurricane to hit US
- Damage from wind and storm surge
- 43 related deaths
- Over 400,000 lost power
- 18 counties included in FEMA Major Disaster Declaration, 16 of which were rural.



### UF/IFAS Mitigating & Recovery Efforts

During **Hurricane Irma**, UF/IFAS Extension implemented

- Daily phone calls with the leadership team
- GroupMe text for Extension Family
- Representative at ESF 17 Incident Command Post (ICP)
- SART distribution points
- County EOCs and as part of Emergency Support Function 17
- Needs/gaps form for areas to use in assessing recovery needs
- Agriculture and Natural Resources Assessments for all impacted areas

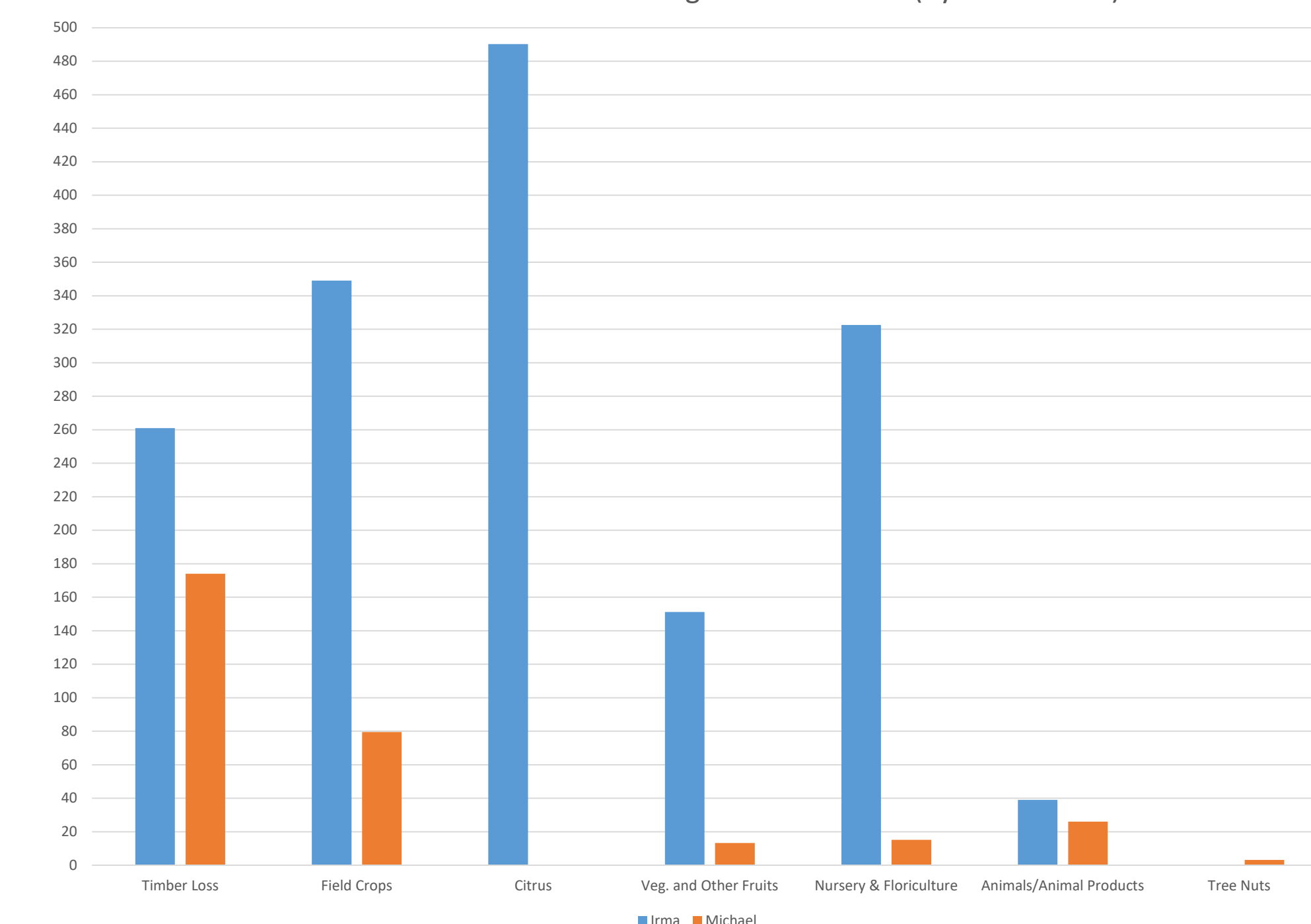
*Mental Health Assessments were also carried out on UF/IFAS Extension members, an resources were distributed throughout communities.*

During **Hurricane Michael**, UF/IFAS adapted its efforts to also include lessons learned during Irma.

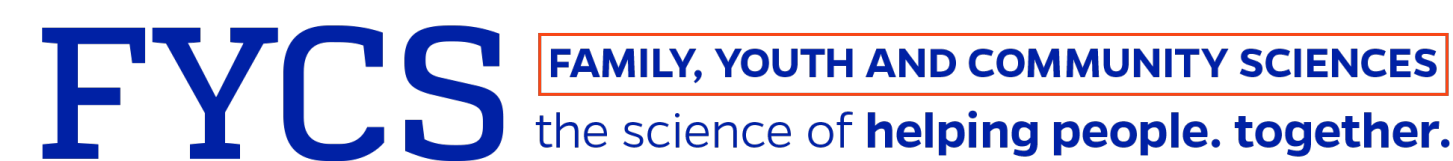
- Representative at the ESF17 Incident Command Post,
- Creating Continuation of Operation Plans (COOP) before the event
- SART Distribution and donation points
- County offices set up as Recovery Centers and Distribution Points for FEMA.

84 IFAS faculty and their staff were personally impacted

Estimated Value of Net Annual Agricultural Losses (by the millions)



Center for Public Issues Education



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the science of helping people. together.

# Animal Biosecurity Videos

[www.ag.ndsu.edu/livestockextension/biosecurity](http://www.ag.ndsu.edu/livestockextension/biosecurity)



**Fairs and Shows**



**Managing Manure**



**Farm and Barn Access**



**Transporting Livestock and Poultry**

# Survey Details

**WHO TOOK THE SURVEY?** 224 Respondents from over 1,300 queried = 16% response rate (not all % below are from all 224).

**DEMOGRAPHICS:** 57% female, 43% male, Average age - 49 years, Average time working in Extension – 12 years

**DISCIPLINE:** Agriculture (46%), Natural Resources (32%), Nutrition & Family (13%), and Youth (9%) programs.

**POSITION TITLES:** County Advisors (agents in other states) - 35%, Program Staff - 17%, University faculty - 15%, Administrative Staff - 12%, Researchers/ Technicians/ Coordinators - 12%, Extension Specialists - 11%

## Involvement of UC ANR Personnel in Disaster Work

Before Disasters	
Educated about disaster risk	64%
Engaged in public outreach on activities / needs	55%
Completed research related to disasters	26%
Conducted pre-disaster risk mitigation projects	26%

During Disasters	
Evacuated or sheltered livestock	48%
Helped with evacuation of communities	20%
Managed community volunteers during disaster	20%
Offered programming at evacuation shelters	8%

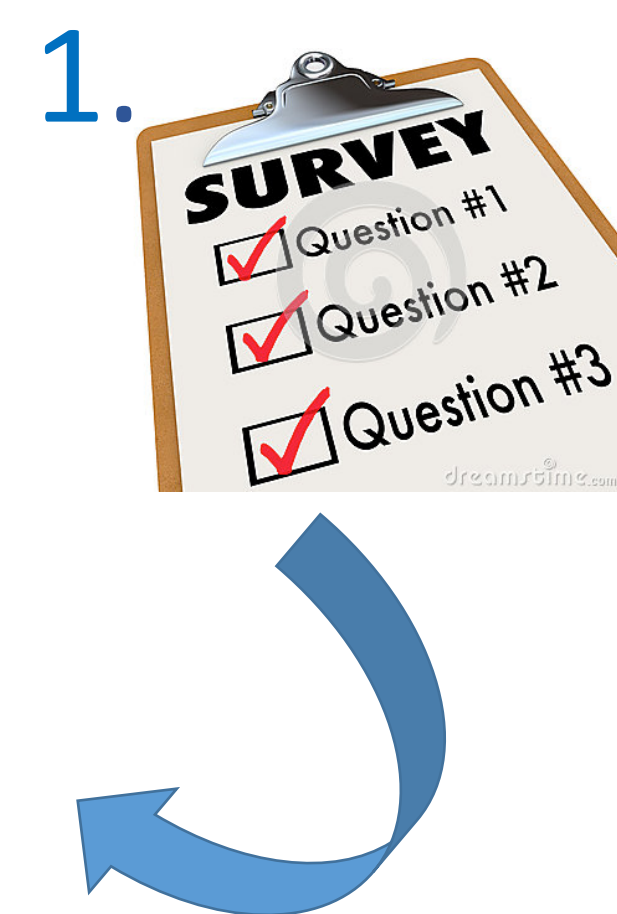
After Disasters	
Engaged in public outreach and extension on risks	46%
Served as a convener to address disaster issues	42%
Educated/ supported ecosystem recovery	40%
Completed disaster related research	36%
Supported community resilience and recovery	32%

## Disaster Management Support Needed by UC ANR Personnel to Better Assist California Communities

Before Disasters	
Help understanding the risks to my community	61%
Help mitigating risks to my community	58%
Disaster resources to educate my community	52%
Connections with others in ANR with experience	45%

During Disasters	
Integration with disaster response services	69%
Coordination with disaster response organizations	66%
Training on the incident command system	48%
Coordination with animal evacuation efforts	39%

After Disasters	
Knowledge of available disaster resources	74%
Pre-established UCANR disaster response network	62%
Written outreach materials in multiple languages	46%
Training on extension program delivery to traumatized audiences	32%



### AUTHORS:

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- Brian Oatman
- Katie Panarella
- Vikram Koundinya
- Faith Kearns

University of California  
Agriculture and Natural Resources



# Disasters Happen

is a USDA NIFA funded grant to help University of California Agriculture and Natural Resources (UC ANR) staff and academics to better prepare for, respond to, and recover from disasters in California communities.

