State of Iowa

Iowa Comprehensive Emergency Plan

Part B: Iowa Hazard Mitigation Plan

June 2018

State of Iowa Hazard Mitigation Plan
Section 5: Hazard Mitigation Strategy

Contents of Section 5 of the 2018 Iowa Hazard Mitigation Plan

5. Hazard Mitigation Strategy

The hazard mitigation strategy is the heart of the *Iowa Hazard Mitigation Plan*. It details what mitigation actions we want to accomplish and how we intend to do it. The strategy is guided by goals and objectives, which are found in section 5.1. Section 5.2, the Comprehensive State Hazard Mitigation Program, describes all of the mitigation capabilities of the State of Iowa. Essentially, this section describes the tools the State has to bring about mitigation actions throughout Iowa. Section 5.3 explains some of the obstacles and challenges the State faces in its comprehensive hazard mitigation program.

With an understanding of the mitigation capabilities, plus an understanding of the hazard risks from section 3, hazard mitigation actions can be considered and outlined. Sections 5.4 and 5.5 designate the mitigation actions the State Hazard Mitigation Team (SHMT) decided to include in the State's hazard mitigation strategy for the next five years. Section 5.4 summarizes the actions that were in the 2013 plan and describes which ones will continue to be actions, which ones will continue in an amended fashion, and which ones will no longer be mitigation actions and why. Section 5.5 introduces a few new mitigation actions to the strategy. It also describes how each action is tied to one or more of the goals, and what funding or agency may be available for assistance with each action. Ranking and prioritization of the mitigation actions is covered in Section 5.6. The next major section of the plan, Monitoring, Review and Maintenance Process (section 6), discusses another important component of an effective hazard mitigation strategy, and that is tracking progress and assessing effectiveness of the actions.

5.1. Goals and Objectives

As part of the planning process, the SHMT provided guidance on the development of the goals and objectives for the update of the *Iowa Hazard Mitigation Plan*. The SHMT reviewed hazard analysis and risk assessment materials as a basis for understanding vulnerabilities to State facilities, urban and rural jurisdictions, housing, public health, economic growth, and natural resources. While the goals from the 2013 edition of the plan are unchanged in this update, they do represent the long-term vision for hazard risk reduction in the state of Iowa.

> Goal 1: Protect the health, safety, and quality of life for Iowa citizens while reducing or eliminating property losses, economic costs, and damage to the natural environment caused by a disaster.
>
> Goal 2: Ensure government operations, response, and recovery are not significantly disrupted by disaster events.
>
> Goal 3: Expand public awareness and encourage intergovernmental cooperation, coordination, and communication to build a more resilient community against hazards.

Once the goals were re-established for this update, the SHMT evaluated the 2013 edition of the plan's objectives. One objective, objective 5, was revised because it had focused more on the response phase of emergency management instead of mitigation.

Old (2013) Objective 5:

> The health, safety, and quality of life of Iowa's residents shall be protected by preventing, controlling, and ensuring an immediate and effective response to all hazards that cause injury, disability, or death and to keep economic loss and social disruption to a minimum.

New 2018 Objective 5: Promote continuity of emergency services for all hazards and disaster events.

This objective now addresses the continuity of government in emergency services and ties directly to the second goal listed above. The SHMT members promote this revised objective as an opportunity for local planners to capture important continuity of government tasks, while separating out specific response or recovery actions from their mitigation planning efforts. A typical mitigation action related to this objective would include acquiring and installing generators and other backup power equipment to ensure essential and emergency services can continue.

Additionally, two objectives addressing structural and infrastructure projects were combined to reduce confusion when evaluating implementation. Other objectives were modified just slightly according to the desires of the State Hazard Mitigation Team. These are the objectives the SHMT decided upon for 2018:

> Objective 1: Establish regulatory measures or processes that reduce the number and severity of all hazard risks in order to alleviate death, injuries, environmental impact, and property losses.
>
> Objective 2 (combined): Encourage property protection measures and construction projects to prevent and reduce structure and other property damage, and promote the health, safety and welfare of citizens, and protect the environment.
>
> Objective 3: Enhance public education to expand awareness and encourage intergovernmental cooperation, coordination, and communication to mitigate against all hazards.
>
> Objective 4: Build support, capacity, and commitment to prevent or reduce risks from all hazards for protection of Iowa's citizens, property, and natural resources.
>
> Objective 5 (revised): Promote continuity of emergency services for all hazards and disaster events.

The first four of these objectives align with the mitigation action types described in FEMA's *Local Hazard Mitigation Handbook* (March 2013), as so:

Objective	Type of Mitigation Actions
1	Local plans and regulations
2	Structure and infrastructure projects
3	Education and awareness programs
4	Natural systems protection

As mentioned previously, objective five aligns with projects that preserve continuity of emergency and essential services.

These objectives provided direction for the formation of the mitigation strategy actions. Mitigation planning regulations require states to identify and analyze a comprehensive range of specific mitigation actions that reduce the impacts of hazard events identified in the risk assessment. The SHMT discussed the impacts of recent disaster events in the state, the status of mapping and hazard mitigation planning, and conceptually "What problems are we trying to solve?" with the identification of mitigation actions. While Section 5 contains the mitigation actions that the SHMT decided to pursue, a greater range of

actions that were considered is contained in Section 3. The profile of each natural hazard in Section 3.3 contains a summary of the problem(s) posed by each hazard and possible actions to address those problems.

5.2. State Comprehensive Hazard Mitigation Program

The State of Iowa has a comprehensive state hazard mitigation program with a broad range of initiatives and activities sponsored by various State agencies. The State's mitigation program integrates FEMA and other federal programs as well as several nonprofit and local initiatives. Together, all these programs and activities help the state become more resilient in the face of future hazard events.

Every one of the 20 hazards outlined in the risk assessment are targeted by half a dozen or more activities or programs of State agencies. Brief descriptions of these programs or activities are found in the chart in section 5.2.1. This chart summarizes the several programs that advance mitigation efforts in the state, and includes information about which hazards are addressed by each program or activity. Many of these programs existed at the time of the last hazard mitigation plan update and are fairly well known and understood. However, several programs have been recently created or implemented. More detailed descriptions of these newer programs are found after the summary chart, in section 5.2.3. Prior to that, in section 5.2.2, is a more in-depth look at the State's administration of several key FEMA programs that the State utilizes to create an effective mitigation program.

5.2.1. Summary Table of Mitigation-related Programs in Iowa

Agency S=State, F=Federal, N=Nonprofit		**Program/ Office**	**Overview of Program or Office** (website, if known, on line below)	**Hazards Targeted by Program/Office**
Iowa Department of Public Safety (DPS)	S	511 Traffic Information	The 511 Traffic Information System works primarily during the winter months as a weather and road warning system for citizens to contact for road conditions. The system can be activated at other times of the year if severe weather warrants and road condition information is necessary for the public.	River Flooding-Severe Winter Storm-Transportation Incident
DPS	S	911 telephone system	The 911 system is both a wired and wireless system. It is designed as a multihazard approach to help reduce road hazards, terrorism threats, grass fires, public disorders, and communications failures.	Dam/Levee Failure-Earthquake-Expansive Soils-Extreme Heat-Flash Flood-Grass/Wildfire-Hazardous Materials-Infrastructure Failure-Landslide-Radiological-River Flooding-Severe Winter Storm-Sinkholes-Terrorism-Lightning/Hail-Tornado/Windstorm-Transportation Incident
Iowa Department of Agriculture and Land Stewardship (IDALS)	S	Abandoned Mined Land Reclamation Division	The division was granted primacy for its Abandoned Mined Lands (AML) Program in 1983 by the Secretary of the Interior and works cooperatively with the U.S. Office of Surface Mining (OSM).	Sinkholes

Agency S=State, F=Federal, N=Nonprofit		Program/ Office	Overview of Program or Office (website, if known, on line below)	Hazards Targeted by Program/Office
Iowa Department of Public Health (IDPH)	S	Acute Disease and Epidemiology Program	This program monitors more than 40 infectious diseases which all have public health impacts. It is designed to assess and build epidemiology infrastructure capacity, such as with smallpox and anthrax. Information gathered is used for decision making and for public education and awareness. The program includes pre-event smallpox plan and vaccination of core group of public health and health care workers to respond to a case or outbreak of smallpox in the state. Also includes a plan to vaccinate a portion or all of Iowa in the event smallpox is detected within the state.	Animal/Crop/Plant Disease -Human Disease-Radiological-River Flooding-Severe Winter Storm-Terrorism
IDALS	S	Agricultural Drainage Well Closure Assistance Program	Agricultural drainage wells were constructed in Iowa in the early 1900s to provide outlets for surface runoff and tile drainage water from cropland areas. Because agricultural drainage wells discharge the water directly to groundwater aquifers, they are potential routes for movement of contaminants to underground drinking water supplies.	Sinkholes
IDALS	S F	Animal Industry Bureau (Consumer Protection and Animal Health Division)	To protect, safeguard, and improve animal health among all livestock industries in Iowa through animal movement regulations, exhibition regulations, import regulations, and cooperative disease control/education campaigns. To cooperatively work with academia, industry groups, and others to eradicate/control infectious and contagious diseases of importance to animal agriculture in Iowa.	Animal/Crop/Plant Disease -Human Disease
Iowa Department of Transportation (DOT)	S	BridgeWatch	A web-based monitoring software solution that empowers bridge owners to predict, identify, prepare for, manage, and record potentially destructive environmental events. Proactively monitors, in real time, road overtopping and bridge infrastructure to better protect against hazardous, costly, and potentially catastrophic events. Iowa DOT personnel are now able to examine those bridges that are at risk, rather than blanketing an area of the state where flooding may be occurring.	Grass/Wild Fire-River Flooding
DPS	S	Building code reviews	The Building Code Bureau reviews plans for new construction and remodeling of State public buildings, especially in relation to the fire code.	River Flooding-Severe Winter Storm-Tornado/Windstorm
IDPH	S	Bureau of Emergency and Trauma Services	Develops plans to prevent, control, and recover from a major influenza epidemic. Also develops a redundant and wide-ranging multifaceted system to notify local and State public health, hospital, State agency, law enforcement, and emergency management of bioterrorism, other outbreaks of infectious disease, and other public health threats and emergencies. Also provides public health, hospital, and EMS disaster and terrorism services across organizational boundaries of all stakeholders that is fully integrated into Iowa's emergency response plan.	Human Disease

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DOT	S	Cargo tank program	Similar to the hazardous materials awareness for First on the Scene Program. This is both education about hazardous materials and instructions on regulations. See https://iowadot.gov/mvd/cdl/hazardous-materials	Hazardous Materials
IDPH	S	Child Death Review Team Program	Recommends to the legislature and the public initiatives and changes that will reduce or prevent child deaths.	Human Disease
IDALS	S	Coal Regulatory Division	Since 1977, the division has permitted, bonded, inspected and enforced coal mining regulations in Iowa. Permits issued were required to provide an assessment of pre-mining conditions, an operation plan for the mining phase, and a reclamation plan for restoration of the site and achievement of the intended postmining land use.	Hazardous Materials
Iowa Economic Development Authority (IEDA) and U.S. Department of Housing and Urban Development (HUD)	S	Community Development Assistance-Water/Sewer Fund	About $11 million in federal Community Development Block Grant (CDBG) funds is available to cities and counties on an annual competitive basis through the Water/Sewer Fund.	Infrastructure Failure
HUD	F	Community Development Block Grant Entitlement Program	The Entitlement Program provides annual grants on a formula basis to entitled cities and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons.	Dam/Levee Failure-Flash Flood-Grass/Wild Fire-Infrastructure Failure-Landslide-River Flooding-Severe Winter Storm-Sinkholes-Tornado/Windstorm
Iowa Department of Natural Resources (DNR) and Federal Emergency Management Agency (FEMA)	F	Community Rating System (CRS)	The National Flood Insurance Program (NFIP) Community Rating System allows communities to earn flood insurance premium discounts for measures implemented at the local level that reduce flood risk. These measures include 18 different activities, including public outreach, building code enforcement, floodplain management planning, and drainage system maintenance, specifically under Activity 330 Outreach Projects, Activity 450 Stormwater Management, Activity 540 Drainage System Maintenance, Activity 620 Levee Safety, and Activity 630 Dam Safety. The CRS gives credit to communities that identify unique and significant flood hazards faced by the community and for plans to manage these risks that include public outreach information accordingly. See http://www.fema.gov/national-flood-insurance-program-communityrating-system	River Flooding

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DNR	S	Conservation Education Program (CEP)	The CEP uses a portion of Resource Enhancement and Protection (REAP) funds to make money available to grantees for programs that teach people of all ages about their environment and how to make intelligent, informed decisions about its well-being. In 2018, $350,000 was available. Contact the DNR for application. See http://www.iowadnr.gov/Environment/REAP/REAPFundingatWork/ConservationEducation.aspx	Flash Flood-Grass/Wild Fire-Landslide-River Flooding
United States Department of Agriculture (USDA), Farm Service Agency (FSA)	F	Conservation Reserve Program (CRP)	CRP is a voluntary program that offers long-term rental payments and cost-share assistance to establish long-term, resource-conserving cover on environmentally-sensitive cropland or, in some cases, marginal pastureland. Buffer strips and protective cover can reduce soil erosion, stabilize stream banks, reduce flooding, and improve water quality. See https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index	Flash Flood-River Flooding
USDA Natural Resources Conservation Service (NRCS)	F	Conservation Technical Assistance Program	The Conservation Technical Assistance Program provides assistance to landowners, communities, and other agencies in planning and implementing conservation systems that help those entities and address various issues including flood risk reduction, drought mitigation, water management structures, wetland restoration/creation, and streambank restoration.	Dam/Levee Failure-Drought-Expansive Soils-Flash Flood-Landslide-River Flooding
IEDA, HUD	S, F	Contingency Fund-Imminent Threat/Special Opportunities	CDBG funds are also available for communities experiencing an imminent threat to public health, safety, or welfare that necessitates immediate corrective action sooner than can be accomplished through normal CDBG procedures or communities responding to an immediate community development opportunity that requires action sooner than can be accomplished through normal funding procedures.	Dam/Levee Failure-Earthquake-Hazardous Materials-Radiological-River Flooding-Terrorism
IDALS	S	Cooperative Soil Survey	Nationwide partnership of federal, regional, State, and local agencies and institutions to develop, maintain, and apply reliable soil resource information.	Drought-Flash Flood-Grass/Wild Fire-Landslide-River Flooding
DNR	S	County Conservation REAP Competitive Grant	40 percent of the REAP funds that go to county conservation are awarded on a competitive basis as grants to counties for conservation projects. Competition for these grants is extremely keen. REAP county grant applications are due annually on August 15. See http://www.iowadnr.gov/Conservation/REAP/REAP-Funding-at-Work/County-Conservation	Flash Flood-River Flooding

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IDALS	S	Dairy and Food Laboratory (Consumer Protection and Animal Health Division)	The Dairy Laboratory is responsible for the testing of finished dairy products that are produced in Iowa and testing the raw milk produced at the farm for antibiotic residues. This testing is performed in accordance with FDA regulations and procedures, the Grade A Pasteurized Milk Ordinance, and standard methods for the examination of milk products. The FDA certifies this laboratory to perform quantitative bacterial chemical tests to determine if a product has been properly pasteurized, tests to find antibiotic residues, and tests to determine abnormal milk. This lab also tests for butterfat content and added water in milk.	Animal/Crop/Plant Disease -Human Disease
IDALS	S	Dairy Products Control Bureau (Consumer Protection and Animal Health Division)	Ensure the safety and quality of dairy products supplied to the consuming public through regulation and education.	Animal/Crop/Plant Disease -Human Disease
DNR	S	Dam Safety Program	DNR staff review and approve the construction of new dams, maintain an inventory of existing dams that meet minimum size criteria, and periodically inspect certain dams. Currently there are approximately 3,800 dams on the State's dam inventory. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Dam-Safety	Dam/Levee Failure-River Flooding
USDA NRCS	F	DamWatch	Web-based dam monitoring tool helps NRCS project sponsors protect communities by providing real-time monitoring of 11,900 watershed program dams throughout the U.S. Alerts essential personnel when rainfall, snowmelt, and earthquakes threaten dams. Provides a 'one-stop" source for critical documents, such as drawings, photographs, and emergency action plans.	Dam/Levee Failure
DNR, U.S. Forest Service, U.S. Dept. of Defense	S, F	Department of Defense-Firefighter Program	The Department of Defense Firefighter Property Program, under the guidance of the U.S. Forest Service provides the DNR the opportunity to provide equipment and vehicles to fire departments. Equipment that is no longer needed by the federal government, but is still suitable for conversion to fire service may be obtained by fire departments. Once obtained, departments will have one year to complete the necessary modifications for the equipment to be put into service. The fire department will notify the DNR Forestry Wildland Fire Program staff that the item is ready to be inspected. Upon a successful inspection, title/ownership of the item will be transferred to the fire department. See http://www.iowadnr.gov/Conservation/Forestry/Fire-Prevention/Fire-Protection-Prevention	Grass/Wild Fire

