



# Guide to Expanding Mitigation

MAKING THE CONNECTION TO AGRICULTURE



FEMA



Photo: Cows in a meadow in Bridgeport, Calif.  
Cover Photo: Organic farmers arranging vegetables at farmers market in Wash.



Photo: Jersey rooftop tomato farm in Queens County, N.Y.

Most Americans eat three meals a day without giving much thought to the industries that produce our food. The eggs and blueberries at breakfast, the grilled cheese sandwich and apple at lunch, or the pork chops with cranberry sauce and potatoes at dinner are often produced by nearby farms. Food is indispensable to our livelihoods, yet the agriculture sector is typically overlooked when communities plan for hazards.

When a disaster, such as a major flood, puts food at risk, it is too late to start the mitigation actions that would help local farmers. Communities need to incorporate an agriculture perspective in their current hazard mitigation planning to add protections now, before the next disaster. Agriculture advocacy organizations, farmers, and industry experts can be engaged during the hazard mitigation plan process to share their insights on vital local crops and resiliency challenges.

The *Guide to Expanding Mitigation* shows how community officials can work with the agriculture sector to support hazard mitigation, including the planning process. This guide can help community officials initiate a conversation about mitigation investments that will make agriculture more resilient.



This *Guide to Expanding Mitigation* is part of a [series](#) highlighting innovative and emerging partnerships for mitigation.

## AGRICULTURE IN YOUR COMMUNITY

Nationwide, agriculture is such a large industry that our first thoughts may turn to the bountiful farm belt in the Midwest that serves as a breadbasket for the world. The United States has 900 million acres of farmland, which accounts for 37% of the nation's land. The U.S. Department of Agriculture (USDA) tracks farms that produce and sell products with a market value more than \$1,000 each year. The market value of products sold in 2017 from more than two million farms across the country was \$388 billion. Agriculture is also a key part of local economies. For example, New York and New Jersey have over 43,000 farms, and the market value of products sold in 2017 was \$6.5 billion. Agriculture is present in rural areas, the suburbs, and even in cities with small urban farms and community gardens.

The local agricultural sector is very diverse. The fish you grilled or raw oysters you ate last night could have come from a local aquaculture farmer. Agriculture also goes beyond the food we eat: when we play golf on lush turf grasses or landscape around our homes with new shrubs, we can thank a local farmer who grows these plants.

Agriculture is a significant part of state and local economies, and the industry represents an important partner for bolstering community resilience. By protecting farms and the services vital to their operation, we are also protecting the local economy and the food supplies we all need. Additionally, in protecting agriculture, we help provide for our community's most vulnerable. Many low-income families and seniors are unable to store a three-day supply of food for emergencies. State, local, tribal and territorial officials can improve resiliency in their communities, as well as in the agriculture industry.

### DID YOU KNOW?



	UNITED STATES
Number of Farms	2 million
Acres of Farmland	900 million
Product Value	\$389 billion
• Crops	\$194 billion
• Livestock, Poultry, and their products	\$195 billion