### PROJECT GOALS:

- Understand how UC ANR personnel have been involved in disaster events
- Identify the types of disaster management support UC ANR personnel need to better assist California communities
- Develop additional written and on-line resources for our personnel to use during disasters.
- Develop disaster related professional development resources needed for UC ANR personnel

### PROJECT ACTIVITIES:

1. **SURVEY:** To develop a better understanding of our personnel's needs we started with a survey in Winter of 2019.
2. **IDENTIFY EXISTING RESOURCES:** Web research to inventory what materials we are using now.
3. **DEVELOP NEW RESOURCES:** Modify and centralize existing resources. Develop UCANR Disaster Guide winter 2020.
4. **PROFESSIONAL DEVELOPMENT:** Trainings/ presentations at two internal UCANR events in winter/ spring 2019.

### SURVEY FINDINGS:

**UCANR ROLE:** 56% of respondents think our role in managing disasters is changing. Most think we need to be more involved especially as a source for research, information or outreach on disasters.

**PERSONNEL'S ROLE:** 57% of personnel were not involved in disaster management activities. Of those involved, 55% were involved with efforts before a disaster 68% during a disaster and 66% with disaster recovery activities.

### NEEDED SUPPORT:

#### Before disaster:

- better understanding of risks to community (61%),
- mitigating risks to their community (53%),
- resources to educate community about risks (52%).

#### During disasters:

- integration with disaster response services (69%),
- coordination with disaster response organizations (66%),
- training on the incident command system (48%).

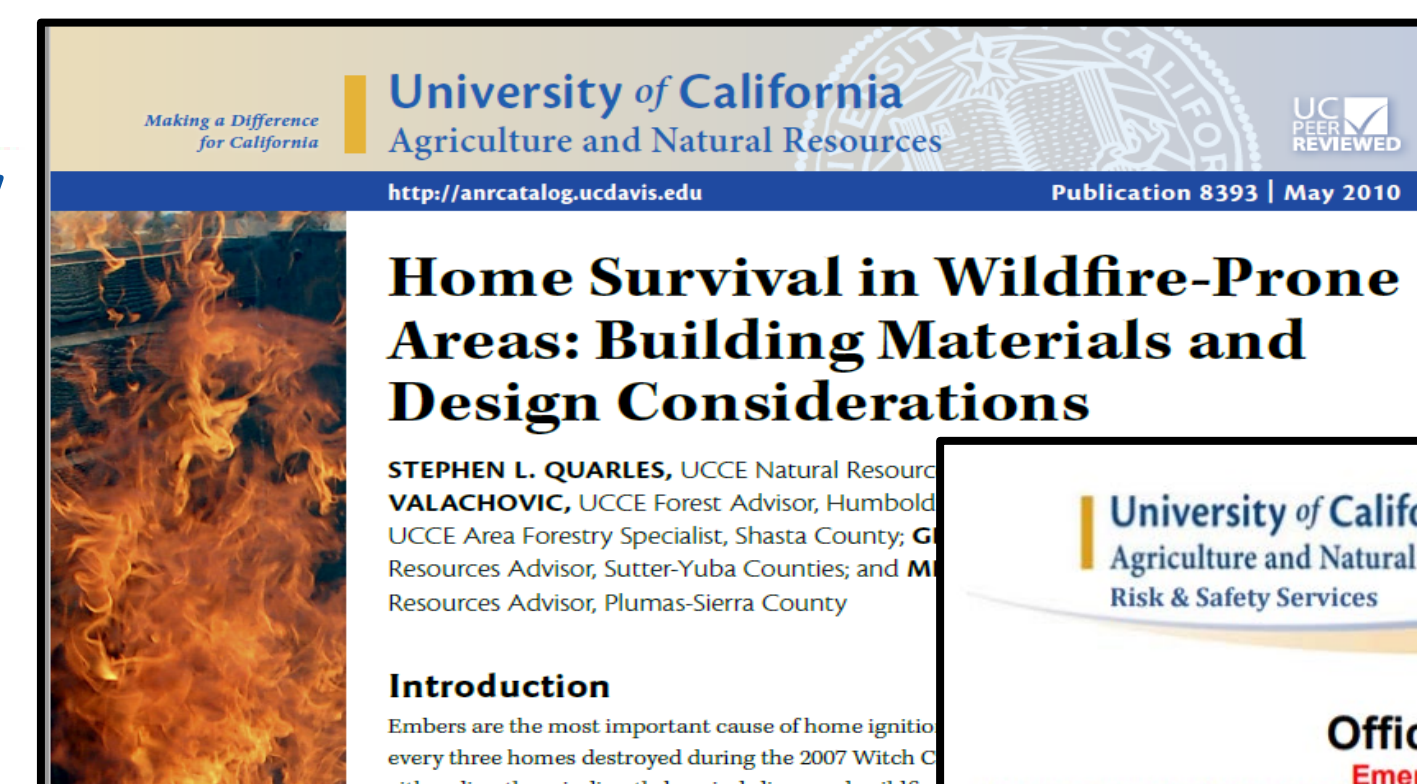
#### Post-disaster support:

- knowledge about disaster response resources (74%),
- a pre-established UCANR network to help respond (62%),
- written outreach materials in multiple languages (48%).



## Inventory

**IDENTIFY EXISTING RESOURCES:** Web research to inventory what materials we are using now.



### EDEN RESOURCES:

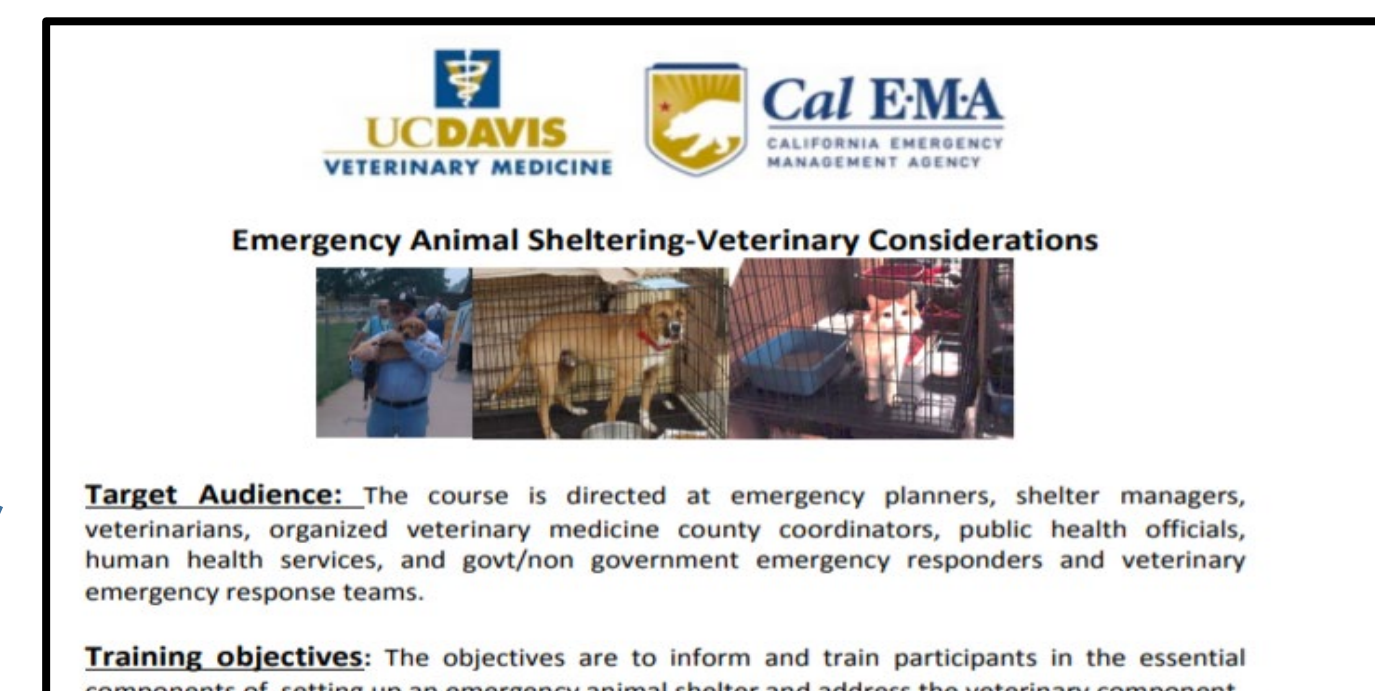
- Only 16% of survey respondents had heard of the Extension Disaster Education Network (EDEN).
- Only 1 respondent had used EDEN's resources.



## 3.

## Create

**DEVELOP NEW RESOURCES:** Modify and centralize existing resources. Identify and fill resource gaps. Adapt and advance resources for youth and volunteer programs. Develop UCANR Disaster Guide. Help to build partnerships with UCANR and state/local emergency planners and responders.

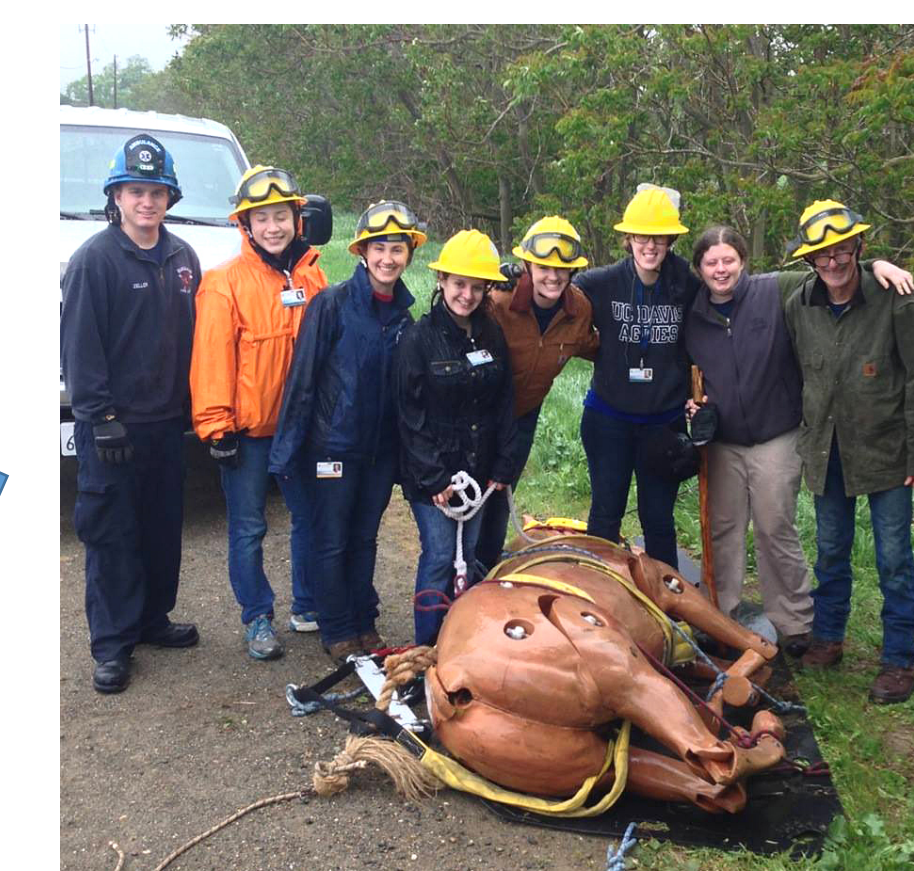


## 4.



## Train

**PROFESSIONAL DEVELOPMENT:** Develop in-person and virtual training opportunities for personnel and volunteers. Conduct regional and statewide training targeted to identified priorities including ICS, and other FEMA trainings.