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HUD	F	Disaster relief and recovery assistance-homeowners	Mortgage insurance, rehabilitation mortgages, mortgage loans to replace destroyed housing	Flash Flood-River Flooding-Terrorism-Tornado/Windstorm
HUD	F	Disaster relief and recovery assistance-municipalities	HUD provides flexible grants to help cities, counties, and states recover from presidentially-declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.	Dam/Levee Failure-Flash Flood-Infrastructure Failure-River Flooding-Terrorism-Tornado/ Windstorm
DOT, DNR, HSEMD	S	Distribution of *Emergency Response Guide Book* to first responders	Through a joint effort of the DOT Office of Motor Vehicle Enforcement, the DNR, and HSEMD the guide book is distributed to fire departments, law enforcement agencies, emergency medical services, and other emergency responders. This includes all State, local, EMS responders, and DOT groups.	Hazardous Materials
IDALS	S	Division of Soil Conservation	The Division of Soil Conservation is responsible for State leadership in the protection and management of soil, water, and mineral resources, assisting soil and water conservation districts and private landowners to meet their agricultural and environmental protection needs.	Animal/Crop/Plant Disease -Dam/Levee Failure-Drought-Expansive Soils-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Sinkholes
DNR	S	DNR foresters, Conservation and Recreation Division	State foresters provide forestry assistance to private landowners, help sustainably manage our State forests, operate the State Forest Nursery at costs of production, and protect, utilize, and enhance the State's forest resources for today and tomorrow. Forestry services include the State Forest Nursery, forest health, urban forestry, landowner assistance, fire management and prescribed fire, educational opportunities, Iowa's wood industry and logging, and fall color reporting. See http://www.iowadnr.gov/Conservation/Forestry	Animal/Crop/Plant Disease -Grass/Wild Fire-Landslide-River Flooding-Severe Winter Storm-Tornado/ Windstorm
DNR	S	DNR mobile education exhibit	The mobile exhibit is equipped with touch screen computer games, flat screen TVs, and interactive displays. It can be brought to a site and showcases sustainability, recycling, and household hazardous materials.	Hazardous Materials
IDPH	S	IDPH emergency operating procedures and homeland security program	Prepares appropriate annexes to the State emergency plan, prepares IDPH emergency plan, participates in Iowa State Capitol Complex security activities, and interfaces with HSEMD, DPS, and other agencies in information sharing activities to prevent or reduce the risk of terrorism and other disasters.	Terrorism
DNR	S	Drinking Water Area-wide Optimization Program (AWOP)	AWOP is a strategy for targeting groups of higher risk systems for State assistance in order to maximize the public health protection that water treatment plants provide. See https://www.asdwa.org/area-wide-optimization-program-awop/	Infrastructure Failure

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DNR	S	Drinking Water SRF	Iowa's drinking water State Revolving Fund (SRF) program makes loans to drinking water systems for design and construction to ensure public health protection and the provision of safe drinking water. DNR has established priorities for the SRF, and will publish them each year in its Intended Use Plan (off-site). The Intended Use Plan includes the proposed uses of the moneys and describes how each project will be managed. See http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Water-Supply-Engineering/State-Revolving-Loan-Fund	Drought-Infrastructure Failure
DPS	S	Drug enforcement/ intelligence	The Division of Narcotics Enforcement focuses on gathering intelligence for purposes of enforcing drug laws and preventing terrorist incidents connected with money raised through illegal drug trafficking. Prevention is directed toward all forms of terrorism, i.e., conventional, cyber, radiological, etc.	Radiological-Terrorism
United States Army Corps of Engineers (USACE)	F	Emergency Preparedness, Response and Recovery (P.L. 84-99, as amended)	Provides preparedness, response and recovery assistance, including emergency response training and exercises, inspection of flood risk reduction works and advisement of maintenance requirements, and technical assistance with development of response and hazard mitigation plans. Immediate response and recovery assistance from flooding, including technical assistance, issuance of sandbags and/or pumps, construction of emergency measures, and initial repair and restoration of flood risk management projects. Opportunities for nonstructural project implementation may be considered in lieu of levee repair. All PL 84-99 efforts are supplemental to local, State, and tribal efforts. Reimbursement or grants are not permitted.	Dam/Levee Failure-Flash Flood-River Flooding
USDA NRCS	F	Emergency Watershed Protection Program	Emergency watershed protection consists of measures to reduce hazards to life and property from floods, drought, and the products of excessive runoff or erosion on any watershed impaired by a natural occurrence. See http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/	Drought-Flash Flood-River Flooding
IDPH	S	EMS disaster planning and preparedness	Provides planning assistance, training, and resources for the State's emergency medical service and providers to adequately respond to disasters and terrorism.	Animal/Crop/Plant Disease -Drought-Earthquake-Extreme Heat-Hazardous Materials-Human Disease - Radiological-River Flooding-Severe Winter Storm-Terrorism-Lightning/Hail-Tornado/ Windstorm

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IDPH	S	EMS education, training and authorization/ certification	Provides and/or facilitates training for EMS providers. Maintains required records and documentation of such training. Ensures that EMS providers are properly trained and operate only within the specific parameters of their authorization.	Human Disease-Terrorism
USDA NRCS	F	Environmental Quality Incentives Program (EQIP)	EQIP provides a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. See https://www.nrcs.usda.gov/wps/portal/nrcs/main/ia/programs/financial/eqip/	River Flooding
DOT	S	Federal-Aid Rail/Highway Crossing Safety Program	The Crossing Safety Program participates in the cost of safety improvements at rail/highway crossings. It is funded by the federal Highway Trust Fund. These funds are used to install new crossing signal devices, to upgrade existing signals, to improve crossing surfaces, and to provide low-cost improvements, such as increased sight distance, widened crossings, increased signal lens size, or crossing closures. See https://iowadot.gov/iowarail/safety/federal-aid-crossing-safety-program	Transportation Incident
IDALS	S	Feed and Fertilizer Bureau (Plant Management and Technology Division)	This bureau is responsible for enforcing the Iowa commercial feed law and for licensing all firms distributing or manufacturing animal feed products offered for sale in Iowa. The bureau also reviews all feed product labels, including those for small pet food products, to ensure their accuracy before those products can be authorized for sale in Iowa.	Animal/Crop/Plant Disease -Hazardous Materials-Human Disease-Transportation Incident
IDALS	S	Field office staff	Field office staff provide support to all 100 soil and water conservation districts (SWCDs) in Iowa. The efforts of these staff support the combined soil and water conservation mission of the SWCDs, the State of Iowa, and the NRCS.	Animal/Crop/Plant Disease-Drought-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Sinkholes
DPS	S	Firefighting training program	The Fire Service Training Bureau performs many training sessions for firefighters from local jurisdictions. Training covers all areas, including fire, hazardous materials, and weapons of mass destruction. The training is for both response and prevention functions.	Hazardous Materials

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USACE	F	Flood damage reduction studies and projects	Section 205, Flood Control Act, as amended, provides for construction/improvement of flood risk reduction works (levees, channels, and dams) for local flood protection. Nonstructural alternatives may include measures such as installation of flood warning systems, raising and/or floodproofing structures, and relocation of flood-prone facilities. Maximum federal expenditures limited to $10 million. Feasibility Study: First $100,000 is federally funded. Remaining costs are shared at 50 percent federal, 50 percent nonfederal. Design and Construction: Cost shared at 65 percent federal, 35 percent nonfederal. Nonfederal sponsor's cost share may include cash and work-in-kind.	Dam/Levee Failure-Flash Flood-River Flooding
HSEMD, FEMA	S, F	Flood Mitigation Assistance Program	The Flood Mitigation Assistance (FMA) program helps states and communities identify and implement measures to reduce or eliminate the long-term risk of flood damage to homes and other structures insurable under NFIP. See http://www.fema.gov/flood-mitigation-assistance-program	River Flooding
USACE	F	Flood Plain Management Service, Section 206	Section 206, Flood Control Act, as amended, provides technical assistance and planning guidance to federal agencies, states, local governments, other nonfederal entities, eligible tribes, and private sector to support effective floodplain management. May include obtaining, interpreting, or developing data about flood sources and types, flood depths and water surface elevations, floodwater velocity, flooding extent and duration, flood frequency, and obstruction of flood flows. May also include larger scale 'special studies' on all aspects of floodplain management planning, including floodplain mapping, dam break analyses, regulatory floodways studies, flood warning and emergency preparedness, and flood damage reduction studies. Allows for technical assistance only; cannot conduct site-specific design or fund construction.	River Flooding
ISU Extension and DNR	S	Flood videos	A series of web-based videos designed to educate local officials and the general public about floodplains, flood risks, and basic floodplain management principles. See http://www.extension.iastate.edu/floodinginiowa/	Flash Flood-River Flooding
DNR	S	DNR Geographic Information Services Section	Responsible for the development, management, and distribution of the department's Natural Resource Geographic Information System (NRGIS). This includes data collection and analysis that may be required for various resource investigations and in support of making natural resource management decisions. Data is delivered in various formats to decision makers and the public. GIS support and training is also provided to other sections of the DNR. GIS data is primarily delivered to natural resource managers and the public through the State's	Dam/Levee Failure-Drought-Earthquake-Expansive Soils-Extreme Heat-Flash Flood-Grass/Wild Fire-Hazardous Materials-Landslide-River Flooding-Severe Winter Storm-Sinkholes-Lightning/Hail-Tornado/ Windstorm

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			Iowa Geodata GIS Clearinghouse, DNR GIS Web Services, and web mapping applications. See http://www.iowadnr.gov/Conservation/Mapping-GIS	
DNR, Iowa Flood Center	S	GIS mapping of floodplains and watersheds	The DNR, the Iowa Flood Center, and other partners, have created comprehensive, accurate floodplain maps for many Iowa cities and counties, and will continue to do so until the entire state has such maps. Through such maps, Iowans will know if their property is at risk from flooding. Also, a watershed atlas provides a variety of interactive GIS data layers for watershed planning on all watersheds in Iowa. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Flood-Plain-Management/Flood-Plain-Mapping	River Flooding
HSEMD, FEMA	S, F	Hazard Mitigation Grant Program	This program helps states and communities implement long-term hazard mitigation measures following a major disaster declaration. The program's objectives are to prevent or reduce the loss of life and property from natural hazards and to implement state or local hazard mitigation plans. See http://www.fema.gov/hazard-mitigation-grant-program	Dam/Levee Failure-Drought-Earthquake-Expansive Soils-Extreme Heat-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Severe Winter Storm-Sinkholes-Lightning/Hail-Tornado/ Windstorm
DOT	S	Hazardous materials awareness for First on the Scene Program	This training program is to educate members of the motor carrier industry, agricultural dealers of chemicals, petroleum marketers, and propane gas associations on hazardous materials awareness and regulations. See https://iowadot.gov/mvd/cdl/hazardous-materials	Hazardous Materials
DNR	S	Hazardous substance spill reporting	Any person manufacturing, storing, handling, transporting, or disposing of a hazardous substance must notify DNR and local law enforcement of the occurrence of a hazardous condition. Notification should be made as soon as possible but not later than six hours after the onset or discovery of the hazardous condition. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Emergency-Planning-EPCRA/Spill-Reporting	Hazardous Materials

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Iowa Water Resources Coordinating Council (WRCC)	S	Headed by IDALS. Includes members from several State agencies, ISU College of Agriculture, UofI College of Public Health, UofI College of Engineering, and UNI College of Natural Sciences, with several federal agencies also invited	WRCC's purpose is to preserve and protect Iowa's water resources, and coordinate their management with a goal to manage such resources comprehensively rather than compartmentally. The WRCC is to promote a watershed management approach to reduce impact of future flooding on the state's residents, businesses, communities, and soil and water quality. The council is directed to consider policies and funding options for various strategies including: additional floodplain regulation; wetland protection, restoration, and construction; the promulgation and implementation of statewide storm water management standards; conservation easements and other land management; perennial ground cover and other agricultural conservation practices; pervious pavement, bioswales, and other urban conservation practices; and permanent or temporary water retention structures.	Dam/Levee Failure-Drought-Flash Flood-River Flooding
DOT	S	Highway Route Controlled Quantities	This is a program to train officers to inspect trucks carrying radioactive waste (spent fuels).	Radiological
DNR	S	Household Hazardous Materials Program	Offers a variety of guidance and information on the proper management, use,and disposal of household hazardous materials to protect public health and safety and the environment. See http://www.iowadnr.gov/Environmental-Protection/Household-Hazardous-Materials	Hazardous Materials
Iowa Floodplain and Stormwater Management Association	N	IFSMA	Organization of professionals involved in floodplain management, flood hazard mitigation, storm water management, the National Flood Insurance Program, flood preparedness, warning, and recovery. IFSMA represents the interests of flood hazard specialists from local and State government, consulting engineers, research community, insurance industry, and the citizens of Iowa. IFSMA's members have skills and experience in the fields of engineering, hydrologic forecasting, community planning, enforcement, emergency response, water resources, and many others.	Dam/Levee Failure-Flash Flood-River Flooding
IDPH	S	Immunization (including tuberculosis) program	Reduces and ultimately eliminates the incidence of vaccine-preventable diseases by achieving and maintaining high vaccination coverage levels, improving vaccination strategies among under-vaccinated populations, prompt reporting and thorough investigation of suspected cases, and rapid implementation of disease control measures.	Animal/Crop/Plant Disease -Human Disease
IDALS	S	Iowa buffer initiatives	Riparian buffers, grassed waterways, contour buffer strips, field borders and other buffers on private farmlands. Promote the USDA-Farm Services Agency Conservation Reserve Program.	Animal/Crop/Plant Disease -Drought-Flash Flood-Grass/Wild Fire-Landslide-River Flooding

Agency S=State, F=Federal, N=Nonprofit		Program/ Office	Overview of Program or Office (website, if known, on line below)	Hazards Targeted by Program/Office
IDALS	S	Iowa Conservation Reserve Enhancement Program	The Iowa Conservation Reserve Enhancement Program (CREP) is a major State/federal initiative to develop wetlands which are strategically located and designed to remove nitrate from tile drainage water from cropland areas.	Flash Flood-Radiological-Sinkholes
IDPH	S	Iowa Disaster Medical Assistance Teams program	The mission of the volunteer Iowa Disaster Medical Assistance Teams is to provide medical care and public health services to disaster/terrorism victims and supplement and support disrupted or overburdened local medical/public health personnel and resources at or near the disaster site during the first 24-72 hours of the incident when requested.	Dam/Levee Failure-Earthquake-Flash Flood-Hazardous Materials-Radiological-River Flooding-Severe Winter Storm-Terrorism-Lightning/Hail-Tornado/Windstorm-Transportation Incident
IDPH	S	Iowa disease reporting program	Local public health and health care practitioners must report certain diseases to the department. The department must report certain diseases to the federal government. Helps ensure proper care and treatment and minimizes transmission.	Human Disease
USACE, HSEMD	F, S	Iowa Flood Risk Management Team (Silver Jackets)	Partners meet quarterly and communicate electronically to provide resources and develop tools to support information sharing. Promote implementation of flood risk management efforts to improve flood risk awareness and reduce flood risk. Currently includes USACE, HSEMD, USDA NRCS, USGS, DNR, NOAA NWS, and others.	Dam/Levee Failure-Flash Flood-River Flooding
DPS	S	Iowa Law Enforcement Intelligence Network	LEIN trains officers on all aspects of intelligence. As they proceed with intelligence gathering, the information is used to identify trends to prevent criminal activity, including terrorism. LEIN works with the FBI and the Joint Terrorism Task Force.	Terrorism
IDALS	S	Iowa Watershed Protection Program	The watershed protection statute includes two elements: 1. Watershed Protection Program to provide technical and financial assistance for the development of local watershed initiatives, 2. Watershed Task Force to study the condition of watershed protection in Iowa.	Dam/Levee Failure
Iowa Storm Water Education Partnership	N	ISWEP	ISWEP is a member-driven organization formed in 2004 to address the educational needs of cities and others impacted by federal storm water regulations. Services have expanded to include training and certification programs, technical services, and workshop facilitation. See http://www.iowastormwater.org/	Flash Flood-River Flooding

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DNR	S	Land Recycling Program	The Land Recycling Program (LRP) allows owners or other stakeholders of a property to voluntarily assess and implement remedial actions at a site that is contaminated or is perceived to be contaminated. The assessment of the property must address the severity of the contamination problems and the risks associated with the contamination. The department will provide a "No Further Action" certificate for the site following assessment and implementation of appropriate cleanup activities and/or other remedies to assure the protection of public health and the environment. This certificate shall provide limited liability protection from further regulatory action relative to the problem(s) addressed. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Contaminated-Sites/Land-Recycling-Program-LRP	Hazardous Materials
USACE	F	Levee Safety Program	Program strives to ensure levees provide benefit to the nation by working with sponsors and stakeholders to assess, communicate, and manage risk to people, property, and the environment from inundation associated with levees. Maintains a national inventory of levee systems and makes the information available in the National Levee Database. Inspects, assesses, and communicates levee risk-related issues and concerns, holding life-safety paramount. Supports USACE and local decisions aimed at reducing flood risk. See http://www.usace.army.mil/Missions/Civil-Works/Levee-Safety-Program/	Dam/Levee Failure
IDPH	S	Local public health and environmental health	Prevention services include screening and assessment for hypertension, cholesterol, diabetes, cancer, scoliosis, tuberculosis, head lice, vision, hearing, mental health, fitness testing, physical assessments, worksite and school testing, immunizations, fall prevention, family planning, and foot care clinics. Also handles licensing of plumbers.	Human Disease-Terrorism
U.S. Environ-mental Protection Agency (EPA)	F	Low-impact development and green infrastructure	Provides resources and training materials to implement storm water management practices and programs to reduce runoff and protect water quality, including design and planning guides, case studies, examples of regulatory and nonregulatory policy approaches, and descriptions of EPA's past assistance projects, archived webinars, and upcoming technical assistance and webinars. See https://www.epa.gov/green-infrastructure and https://www.epa.gov/nps/urban-runoff-low-impact-development.	Flash Flood-River Flooding