Source: USDA 2017 Census of Agriculture

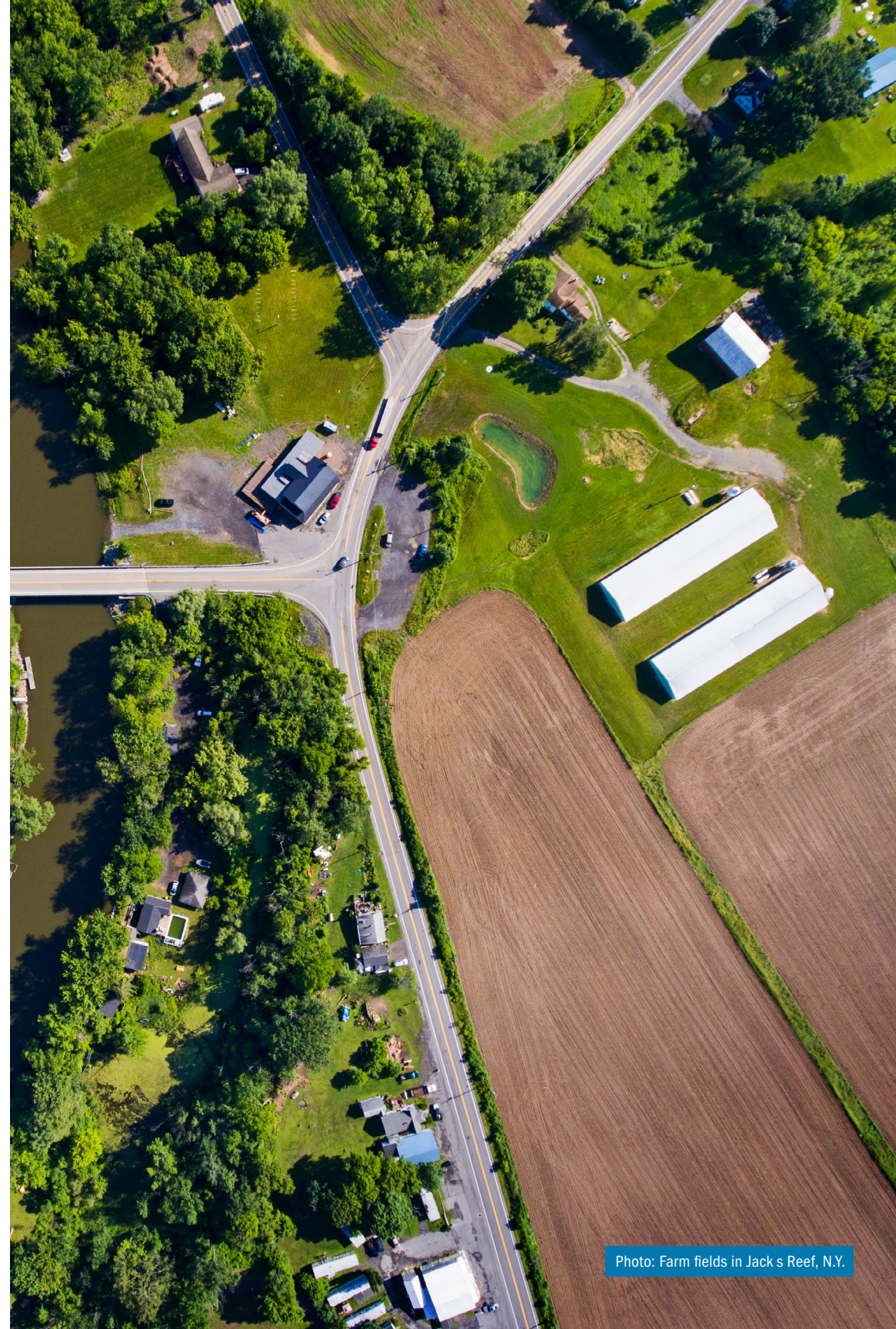


Photo: Farm fields in Jack's Reef, N.Y.



Photo: Buffers along a river bank in Pennsylvania

## ENGAGING THE AGRICULTURE SECTOR IN MITIGATION DECISIONS

To improve the resiliency of the local agricultural sector and to secure food supplies, communities should take actions before, during and after a disaster. Discussions with farmers, farm representatives and community garden stewards will identify possible mitigation opportunities. Supporting cooperative local garden programs promotes resiliency by enhancing a sense of community. Officials can begin working with the local agricultural community to address questions such as these:

- Are crops spoiling in the aftermath of a disaster? If so, why? Did they spoil because the roads between farms and markets were closed? Was it due to a power grid failure that kept farmers from maintaining cold storage? Or was it because storage facilities, on or off the farm, could not withstand the event?
- What effects might an earthquake have on farms that rely on well water? Are residents aware that even moderate earthquakes can render water wells inoperable?
- To what degree are farms vulnerable to changes in development, erosion, dam controls, land management practices and nonpoint source pollution?
- Are the potential effects of sea level rise well understood or anticipated? Which farms risk inundation? Will salt water modify the water table on which farmers rely?
- What can be done to mitigate the impacts of climate change? Beyond sea level rise, how will the effects of more intense rain, increasing temperatures and drought affect farms?
- What vital services do farms depend on which need protecting?