University of California  
Agriculture and Natural Resources



# Large Animal Welfare, Behavior and Handling Workshops: Extension Reaching New Audiences

K.M. Hiney, B. Kirkland, R. Clovis, and C. Webb

## Introduction

- Disasters severely impact animal agriculture and the economic base of rural communities.
- Disaster preparedness/risk management is a necessity for creating resilient communities.
- Trained personnel are needed to handle disasters/emergencies involving large animals.
- Growing gap between rural and suburban communities with very different experiences, opinions, and beliefs about animal behavior and welfare.
- Law enforcement officers and first responders are often called to assist with issues involving large animals, regardless of their familiarity with horses or cattle.
- Cooperative Extension programs should be proactive in creating local/county stakeholder *partnerships* between Extension and law enforcement, first responders and volunteers to not only enhance political and social capital, but to respond efficiently to the specific needs of agriculture communities.



## Oklahoma's Background

- Animal agriculture is essential to the state of Oklahoma.
- Cattle and horses are significant economic industry, 5<sup>th</sup> largest state in both cattle and equine numbers
- A small percentage of the population is responsible for a significant proportion of Oklahoma's economy
- Unique challenges of the robust livestock and equine exhibition industries.
- Animals are frequently transported to events, which increases the likelihood of events involving animals on roadways.

## Objectives

- Directly support ESF-11
- Develop partnerships between emergency and Extension personnel
- Increase confidence and effectiveness of responders during large animal emergencies and welfare calls

## Audience

- First responders (fire, police, sheriff, etc.)
- Animal control officers
- Members of Oklahoma Medical Reserve Corp and State Animal Response Teams



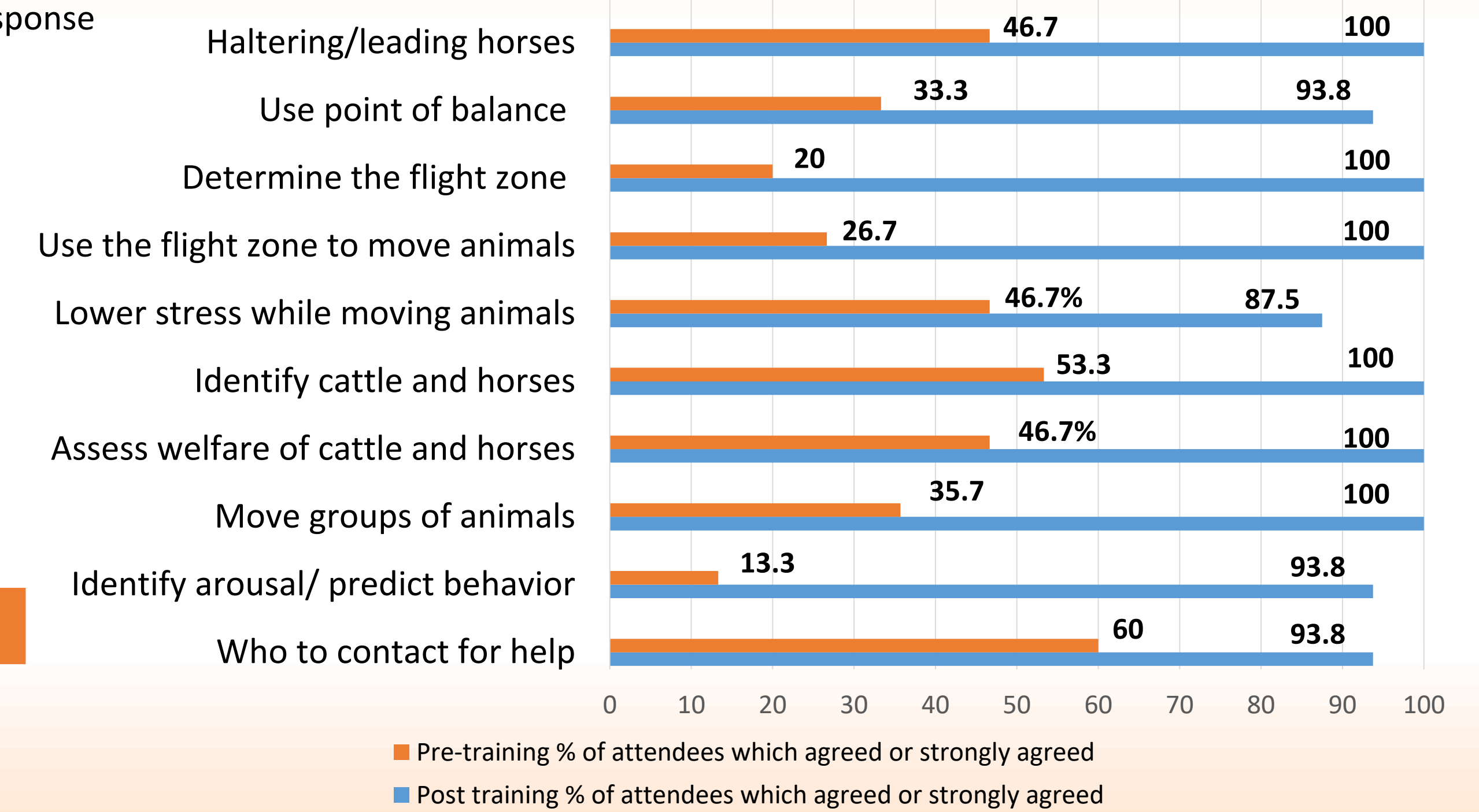
## Program Description

- One day event with lecture and hands-on segments
  - AM - In class modules, PM – live animal handling
  - Delivered in class and experiential
  - Address best practices and local cultural norms
- Opportunity for responders to receive Council of Law Enforcement Education and Training – certification attained in 2017
  - Attendees receive 8 hr. of CLEET credit
- 3 main subject areas:
  - Equine and Cattle Identification
  - Equine and Cattle Welfare
  - Equine and Cattle Behavior and Handling
- Focus on:
  - Neglect and abuse cases
  - Loose animals on roadways
  - Aftermath of natural/manmade disasters

## Outcomes

- 6 programs delivered in 6 Oklahoma counties
- Reach extended past original CLEET workshops
- Instructional materials now used by Oklahoma Dept. of Agriculture

## Participant Confidence Levels Pre/Post Training



## Findings

- Majority of attendants had no previous experience with Extension.
- Live animal handling attracts diverse audience with limited animal agriculture experience
- Format proved highly effective in increasing participants confidence in large animal behavior and handling for emergency scenarios.
- Flexibility is key – all 6 workshops offered unique animal handling experiences due to facility design and animal availability

# PREPARING FOR WILDFIRES: WHAT TO DO AT 15 MONTHS, 15 DAYS, 15 HOURS, 15 MINUTES

Karen Crumbaker, Larimer County; Irene Shonle, Gilpin County; Sharon Bokan, Boulder County; CSU Extension

## ABSTRACT/BACKGROUND

According to the Colorado State Forest Service, “Half of Coloradans now live in areas at risk for wildfire.” From 2012 to 2017, the number of people living in areas at risk for wildfires has increased by nearly 50 percent. Many people who move into Colorado’s wildland-urban interface (WUI) do not understand the importance of being prepared in the event of a wildfire, or what to do when an evacuation order has been issued.

To address this situation, we developed a collaborative community-based fire preparedness workshop called “Preparing for Wildfires – 15 Months, 15 Days, 15 Hours, 15 Minutes.” We present these workshops in fire-prone areas with a unique and impactful suite of partners to help homeowners increase the odds that their home will survive a wildfire and prepare for evacuation.

## OBJECTIVES

The objectives for this workshop are to increase homeowner’s resiliency and peace of mind while living with the threat of wildfire, to reduce home loss, and avert financial problems due to insurance issues or loss of documents.

We increased the impact of our message to people by bringing together many different partners and perspectives.

Participants received handouts that included factsheets, checklists, communication plan, grab list, and exercises to complete now and on an ongoing basis.



## PARTNERS

The success of this program relies on the suite of partners we bring together. The combined message from all of the different perspectives and expertise provides a uniquely effective preparedness message, especially when combined with the personal stories each person can tell.

- CSU Extension
- Colorado State Forest Service (CSFS)
- Local Fire Chief or Firefighter
- Local Government/Emergency Coordinators
- Insurance Agents
- Survivors of a fire
- Local Animal Response Team

## METHODS

We present these programs in fire-prone areas where most of the homeowners live in a WUI. We break the program into different timeframes for taking action. The **15 months** represents a long-term time horizon. Well in advance of a fire is the time to create defensible space, improve the building envelope, and discuss any grant opportunities and local resources such as slash pile for residents to use. It is also the time to make sure the house is well marked, the driveway is navigable by fire trucks, and that insurance is up to date. Presenters here include the Colorado State Forest Service, Firefighters, and the Insurance Representative. In the **15 days** timeframe, we address making sure documentation is in order, develop a “grab list” of irreplaceable and important items and an evacuation bag, as well as a family communication plans. We also remind of the need to clean up defensible space. When a fire is nearby (**15 hours**), we teach how to prepare to evacuate. The **15 minutes** section outlines the necessary steps after an evacuation call has been placed in order to reduce panic and ensure an orderly evacuation (with minimal regrets about irreplaceable items that were left behind).