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IDPH	S	Mass fatality program	This program involves performing autopsies. The information is used to diagnose disease, help identify patterns of fatalities, and can lead to helpful legislation designed to prevent or lessen mass fatalities. The information can also help education/awareness efforts.	Animal/Crop/Plant Disease-Extreme Heat-Hazardous Materials-Human Disease - Radiological-River Flooding-Terrorism-Transportation Incident
IDALS	S	Meat and Poultry Inspection Bureau (Consumer Protection and Animal Health Division)	IDALS holds cooperative agreements with the USDA/Food Safety and Inspection Service to provide a meat and poultry inspection program that meets the "equal to" provisions in the federal meat and poultry inspection acts. The dividing line between federal and State inspection is based on where the products will be distributed, as in interstate commerce and foreign export or intrastate commerce.	Animal/Crop/Plant Disease-Human Disease
DPS	S	Mid-States Organized Crime Information Center program	This program is connected with RISS (Regional Information Sharing Systems) a national system in which law enforcement can securely exchange and submit information on crime, including terrorism.	Terrorism
IDALS	S	Mines and Minerals Bureau	This bureau has registered more than 1,100 registered mineral sites in Iowa, utilized by some 250 operators in 26 counties. Minerals extracted at these sites include limestone, sand and gravel, gypsum, and clay. The limestone industry alone produces over 25 million tons of stone each year for use in the construction industry.	Hazardous Materials-Sinkholes-Transportation Incident
Iowa Association of Municipal Utilities (IAMU)	N	Mutual aid program	IAMU members participate in IAMU's mutual aid program by providing assistance to any member in need of emergency support. Participating IAMU electric, gas, and telecommunication utilities stand ready with backup equipment, materials, and personnel to ensure the continuation of service to customers during the most adverse conditions.	Dam/Levee Failure-Drought - Earthquake-Expansive Soils-Extreme Heat-Flash Flood-Infrastructure Failure-Landslide -River Flooding-Severe Winter Storm-Terrorism-Lightning/Hail-Tornado/ Windstorm
DNR	S	NFIP	The DNR works with communities and counties to develop and administer local floodplain management programs, coordinates the National Flood Insurance Program, and assists FEMA and HSEMD in responding to flood disasters. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Flood-Plain-Management/National-Flood-Ins-Program	River Flooding
USACE	F	National Nonstructural Flood Proofing Committee	Promotes the use of nonstructural flood proofing methods for reducing life loss and minimizing property damage. Provides technical consultation from initial assessments and plan formulation through technical review. Offers tools and resources including publications, assessment tools, structure attribute table, nonstructural matrix, and National Flood Barrier Testing and Certification Program. See http://www.usace.army.mil/Missions/Civil-Works/Project-Planning/nfpc/	Flash Flood-River Flooding

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DNR	S	Native Prairie, Wetland, and Wildlife Habitat Tax Exemption	All applications for tax exemptions must be inspected by a DNR biologist to ensure they meet the definition of native prairie, wetland, or wildlife habitat. Applications are available from the DNR website or by contacting an Iowa DNR private lands staff or wildlife management biologist. See http://www.iowadnr.gov/Conservation/Wildlife-Landowner-Assistance/Property-Tax-Exemption	River Flooding
IDALS	S	No-interest loans	Alternative financial incentive for construction of permanent soil conservation practices	Drought-Grass/Wild Fire-Landslide
Iowa Department on Aging	S	Nutrition programs and services	The nutrition program is designed to improve clients' health through improved nutritional intake. Emphasis is placed on serving older Iowans with the greatest social and economic need, the frail elderly, and on reducing isolation.	Human Disease
HUD	F	Oversight and Evaluation Division programs	OED programs address a wide range of economic and community development needs among the nation's individual communities, ranging from job retention and creation, to new investments in public facilities and infrastructure and the development of affordable housing.	Flash Flood-Infrastructure Failure-River Flooding-Severe Winter Storm-Tornado/Windstorm
Iowa Geological Survey (IGS)	S	Iowa Geological Survey overview	As a part of IIHR—Hydroscience and Engineering, a research institute within the University of Iowa's College of Engineering, IGS continues to build on its rich scientific heritage, while serving Iowans through research, education, and outreach. See http://www.iihr.uiowa.edu/igs/	Expansive Soils-Landslide-River Flooding-Sinkholes-
U.S. Geological Survey (USGS)	F	U.S. Geological Survey-Iowa	The USGS provides maps, reports, and information to help others manage, develop and protect America's water, energy, mineral, and land resources.	Earthquake-Expansive Soils-Landslide-River Flooding-Sinkholes
IDALS	S	Pesticide Bureau (Plant Management and Technology Division)	Program areas addressed by the bureau are: enforcement; private and commercial pesticide applicator certification; pesticide product registration; licensing of pesticide dealers and commercial applicator businesses; groundwater protection, endangered species protection; and worker protection outreach.	Animal/Crop/Plant Disease -Hazardous Materials Human Disease-Transportation Incident
Iowa Department of Commerce – Iowa Utilities Board	S	Pipeline Safety Program	This program follows extensive federal regulation on maintenance of natural gas pipelines only. Integrity management rules form a study of potential impact along pipelines, especially in developed areas. Public information brochures related to safety on land restoration on pipeline construction sites are available for distribution.	Hazardous Materials-Infrastructure Failure

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USACE	F	Planning Assistance to States (Section 22 of the Water Resources Development Act of 1974)	Assists states, local governments, tribes, and other nonfederal entities with preparation of comprehensive plans for development, utilization, and conservation of water and related resources of drainage basins, watersheds, or ecosystems. Provides: technical assistance in support of water resources management and related land resources as identified in state hazard mitigation plans; preparedness, response and recovery plans; or plans associated with changing hydrologic conditions, climate change, long-term sustainability, and resilience. Studies are for project planning and may not include preparation of site-specific designs or fund construction.	Dam/Levee Failure-Flash Flood-River Flooding
HSEMD, FEMA	F, S	Pre-disaster Mitigation Program	This program helps states and communities implement long-term hazard mitigation measures. The program's objectives are to prevent or reduce the loss of life and property from natural hazards, to implement state or local hazard mitigation plans. See https://www.fema.gov/pre-disaster-mitigation-grant-program	Dam/Levee Failure-Drought-Earthquake-Expansive Soils-Extreme Heat-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Severe Winter Storm-Sinkholes-Lightning/Hail-Tornado/ Windstorm
HSEMD, FEMA	S, F	Public Assistance Program (PA)	PA consists of three components; emergency protective measures, permanent work, and mitigation. It must result from a disaster declaration, but Section 406 provides discretionary authority to fund mitigation measures in conjunction with the repair of damaged facilities. The mitigation measures must be related to eligible disaster-related damage and must directly reduce the potential of future, similar disaster damage to the eligible facility. See https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit	Dam/Levee Failure-Earthquake-Expansive Soils-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Severe Winter Storm-Sinkholes-Lightning/Hail-Tornado/ Windstorm
IDPH	S	Radioactive materials	All radioactive materials used in Iowa are regulated. Staff of the bureau license and inspect approximately 215 radioactive material licenses.	Radiological
HSEMD, FEMA	S, F	Radiological Emergency Response Plan	RERP involves training and full-scale, evaluated exercises each year on nuclear plants. It is a multihazard plan.	Radiological
IDPH	S	Radon Program	The Radon Program certifies radon testers and laboratories, approves credentials for mitigators that are inspected annually, and supplies information on radon to the public.	Human Disease
DOT	S	Rail Revolving Loan and Grant Program	The Rail Revolving Loan and Grant Program provides funding to improve rail facilities that will spur economic development and job growth and provide assistance to railroads for the preservation and improvement of the railroad transportation system. See https://iowadot.gov/iowarail/financial-assistance/rrlgp	Infrastructure Failure-Transportation Incident

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DNR	S	REAP open space	One-tenth of the REAP funds that go to open space are set aside to cost-share land acquisitions with private organizations. The cost-share arrangement entails 75 percent of the acquisition costs coming from REAP and the other 25 percent coming from private contributions. The DNR owns and manages the property that is jointly purchased on behalf of the public. A project review committee made up of three DNR administrators and three representatives of private conservation organizations selects the projects. Applications for these projects are accepted once a year on August 15th. See http://www.iowadnr.gov/Conservation/REAP/REAP-Funding-at-Work/Open-Spaces-Protection	Flash Flood-River Flooding
USDA NRCS	F	Regional Conservation Partnership Program (RCPP)	RCPP promotes coordination between NRCS and its partners to deliver conservation assistance on a regional or watershed scale to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements. See https://www.nrcs.usda.gov/wps/portal/nrcs/ia/programs/farmbill/rcpp/	Animal/Crop/Plant Disease-Drought-River Flooding
DNR	S	Regional Watershed Assessment Program	The program assesses all regional watersheds in the state, doing about one-fifth of the watersheds per year. Thereafter, DNR is to review and update the assessments on a regular basis. Each regional watershed assessment is to provide a summary of the condition of the watershed. The summary may include land use patterns, soil types, slopes, management practices, stream conditions, and both point and nonpoint source impairments. In conducting the program, the DNR is to provide hydrological and geological information sufficient for the WRCC to prioritize watersheds statewide and for the various communities in those watersheds to plan remedial efforts in their local communities and subwatersheds. Upon completion of the statewide assessment, and upon updating the assessments, the DNR shall report the results of the assessment to the WRCC.	Flash Flood-River Flooding
DNR, DOT, Iowa Department of Cultural Affairs, IDALS	S	Resource Enhancement and Protection	REAP is funded from the State's Environment First Fund (Iowa gaming receipts) and from the sale of the natural resource license plate. First $350,000 of REAP funds each year go to conservation education, then 1 percent of balance goes for DNR administration and the remaining balance is divided as follows: (3 percent) roadside vegetation, (5 percent) historical resources, (9 percent) public land management, (15 percent) city parks and open space, (20 percent) soil and water enhancement, (20 percent) county conservation, (28 percent) State open space. See http://www.iowadnr.gov/Conservation/REAP	Landslide-River Flooding

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IDPH	S	Risk communication service	Delivers training classes for public health professionals on communicating with the public prior to and during emergency/disaster situations. Funded with focus area funds from the Centers For Disease Control and Prevention.	Human Disease
DNR, HSEMD, FEMA	S, F	Coordinating technical partners and Risk MAP	Risk Mapping, Assessment, and Planning (Risk MAP) is a FEMA program that DNR coordinates through Coordinating Technical Partners (CTP). The CTP includes FEMA and HSEMD. Risk MAP makes planning resources available to local jurisdictions for hazard mitigation. These resources can be utilized for the development of risk assessments, watershed studies, mitigation plan elements, mapping, and risk communications.	Flash Flood-River Flooding
DOT	S	Roadside vegetation grants	Three percent of REAP funds are available through the DOT's Living Roadway Trust Fund (LRTF) for integrated roadside vegetation management (IRVM) activities, including the establishment of native prairie vegetation in rights-of-way. Low-maintenance prairie roadsides reduce erosion, slow runoff, trap sediment, and provide habitat. See www.iowalivingroadway.com	Flash Flood-River Flooding
USACE	F	Section 14 of Flood Control Act: Emergency Stream Bank and Shoreline Protection	Allows emergency stream bank and shoreline protection to prevent damage to public facilities, such as roads, bridges, hospitals, schools, and water/sewage treatment plants. Maximum federal expenditures limited to $5 million. Feasibility Study: First $100,000 is federally funded. Remaining costs are shared at 50 percent federal, 50 percent nonfederal. Design and Construction: Cost shared at 65 percent federal, 35 percent nonfederal. Nonfederal sponsor's cost share may include cash and work-in-kind.	Flash Flood-River Flooding
DNR	S, F	Section 311-312 Hazardous Chemical Storage Reporting (Tier II)	Environmental Protection Community Right-To-Know Act (EPCRA) Section 311-312 requires facilities that have a material safety data sheet (SDS) for any hazardous chemicals stored or used in the work place above certain quantities to submit an emergency and hazardous chemical inventory form (TIER II) to the State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC), and local fire department. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Emergency-Planning-EPCRA/Chemical-Inventory-Reporting	Hazardous Materials
DNR Watershed Improvement	S, F	SECTION 319	Grants can be used to reduce runoff and monitor and evaluate progress and may include wetland restoration and improved storm water management. Recipients must have an approved watershed plan in place in accordance with CWA 319.	Drought-Flash Flood-River Flooding

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US Environ-mental Protection Agency (EPA)	F	SMART GROWTH/ Sustainable Communities Program	Provides technical assistance through Building Blocks Program to implement sustainable approaches, including presentations and exercises to facilitate discussion on a priority topic, leading to agreed-upon actions. Dozens of communities have received technical assistance using one of five sustainability tools. The Flood Resilience for Riverine and Coastal Communities tool helps communities prepare for flooding or sea level rise and plan for disaster resilience. See https://www.epa.gov/smartgrowth	Flash Flood-River Flooding
IDALS	S	Soil and Water Conservation Districts	Iowa's 100 soil and water conservation districts (SWCD) are responsible for carrying out soil conservation and water quality protection programs at the local level.	Animal/Crop/Plant Disease -Drought-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Sinkholes
HUD	F	State-administered CDBG	States participating in the CDBG Program award grants only to units of general local government that carry out development activities. Annually each state develops funding priorities and criteria for selecting projects.	Dam/Levee Failure-Flash Flood-Grass/Wild Fire-Infrastructure Failure-Landslide-River Flooding-Severe Winter Storm-Sinkholes-Tornado/Windstorm
DOT	S	State Grade Crossing Surface Repair Program	Provides annual appropriation from the Road Use Tax Fund to assist railroad companies and highway jurisdictions repair rail/highway grade crossings. The Grade Crossing Surface Repair Fund will pay 60 percent of the cost of repairs, with the responsible roadway jurisdiction and the railroad company each paying 20 percent. See https://iowadot.gov/iowarail/safety/grade-crossing-surface-repair-program	Infrastructure Failure-Transportation Incident
IDPH	S	State of Iowa Toxicology Program	The Toxicology Program addresses any specific public health questions that may arise, such as on mercury dental amalgam, soy, hog lots, and pressure treated lumber. The program assists the Iowa Poison Control Center on technical questions and the Department of Natural Resources to establish protective levels. It also administers the Hazardous Substances Emergency Events Surveillance System, which is an ongoing, state-based surveillance program. The system's purpose is to describe the public health consequences associated with the release of hazardous substances and to reduce morbidity and mortality resulting from these releases.	Hazardous Materials-Human Disease
IDALS	S	State soil conservation cost share	Provides financial assistance to build terraces, waterways, structures, basins, and other measures that protect the productivity of Iowa land while helping with water quality and flooding.	Drought-Grass/Wild Fire-Landslide
IDPH	S	Statewide trauma system and medical surge	To match patients' needs to the existing medical resources through appropriate selection and use of care facility or hospital, trauma system evaluation, and trauma registry.	Hazardous Materials-Human Disease-Severe Winter Storm-Terrorism

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DNR	S	Storm Water Program	The following activities must be covered by storm water permits issued by the Storm Water Program: (1) Construction activity that disturbs one or more acres or which is part of a larger project that disturbs one or more acres in total; (2) Certain types of industrial or commercial activities; and, (3) Many city storm sewer systems in larger communities or those near larger communities. See http://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Storm-Water	Flash Flood-River Flooding
NOAA National Weather Service	F	StormReady	A voluntary program to provide guidance and incentive to communities interested in improving their hazardous weather operations. Once communities are recognized as StormReady, they can provide their StormReady recognition letter to their regional FEMA National Flood Insurance Program to determine if their activities will be acceptable for Community Rating System credits. Although there are no fees for StormReady recognition, a community may need to upgrade its emergency preparedness infrastructure to qualify for StormReady status. See http://www.stormready.noaa.gov/index.html	Flash Flood-River Flooding-Severe Winter Storm-Lightning/Hail-Tornado/Windstorm
IDPH	S	Strategic National Stockpile Program	Provides a statewide, effective plan and operational procedures to ensure Iowa is prepared to receive and distribute the assets of the Strategic National Stockpile and ensure integration into Iowa's homeland security and emergency plan.	Animal/Crop/Plant Disease -Drought-Human Disease-River Flooding-Terrorism-Tornado/Windstorm
EPA	F	Watershed Academy	Located in EPA's Office of Water, the Watershed Academy provides training and information about watershed implementation approaches. Self-paced training modules, webcast seminars, and live training courses provide current information from national experts across a broad range of watershed topics. See http://water.epa.gov/learn/training/wacademy/index.cfm	Flash Flood-River Flooding
HSEMD	S	Threat and Hazard Identification and Risk Assessment (THIRA) for Iowa	The THIRA evaluates the disasters that may arise from hazards and evaluates what is needed to respond to such disasters. Upon evaluating what is needed for response to a serious scenario of each hazard, a comparison is then made to the capabilities within the state to deal with and respond to each scenario. The THIRA determines which capabilities need to be improved and how much.	All hazards
DOT	S	Traffic Safety Improvement Program	Traffic safety improvements or studies on public roads under county, city, or State jurisdiction. See https://iowadot.gov/traffic/traffic-and-safety-programs/traffic-safety-improvement-program-tsip	Transportation Incident