In addition to evaluating how hazards could affect local agriculture, emergency managers and community planners should consider that agricultural practices can inform hazard mitigation actions. For example, farming practices can play an important role in reducing flood risk. According to the Union of Concerned

Scientists, when farmers engage in no-till planting and keep the soil continuously covered with living plants (through cover crops or perennial crops like alfalfa), water runoff from extreme weather events has been reduced by 20%. This protects downstream properties, as well as the farms. It also replenishes the natural water table and reduces erosion.

Another approach to reducing runoff is to ensure farms continue to be used only for agriculture. Farmland preservation programs, for example, pay landowners to place deed restrictions on their land to prevent future development that could increase stormwater runoff. Many private land trusts and state and federal programs are dedicated to farmland preservation, including the U.S. Department of Agriculture's Natural Resources Conservation Services (NRCS).

Vegetative buffers are another useful and low-cost mitigation tool. They protect the streams they border and there are federal funds to share the cost of creating buffers. While FEMA's hazard mitigation grant programs focus on public infrastructure, the NRCS provides financial assistance for landowners to offset the costs of projects to improve private properties. Through the mitigation planning process, these potentially complementary funding sources may be used together.



### DID YOU KNOW?

The Secretary of U.S. Department of Agriculture is authorized to designate counties as disaster areas and to make emergency loans available to producers suffering losses. Eligible natural disasters must have substantially affected farms which caused severe production losses. This designation is different from, but often occurs alongside, the Presidential Disaster Declarations administered by FEMA.

### USDA Disaster Declarations

*Between 2012 and 2020, there were 1,609 USDA Secretarial disaster designations requested across the United States.*



Photo: Green soybean fields in Missouri

## AGRICULTURE REPRESENTATIVES

Which organizations might be invited to engage in the planning process? The answer will vary from county to county and state to state, but these organizations should be considered:

- Cooperative Extensions
- Local Farm Bureaus
- County Soil and Water Conservation Districts
- County Boards of Agriculture
- County Agriculture Development Boards
- State Departments of Agriculture
- USDA Natural Resources Conservation Services
- USDA Rural Development
- Academic Institutions

In addition, the Extension Disaster Education Network links disaster research and resources from agriculture educators working across the country. State and territory institutions within the network also offer locally relevant resources and connections that may be useful during the planning process.

## RELATIONSHIPS GO BEYOND MITIGATION PLANNING

Involve organizations that represent the agriculture sector in mitigation planning. This leads to benefits in other areas of emergency management. In some cases, these relationships already exist through emergency preparedness planning:

- Farms store chemicals on site. Actions to protect these stored chemicals from damage during a natural hazard are mitigation actions. Additionally, some first responders meet annually with farmers to update their records on what is contained and where.
- Plans for managing the movement and storage of farm animals before a disaster continue to be used. They may be relevant to inform or incorporate into a hazard mitigation plan.
- In Iowa, for example, the state partnered with rural electric cooperatives to repair infrastructure damaged in a major ice storm that left many farms without electricity for an extended time. The state's hazard mitigation plan now includes an annex for the cooperatives, which has helped them to collaborate and identify mitigation projects that improve electrical service to farms.