Figure 1. Slide from Presentation

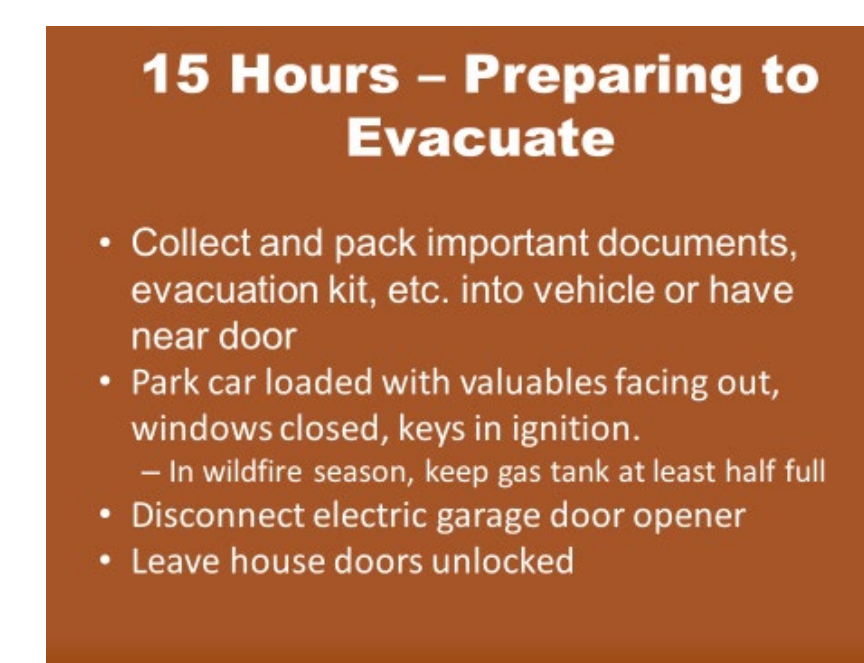


Figure 2. Slide from Presentation

## CONTACT

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## PROGRAMS & OUTCOMES

We have delivered a total of 19 programs with 769 attendees in Boulder, Gilpin, and Larimer Counties, Colorado.

All participants were evaluated. 98% responded they gained knowledge about defensible space, evacuation plans, access concerns, updating insurance, and preparing to evacuate.

Some of the actions that participants committed to completing included creating a defensible space, ongoing maintenance, creating a family emergency evacuation and communication plan, updating and properly storing documents and valuables, updating insurance, and creating a home inventory, disaster kit and “grab” list.

As a result of this program, we applied for and received mitigation grants to create defensible spaces around 142 homes. (\$184,909 grant dollars matched by \$232,000 in homeowner in-kind labor).

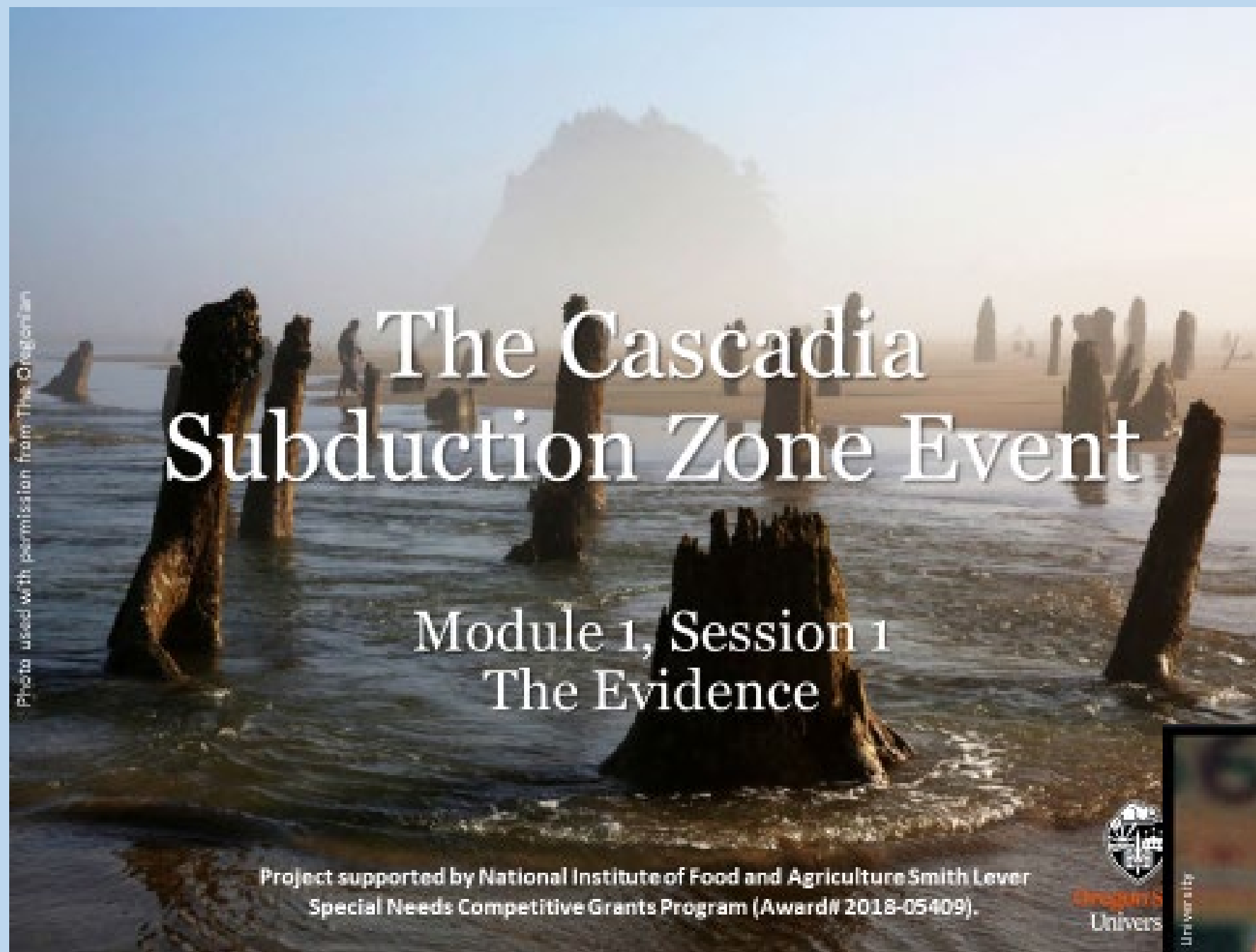
## SUMMARY

These workshops have been extremely well received. They have helped attendees feel more prepared and in control of their lives when living with the unpredictability and potential devastation associated with fires. It has also led to increased community resiliency.

This program is easily replicable by other Extension Agents in other States/Countries, and has even been duplicated by other groups in some areas.