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HSEMD, FEMA	S, F	Training programs	Training in both preparedness and mitigation in areas related to terrorism awareness and hazardous materials awareness training. Training is done both in-house and in other State and local government agencies.	Hazardous Materials-Radiological-Terrorism
DNR	S	Underground Storage Tanks Section	Responsible for the regulation of underground storage tank systems used for the storage of regulated substances, primarily petroleum products. Staff in the section work with the owners of sites on the detection, prevention, and correction of releases of products from underground tanks.	Hazardous Materials
U.S. Forest Service	F	Urban and Community Forestry (UCF)	Cooperative program of the U.S. Forest Service that focuses on the stewardship of urban natural resources. UCF provides technical, financial, research, and educational services to local government, nonprofit organizations, community groups, educational institutions, and tribal governments. The program is delivered through state forestry agencies. See http://www.fs.fed.us/ucf/index.shtml.	Flash Flood-River Flooding
DNR	S	Wastewater State Revolving Fund (SRF) Loan Program and Wastewater Engineering Section	The Wastewater Section issues permits for the construction of any municipal and industrial treatment and collection facilities that discharge treated wastewater to a river or stream. The section also administers the Wastewater State Revolving Fund Loan Program offering communities and sanitary districts low-interest loans for the construction of wastewater treatment and collection system improvements. See http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Wastewater-Construction	Infrastructure Failure
EPA	F	Water data and tools	This site aggregates EPA water data and tools including integrated analysis, ambient water quality, watershed plan building, and financing. See https://www.epa.gov/waterdata	Flash Flood-River Flooding
DNR	S	Water Quality Bureau	The Water Quality Bureau is responsible for a diverse group of surface and groundwater programs. Many of the programs are based upon federal law administered by the EPA. In these cases the federal government has delegated program responsibility to the DNR. In each case, permits and review of technical proposals are supplemented by assistance from staff to help local governments, businesses and individuals meet the requirements of State and federal law. Often, there is overlap between the bureau's efforts to deal with water quality with efforts of others to deal with water quantity problems (flooding), and therefore they are partners in flood mitigation. See http://www.iowadnr.gov/Environmental-Protection/Water-Quality	Drought-Flash Flood-Infrastructure Failure-River Flooding

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IDALS	S	Water quality protection practices	The Resource Enhancement and Protection program provides funding to work with soil and water conservation districts to address local water quality protection needs.	Drought-Flash Flood-Grass/Wild Fire-Landslide-River Flooding
IDALS	S	Water quality protection projects	Water quality protection projects protect the state's surface and groundwater resources from point and nonpoint sources of contamination.	Drought-Flash Flood-Grass/Wild Fire-Landslide-River Flooding-Sinkholes
DNR	S	Water Supply Engineering (WSE) Section and the Water Supply Operations (WSO) Section	These sections are responsible for the programs associated with the public and private water supply systems of Iowa. Both sections are housed in the DNR's Water Quality Bureau. The sections are responsible for: Iowa's water allocation and use program; environmental laboratory certification program, certification programs for water operators, wastewater operators, and well drillers; and the technical aspects of the Drinking Water State Revolving Loan Fund program. See : http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Water-Supply-Engineering	Drought-Infrastructure Failure
DNR, EPA	F, S	Watershed Improvement Program and Comprehensive Water Quality Management Planning Grant	A federally-funded grant opportunity through the State-administered Clean Water Act Section 319 and Section 604(b) grants. The grant is limited to applicants representing State-recognized watershed management authorities. Watershed improvement plans that improve water quality will also address water quantity, and therefore are listed here as a flood mitigation capability. See http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Watershed-Improvement/Watershed-Planning	River Flooding
USDA NRCS	F	Watershed Protection and Flood Prevention Program (WFPO)	Provides for cooperation between the federal government, the State, and local jurisdictions to work together to prevent erosion, floodwater, and sediment damage to: further the conservation, development, use and disposal of water; further the conservation and proper use of land in authorized watersheds. The NRCS offers financial and technical assistance through this program for the following purposes: erosion and sediment control; watershed protection; flood prevention; water quality improvements; rural, municipal, and industrial water supply; water management; and others. See https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/#	Dam/Levee Failure-Drought-Flash Flood-Infrastructure Failure-River Flooding

Agency S=State, F=Federal, N=Nonprofit		**Program/ Office**	**Overview of Program or Office** (website, if known, on line below)	**Hazards Targeted by Program/Office**
USDA NRCS	F	Watershed surveys and planning	Program assists federal, State and local agencies to protect watersheds from damage caused by erosion, floodwater, and sediment, and to conserve and develop water and land resources. Resource concerns addressed by the program include opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, municipal water needs, and upstream flood damage. Rapid watershed assessments are used as one tool to collect data.	Dam/Levee Failure-Drought-Flash Flood-Grass/Wild Fire-Infrastructure Failure-Radiological
IDALS	S	Weights and measures	Improve the accuracy of measurements, enhance consumer protection, promote fair competition, and facilitate economic growth and trade.	Animal/Crop/Plant Disease -Hazardous Materials-Human Disease-Transportation Incident
IDPH	S	West Nile and other mosquito-borne viruses planning and preparedness program	Tracks all reports of mosquito-borne illness in birds, horses and other mammals, and humans. Provides education to health care professionals and the public on disease avoidance and protection.	Animal/Crop/Plant Disease -Human Disease
DNR, USACE	S, F	Wetlands or floodplain development permitting	Construction, excavation, or filling in streams, lakes, wetlands or on the flood plains may require permits from both the USACE and DNR. A joint application form shall be submitted to both agencies to begin the permit process for a variety of activities that impact a river, stream, wetland, or lake, or placement of fill in a flood plain, or construction of levees, roadways, bridges, or buildings in a flood plain. See http://www.iowadnr.gov/Environmental-Protection/Land-Quality/Flood-Plain-Management/Flood-Plain-Dev-Permits	River Flooding
USDA NRCS	F	Wetlands reserve easement and the Agricultural Conservation Easement Program (ACEP)	Provides financial and technical assistance to help conserve agricultural lands, wetlands, and their related benefits. The wetland reserve easement component is a voluntary program offering landowners an opportunity to protect, restore, and enhance wetlands on their property and offers an opportunity to establish long-term conservation and wildlife practices and protection. Goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every enrolled acre. In many cases, restoration and protection of wetlands reduces flood damage. For permanent wetland easements, NRCS pays 100 percent of easement value and up to 100 percent of restoration costs. See http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/.	River Flooding
DNR	S	Wildland Fire Program	Coordinating with the U.S. Forest Service Northeastern Area (NA) State and Private Forestry and the Big Rivers Forest Fire Management Compact to support Iowa's natural resource managers and fire departments. See	Grass/Wild Fire

Agency S=State, F=Federal, N=Nonprofit		Program/ Office	Overview of Program or Office (website, if known, on line below)	Hazards Targeted by Program/Office
			http://www.iowadnr.gov/Conservation/Forestry/Fire-Management	
DNR	S	Wildlife Bureau Private Lands Program	A focused effort to enroll landowners in conservation programs across the state. This private lands effort involves contacting and advising landowners about possible conservation practices that could be put into place on their lands. Provides technical expertise to landowners interested in restoring wetlands or grasslands on their property. Private Lands biologists are able to assist landowners in evaluating their properties' potential for wetland or grassland restoration, setting goals, and identifying priorities for their land. Wildlife Bureau biologists can also assist landowners by identifying potential partners and federal programs that can help the landowner construct and cover costs of restoring wetlands or grasslands, both of which can reduce flooding. See http://www.iowadnr.gov/Conservation/Wildlife-Landowner-Assistance	Infrastructure Failure-River Flooding
Watershed management authorities	N	WMAs	A watershed management authority (WMA) is a mechanism for cities, counties, and soil and water conservation districts to cooperatively engage in watershed planning and management. A WMA may assess and reduce flood risk, assess and improve water quality, monitor federal flood-risk planning and activities, educate residents of the watershed regarding flood risks and water quality, and allocate moneys made available to the authority for purposes of water quality and flood mitigation.	Drought-Flash Flood-River Flooding

5.2.2. More Details on FEMA Programs Important to Hazard Mitigation in Iowa

A. National Flood Insurance Program and Community Rating System

Participation in the National Flood Insurance Program continues to increase in Iowa. This is reflected in local policies and ordinances aimed at reducing development in flood plains and other hazard areas as well as providing homeowners the opportunity to purchase flood insurance through the NFIP. Several communities are in the process of applying for NFIP membership, in part to become eligible for federal and State mitigation funds. In 2010 there were 517 Iowa communities participating in the NFIP. More than 670 communities are currently participating.

A statute that was recently passed by the Iowa General Assembly involves participation in NFIP. Iowa Code 455B.262A is a law that was enacted in the spring of 2009. The law ties a community's eligibility for certain post-disaster State assistance to participation in the National Flood Insurance Program.

Following a presidentially-declared disaster, FEMA makes public assistance grants available to local governments. The grants may be used for cleanup and repairs (e.g., assistance for debris removal or infrastructure repair). These grants usually provide only 75 percent of the cost of any post-disaster project. The State of Iowa typically contributes another 10 percent toward the required 25 percent nonfederal match for public assistance grants. However, since 2011 the State of Iowa has made this match contribution contingent upon the community being in good standing with the NFIP.

This code chapter only affects those communities that have an existing Flood Insurance Rate Map (FIRM) published by FEMA that identifies areas within the community that are subject to inundation by flood waters during a 1-percent-chance flood event (also known as the 100-year flood). If a community is newly identified as having areas that are subject to inundation during a 1-percent-chance flood event, it will have two years from the effective date of the FIRM to join the NFIP before the community loses eligibility for State matching funds.

Iowa law also allows the DNR to delegate the State's floodplain regulatory functions to a local government that has a flood study identifying the regulatory floodway and floodway fringe along with 100-year flood profile(s) and a floodplain management ordinance meeting NFIP and State minimum requirements. The State allows communities with delegated floodplain management authority to issue floodplain development permits for most types of development in lieu of the DNR. The State has delegated floodplain authority to approximately 140 communities participating in the NFIP. As part of the delegation process, the State retains the right to concur with or deny the granting of any variance from the community's floodplain management regulations. Although the State of Iowa's criteria for new floodplain development is similar to the minimum NFIP criteria in most respects, there are some important differences. For example:

- The lowest floor of new structures must be elevated an additional 1 foot above the 100-year (base) flood.
- Iowa does not allow new residential structures in the floodway.
- Residential structures must have wheeled vehicular access during the 100-year flood.
- The substantial improvement threshold includes additions that increase a building's footprint by 25 percent or more.
- All post-FIRM additions are considered cumulative improvements in the determination of increase in floor area.

There are currently 11 communities that participate in the Community Rating System in the state of Iowa, which is an increase from the last plan update. The cities of Cedar Falls, Cedar Rapids, Clive, Coralville, Davenport, Des Moines, Iowa City, Kalona, and the counties of Linn, Pottawattamie, and Story all voluntarily participate in activities that exceed the minimum standards for the NFIP. These communities receive discounted flood insurance rates for reducing flood damage to insurable property, supporting the insurance aspects of the NFIP, and encouraging a comprehensive approach to floodplain management.

B. Risk Mapping, Assessment, and Planning (Risk MAP)

Risk Mapping, Assessment, and Planning (Risk MAP) is a FEMA program that the DNR coordinates through Coordinating Technical Partners (CTP). Besides the Iowa DNR, FEMA and HSEMD are also included in CTP. Risk MAP makes planning resources available to local jurisdictions for hazard mitigation. These resources can be utilized for the development of risk assessments, watershed studies, mitigation plan elements, mapping, and risk communications. As it relates to flooding, Risk MAP completed five flood-risk reports for the Middle Cedar, Middle Iowa, East and West Nishnabotna, and North Raccoon watersheds. These reports inform communities about risk to the built environment through Hazus modeling. HSEMD planners work with Risk MAP program staff to integrate data and technical resources into local hazard mitigation planning.

The emphasis of the Risk MAP program in Iowa over the last 10 years has been mapping flood zones. They have accomplished a considerable amount of work in that time. The mapping work has progressed ahead of the discovery phase, which is atypical. Now, some watersheds are going back to the discovery

phase. Coordination is getting much better between HSEMD and DNR as they reach out together to engage local jurisdictions and help them discover their flood risks and what can be done about them.

C. FEMA Hazard Mitigation Assistance and Public Assistance (C-G Categories) Grants

FEMA's Hazard Mitigation Assistance (HMA) grants include the Hazard Mitigation Grant Program (HMGP), the Pre-disaster Mitigation Grant Program (PDM), and the Flood Mitigation Assistance (FMA) grant. In the past HMGP was the most critical mitigation program for Iowa, based primarily on the amount of grant funding made available. Due to a reduced amount of HMGP funds, Iowa has had to rely on annually funded programs like the FMA and PDM grant programs.

The areas of hazard mitigation specifically supported by FEMA grant programs in Iowa include:

- Acquire, relocate, or elevate structures located in flood hazard areas
- Protect critical public facilities and important commercial and business areas
- Construct tornado safe rooms in public facilities and schools
- Support the development and adoption of local hazard mitigation plans and enhance the capability of communities for effective hazard analysis and risk assessment
- Educate and market hazard mitigation to Iowa citizens and to promote safer homes and safer more disaster resistant communities
- Utility system retrofits

Iowa's grant priorities have consistently targeted locally-identified projects to remove residential and commercial structures from flood hazard areas. Diligent attention is used in evaluating all funded projects to determine the likely economic benefit through use of benefit-cost analysis. Iowa's criteria for grant funding not only ensure that the greatest number of flooded homeowners are provided with assistance, but also prioritizes funding to ensure the greatest benefit in avoided future damage.

Among Iowa's leading efforts in mitigation is the acquisition and removal of residential and commercial structures from flood hazard areas. Prior to the 2008 flood event, Iowa funded projects in 71 separate jurisdictions removing 1,447 flood-prone structures from identified flood hazard areas.

One aspect of managing mitigation grants has been the leadership role that the mitigation staff plays in addressing long-term housing recovery needs in the aftermath of severe flooding. Subsequently, an additional benefit of acquiring and removing residential structures is that the proven cost effectiveness is enhanced by contributing to the effectiveness of the recovery process through quick and efficient delivery of community home acquisition and relocation projects. HMGP funding has been utilized to address flood impacted areas to nearly eliminate needs associated with short-term replacement housing, Individual Assistance Program funding, underinsured or uninsured housing, or home rehabilitation needs.

Protection of critical public facilities is one of Iowa's leading types of mitigation measures. A natural hazard event which disrupts or shuts down wastewater treatment systems, electrical generation facilities, and water treatment plants serves to magnify the effects of a disaster event and encompasses citizens and areas otherwise not directly impacted. Great benefit has been achieved by ensuring that critical public facilities are sufficiently protected from hazards and risks, oftentimes ensuring that the impacts of natural hazards do not become a disaster event.

The State of Iowa has demonstrated a substantial financial commitment to hazard mitigation. Following a presidentially-declared disaster, FEMA makes Public Assistance (PA) Program grants available to local governments. The grants may be used for cleanup and repairs (e.g., assistance for debris removal, infrastructure repair, etc.). These grants usually provide only 75 percent of the cost of any postdisaster project. The State of Iowa typically contributes another 10 percent toward the required 25 percent nonfederal match for Public Assistance Program grants, however, since 2011, the State of Iowa has made this match contribution contingent upon the community being in good standing with the NFIP. Since disaster DR-1688 was declared in 2007, the State has contributed nearly $40 million in match for HMGP activities.

The chart below provides details on the mitigation projects that have been funded with HMGP, FMA, and PDM funds as well as with PA grants in categories C, D, E, F, and G. The chart illustrates just how important these FEMA mitigation programs are to the State's comprehensive mitigation program. The chart also shows how the State has fully made use of these funds to effectively advance the mitigation actions from the 2013 *Iowa Hazard Mitigation Plan*.