## RESOURCES

### Guides to Expanding Mitigation

<https://www.fema.gov/mitigation-risk-reduction>

*Link to all available Guides to Expanding Mitigation.*

### FEMA Hazard Mitigation Planning

<https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning>

*Review standards and guidance for the planning process.*

### USDA Disaster Resource Center

<https://www.usda.gov/topics/disaster>

*Find information about USDA and other assistance to recover from disasters and build resilience.*

### Extension Disaster Education Network

<https://extensiondisaster.net/>

*Find disaster-specific courses, exercises, and resources from educators in Extension programs.*

### Funding Opportunities

<https://toolkit.climate.gov/content/funding-opportunities>

*Learn about a range of government and private financing for climate adaptation and resilience projects.*

### Fourth National Climate Assessment

<https://nca2018.globalchange.gov/chapter/10/>

*Learn how climate change affects agricultural productivity, the health of people and ecosystems, and the vulnerability of rural communities.*

## REFERENCES

Penn State Cooperative Extension. 2010. Ready AG©: Disaster and Defense Preparedness for Production Agriculture. The Pennsylvania State University.

<https://extension.psu.edu/readyag-workbook>

Rutgers Climate Institute. 2016. Climate Change and Agriculture, Including Aquaculture and Fisheries, in New Jersey. Rutgers New Jersey Agricultural Experiment Station.

<https://climatechange.rutgers.edu/docman-list/affiliate-publications/449-ag-and-climate-document-final-1/file>

Union of Concerned Scientists. 2017. "Turning Soils into Sponges: How Farmers Can Fight Floods and Droughts." <https://www.ucsusa.org/resources/turning-soils-sponges>

USDA. 2017. Census of Agriculture, U.S. Summary and State Data.

<https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

USDA. 2019. Disaster Designation Information. <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/disaster-designation-information/index>

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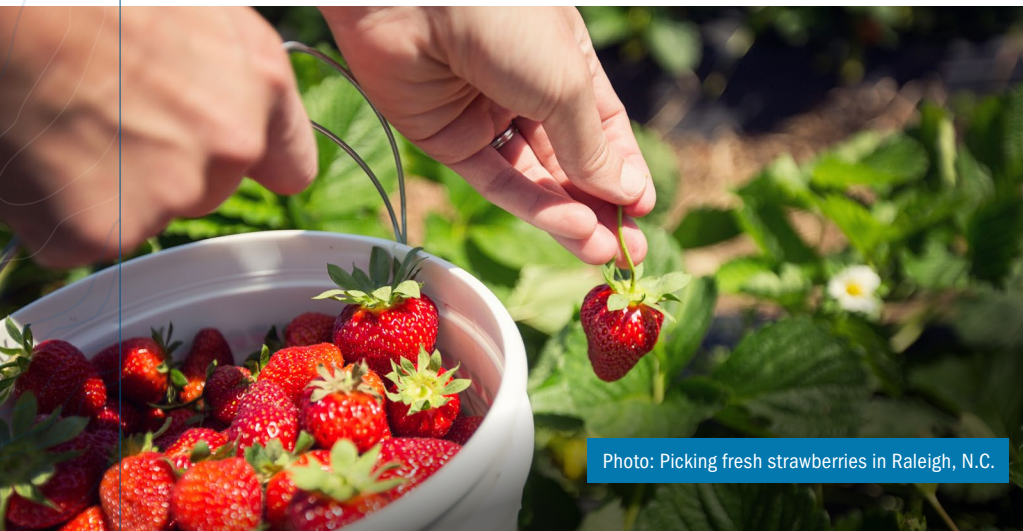


Photo: Picking fresh strawberries in Raleigh, N.C.



## ENGAGE WITH US

Are you a state, local, tribal or territorial official interested in making the connection between agriculture and hazard mitigation? Are you a representative from an agricultural organization or cooperative interested in connecting with local officials to reduce risk from hazards? Please contact us at [FEMA-ExpandingMitigation@fema.dhs.gov](mailto:FEMA-ExpandingMitigation@fema.dhs.gov).