## REFERENCES

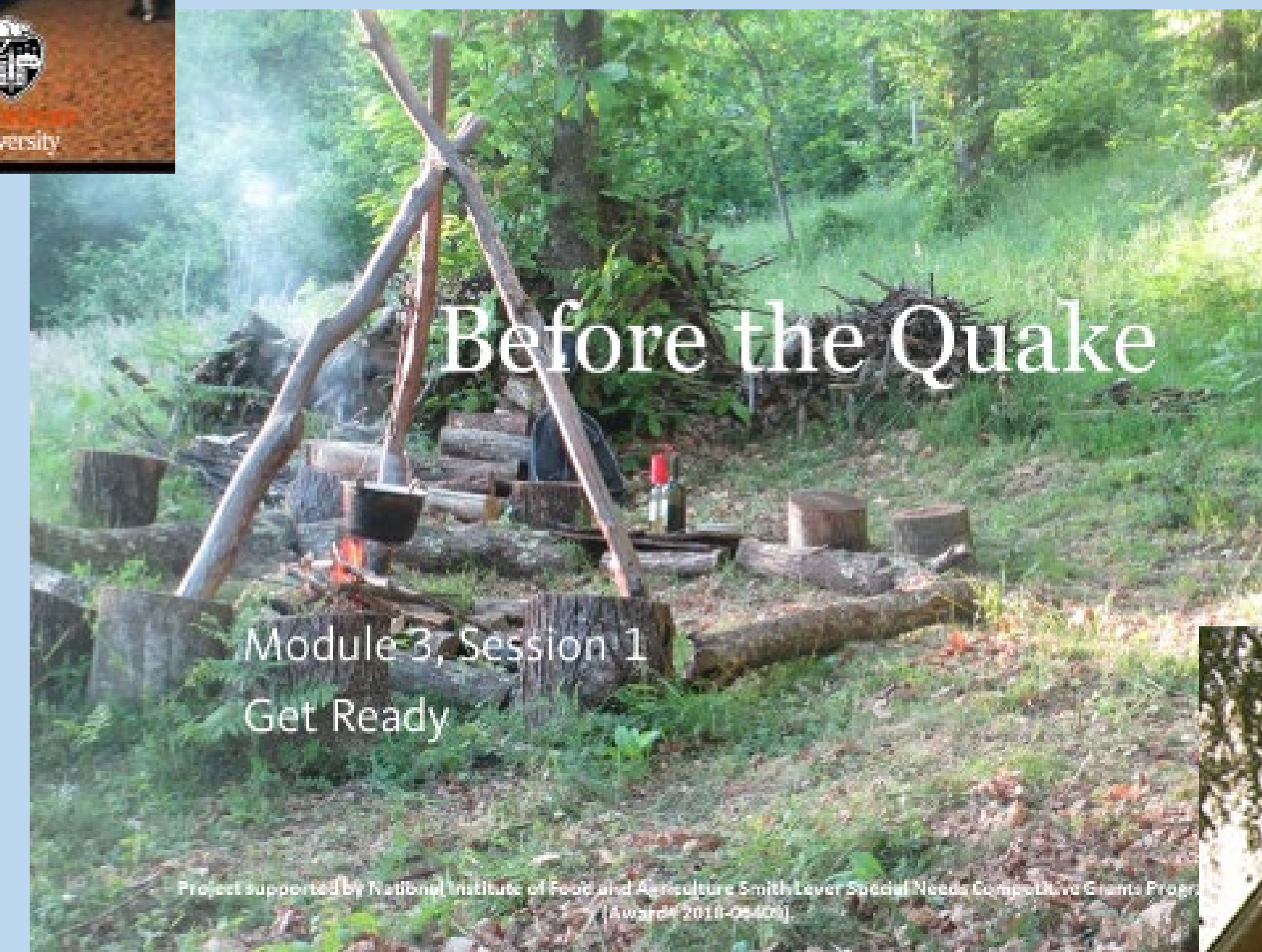
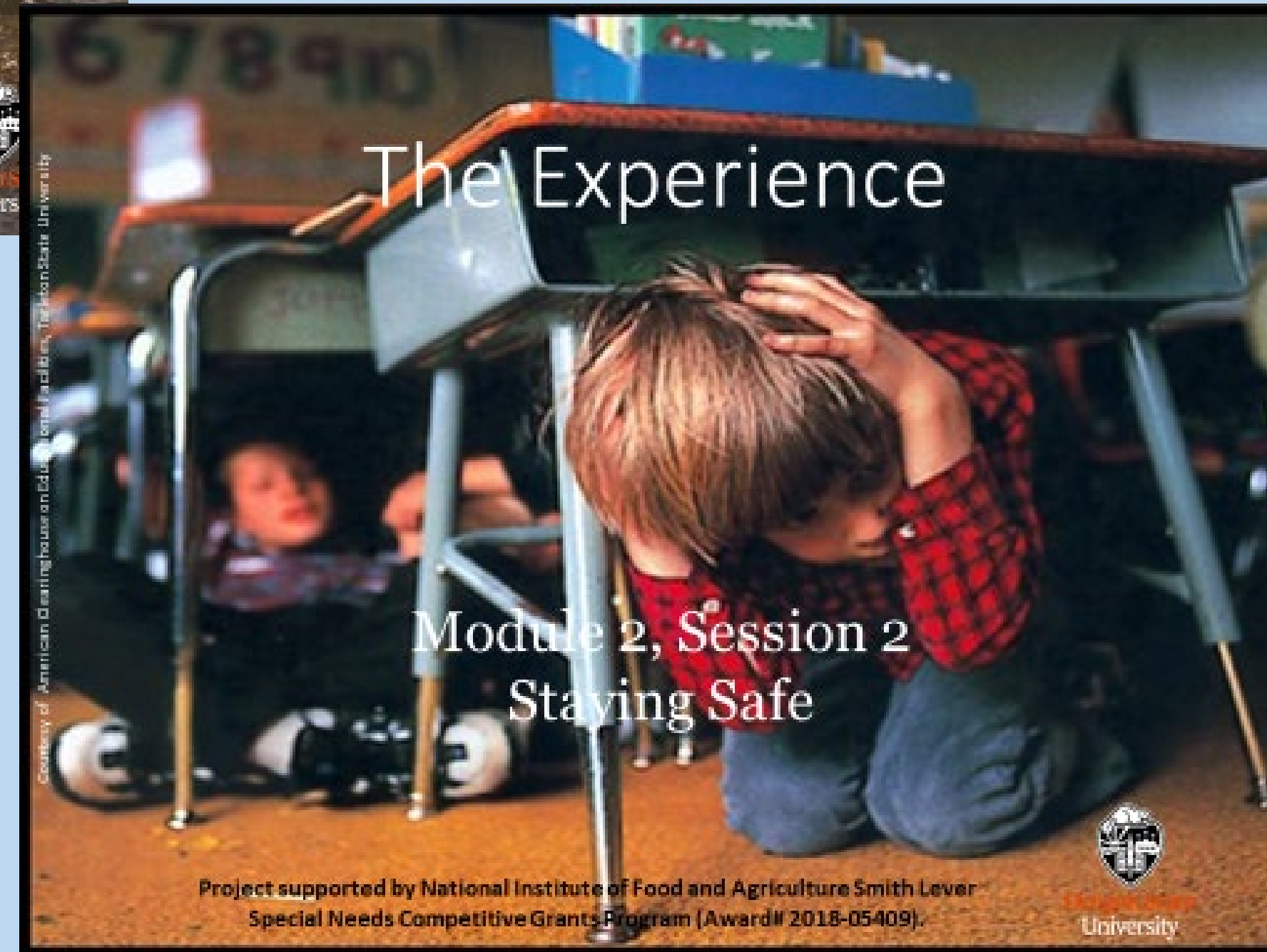
1. Protecting Your Home from Wildfire: Creating Wildfire-Defensible Zones. Fire 2012-1. Colorado State Forest Service
2. CSU Extension fact sheet 9.156, Financial Emergency Preparedness
3. CSU Extension fact sheet 6.305 FireWise Plant Materials
4. CSU Extension fact sheet 6.303 Fire Resistant Landscaping
5. CSU Extension fact sheet 1.817 Wildfire Preparedness for Horse Owners
6. CSU Extension fact sheet 1.814 Caring for Livestock Before a Disaster
7. CSU Extension fact sheet 6.304 Forest Home Fire Safety



# Preparing Oregon for a Catastrophic Disaster Never Experienced in Recent History:

## The Cascadia Subduction Zone Earthquake and Tsunami

An on-line learning course by  
**Lynette Black and Glenda Hyde**  
Associate Professors,  
OSU Extension Service



Project supported by National Institute of Food and Agriculture Smith Lever Special Needs Competitive Grants Program  
(Award# 2018-05409)

# Scenario Planning: Developing Crop Management Strategies for the Most Impactful Climate and Weather Scenarios

Ashley Mueller<sup>1</sup>, Tyler Williams<sup>1</sup>, Anthony Bly<sup>2</sup>, Laura Edwards<sup>2</sup>, Justin McMechan<sup>1</sup>, & Nathan Mueller<sup>1</sup>

<sup>1</sup>University of Nebraska-Lincoln, <sup>2</sup>South Dakota State University

## The Issue

Extreme weather events cannot be prevented, but there are many management practices crop producers can adopt that increase farm sustainability. These **practices can help farmers** prepare for and recover from extreme weather and climate variation.

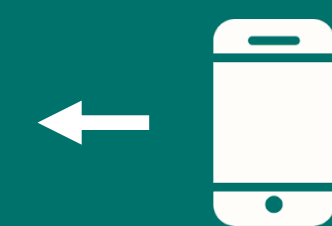
## Methods

This project was a **collaborative effort** between two state Extension organizations, a university center, a state climate office, a regional climate center, and a regional USDA Climate Hub.

**Five meetings, using the scenario planning method, were hosted** in four locations in Nebraska and South Dakota. Discussions at these meetings generated **hundreds of crop- and climate-scenario impacts and potential management strategies**. Eighty-five cropping systems stakeholders participated in the meetings.

- 1 **Facilitated large-group discussions** about weather events that impact farming operations throughout the year. Identified key themes.
- 2 **Led focus groups** about the impact of certain climate scenarios. Created large list of impacts.
- 3 **Developed scenario planning tool**.

The scenario planning method is a successful approach to addressing weather and climate impacts on the farm.



Visit the *scenario planning tool*  
[go.unl.edu/scenarioplanning](http://go.unl.edu/scenarioplanning)

## Scenario Planning Tool



## Reflections

The scenario planning method is a **successful approach to addressing weather and climate impacts on the farm**, particularly cropping systems. These topics are particularly challenging to address with agricultural audiences because of **political and social influences**. Through facilitated large- and small-group discussions, we were able to understand and use our target audiences' knowledge and experiences. We **developed a planning tool that will benefit producers** and agricultural stakeholders in our region and beyond.



United States Department of Agriculture  
 National Institute of Food and Agriculture

*Funding for this project was provided by USDA Northern Plains Climate Hub.*



# Weather Ready Landscapes Infographic Series: A Look at the Resources and Lessons Learned in Development

Ashley Mueller, Tyler Williams, John Fech, Kelly Feehan, Elizabeth Killinger, & David Lott

## The Issue

In the blink of an eye, **extreme weather events can wreak havoc on lawns and landscapes**, often leaving homeowners and landscape managers at a loss for what to do. To help these people make decisions and take actions prior to and after extreme weather events, we developed the **Weather Ready Landscapes infographic series**.