Projects Initiated to Advance Mitigation Measures in the 2013 *Iowa Hazard Mitigation Plan*

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
934 communities have FEMA-approved local mitigation plans	Complete local hazard mitigation plans	All	HMGP, PDM, FMA, local		Completed
Installation of box culvert and stream bank stabilization	Flood control	River Flooding-Flash Flooding	HMGP	$619,602	Completed
Build 14 multipurpose tornado safe rooms in school facilities (DR-1763)	Construct safe rooms	Tornado/Windstorm	HMGP	$18,238,730	Completed
Build 14 tornado safe rooms in community facilities (DR-1763)	Construct safe rooms	Tornado/Windstorm	HMGP	$12,661,863	Completed
Acquire and demolish 254 substantially damaged or destroyed properties in 46 communities	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$24,400,000	-open performance period
25 electrical retrofit projects. These will retrofit and harden a total of more than 2,720 miles of electrical conductors, distribution lines, transmission lines, and poles (DR-1763)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	HMGP	$212,470,949	Completed
Installation of a floodwall around critical wastewater treatment plant and addition of backflow prevention mitigation	Construct flood wall	River Flooding, Flash Flooding	HMGP	$20,918,152	Completed
Replacement and construction of a lift station and sanitary sewer force main, addition of a wastewater treatment lagoon cell	Flood control	River Flooding-Flash Flooding	HMGP	$1,367,063	Completed
Installation of three detention basins, retrofit two existing detention basins and increase capacity of storm water system	Flood control	River Flooding-Flash Flooding	HMGP	$2,020,021	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
Construction of floodwall around water treatment plant and retrofit storm sewer system	Construct flood wall	River Flooding-Flash Flooding	HMGP	$16,222,100	Completed
Installation of five storm water detention basins	Drainage	River Flooding-Flash Flooding	HMGP	$9,896,000	Completed
Construction of a new wastewater treatment force main, lift stations, and expansion of the treatment lagoon	Drainage–flood protection for critical facilities	River Flooding-Flash Flooding	HMGP	$17,867,473	Completed
Installation of five backflow valves and addition of three storm water lift stations	Drainage–flood protection for critical facilities	River Flooding, Flash Flooding	HMGP	$1,851,868	Completed
Construction of an invisible floodwall and flood control system (PA)	Construct flood wall	River Flooding, Flash Flooding	Public Assis-tance Program (PA)	$4,448,820	Completed
Increase capacity of storm sewer drainage system and eliminate storm water infiltration in the sanitary sewer system	Construct storm sewer drainage	River Flooding, Flash Flooding	HMGP	$3,339,846	Completed
Buyout of 22 repetitive loss flood-damaged residential properties and provide relocation benefits to occupants in seven communities	Acquire property through purchase for demolition	River Flooding, Flash Flooding	CDBG	$2,800,000	Completed
Two electrical retrofit projects (DR-1737). These projects will retrofit a total of 152.4 miles.	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Severe Winter Storm, Tornado/Windstorm, Infrastructure Failure	HMGP	$5,365,550	Completed
Elevation of electrical motor controls for two water supply wells (DR-1737)	Construct/elevate lift station controls	River Flooding, Flash flooding	HMGP	$23,975	Completed
Strengthen 20.5 miles of electric lines, increase conductor size, span widths, install underground cable (DR-1727)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Severe Winter Storm, Tornado/Windstorm	HMGP	$1,336,700	Completed
Prevent sewer backups by improving storm sewer drainage (DR-1705)	Drainage–construct storm sewer drainage	River Flooding, Flash Flooding	HMGP	$1,914,250	Completed
Electrical retrofit projects for two electric cooperatives covering 12.4 miles of electrical lines (DR-1705)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Severe Winter Storm, Tornado/Windstorm, Thunder/Lightening/ Hail	HMGP	$747,500	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
Electrical retrofit project for a municipal utility converting 1.4 miles of overhead electric distribution lines to underground power lines (DR-1705)	Electrical retrofit–lower or bury electric lines in nonflood, high-wind areas	Severe Winter Storm, Tornado/Windstorm, Lightening/Hail, Infrastructure Failure	HMGP	$233,603	Completed
Protect community utilities facility during flood events, remove seepage and ground water intrusion (DR-1688)	Storm water pump–flood protection for critical facilities	River Flooding, Flash Flooding	HMGP	$115,000	Completed
Electric retrofit projects for four electrical cooperatives strengthening 117.25 miles of distribution lines, increasing conductor size and pole span (DR-1688)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Infrastructure Failure, Severe Winter Storm	HMGP	$12,928,628	Completed
Electric retrofit projects for two electrical cooperatives strengthening 32.66 miles of distribution lines, increasing conductor size and pole span (DR-4114)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Infrastructure Failure, Severe Winter Storm	HMGP	$1,717,726	Ongoing -open performance period
Electric retrofit project for one electrical cooperative strengthening 10 miles of distribution lines, increasing conductor size and pole span (DR-4119)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Infrastructure Failure, Severe Winter Storm	HMGP	$371,128	Completed
Electric retrofit projects for two electrical cooperatives strengthening 16.3 miles of distribution lines, increasing conductor size and pole span (DR-4126)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Infrastructure Failure, Severe Winter Storm	HMGP	$630,933	Completed
Electric project for one electrical cooperative re-routing 2.09 miles of distribution lines (DR-4135)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Infrastructure Failure, Severe Winter Storm	HMGP	$135,000	Completed
Electric retrofit project for one electrical cooperative strengthening 21.1 miles of distribution lines, increasing conductor size and pole span (DR-4281)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Infrastructure Failure, Severe Winter Storm	HMGP	$1,299,500	Ongoing -open performance period

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
Installation of floodwall around main lift station (DR-1880)	Construct flood wall	River Flooding, Flash Flooding	HMGP	$358,337	Completed
Increase capacity of lift station and equalization basin (DR-1880)	Construct flood wall	River Flooding, Flash Flooding	HMGP	$617,500	Completed
Retrofit storm sewers to prevent flooding caused by heavy rainfall events (DR-1928	Flood control	River Flooding, Flash Flooding	HMGP	$1,637,610	Completed
Retrofit sanitary sewer system (DR-1928).	Flood control	River Flooding, Flash Flooding	HMGP	$503,000	Completed
Installation of floodwall and earthen berm around critical water treatment plant (DR-1930)	Construct flood wall	River Flooding, Flash Flooding	HMGP	$772,168	Completed
Bank stabilization of creek (DR-1998))	Flood control	River Flooding, Flash Flooding	HMGP	$714,000	Completed
Retrofit sanitary sewer system, install new pump station and force main.	Flood control	River Flooding, Flash Flooding	HMGP	$2,641,492	Completed
5% Initiative: 41 emergency storm warning sirens for nine communities (DR-1930)	Install siren warning system	Tornado/Windstorm	HMGP	$457,038	Completed
5% Initiative: six emergency backup power generators for five communities (DR-1930)	Purchase/install backup generators	Infrastructure Failure	HMGP	$628,811	Completed
5% Initiative: emergency backup power generators for one community (DR-1977)	Purchase/install backup generators	Infrastructure Failure	HMGP	$23,902	Completed
5% Initiative: emergency backup power generators for one community (DR-4126)	Purchase/install backup generators	Infrastructure Failure	HMGP	$431,820	Completed
5% Initiative: 20 emergency storm warning sirens for eight communities (DR-1998)	Install siren warning system	Tornado/Windstorm	HMGP	$406,071	Completed
5% Initiative: emergency warning sirens for one community (DR-4119)	Install siren warning system	Tornado/Windstorm	HMGP	$19,927	Completed
5% Initiative: nine emergency backup power generators for seven communities (DR-1998)	Purchase/install backup generators	Infrastructure Failure	HMGP	$827,425	Completed
5% Initiative: two emergency backup power generators for two communities (DR-4016)	Purchase/install backup generators	Infrastructure Failure	HMGP	$89,678	Completed
5% Initiative: emergency warning sirens for one community (DR-4016)	Install siren warning system	Tornado/Windstorm	HMGP	$13,189	Completed
5% Initiative: two emergency storm warning sirens for two communities (DR-4184)	Install siren warning system	Tornado/Windstorm	HMGP	$61,538	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
5% Initiative: emergency warning sirens for one community (DR-4181)	Install siren warning system	Tornado/Windstorm	HMGP	$49,328	Completed
5% Initiative: two emergency storm warning sirens for two communities (DR-4234)	Install siren warning system	Tornado/Windstorm	HMGP	$49,328	Ongoing -open performance period
5% Initiative: emergency warning sirens (DR-4281)	Install siren warning system	Tornado/Windstorm	HMGP	$38,614	Ongoing -open performance period
5% Initiative: emergency backup power generators for one community (DR-4018)	Purchase/install backup generators	Infrastructure Failure	HMGP	$46,236	Completed
5% Initiative: emergency backup power generators for one community (DR-4119)	Purchase/install backup generators	Infrastructure Failure	HMGP	$46,236	Completed
5% Initiative: one emergency backup power generator for one community (DR-4184)	Purchase/install backup generators	Infrastructure Failure	HMGP	$96,360	Ongoing -open performance period
5% Initiative: three emergency backup power generators for two communities (DR-4234)	Purchase/install backup generators	Infrastructure Failure	HMGP	$317,766	Ongoing -open performance period
5% Initiative: one emergency backup power generator for one community (DR-4281)	Purchase/install backup generators	Infrastructure Failure	HMGP	$31,153	Ongoing/Open performance period
5% Initiative: two emergency backup power generators for two communities (DR-4289)	Purchase/install backup generators	Infrastructure Failure	HMGP	$28,392	Ongoing -open performance period
Build 12 multipurpose tornado safe rooms in school facilities (DR-1880)	Construct safe rooms	Tornado/Windstorm	HMGP	$12,826,882	Completed
Build 14 multipurpose tornado safe rooms in community facilities (DR-1880)	Construct safe rooms	Tornado/Windstorm	HMGP	$2,186,643	Completed
Build two multipurpose tornado safe rooms in school facilities (DR-4114)	Construct safe rooms	Tornado/Windstorm	HMGP	$1,864,420	Ongoing -open performance period
Build one multipurpose tornado safe room in school facilities (DR-4119)	Construct safe rooms	Tornado/Windstorm	HMGP	$729,911	Completed
Acquire and demolish 129 substantially damaged or destroyed properties in six communities (DR-1880)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$11,705,378	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
Acquire and demolish 34 substantially damaged or destroyed properties in four communities (DR-1930)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$6,010,586	Completed
Acquire and demolish 65 substantially damaged or destroyed properties (DR-1998)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$8,955,687	Completed
Acquire and demolish one substantially damaged or destroyed property (DR-4114)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$105,893	Ongoing-open performance period
Acquire and demolish one substantially damaged or destroyed property (DR-4119)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$37,028	Completed
Acquire and demolish 42 substantially damaged or destroyed properties (DR-4126)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$2,720,684	Completed
Acquire and demolish 11 substantially damaged or destroyed properties (DR-4181)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$1,022,682	Completed
Acquire and demolish 37 substantially damaged or destroyed properties (DR-4184)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$3,603.648	Completed
Acquire and demolish 25 substantially damaged or destroyed properties (DR-4187)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$3,672,862	Ongoing -open performance period
Acquire and demolish 10 substantially damaged or destroyed properties (DR-4234)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$1,572,075	Ongoing -open performance period
Acquire and demolish four substantially damaged or destroyed properties (DR-4281)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$376,150	Ongoing/open performance period
Acquire and demolish 53 substantially damaged or destroyed properties (DR-4289)	Acquire property through purchase for demolition	River Flooding, Flash Flooding	HMGP	$5,277,894	Ongoing/open performance period
Build two multipurpose tornado safe rooms in school facilities (DR-1854)	Construct safe rooms	Tornado/Windstorm	HMGP	$1,171,260	Completed
Build two multipurpose tornado safe rooms in community facilities (DR-1854)	Construct safe rooms	Tornado/Windstorm	HMGP	$392,180	Completed
Build one multipurpose tornado safe room in school facility (DR-1877)	Construct safe rooms	Tornado/Windstorm	HMGP	$1,505,096	Completed
Build one multipurpose tornado safe room in community facility (DR-1877)	Construct safe rooms	Tornado/Windstorm	HMGP	$324,408	Completed
Build four multipurpose tornado safe rooms in school facilities (DR-1930)	Construct safe rooms	Tornado/Windstorm	HMGP	$3,166,107	Completed
Build one multipurpose tornado safe room in community facility (DR-1930)	Construct safe rooms	Tornado/Windstorm	HMGP	$861,076	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
Build two multipurpose tornado safe rooms in community facilities (DR-1928)	Construct safe rooms	Tornado/Windstorm	HMGP	$966,535	Completed
Build one multipurpose tornado safe room in community facility (DR-1977)	Construct safe rooms	Tornado/Windstorm	HMGP	$444,663	Completed
Build two multipurpose tornado safe rooms in school facilities (DR-1998)	Construct safe rooms	Tornado/Windstorm	HMGP	$1,679,844	Completed
Build two multipurpose tornado safe rooms in school facilities (DR-4016)	Construct safe rooms	Tornado/Windstorm	HMGP	$1,933,421	Completed
Build one multipurpose tornado safe room in school facility (DR-4018)	Construct safe rooms	Tornado/Windstorm	HMGP	$819,752	Completed
Four electrical retrofit projects. These will retrofit and harden a total of more than 150 miles of electrical conductors, distribution lines, transmission lines, and poles (DR-1880)	Electrical retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	HMGP	$5,587,120	Completed
Three electrical retrofit projects. These will retrofit and harden a total of more than 309 miles of electrical conductors, distribution lines, transmission lines, and poles (DR-1930)	Electrical Retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	HMGP	$11,276,194	Completed
One electrical retrofit project. This will retrofit and harden a total of more than seven miles of electrical conductors, distribution lines, transmission lines, and poles (DR-1977)	Electrical Retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	HMGP	$341,900	Completed
One electrical retrofit project. This will retrofit and harden a total of more than 64 miles of electrical conductors, distribution lines, transmission lines, and poles (DR-1998)	Electrical Retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	HMGP	$3,017,600	Completed
Electrical retrofit projects for 29 electrical cooperatives strengthening distribution lines through 262 total projects (DR-1763)	Electrical Retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	PA	$31,354,259	Completed
Electrical retrofit projects for one electrical cooperative strengthening distribution lines through 14 total projects	Electrical Retrofit-replace damaged power lines with lines more resistant to ice and snow buildup and other hazards	Tornado/Windstorm, Severe Winter Storm, Thunder/Lightning/ Hail, Infrastructure Failure	PA	$6,962,404	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
Acquire and demolish 831 substantially damaged or destroyed properties in the 100-year floodplain	Acquire property through purchase for demolition	River Flooding, Flash Flooding	CDBG	$112,252,484	Completed
An estimated 960 projects to provide erosion protection and soil stabilization are in progress (DR-1763)	Develop soil erosion stabilization projects	River Flooding, Flash Flooding	PA -406 Mit. Cat.(C-G)		Completed
An estimated 300 projects to provide drainage improvements are in progress (DR-1763)	All drainage mitigation measures	River Flooding, Flash Flooding	PA -406 Mit. Cat.(C-G)		Completed
An estimated 65 projects to provide flood proofing are in progress (DR-1763)	Flood protection for critical facilities and other properties	River Flooding, Flash Flooding	PA 406 Mit. Cat.(C-G)		Completed
An estimated 170 projects to provide elevation and relocation of critical components are in progress (DR-1763)	Elevate or relocate critical components above base flood elevation	River Flooding, Flash Flooding	PA 406 Mit. Cat.(C-G)		Completed
An estimated 50 projects to encase or enclose critical utilities are in progress (DR-1763)	Ensure no leaks exist in water supply and sewer lines. Flood protection for critical facilities.	River Flooding, Flash Flooding	PA 406 Mit. Cat.(C-G)		Completed
An estimated 65 projects to install backflow devices are in progress (DR-1763)	Flood protection for critical facilities	River Flooding, Flash Flooding	PA 406 Mit. Cat.(C-G)		Completed
An estimated 15 projects to do building elevations are in progress (DR-1763)	Elevate properties above base flood elevation	River Flooding, Flash Flooding	PA 406 Mit.Cat. (C-G)		Completed
An estimated 22 projects for miscellaneous mitigation measures are in progress (DR-1763)	Various mitigation measures	River Flooding, Flash Flooding, Tornado/Windstorm	PA 406 Cat.(C-G)	Total DR-1763 $79,062,871	Completed
A total of 18 projects to relocate buildings that have been or will be subject to repetitive heavy damage outside of the floodplain (DR-1763)	Acquire property through purchase for relocation	River Flooding, Flash Flooding	PA – Codes &Stan-dards / Bldg. Replace-ment	$104,208,574	Completed
One elevation project to remove a critical facility out of the floodplain (DR-1763)	Acquire property through purchase for elevation to or above base flood elevation. Flood protection for critical facilities	River Flooding, Flash Flooding	PA – Codes & Stan-dards/ Bldg. Replace-ment	$6,483,880	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
An estimated total of 201 category C projects (DR-1930)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. C	$874,398	Completed
An estimated total of 34 category D projects (DR-1930)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. D	$361,541	Completed
An estimated total of 27 category E projects (DR-1930)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$2,074,826	Completed
An estimated total of 38 category F projects (DR-1930)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. F	$378,232	Completed
An estimated total of 64 category G projects (DR-1930)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. G	$542,982	Completed
An estimated total of six category E projects (DR-1877)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$10,315	Completed
An estimated total of 15 category F projects (DR-1877)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. F	$19,486	Completed
An estimated total of 21 category C projects (DR-1877)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. C	$29,802	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
An estimated total of one category E projects (DR-1880)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$1,343	Completed
An estimated total of 82 category F projects (DR-1880)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. F	$608,202	Completed
An estimated total of 16 category C projects (DR-1928)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. C	$534,336	Completed
An estimated total of 17 category D projects (DR-1928)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. D	$570,410	Completed
An estimated total of one category G project (DR-1928)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. G	$1,601	Completed
An estimated total of 18 category C projects (DR-1998)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. C	$47,245	Completed
An estimated total of 15 category D projects (DR-1998)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. D	$85,639	Completed
An estimated total of five category E projects (DR-1998)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$395,258	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
An estimated total of three category F projects (DR-1998)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. F	$59,522	Completed
An estimated total of seven category G projects (DR-1998)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. G	$19,231	Completed
An estimated total of three category C projects (DR-4016)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. C	$1,457	Completed
An estimated total of seven category E projects (DR-4016)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$211,964	Completed
An estimated total of 26 category C projects (DR-4018)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. C	$171,751	Completed
An estimated total of two category D projects (DR-4018)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. D	$2,343	Completed
An estimated total of one category E project (DR-4018)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$600	Completed
An estimated total of two category F projects (DR-4018)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. F	$2,125	Completed

Mitigation Project Synopsis	Mitigation Measure	Hazard(s) Addressed	Federal Fund	Estimated Cost	Status
An estimated total of two category G projects (DR-4018)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. G	$18,449	Completed
An estimated total of two category E projects (DR-1977)	Elevation and or relocation of critical facilities, erosion stabilization, drainage mitigation, flood protection	River Flooding, Flash Flooding	PA 406 Mit. Cat. E	$2,819	Completed

D. Emergency Management Performance Grant (EMPG)

Of the several projects that the State uses EMPG to fund, one of them supports various efforts within the Recovery Division of HSEMD. In addition to development and implementation of the State's hazard mitigation plan, this project includes continuity of operations planning and exercise efforts, coordination of mitigation efforts related to the Silver Jackets, and development and exercise of the State's recovery plan.

Continuity of operations planning and exercise ties to one of the five objectives of the State's hazard mitigation strategy. The involvement of the Silver Jackets and the State is described in much more detail in section 5.2.3.

For the past few years, and into the near future, the State has been holding exercises to test its recovery plan. These exercises, while focused on recovery, very often include mitigation. For instance, when exercising the Housing Recovery Support Function (RSF) of the recovery plan, much discussion involves building or rebuilding housing for people impacted by disaster. Rebuilding housing is an opportunity to mitigate future disaster impacts on that housing, and therefore deeply involves mitigation programs and staff. Exercises of other RSFs have also touched the mitigation realm, and such exercises have provided a great opportunity for HSEMD mitigation planners to engage with representatives of other State agencies, as well as federal agencies, on hazard mitigation efforts. HSEMD hazard mitigation staff will continue to participate in the exercise and development of the recovery plan for this reason.

E. Dam Safety Program

The Iowa Department of Natural Resources is responsible for the State's dam safety program. The program involves the review and approval for the construction of new dams, maintaining an inventory of existing dams that meet minimum size criteria, and the periodic inspection of certain dams. Currently there are approximately 3,800 dams on the State's dam inventory.

Dams that have the potential to create extensive damage to downstream houses or buildings, or to cause loss of life should they fail and release their impounded water, are required to be regularly inspected. There are currently 321 dams that require regular inspection either on a two- or five-year inspection frequency.

Permits may be required to construct a dam, modify an existing dam, drawdown the water level, or remove a dam. The Permit Application Process in Iowa is described online.

More information on the classification of dams in the state is described in the Section 3 subsection on dams and levees. DNR dam safety staff were consulted in developing this mitigation plan and strategy. They recognize a great need for dam owners to develop emergency action plans (EAP) for their dams. The development of EAPs is one of the mitigation actions listed in this strategy in section 5.5.

5.2.3. More Details on Other Recent Initiatives Important to Hazard Mitigation in Iowa

A. Recent Legislative Initiatives

In 2015 the Iowa General Assembly passed legislation that adopted a State building code. Adoption of the building code realized the accomplishment of one mitigation action and part of another from the last Iowa Hazard Mitigation Plan. The first listed mitigation action from that 2013 Plan called for promoting legislation and building codes that regulate construction and decrease risk. Another mitigation action on the list sought to increase shelter standards. Both of these came to fruition when the General Assembly adopted the State Building Code. The legislation makes the building code applicable to all Iowa cities with a population of 15,000 or more that have not adopted a local building code substantially in accord with the standards of a national building code organization. In addition, the State building code becomes applicable to any jurisdiction (county or city with less than 15,000) that has an ordinance passed accepting the application of the code. More than half of the population of Iowa is covered by a local building code.

The Iowa General Assembly passed legislation in 2012 to create a flood mitigation program and the Iowa Flood Mitigation Board to oversee the program[1]. This program allows certain governmental entities to submit flood mitigation projects to the board for review and possible approval for funding. The funding for this program comes from funds appropriated by the general assembly or by sales tax increment. The sales tax increment consists of the amount of increased sales tax revenue within the jurisdictional boundaries of the governmental entity receiving approval from the Flood Mitigation Board to participate. The Iowa Department of Revenue works with the governmental entity to establish a base year, and in subsequent years, deposits those sales tax revenues that exceed the base year revenues into a separate account maintained by the State treasurer. By law, only 70 percent of the increment revenue can be deposited into this account, with the remainder going to the State general fund. Funds placed into the account are then made available to the participating governmental entities to support their flood mitigation projects.

The funding made available each year cannot exceed $30 million in total for all governmental entities, with no more than $15 million going to a single entity. As of 2018, the entities participating in this program are the City of Des Moines and Metropolitan Wastewater Reclamation Authority and the cities of Burlington, Cedar Falls, Cedar Rapids, Council Bluffs, Dubuque, Iowa City, Coralville, Storm Lake, and Waverly. Their combined projects are projected to utilize the annual $30 million maximum until 2034, and as a result no new project applications are being accepted by the Flood Mitigation Board at this time.

[1] **Iowa Code, Chapter 418**

While not focused on flood mitigation, the water quality bill passed by the Iowa General Assembly in early 2018 reflects another legislative effort that will have an impact on flood reduction. The bill establishes a water quality infrastructure fund which will provide about $156 million over 12 years to farmers to help them establish cover crops, wetlands, and other structures. In addition to improving water quality, most of these structures will have the effect of reducing runoff and peak flows.

B. Partnership Efforts and Coordinating Councils and Teams

1. Iowa Storm Water Management Manual

Recently, the *Iowa Storm Water Management Manual* was developed and posted on the DNR's website. The manual was developed by a team representing cities, State and federal agencies, and academic and research professionals from colleges and universities. The manual provides information on hydrologic changes with urban development, uniform sizing criteria, and low-impact development alternatives and design guidelines for practices that protect water quality and reduce stream corridor erosion. The manual has been successful in providing a guide for local ordinances to control storm water.

2. State Hazard Mitigation Team and Iowa Flood Risk Management Team (Silver Jackets)

Iowa's State Hazard Mitigation Team was created in 1998 by Executive Order (EO) 62 of the governor. The SHMT is given certain responsibilities in EO 62[2], including:

A. Determine the capabilities of each State agency to address various hazards, including the legal authority of each agency and the programs and funding sources available to address mitigation activities;
B. Provide assistance in developing, implementing and updating the State multi-hazard mitigation plan;
C. Coordinate activities of State agencies to reduce the loss of life and property, and costs of disaster; and
D. Recommend methods to improve mitigation activities of State agencies, local governments, federal government, and private industry

In 2011, the Silver Jackets was created. Its charter was revised in 2015, after which several additional partners joined the team. As it was chartered to do many of the above activities for flood hazards, the SHMT and Silver Jackets agreed to have the Silver Jackets assist the SHMT with those functions as they pertain to the flooding hazard. Rather than cover flood hazard issues in both meetings, the SHMT largely leaves to the Silver Jackets the discussion of particulars relating to flood mitigation issues. The SHMT meeting receives a brief report of the Silver Jackets activities and then can spend the rest of their meeting time on other hazards or items more general in nature. This arrangement has improved coordination while decreasing duplication.

At their meeting, the Silver Jackets do the following that previously would have been done by the SHMT for flooding:

- Report/evaluate progress on flood mitigation actions and projects
- Identify implementation issues
- Provide briefings on updates

The Silver Jackets is well positioned to coordinate and work with the SHMT to mitigate flood impacts because of all the knowledge and expertise of the partners and the resources they can bring to the table. Agencies participating in the Iowa Silver Jackets include HSEMD, DNR, IEDA, USACE (including St. Paul, Omaha, and Rock Island Districts), USDA NRCS, NOAA

[2] See http://publications.iowa.gov/3954/1/Executive_Order_Number_Sixty_-_Two.pdf for entire text of Executive Order 62.

National Weather Service, USGS Iowa Water Science Center, Iowa Flood Center at the University of Iowa, and the Iowa Floodplain and Stormwater Management Association.

The Iowa Silver Jackets has pursued more than a dozen projects. Descriptions of two of them are provided below:

Iowa Bridge Sensor Demonstration Project

The Iowa Bridge Sensor Demonstration Project documents the survey methods, procedures, hydrology and hydraulic analyses, development of the bridge sensor rating curve methodologies, product strengths and limitations, peer review, evaluation of the rating curve products, and implementation costs. The bridge sensor data serves to supplement USGS gauge sites and **not** replace the high quality of the USGS gauge site data. Bridge sensor rating curves are intended for locations where no other means of hydraulic measurement are available to provide some level of flood awareness for communities.

The implementation of the bridge sensor rating curve methodology utilizing the step-backwater method is a suitable resource of flow data to supplement established USGS stream gauge data at locations that do not currently have a USGS stream gauge. However, the products do provide water level and flow information at locations that are currently not served by the USGS gauging systems. Counties and communities using the Iowa Flood Center's (IFC) Iowa Flood Information System (IFIS) website and products accept the limitations to the accuracy of the information provided by IFIS. The online availability of this data, where no other data is available, allows flood response teams to use their limited time and resources in a more efficient and effective manner rather than engaging in repetitive, time-consuming field reconnaissance in anticipation of an impending high-water flood event.

Iowa Flood Risk Data Inventory

The Iowa Flood Risk Data Inventory compiles federal and State agency flood risk models and metadata into a single easily-accessible source. Using the IFIS platform, interagency stream model repository enables statewide ability to quickly access the availability of flood risk models. The geospatial inventory map identifies stream reaches that extend through multiple communities. For each model, the posted information includes:

1) Stream name and site description;
2) Type of model (hydrologic, hydraulic 1D, 2D); and,
3) Agency name, point-of-contact, date of model data and model properties.

The inventory interagency team has established model documentation and review criteria to ensure only technically-appropriate models are included in the inventory. By maintaining an up-to-date Iowa Flood Risk Data Inventory, all governmental participating partners benefit from sharing the responsibility of posting recently-completed model metadata to the IFIS platform. This site identifies models that can be leveraged in a timely manner for additional applications, analysis, and expedited flood risk response.

3. Water Resources Coordinating Council (WRCC)

The WRCC's purpose is to preserve and protect Iowa's water resources, and coordinate the management of those resources in a sustainable and fiscally responsible manner. As directed in statute, the WRCC is to use an integrated approach to overcome old categories, labels, and

obstacles, with the primary goal of managing the State's water resources comprehensively rather than compartmentally. The authorizing legislation also directs the WRCC to develop recommendations for policies and funding, and to promote a watershed management approach to reduce the adverse impact of future flooding on the state's residents, businesses, and communities. It is also to promote the improvement of soil and water quality. The council is directed to consider policies and funding options for various strategies including, but not limited to: additional floodplain regulation; wetland protection, restoration, and construction; the promulgation and implementation of statewide storm water management standards; conservation easements and other land management; perennial ground cover and other agricultural conservation practices; pervious pavement, bioswales, and other urban conservation practices; and permanent or temporary water retention structures.

The WRCC is headed by IDALS. Other members include representatives from the DNR, IDPH, HSEMD, Iowa State University College of Agriculture, University of Iowa College of Public Health, University of Iowa College of Engineering, University of Northern Iowa College of Natural Sciences, DOT, IEDA, and the Iowa Finance Authority. Others invited to attend WRCC meetings include representatives from USACE, EPA, USDA (NRCS, Rural Development, and Farm Services agencies) and USGS Iowa Water Science Center.

4. Iowa Watershed Approach

The Iowa Watershed Approach (IWA) is a collaborative program bringing together local, State, federal, and private organizations to address factors that contribute to flooding and nutrient flows. Iowans will enjoy improvements in quality of life and health resulting from upstream watershed investments tied to community resilience activities. This adaptive model, supported by HUD dollars, will leverage the principles of Iowa's innovative nutrient reduction strategy to make our communities more resilient to flooding and help improve water quality. The IWA will accomplish six specific goals:

1) Reduce flood risk

2) Improve water quality

3) Increase resilience

4) Engage stakeholders through collaboration and outreach/education

5) Improve quality of life and health, especially for vulnerable populations

6) Develop a program that is scalable and replicable throughout the Midwest and the United States.

5. Water Management Authority (WMA)

Since 2010, Iowa law has authorized the creation of WMAs, a mechanism for cities, counties, soil and water conservation districts and other stakeholders to cooperatively engage in watershed planning and management. A watershed management authority may assess and reduce flood risk, assess and improve water quality, monitor federal flood-risk planning and activities, educate residents of the watershed regarding flood risks and water quality, and allocate moneys made available to the authority for purposes of water quality and flood mitigation. The Iowa Watershed Approach is implemented through WMAs in Iowa. Where a WMA was not already organized, State partners involved in the IWA have helped local entities organize and create a watershed management authority. Thus, WMAs have been created for the East Nishnabotna, West Nishnabotna, and North Raccoon River watersheds. Other watersheds that already had WMAs prior to becoming involved in the IWA include the Upper Iowa, Upper Wapsipinicon, Middle Cedar, Clear Creek, and English River. With such structures in place, it is hoped that the local entities and WMAs can work together to develop a watershed plan and implement actions that will reduce flooding and improve water quality in their respective watersheds.

6. Iowa Flood Center (IFC)

The Iowa Flood Center at the University of Iowa is the nation's only academic research center devoted solely to flooding. Created in 2009 by the Iowa General Assembly in the aftermath of the devastating flood of 2008, IFC is a valuable resource for a variety of information and tools that help Iowans prepare for and avoid flood damage. The general assembly has provided annual funding to the IFC, including more than $1 million in 2017.

The IFC's online Iowa Flood Information System (IFIS) is a free online suite of tools that offers access to the latest local flood information. IFIS now also includes data that gives businesses and homeowners a dollar estimate of property damage depending on the flood scenario. IFIS includes these features:

- Real-time stream levels at nearly 250 locations
- Flood alerts and forecasts for more than 1,000 Iowa communities
- Weather conditions including current and past rainfall accumulations
- Flood inundation maps

The IFC also has knowledgeable staff who help Iowa communities, both large and small. For example, an IFC water resources engineer assisted the town of Plainfield in northeast Iowa with finding solutions for its water problems. Floodwaters poured into Plainfield from all directions during rare fall flooding in 2016. In response to Plainfield's request for assistance, the IFC sent an engineer to model the flow of water through the community. Storm water movement modeling software simulated water flow in Plainfield, including ditches, culverts, and more. LiDAR (laser radar) data was also used to create a model of overland flow. The modeling results were then used to develop a report recommending mitigation projects for Plainfield to help city officials obtain funding for the projects. Plainfield, population of 450, is only one of the small towns that has benefitted from the expertise of the Iowa Flood Center. Engineers with IFC have also worked with officials from Kalona, Clarksville, and other communities to solve complex water issues.

The Iowa Flood Center's Resilience Team is currently working with nine watersheds through the IWA program to promote flood resilience in Iowa communities. Through their efforts, flood resilience action plans will provide local decision makers with opportunities to increase support and expand resources, implement flood mitigation practices that maximize benefits, and protect vulnerable populations.

7. Iowa Floodplain and Stormwater Management Association (IFSMA)

The Iowa Floodplain and Stormwater Management Association is an organization of professionals with members involved in floodplain management, flood hazard mitigation, storm water management, the National Flood Insurance Program, flood preparedness, warning, and recovery.

IFSMA represents the interests of flood hazard specialists from local and State government, consulting engineers, research community, insurance industry, and the citizens of Iowa. IFSMA's members have skills and experience in the fields of engineering, hydrologic forecasting, community planning, enforcement, emergency response, water resources, and many others. IFSMA seeks to promote flood risk education throughout the state of Iowa, focusing on the following five main objectives:

- Increase awareness of the role floodplains play in conveying floodwaters, and the flood risks to structures that are built in the floodplain.
- Increase participation in the National Flood Insurance Program.
- Increase participation of NFIP communities in the Community Rating System.
- Increase the number of certified floodplain managers in the state of Iowa.
- Increase membership in IFSMA.

Creation of such an association was one of the recommendations that came out of the Rebuild Iowa Office after the 2008 Iowa floods. IFSMA was incorporated in 2010 and today is one of the

partners of the Silver Jackets, representing a growing number of floodplain managers and storm water management professionals throughout the state.

8. Iowa Association of Electric Cooperatives (IAEC)

Since 2007 Iowa rural electric cooperatives (REC) have participated in mitigation planning. With most mitigation planning done at a local- or county-based level it did not make sense to require an REC to participate in multiple local mitigation plans. For this reason the Iowa Association of Electric Cooperatives developed a plan to cover member cooperatives in Iowa through an annex to the State mitigation plan. Each time the State plan is updated, so too is the REC mitigation plan. In that way, REC mitigation plans and strategies are kept up-to-date and remain eligible for potential mitigation funding for individual local RECs. The 2018 REC mitigation plan is found in the annexes.

C. Training and Workshops

Hazard mitigation training and workshops are an important component of Iowa's comprehensive hazard mitigation program. Section 4.2.1 describes the training and workshops that are offered or coordinated by HSEMD. In addition to the training that HSEMD coordinates, mitigation training related to different hazards is sponsored by the following entities and information about training opportunities can be found at the websites shown:

Iowa Floodplain and Stormwater Management Association: http://www.iowafloods.org/
Iowa Flood Center: http://iowafloodcenter.org/education-outreach/
ISU Extension, Flooding in Iowa: https://www.extension.iastate.edu/floodinginiowa/

5.3. Obstacles and Challenges of State Hazard Mitigation Program

While the State has many programs, offices and resources that address different facets of hazard mitigation, obstacles and challenges hinder the overall effectiveness of the State's hazard mitigation program. This section describes some of these obstacles and challenges.