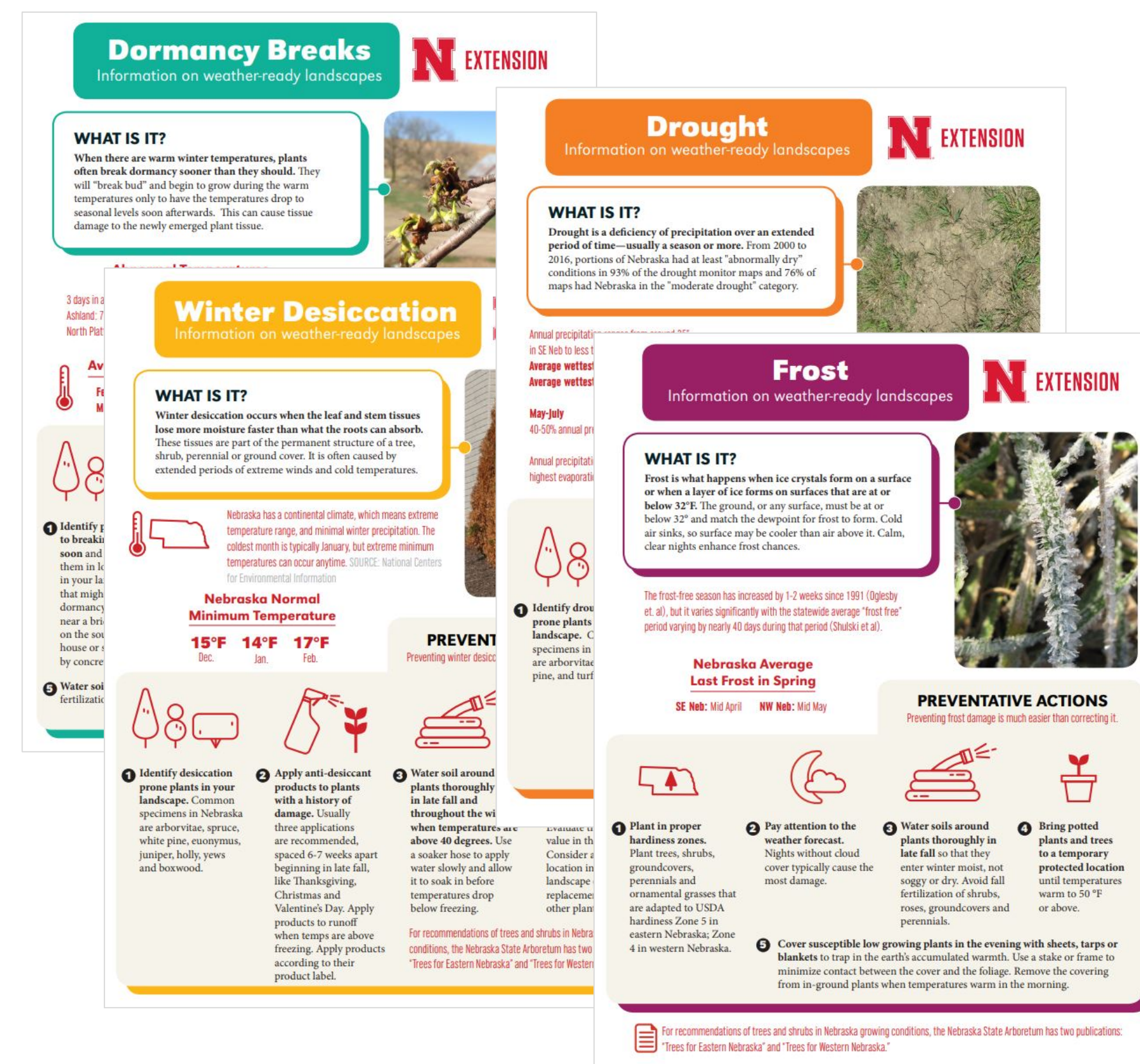
## Methods

The primary objective of the Weather Ready Landscapes infographic series is **to provide our target audiences with easy-to-read and visually appealing resources** that can be accessed online and in print. Eight two-page infographics were developed on the following topics: flood, hail, ice, tornado and wind, winter desiccation, frost, dormancy breaks, and drought.

- ✓ On the front page, the **weather terms are defined and preventative actions are explained**.
- ✓ On the back page, **typical damage is shown and corrective actions are covered**.

All **infographics contain photos**. The infographics are **formatted for desktop printing**, and they can be printed on an as-needed basis, which reduces the production costs.

## Infographic Series



## Reflections

We **gained critical insight and understanding of best practices for infographic development**, and this was because we worked directly with Jacht Ad Lab, UNL's student-run advertising agency. The students guided us through the stages of infographic development, and we documented lessons learned along the way.

During the **spring and summer 2019 flooding** in Nebraska, our team and colleagues **shared the flood infographic with impacted stakeholders** at recovery events and on social media.

The Weather Ready Landscapes infographic series provides homeowners and landscape managers with information to make decisions before and after extreme weather events.



Visit the website  
[go.unl.edu/wrlinfographics](http://go.unl.edu/wrlinfographics)

# Supporting Urban Ecosystems and Communities in Times of Natural Disaster

## Introduction

There is a disconnect between community and ecosystem resilience, especially in urban areas. While there are communities that embrace green infrastructure for issues such as flood mitigation (Opperman, 2014), silos often exist between agencies and community organizations involved in nature conservation and those charged with disaster planning and recovery.

## Urban Ecosystems

Urban areas represent ~ 2% of land cover globally, but house >50% of the population and consume >75% of natural resources.

Urban ecosystems are regionally, and sometimes globally important for numerous species, and new methods are being developed to evaluate (e.g. Li et al., 2019, ) and provide tools to conserve biodiversity in cities (Biophilic Cities, WILD Cities, etc.).

For human communities, access to nature is important for mental and physical health, and can increase emotional resilience in the face of stressful events (Marselle et al., 2019) including natural disasters. Access to nature in cities is especially important for some of the most vulnerable low-income communities.



An aerial rendering of New Meadowlands, a proposal to provide flood protection and recreational amenities with a system of berms and marshes in Meadowlands, New Jersey. Photograph: MIT CAU + ZUS + URBANISTEN



Mountain lion P22 in Griffith Park, Los Angeles, CA. Photo by Steve Winter for USGS/National Wildlife Federation



Peregrine falcon in New York City. Photo: Barbara Loucks, NY DEC

## Methods and Data

- Utilize or develop a database to evaluate urban ecosystem protection
- Generate new elements related to disturbance/extreme weather
- Develop scoring system to evaluate impact and recovery



Title	Country	Scale	Biodiversity Programs & Activities
Petaling Jaya City Council	Malaysia	municipality	Programs <a href="#">USBC</a> (member)
Phoenix, AZ	USA	municipality	Programs 2007 <a href="#">Ecological Footprint</a> (single year) Activities 2010 <a href="#">Use &amp; Shade Master Plan</a> (Urban Forest Plan)
Phuket	Thailand	municipality	Programs <a href="#">Sustainable Index</a> (applied by government)
Pierrefonds-Roadboro, Montreal	Canada	community	Activities 2012 <a href="#">In Future, Durable, Fresh</a> (Sustainability Plan)
Pittsburgh, PA	USA	municipality	Programs 2016 <a href="#">Biophilic Cities</a> (partner city) 2018 <a href="#">City Nature Challenge</a> (participant)

## Outputs

- Identify best practices for incorporating urban nature conservation and disaster planning and response at the municipal level
  - Story map, journal publication
- Examine use of community science to evaluate and monitor diversity
  - iNaturalist
  - Outreach and service programs (Master Naturalist)
- Create usable tools to guide local planning processes
  - Extension publication, eXtension short course, decision support tools

## References

Li, E., Parker, S. S., Pauly, G. B., Randall, J. M., Brown, B. V., & Cohen, B. S. (2019). An Urban Biodiversity Assessment Framework That Combines an Urban Habitat Classification Scheme and Citizen Science Data. *Frontiers in Ecology and Evolution*, 7. <https://doi.org/10.3389/fevo.2019.00277>

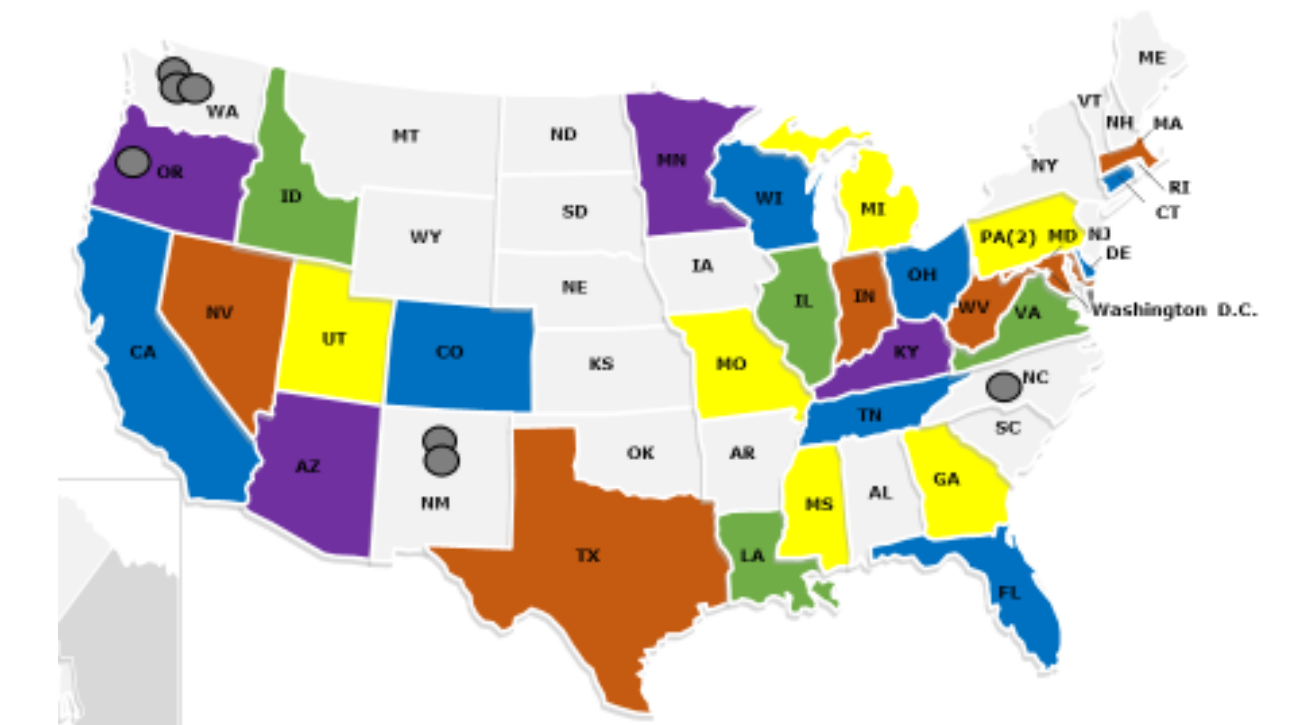
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Opperman, J. (2014). A Flood of benefits: Using Green Infrastructure to reduce flood risks. Retrieved from <https://www.conservationgateway.org/ConservationPractices/Freshwater/HabitatProtectionandRestoration/Documents/A%20Flood%20of%20Benefits%20-%20J.Opperman%20-%20May%202014.pdf>

<https://www.biophiliccities.org/>

<https://wildcities.org/>

Sabrina Drill, Natural Resources Advisor, UC Cooperative Extension – Los Angeles/Visiting Researcher, OU Oklahoma Biological Survey  
[sldrill@ucanr.edu](mailto:sldrill@ucanr.edu)



State and local Master Naturalist and similar program members of the Alliance of Natural Resource Outreach and Service Programs (ANROSP)