1. As is often the case, employees and elected officials of cities and counties will declare that a major challenge is lack of funding to implement their identified mitigation solutions. While this is no doubt often true, an almost hidden obstacle is identifying alternative solutions that are less expensive. To illustrate: One city had a well house in a location threatened by floodwaters, and the identified solution was that of a costly relocation or elevation. After consultation with DNR staff, the city determined they could instead flood-proof the structure and install a door to hold back flood water. This alternative is a far cheaper solution. Often, less expensive alternatives are not widely understood or considered.
2. The issue above speaks to the challenge of a lack of awareness of options for mitigation solutions. Not only is awareness of mitigation options a challenge, but so also is an awareness of programs, problems, and risk. Across the state, community leaders and administrators are not aware that mitigation programs exist or who they need to contact to get assistance. Often, they do not know what risks and threats are present and which are of major concern. In addition, they may know they have a recurrent issue due to a hazard, but the causes that influence the problem are not understood resulting in an inability to address it.
3. Related to a lack of awareness is misunderstanding or incomplete understanding, which can cause real obstacles to effective hazard mitigation. For example, many people blame field tiling as a primary cause of downstream flooding. Yet little research has been done to examine that idea,

and in fact one study found "some evidence that streamflow peaks resulting from very intense rainfall events are either not impacted or are reduced under tile drainage scenarios compared to undrained scenarios"[3]. Other factors, including soil health, soil type, drainage ditches, channel modification, and surface intakes may be greater factors. What needs to be conveyed is what works to reduce hazard risks and under what conditions. When the impact of factors is not well understood, it can be a real obstacle to implementing effective mitigation solutions. If there is a lack of understanding of all the factors of the problem, when attempts are made to address the problem, the chosen solution may only address 15% of the problem, when it may have been anticipated to address 85% of the problem.

4. Another challenge is that sometimes the problems and solutions are very technical in nature. Detailed engineering may be needed to fully comprehend problems and solutions. Once engineering is complete, there is a challenge of communicating the issues to the public so they can trust the potential solutions enough to commit to them.
5. Another challenge is the lack of documentation that leads to misunderstanding locations with the most severe hazard impacts of hazards. For example, many communities experience floods that damage roads or otherwise result in road closures, but expenses associated with such damages and closures are not documented until there is a federal disaster declaration. How many times are these locations damaged, but never documented? What are the associated expenses of these undocumented damages? Without this information, it is a challenge to know where impacts are the most severe and to what degree.
6. Related to the lack of documentation of expenses and impacts of hazard events is the challenge of identifying the most pressing needs. Some communities know which agencies provide assistance and make themselves known to these state and federal partners. But many communities may quietly endure hazard impacts for a long time, and their issues go "under the radar." Without knowing where impacts are felt, mitigation resources may not be properly allocated. That is, mitigation resources may not be targeted to locations that would result in risk reduction for larger areas, greater populations, or more structures.
7. Finally, with well over 100 different programs that can advance mitigation efforts in the state, coordination among all those programs and agencies can be a challenge. Without proper communication and coordination, duplication of efforts can occur. Even worse, some programs may end up working at cross purposes and result in efforts that hinder those of others.

The strategies listed in this plan seek to overcome these obstacles and challenges. For example, the Iowa Watershed Approach provides a method or framework that may overcome many of the challenges listed above. It provides a better way to organize and analyze issues. Rather than focusing on the problems in a single city or county, the approach takes a look at several cities and county areas that fall within one watershed. By evaluating the issues and factors that affect a watershed area, synergistic practices that will address more than one jurisdiction, and thereby prove more cost effective, can be identified. Also, the watershed approach brings partners together that may not necessarily work together on a regular basis. For instance, one agency or program may address water quality, while another focuses on water quantity

[3] Franz, Kristie and Nandita Basu , William Simpkins, Matt Helmers, Özlem Acar, Becca Scheler , Brandon Sloan, Alexander Morrison, Larry Weber, Rick Cruse, *HYDROLOGIC IMPACTS OF DRAINAGE SYSTEMS* report submitted to IEDA in 2014.

(flooding). The two agencies may not normally work together because they are trying to address different problems, but by coordinating they may find they could take advantage of one another's efforts.

Similarly, the Iowa Silver Jackets provides a framework for coordination and understanding. Plus, the agencies and staff in these partnerships can work together for outreach and to improve awareness of problems and potential solutions.

The Risk MAP efforts of the Coordinating Technical Partners also bring awareness and technical assistance directly to local communities. The CTP agencies have been working more closely in the past few years to overcome the challenges listed above.

5.4. Going Forward by Taking a Look Back

To decide what mitigation actions to pursue, the SHMT took a look back in two different ways. First, they looked back over the hazards the state and its jurisdictions face and the overall risk faced due to vulnerability to the various hazards. Second, they looked back over the mitigation measures or actions from the 2013 *Iowa Hazard Mitigation Plan*. They considered what progress has been made in these areas and what recent changes have occurred that may have impacted those measures.

With everyone representing all the programs and agencies coming together, the SHMT went through all of the 2013 measures, one by one, to determine how each should be changed. Some they determined had been completed, and therefore should be discontinued. Some they determined should be discontinued for other reasons. Some they decided to simply continue, but most were altered in some way to reflect changing conditions and to better clarify them. They also added several measures, which are found in section 5.5. The chart below shows the disposition of the actions of the 2013 Plan. (Note that the chart in 5.2.2 gives more details about what was accomplished under many of the actions.)

Disposition of 2013 Hazard Mitigation Actions
(Numbered for convenience, though the original 2013 document did not have numbering.)

	#	Mitigation Action (*additions in italics;* cuts shown with ~~strike out~~)	Change from 2013
Previous Category: Preventative	1.1	~~Develop and promote comprehensive cost effective recommendations for adoption and enforcement of~~ *Increase number of jurisdictions adopting* ~~land use,~~ ordinances, ~~and~~ regulations, ~~promote legislation, zoning,~~ and building codes that *provide higher standards to* regulate construction~~, and~~ *in order to* decrease risk in areas susceptible to hazards.	Partially achieved with adoption of state building applicable to all cities over 15,000 people. Continued action with modification.
	1.2	~~Encourage~~ *Of the communities that have repetitive loss properties, increase the percentage of such* communities *that* ~~to~~ include *mitigation actions to address* severe repetitive loss and repetitive loss ~~strategy~~ in *their* all-hazard mitigation plans and comprehensive plans. *Do this by verifying and updating the list of repetitive loss properties,* and *by* educati*ng*~~e~~ communities on these properties in their jurisdictions and measures which may be used to reduce future damage.	Continued and altered
	1.3	*Increase the number of jurisdictions adopting recently* completed FIRM (Flood Insurance Rate Maps). ~~and encourage NFIP community and individual participation, and survey of flood prone areas, and river channel studies, and update of existing flood maps and evaluation of the existing Community Rating System.~~	Significant progress made on the actual mapping, therefore shifting focus to getting communities to adopt new FIRMs

	#	Mitigation Action (*additions in italics;* cuts shown with ~~strike out~~)	Change from 2013
Previous Category: Property Protection	~~1.4~~	~~Support legislation increasing shelter standards and provide safe room education for builders and developers.~~	This 2013 measure was completed in that legislation was passed, so eliminate
	~~1.5~~	~~Encourage communities to continue Hazardous Materials agreements, Support *consultation and education about* enforcement of Occupational Safety and Health Administration's (OSHA) regulations *regarding hazardous materials*, and support *maintain and increase the number of jurisdictions covered under agreements with* regional Hazardous Materials teams.~~	SHMT decided to cut because measure not really mitigation and is already handled by cities and IAMU
	1.6	~~Encourage~~ *Identify* communities in areas vulnerable to earthquake *and make them aware of, and encourage them* to adopt, current building codes for seismic retrofitting—to make structures earthquake resistant.	Continued and altered
	Old 2.1, new 1.11	*Increase number of jurisdictions that have hazard mitigation plan action to do n*on-structural retrofit of public structures.	Moved from Category 2 to Category 1, and altered
	~~2.2~~	~~Relocate critical facilities for flood protection~~	Omitted because not too feasible and cost effective when compared to 2.10
	2.3	~~Construct/elevate~~ *Increase number of* wastewater lift station*s that are elevated/protected*	Continued (with clarification added)
	2.4	Acquire *more* flood prone properties (*with priority for repetitive loss and SRL properties)* and convert to open space/green space; or elevate to ~~or~~ *at least one foot* above base flood elevation.	Continued and altered
	~~2.5~~	~~Encourage communities to participate in the National Flood Insurance Program and to complete and adopt the FIRM (Flood Insurance Rate Map).~~	*This essentially same as 1.3 above, so eliminated*
	2.6	Construct *more* floodwalls *and other flood protection.*	Altered
	2.7	Install and maintain protective measures for the *physical* safety and security of critical facilities.	Continued (with clarification added)
	~~2.8~~	~~Employ~~ *Provide model standards and guides to local jurisdictions about* construction*, design and landscaping* measures that direct water away from structures.	Altered and moved to Category 3
	2.9	Remove asbestos from public facilities.	Continued
	2.10	Construct, retrofit or maintain levees, dams, floodwalls, culverts, and floodgates to ensure adequate flood ~~capacity and~~ protection ~~levels~~ for property and critical facilities.	Previous 2.10 and 6.6 merged and altered to become this
	2.11	~~Remove~~ *Mitigate hazards associated with* underground fuel storage tanks.	Altered
	~~2.12~~	~~Build airport consolidated fuel storage facilities~~	Essentially completed, as most now consolidated. What remains is no longer a significant hazard, so eliminated

	#	Mitigation Action (*additions in italics;* cuts shown with ~~strike out~~)	Change from 2013
Previous Category: Public Education *Proarams*	3.1	Develop *signage and* educational materials for the general public, ~~and~~ decision makers, ~~educational projects and information regarding public~~ and private volunteer *organizations* ~~initiatives as well as information regarding health safety and alternatives~~ to improve ~~the public's~~ awareness of hazard risks and ways to prevent or reduce impacts of hazard events. Also, d*evelop or maintain* ~~with a~~ sustainment mechanisms to dispense *such signage and* educational materials.	Merged with 5.12
	3.2	Promote NOAA a*ll-hazards* weather radio, including citizen purchase of receivers ~~and maintenance of existing NOAA towers.~~	Continued and altered
Previous Category: Natural-resources	4.1	Develop and implement watershed ~~studies and implement watershed~~ plans ~~and~~ *which include* conduct*ing* hydrology studies, and studies of groundwater ~~problem~~ *issues and areas of risk to erosion*; *and implementing* ~~support of~~ stormwater *best* management *practices such as* ~~including~~ infiltration, retention basins, bioswales, rain gardens, and siltation removal projects.	Continued (with clarification added)
	4.2	*Minimize damage and also preserve/restore the functions of natural systems by utilizing actions, like* establish*ing* natural vegetation buffers and *strategically-placed wetlands that capture runoff and drainage waters before they can negatively impact the surrounding environment.* ~~removal of dead vegetation next to sensitive lands and forestry improvements/tree planting (sinkholes, floodplains, etc.)~~	Altered
Previous Category: Emergency Services	5.1	Develop/update/publicize ~~emergency management~~ *continuity of operations* plans f*or emergency and other essential functions (as defined by FEMA for continuity of operations)*~~, including preparedness, response, recover, operations, long term recovery, and mitigation plans and maintain data inventory~~	Altered to focus on continuity of operations of essential services
	old 5.2	~~Maintain Emergency Operations Center (EOC) with 24 hour capability~~	Not mitigation per se. No need to include response actions in a mitigation plan, so eliminated
	5.2	Purchase/install backup power generators	Moved from category 2
	~~5.3~~	~~Ensure that the state and individual local communities have adequate equipment, training, and staff to respond to hazard events specific to their needs~~	Not mitigation per se. No need to include response actions in a mitigation plan, so eliminated
	~~5.4~~	~~Train, exercise, and equip key state and local leaders for *to be able to continue* emergency/disaster/and response efforts *in the event of disaster events that hinder such capabilities*~~	Already sufficiently dealt with in 5.1, so SHMT decided to cut.
	~~5.5~~	~~Ensure that proper security measures are in place for critical facilities~~	Deleted this one because 2.7 very similar

	#	Mitigation Action (*additions in italics;* cuts shown with ~~strike out~~)	Change from 2013
	5.6	Establish ~~procedures, installation, networks, response teams and equipment~~ *systems* necessary to issue warnings, alert officials *and* emergency personnel, and inform the public *(e.g., sirens)* ~~and ensure that they are in place and operational~~	Altered
	~~5.7~~	~~Identify/develop/maintain inventory of special needs population to promote hazard mitigation and emergency management training specific to the requirements of the special needs population~~	Cut because not feasible and more response/preparedness-related anyway
	~~5.8~~	~~To the extent possible, collaborate and coordinate processes to strengthen interagency cooperation as a means to enhance collaborative planning and response~~	Not mitigation per se. No need to include response actions in a mitigation plan, so eliminated
	~~5.9~~	~~Plan and monitor Hazardous Materials decontamination sites~~	
	~~5.10~~	~~Develop/maintain list of facilities that produce, process, store or transport hazardous materials~~	
	~~5.11~~	~~Develop Metro Area Hazardous Materials transportation routes~~	
	~~5.12~~	~~Install safety and warning signage in appropriate vulnerable locations~~	Merged into 3.1
	~~5.13~~	~~Provide efficient, rapid allocation, distribution, testing, and administration of anti-virals and/or vaccine to officially designated high priority groups to facilitate control and management of outbreak~~	Omitted because covered in other plans with more response focus.
	~~5.14~~	~~Monitor hospital surge capacity associated with a pandemic *so that continuity of hospital care and services can be maintained*~~	
	~~5.15~~	~~Limit or prohibit mass gatherings, close schools, and implement quarantines, as necessary~~	Not mitigation, per se. More response. No need to include
	~~5.16~~	~~Conduct inspections at mass feeding/sheltering/care operations or other mass gathering sites to assure food safety~~	
	~~5.17~~	~~Identify and map existing sinkholes and evaluate the potential for new sinkholes in hazard plans~~	Moved this to Category 1
	~~5.18~~	~~Coordinate with FEMA (Federal Emergency Management Agency) on earthquake program~~	Moved this to Category 4

	#	Mitigation Action (*additions in italics;* cuts shown with ~~strike out~~)	Change from 2013
Previous Category: Structure	~~6.1~~	Electrical utility retrofit/hardening	Moved to Category 2 and continued
	~~6.2~~	~~Purchase/install backup power generators~~	Moved to Category 5
	~~6.3~~	Construct, retrofit or maintain *storm and sewage* drainage systems (including *retention and detention basins,* pipes, culverts, and channels) to function adequately and properly ~~to include sewage systems and retention and detention systems~~	Moved to Category 2 and continued
	~~6.4~~	~~Replace or retrofit~~ *Use a comprehensive approach to address problems with water washing over or threatening public roads, and with public* bridges and culverts *that do not* ~~to~~ meet *flow* ~~capacity~~ requirements. *A "comprehensive approach" could mean a simple elevation,* replace*ment, or* retrofit, *OR it could be system-wide with a collection of projects/changes that might include green infrastructure, basins, and increased capacity of soil to retain water).*	Merged previous 6.4 and 6.8, altered some, and moved to Category 2
	~~6.5~~	~~Install~~ *Bring about green infrastructure practices for storm water management and the creation of healthier urban environments. Practices can include mechanisms that prevent* soil ~~stabilization, drainage and~~ erosion, *provide habitat, or provide flood* protection ~~.measures~~ *and cleaner air and water.*	Altered and moved to Category 2
	~~6.6~~	~~Construct, retrofit or maintain levees, dams, floodwalls, culverts, and floodgates to ensure adequate capacity and protection levels for property and critical facilities~~	Merged into 2.10
	~~6.7~~	Construct public safe rooms ~~for government facilities functions, critical facilities functions, recreational areas, manufactured home parks, schools, and day care centers~~	Continued and altered, and moved to Category 2
	~~6.8~~	~~Raise roads to reduce hazard risk~~	Merged with 6.4, moved to Category 2 and reworded
	~~6.9~~	~~Develop~~ Implement *floodplain and* stream*bank restoration* ~~modifications~~/channel improvement projects *that reduce peak flow during flood events.*	Continued and altered, and moved to Category 2
	~~6.10~~	Connect to *redundant* ~~regional~~ water *sources*	Continued and altered, and moved to Category 2
	~~6.11~~	Install dry hydrants in areas without water mains and domestic fire hydrants	Continued and moved to Category 2

5.5. 2018 State of Iowa Mitigation Actions

In addition to the mitigation actions that were continued or amended as shown above, this plan contains several new actions that the SHMT has developed. The chart below shows all of the actions the SHMT decided upon for this year's strategy and how they tie to one or more of the three mitigation goals described in section 5.1. The actions are grouped by category/objective. The chart also shows possible funding programs and agencies that may assist with implementation of the actions.