Sampling fish communities in the Los Angeles River. Photo: Sabrina Drill

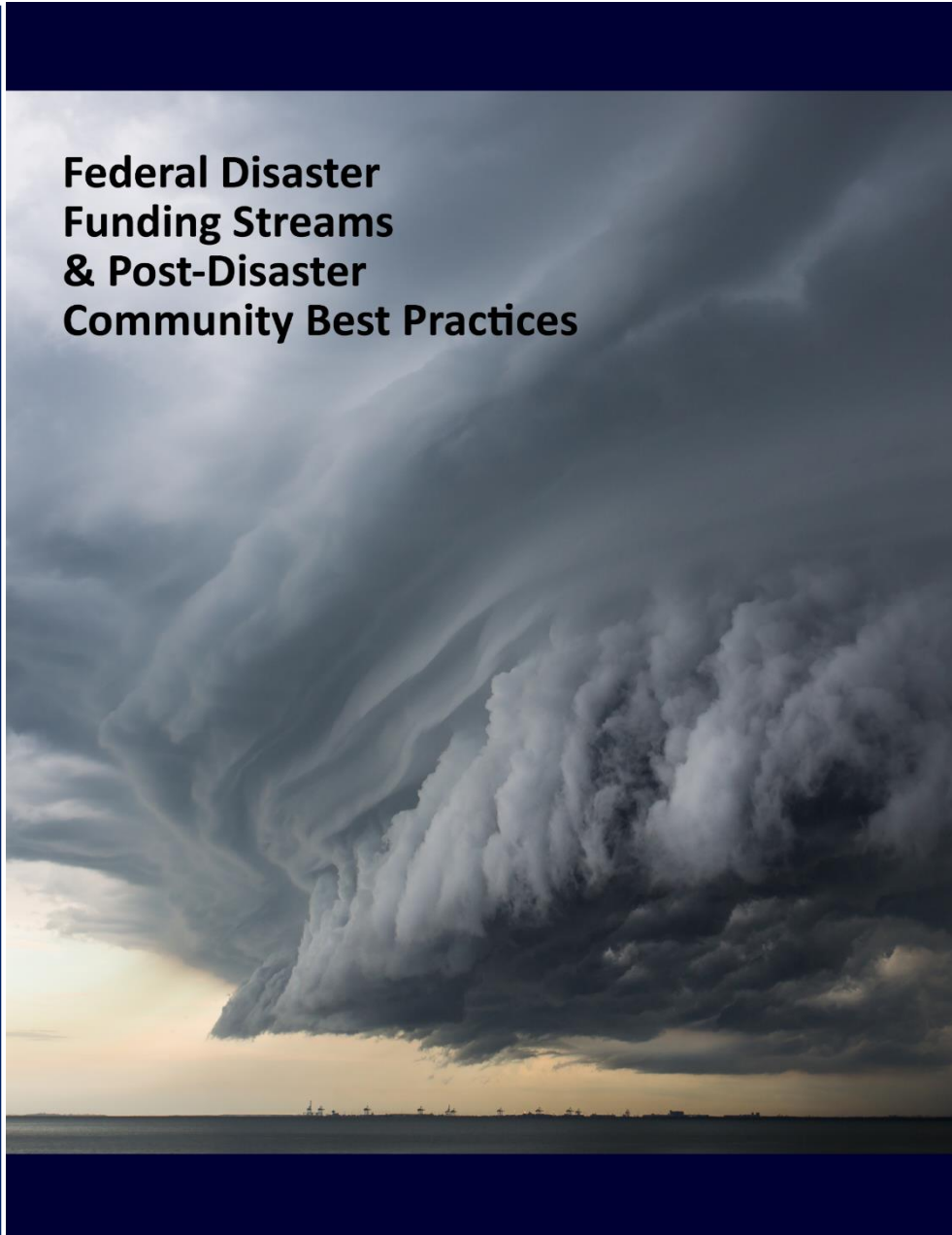


# Federal Disaster Funding Streams & Post Disaster Community Best Practices

## Project Overview

The purpose of the project is to streamline the response and recovery process for communities affected by disasters by:

1. Creating a set of **funding matrices** detailing programs available from federal agencies to individuals, communities and business.
2. Identifying and documenting best practices for community disaster preparation, response and recovery through a series of **case studies**.

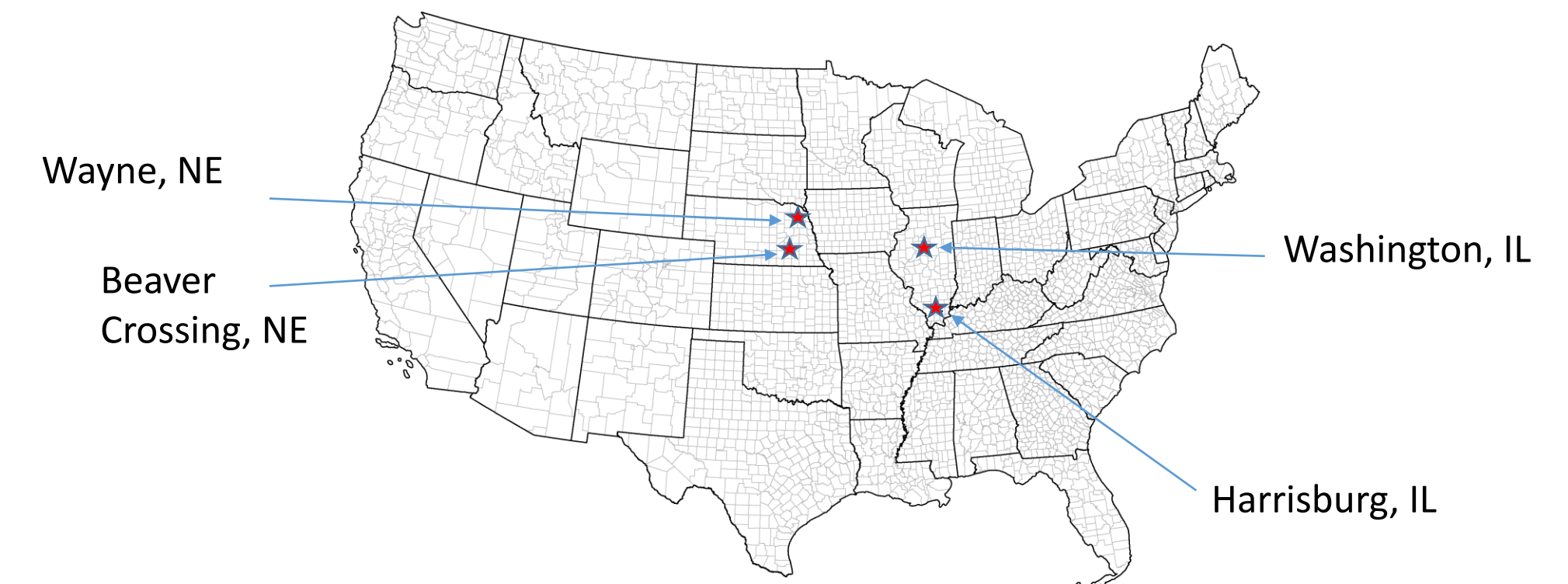


Federal Disaster Funding Streams & Post-Disaster Community Best Practices

## Community Case Studies

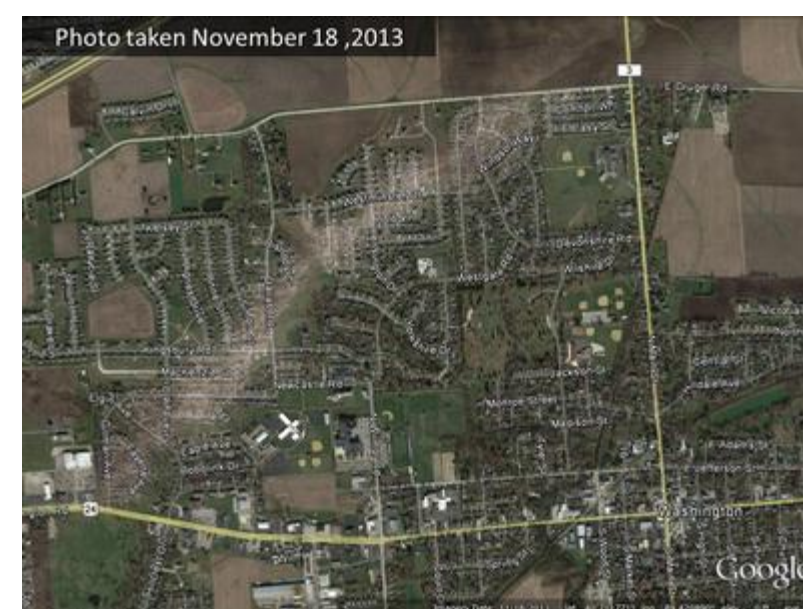
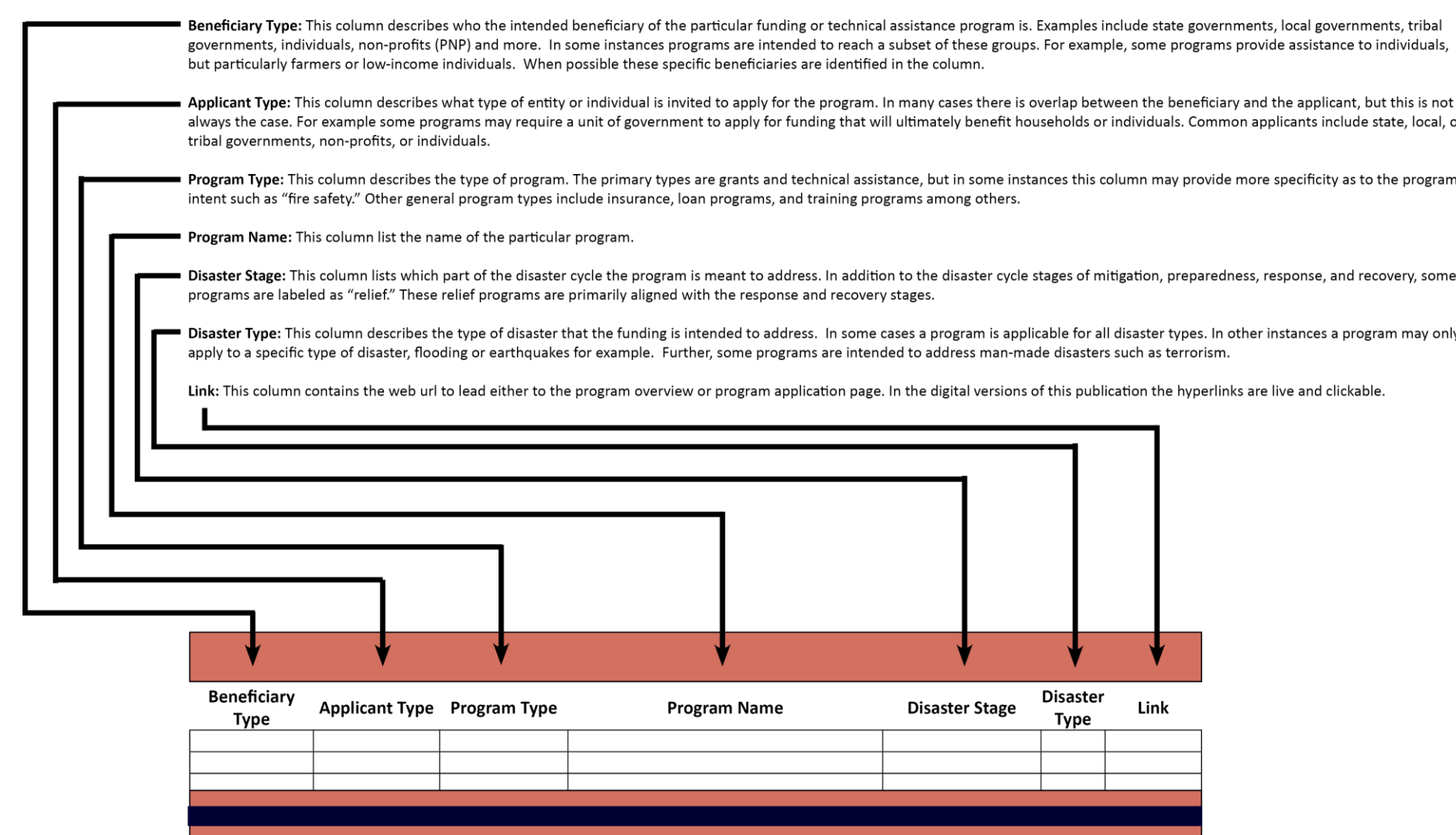
Case studies were developed by convening focus groups in four communities that had been affected by tornados:

- Harrisburg, Illinois
- Washington, Illinois
- Beaver Crossing, Nebraska
- Wayne, Nebraska



## Funding Matrix Overview

Federal Disaster Funding Matrices Overview



Top: Residential Neighborhood Destroyed in Washington, IL.  
Bottom: Google Satellite Image of Tornado Path in Washington, IL.  
Photos originally appearing on the NWS website.



Top: Redeveloped neighborhood with homes constructed after the tornado in Washington, IL.  
Bottom: New construction underway on one of the last lots impacted by the tornado.  
Photos courtesy of Jon Oliphant

## Funding Matrix Example

### Disaster Funding Matrix: FEMA

Beneficiary Type	Applicant Type	Program Type	Program Name	Disaster Stage	Disaster Type	Link
Individuals/Households	Individuals/Households	Assistance	Individuals and Households Program	Recovery	Presidentially Declared Disasters	<a href="https://www.fema.gov/media-library-data/1528984381158-6f25cab096b6e747510-2115445560/IndividualHouseholdsPrograms.pdf">https://www.fema.gov/media-library-data/1528984381158-6f25cab096b6e747510-2115445560/IndividualHouseholdsPrograms.pdf</a>
Individuals/Households	American Bar Association Young Lawyers Division	Legal Services	Disaster Legal Services (DLS)	Recovery	Presidentially Declared Disasters	<a href="https://www.fema.gov/media-library-data/1502303152795-4737184ef3e964b70dc563b-473ae4e4/FAC3HEEDisasterLegalServices.pdf">https://www.fema.gov/media-library-data/1502303152795-4737184ef3e964b70dc563b-473ae4e4/FAC3HEEDisasterLegalServices.pdf</a>
Individuals/Households	State/Tribal/Territory	Grant Program	Crisis Counseling Assistance & Training Program	Recovery	Presidentially Declared Disasters	<a href="https://www.fema.gov/recovery-directorate/crisis-counseling-assistance-training-program">https://www.fema.gov/recovery-directorate/crisis-counseling-assistance-training-program</a>
Individuals/Households	State/Tribal/Territory	Grant Program	Disaster Unemployment Assistance	Recovery	Presidentially Declared Disasters	<a href="https://www.fema.gov/media-library-data/1502303098195-36-608049769-5e1e978bb8b5-3077af/FAC3HEEDisasterUnemployment.pdf">https://www.fema.gov/media-library-data/1502303098195-36-608049769-5e1e978bb8b5-3077af/FAC3HEEDisasterUnemployment.pdf</a>
Individuals/Households	State/Tribal/Territory	Grant Program	Disaster Case Management	Recovery	Presidentially Declared Disasters	<a href="https://www.fema.gov/media-library-data/150237247458-8cc08f5e4038b11bc-2558b65a72ae0b6/FAC3HEEDisasterCaseManagement.pdf">https://www.fema.gov/media-library-data/150237247458-8cc08f5e4038b11bc-2558b65a72ae0b6/FAC3HEEDisasterCaseManagement.pdf</a>
Individuals/Households	Individuals/Households	Insurance	National Flood Insurance Program (NFIP)	Preparedness	Flooding	<a href="https://www.fema.gov/national-flood-insurance-program">https://www.fema.gov/national-flood-insurance-program</a>
Individuals/Households	Individuals/Households	Grant Program	Cora Brown Fund	Response, Recovery, Preparedness	All	<a href="https://www.fema.gov/media-library/assets/documents/24409">https://www.fema.gov/media-library/assets/documents/24409</a>
Individuals/Households	Individuals/Households	Grant Program	Disaster Case Management (DCM)	Response, Recovery	All	<a href="https://www.fema.gov/media-library/assets/documents/101282">https://www.fema.gov/media-library/assets/documents/101282</a>
Local Governments	Local Governments	Loan	Community Disaster Loan Program	Recovery	Presidentially Declared Disasters	<a href="https://www.dhs.gov/library/assets/recovery/FEMA_Community_Disaster_Loan.pdf">https://www.dhs.gov/library/assets/recovery/FEMA_Community_Disaster_Loan.pdf</a>
Local Governments	Local Governments	Toolkit	Community Recovery Management Toolkit (not a grant program)	Recovery	All	<a href="https://www.fema.gov/national-disaster-recovery-framework/community-recovery-management-toolkit">https://www.fema.gov/national-disaster-recovery-framework/community-recovery-management-toolkit</a>
Local Governments	Local Governments	Grant Program	Emergency Management Performance Grant Program	Long-term recovery	All	<a href="https://www.fema.gov/media-library-data/1464196875293-190ed88e1b6304087121a3f0b-779ba9c1f6f0c_Multi_Year_Program_Guidance_Final.pdf">https://www.fema.gov/media-library-data/1464196875293-190ed88e1b6304087121a3f0b-779ba9c1f6f0c_Multi_Year_Program_Guidance_Final.pdf</a>
Local Governments	Local Governments	Grant Program	Emergency Management Baseline Assessments	Preparedness	All	<a href="http://open.grants.usdoj.gov/oc430443/View/View/FP-2016-Emergency-Management-Baseline-Assessment-Grant-EMBAG-DHS-16-NPD-131-00-01">http://open.grants.usdoj.gov/oc430443/View/View/FP-2016-Emergency-Management-Baseline-Assessment-Grant-EMBAG-DHS-16-NPD-131-00-01</a>
State Government	State Government	Infrastructure Safety	National Dam Safety Program Information	Preparedness	Infrastructure Safety	<a href="https://www.fema.gov/national-dam-safety-program">https://www.fema.gov/national-dam-safety-program</a>
State/Local	State/Local	Grant Program	Fire Management Assistance Grant Program	Response, Recovery	Fire Management Assistance Grant Program Declaration	<a href="https://www.fema.gov/media-library-data/1398280975537-42799af7a4a300676b870154ace922b/1345262064e4c19e4b3207014_508.pdf">https://www.fema.gov/media-library-data/1398280975537-42799af7a4a300676b870154ace922b/1345262064e4c19e4b3207014_508.pdf</a>
State/Local	State/Local	Grant Program	Urban Search and Rescue Cooperative Agreements	Response	All	<a href="https://www.fema.gov/urban-search-rescue">https://www.fema.gov/urban-search-rescue</a>
State/Local	State/Local	Fire Safety	Fire Prevention & Safety Grants	Preparedness	Fire	<a href="https://www.fema.gov/fire-prevention-safety-grants">https://www.fema.gov/fire-prevention-safety-grants</a>
State/Local	State/Local	Fire Safety	Assistance to Firefighters Grant Programs	Preparedness	Fire	<a href="https://www.fema.gov/welcome-assistance-firefighters-grant-program">https://www.fema.gov/welcome-assistance-firefighters-grant-program</a>
State/Local	State/Local	Fire Safety	Building for Adequate Fire & Emergency Response Grant Program	Preparedness	Fire	<a href="https://www.fema.gov/staffing-adequate-fire-emergency-response-grants">https://www.fema.gov/staffing-adequate-fire-emergency-response-grants</a>
State/Local	State/Local	Fire Safety	State Fire Training System Grant	Preparedness	Fire	<a href="https://www.fema.gov/media-library/assets/documents/20589">https://www.fema.gov/media-library/assets/documents/20589</a>



Top: Strip Mall at U.S. 45 & U.S. 145 in Harrisburg, IL destroyed



Bottom: Rebuilt Strip Mall at U.S. 45 and U.S. 145 in Harrisburg, IL  
Top photo courtesy of Gary Rann, bottom photo courtesy of Susan Odum

## Example Case Study Findings

- The city officials, police and fire departments must take control of the area quickly. After the disaster people are going to want to help immediately. Harrisburg quickly designated areas to receive donated goods as well as established an area to coordinate volunteers and contractors.
- The focus group members mentioned the importance of distinguishing volunteers from qualified contractors as well as having a system for contractors to register with the city. This has the dual benefit of increasing safety as well as keeping unscrupulous contractors, who may be looking to capitalize on the disaster, out of the community.
- Focus group members stressed the importance of keeping track of all the response and recovery activities as having this information is critical in applying for various recovery funds. Key records that were kept included the number of hours worked by city staff, the resources and equipment used in the response and recovery effort, and the number of volunteer hours donated.
- It is a necessity that a community creates an entity, or has identified an entity, that has the ability to accept cash donations because after the disaster strikes the donations will come quickly and the community must be prepared to make immediate use of those funds.
- The community must have a plan for debris management and must make sure that it has the infrastructure and resources to handle the massive amounts of debris caused by the natural disaster.
- The focus group members emphasized the importance of having a person or group of people designated as the main community liaison and points of contact to FEMA in order to ensure effective communication between FEMA and the community.

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