Objective/ Category	#	2018 State Mitigation Action	Program/ Funding Source/ Agency that may assist	How contributes to goal(s)
1: Establish regulatory measures or processes that reduce the number and severity of all hazard risks in order to alleviate death, injuries, environmental impact, and property losses.				
Category: Local Plans and Regulations	1.1	*Increase number of jurisdictions adopting* ordinances, regulations, and building codes that *provide higher standards to* regulate construction *in order to* decrease risk in areas susceptible to hazards.	DNR Flood Plain Mgmt., State Fire Marshal	1 Reduces property losses and environmental damage
	1.2	*Of the communities that have repetitive loss properties, increase the percentage of such* communities *that* include *mitigation actions to address* severe repetitive loss and repetitive loss in *their* all-hazard mitigation plans and comprehensive plans. *Do this by verifying and updating the list of repetitive loss properties,* and *by* educat*ing* communities on these properties in their jurisdictions and measures which may be used to reduce future damage.	HSEMD, DNR Flood Plain Mgmt.	1 Reduces property losses, 3 Encourages intergovernmental coordination to build resilient community
	New 1.3	*Increase the number of jurisdictions participating in NFIP as well as Community Rating System.*	DNR	1 Reduces property losses and environmental damage
	New 1.4.	*Promulgate (and develop if necessary) a handbook explaining options and methods for communities to deal with property acquired from flood buyouts.*	USACE, DNR, HSEMD, and rest of Flood Risk Mgmt. Team	Accomplishes all three goals
	1.5	*Identify* communities in areas vulnerable to earthquake *and make them aware of, and encourage them* to adopt, current building codes for seismic retrofitting to make structures earthquake resistant.	HSEMD	Furthers goals 1 and 3
	New 1.6	*As new watershed plans are developed, ensure most integrate local hazard mitigation plan elements. Then, ensure that most jurisdictions in those watersheds include in their local hazard mitigation plan the references to relevant watershed plan elements.*	HSEMD, DNR Watershed Improvement Section, RiskMAP	Furthers goals 1 and 3
	New 1.7	*Develop a strategy for flood buyouts.*	HSEMD, DNR Floodplain Sect.	Furthers goals 1 and 3
	New 1.8	*Increase number of dams with completed Emergency Action Plans.*	DNR Dam Safety, NRCS	Furthers goals 1 and 3, possibly 2
	1.9	Identify and map existing sinkholes and evaluate the potential for new sinkholes in hazard plans.	DNR GIS Section	3 Expands and communicates awareness of hazard
	1.10	*Increase number of jurisdictions that have hazard mitigation plan action to do n*onstructural retrofit of public structures.	HSEMD, RiskMAP	Furthers goals 1 and 2

Objective/ Category	#	2018 State Mitigation Action	Program/ Funding Source/ Agency that may assist	How contributes to goal(s)
2: Encourage property protection measures and construction projects to prevent and reduce structure and other property damage, and promote the health, safety and welfare of citizens, and protect the environment.				
Category: Structure and Infrastructure Projects	2.1	Install dry hydrants in areas without water mains and domestic fire hydrants	DNR	1 Protects areas from wildfire, 2 Provides water source to fight fire
	2.2	Connect to *redundant* water *sources.*	SRF-DNR/IFA	Accomplishes 1 and 2
	2.3	*Increase number of* wastewater lift stations *that are elevated/protected.*	HSEMD, DNR SRF, IEDA (CDBG)	Accomplishes 1 and 2
	2.4	Acquire *more* flood-prone properties (*with priority for repetitive loss and SRL properties)* and convert to open space/green space; or elevate to *at least 1 foot* above base flood elevation.	HSEMD, IEDA (CDBG) USACE	1 Reduces property losses from flood hazard
	2.5	Implement *floodplain and* stream*bank restoration*/channel improvement projects *that reduce peak flow during flood events.*	HSEMD, USACE, NRCS, DNR	Accomplishes 1 and 2
	2.6	Construct *cost-effective small-scale flood protection (e.g., impervious manholes, pumps, backflow prevention), other than the other methods listed in these mitigation actions.*	HSEMD	Accomplishes 1 and 2
	2.7	Install and maintain protective measures for the *physical* safety and security of critical facilities	HSEMD (HSGP), DPS	2 Ensures continued operations
	2.8	Construct public safe rooms.	HSEMD (HMA)	1 Provides safety
	2.9	Remove asbestos from public facilities.	DAS, HSEMD	1 Protects health
	2.10	Construct, retrofit or maintain levees, dams, floodwalls, and floodgates to ensure adequate flood protection for property and critical facilities.	HSEMD, USACE, perhaps others	Accomplishes 1 and 2
	2.11	*Mitigate hazards associated with* underground fuel storage tanks.	DNR	Accomplishes goal 1
	2.12	*Encourage and implement green infrastructure practices to create healthier urban environments and manage storm water in cities. Practices include mechanisms that prevent* soil erosion *or provide flood* protection, *habitat, and cleaner air and water (riparian forest* buffers, infiltration including bioswales, *wet d*etention *systems, storm water wetlands, vegetated swales, permeable pavement, and green roofs*).	HSEMD, IDALS, NRCS, Cities	Furthers goals 1 and 3, possibly 2
	2.13	Electrical utility retrofit/hardening *(see REC Mitigation Plan in Annex)*	HSEMD	Accomplishes 1 and 2
	2.14	*Use a comprehensive approach to address problems with water washing over or threatening public roads, and with public* bridges and culverts *that do not* meet *flow* requirements. *A comprehensive approach could simply mean elevation,* replace*ment, or* retrofit, *OR it could be systemwide with a collection of projects/changes that might include green infrastructure, basins, and increased capacity of soil to retain water.*	HSEMD, DOT, IWA	Accomplishes goal 1, possibly 2

Objective/ Category	#	2018 State Mitigation Action	Program/ Funding Source/ Agency that may assist	How contributes to goal(s)
	2.15	Construct, retrofit or maintain *storm and sewage* drainage systems (including *retention and detention basins,* pipes, culverts, and channels) to function adequately and properly.	HSEMD	Accomplishes goal 1, possibly 2
3: Enhance public education to expand awareness and encourage intergovernmental cooperation, coordination, and communication to mitigate against all hazards.				
Category: Education and Awareness Programs	3.1	Develop *signage and* educational materials for the general public, decision makers, and private volunteer *organizations* to improve awareness of hazard risks and ways to prevent or reduce impacts of hazard events. Also, d*evelop or maintain* sustainment mechanisms to dispense *such signage and* educational materials.	DNR, HSEMD, rest of Flood Risk Mgmt. Team (SJ)	3 Expands public awareness
	3.2	Promote NOAA a*ll-hazards* weather radio, including citizen purchase of receivers.	HSEMD, NOAA	3 Expands public awareness
	New 3.3	*Educate architects and developers about need for shelters/safe rooms as well as guidance for their design as found in ICC/NSSA Standard for the Design and Construction of Storm Shelters and FEMA P-320 - Taking Shelter from the Storm: Building a Safe Room for Your Home or Small Business.*	FEMA, HSEMD, NOAA	1 Provides safety, 3 expands awareness
	3.4	*Provide model standards and guides, including the Iowa Stormwater Management Manual, to local jurisdictions about* construction, *design and landscaping* measures that direct water away from structures.	SWCDs, DNR Watershed Improvement, IDALS, and rest of Flood Risk Mgmt Team (SJ)	Accomplishes goals 1 and 3
4: Build support, capacity and commitment to prevent or reduce risks from all hazards for protection of Iowa's citizens, property and natural resources.				
Category: Natural systems protection	4.1	Develop watershed plans, hydrology studies, and studies of groundwater *issues and areas of risk to erosion,* and implement *recommendations of such plans and studies.*	USACE, DNR Watershed Improvement, SWCDs, WMAs	Furthers goals 1 and 3, possibly 2
	4.2	Coordinate with FEMA on earthquake program	HSEMD	Accomplishes all three goals
	4.3	*Minimize damage and also preserve/restore the functions of natural systems by* establish*ing* vegetat*ed* buffers and *strategically-placed wetlands that capture runoff and drainage waters before they can negatively impact the surrounding environment.*	IDALS Water Quality Initiative, IEDA, HSEMD, DNR and IFA SRF, SWCDs	1 Reduces losses and damage to environment from flood hazard
5: Promote continuity of emergency services for all hazards and disaster events.				
Category: Continuity of Emergency Services	5.1	Develop/update/publicize *continuity of operations* plans f*or emergency and other essential functions (as defined by FEMA for continuity of operations).*	HSEMD, IAMU, Safeguard Iowa Partnership	2 Ensures government operations and response continue
	5.2	Purchase/install backup power generators.	HSEMD, DNR and IFA SRF	2 Ensures government operations continue

Objective/ Category	#	2018 State Mitigation Action	Program/ Funding Source/ Agency that may assist	How contributes to goal(s)
	5.3	Establish *systems* necessary to issue warnings, alert officials *and* emergency personnel, and inform the public *(e.g., sirens).*	HSEMD, USGS, NOAA	Accomplishes all three goals

5.6. Prioritizing Mitigation Actions

After the SHMT finished adding new mitigation actions and winnowing and clarifying the previous ones, it then turned its attention to determining the priority or rank of all the actions. The team agreed to use a scoring methodology to assist in the ranking. Depending on the score, each action was ranked in priority compared to the other mitigation actions in its respective category, according to these ranking classifications:

- High priority (abbreviated as priority A in places)
- Medium-high priority (abbreviated as priority B in places)
- Medium priority (abbreviated as priority C in places)

Actions that ranked below medium (C) priority, were determined to be actions that will be delayed (and so marked D) for now, and implementation would not be pursued in the next five years unless a very good opportunity suddenly appeared that made implementation easy with little commitment of existing State resources. (Also note, as always, local entities are welcome to pursue those, or any actions they wish, with their own resources.)

The criteria that the SHMT used to score the actions included criteria meant to evaluate how cost effective, environmentally sound, and technically feasible each action is. The actions were also considered relative to how much progress has been achieved by that action, or rather, how much more progress the SHMT felt still needed to be made implementing the particular action. Finally, the actions were also considered relative to which hazard or hazards each one addressed, and the risks and vulnerabilities associated with such hazard(s).

To score the actions, the State Hazard Mitigation Team met in a group to ensure it had subject matter experts who could explain to the entire team details about each of the several actions. The group would then come to a consensus on how to score each action. The scoring factors they used are explained below.

State Mitigation Action Evaluation/Scoring Factors

1. Cost Effective Score:
   Each action given a score based on its considered likelihood of getting more benefit than cost. Scores given based on:

   5 points = Benefit expected to be five times or more than cost, **OR** will prevent deaths/injuries

   4 points = Benefit expected to be four to five times cost

   3 points = Benefit expected to be three to four times cost

2 points = Benefit expected to be two to three times cost

1 point = Benefit expected to be one to two times cost

0 points = Unsure if benefit will exceed cost

-1 point = Cost expected to exceed benefit, but not by much

2. Environmentally Sound Score:

Each action given an "environmental" score according to how closely it matched the following:

5 points = Great benefit to the environment and most everyone knows it!

4 points = Most likely a benefit to the environment

3 points = Perhaps some benefit to the environment, certainly no harm

2 points = Generally accepted as causing no harm to environment, though not really considered a benefit either

1 point = More likely NOT to damage the environment than to damage the environment

0 points = Questionable if environmentally sound or not

3. Technical Feasibility: Cost

Each action considered in terms of ability for an agency (or agencies) to pay for it. Scores given on how closely each action matched the following:

5 points = Cost easily covered within agency budgets or funding avenues (which may be from outside sources)

4 points = Cost within agency budgets or funding streams, but it would be tight and sometimes implementation would have to be delayed due to competing priorities

3 points = Could probably only do this action on a part-time basis, or provide sometimes

2 points = Could only do this action as a tangent or auxiliary to another purpose

1 point = Would need to find funding for this, as none currently available, but there is hope

0 points = Maybe we could do it/maybe not, chances are equal

-1 point = Not likely to be able to find funding for this now due to legislative or other barriers

4. Technical Feasibility: Capability

Other than cost, how technically feasible is the action? How capable is an agency to handle it?

5 points = Already have an established program that does this very thing

4 points = Fairly easy – have capable staff, resources, political support, etc.

3 points = Would need to juggle staff and resources, but it is possible

2 points = Would need some technical assistance to do this, because currently not entirely capable

1 point = Very little capacity to do this, or political or other leaders do not seem to support

0 points = Political or other factors make this idea hinge in the balance

-1 point = Political or other factors are against, but there is a chance tide could turn

5. How Much More To Do

According to 44 CFR 201.4d, the plan needs to be updated to reflect progress on past mitigation efforts, and priorities must reflect that. To reflect that, points will be given based on the following:

5 points = A lot more left to be done in the state

2-4 points = Somewhere between above and below

1 point = So much past progress that little need left for this, but still some need

0 or -1 points = So much past progress little or no need for this action

6. In addition to points for the above, each mitigation action gets three points for each Group 1 high risk (as defined in section 3.5) hazard to which the action applies. An action gets two points for applicability to Group 2 risk hazards and one point for applicability to all other hazards.

The chart below shows the actions and the sum of their scores according to the factors above. The priority ranking is also shown. As mentioned above, each action is ranked in priority only as it compares to the other mitigation actions in its respective category. That may mean that an action that scores 30 in one category may be High (A) priority, but one with the same score, but in a different category, would only be Medium-high (B) priority. For actions that were determined to reduce vulnerability of State facilities, a + sign is shown in addition to the A, B, C, or D priority designation (as described above).

2018 State Hazard Mitigation Actions – Priority Ranked

#	Mitigation Action	Total Evaluation Score	Reduces Vulnerability of State Facilities (+)	Priority: A=High, B=Medium High, C=Medium
Category: Local Plans and Regulations				
1.1	Increase number of jurisdictions adopting ordinances, regulations, and building codes that provide higher standards to regulate construction in order to decrease risk in areas susceptible to hazards.	45		A
1.2	Of the communities that have repetitive loss properties, increase the percentage of such communities that include mitigation actions to address severe repetitive loss and repetitive loss in their all-hazard mitigation plans and comprehensive plans. Do this by verifying and updating the list of repetitive loss properties, and by educating communities on these properties in their jurisdictions and measures which may be used to reduce future damage.	33		B
New 1.3	Increase the number of jurisdictions participating in NFIP as well as Community Rating System.	25		C
New 1.4.	Promulgate (and develop if necessary) a handbook explaining options and methods for communities to deal with property acquired from flood buyouts.	30		B
1.5	Identify communities in areas vulnerable to earthquake and make them aware of, and encourage them to adopt, current building codes for seismic retrofitting to make structures earthquake resistant.	8	This lower-priority action delayed (will do if opportunity suddenly appears, or locals may do with their own resources)	
New 1.6	As new watershed plans are developed, ensure most integrate local hazard mitigation plan elements. Then, ensure that most jurisdictions in those watersheds include in their local hazard mitigation plan the references to relevant watershed plan elements.	30	+	B+
New 1.7	Develop a strategy for flood buyouts.	33		B
New 1.8	Increase number of dams with completed Emergency Action Plans.	25	+	C+
1.9	Identify and map existing sinkholes and evaluate the potential for new sinkholes in hazard plans.	8	This lower-priority action delayed (will do if opportunity suddenly appears, or locals may do with their own resources)	
1.10	Increase number of jurisdictions that have hazard mitigation plan action to do nonstructural retrofit of public structures.	27		C
Category: Structure and Infrastructure Projects				
2.1	Install dry hydrants in areas without water mains and domestic fire hydrants.	13	This lower-priority action delayed (will do if opportunity suddenly appears, or locals may do with their own resources)	
2.2	Connect to redundant water sources.	19		
2.3	Increase number of wastewater lift stations that are elevated/protected.	28	+	B+
2.4	Acquire more flood-prone properties (with priority for repetitive loss and SRL properties) and convert to open space/green space, or elevate to at least 1 foot above base flood elevation.	33	+	A+

#	Mitigation Action	Total Evaluation Score	Reduces Vulnerability of State Facilities (+)	Priority: A=High, B=Medium High, C=Medium
2.5	Implement floodplain and streambank restoration/channel improvement projects that reduce peak flow during flood events.	32		A
2.6	Construct, retrofit, or maintain storm and sewage drainage systems (including retention and detention basins, pipes, culverts, and channels) to function adequately and properly.	37	+	A+
2.7	Install and maintain protective measures for the physical safety and security of critical facilities.	18	+	Delayed - low priority
2.8	Construct public safe rooms.	24	+	C+
2.9	Remove asbestos from public facilities.	18	+	Delayed - low priority
2.10	Construct, retrofit or maintain levees, dams, floodwalls, culverts, and floodgates to ensure adequate flood protection for property and critical facilities.	23	+	C+
2.11	Mitigate hazards associated with underground fuel storage tanks.	16	This lower-priority action delayed (will do if opportunity suddenly appears, or locals may do with their own resources)	
2.12	Encourage and implement green infrastructure practices to manage storm water management and create healthier urban environments. Practices can include mechanisms that prevent soil erosion, provide habitat, or provide flood protection and cleaner air and water.	34	+	A+
2.13	Electrical utility retrofit/hardening (see REC Mitigation Plan in Annex)	31		A
2.14	Use a comprehensive approach to address problems with water washing over or threatening public roads, and with public bridges and culverts that do not meet flow requirements. A comprehensive approach could mean a simple elevation, replacement, or retrofit, OR it could be systemwide with a collection of projects/changes that might include green infrastructure, basins, and increased capacity of soil to retain water.	30	+	A+
2.15	Construct, retrofit, or maintain storm and sewage drainage systems(including retention and detention basins, pipes, culverts, and channels) to function adequately and propertly.		+	A+
Category: Education and Awareness Programs				
3.1	Develop signage and educational materials for the general public, decision makers, and private volunteer organizationsto improve awareness of hazard risks and ways to prevent or reduce impacts of hazard events. Also, develop or maintain sustainment mechanisms to dispense such signage and educational materials.	56	+	A+
3.2	Promote NOAA all-hazards weather radio, including citizen purchase of receivers.	45	+	B+

#	Mitigation Action	Total Evaluation Score	Reduces Vulnerability of State Facilities (+)	Priority: A=High, B=Medium High, C=Medium
3.3	Educate architects and developers about need for shelters/safe rooms as well as guidance for their design as found in ICC/NSSA Standard for the Design and Construction of Storm Shelters and FEMA P-320 - Taking Shelter from the Storm: Building a Safe Room for Your Home or Small Business.	20	+	C+
3.4	Provide model standards and guides, including the Iowa Stormwater Management Manual, to local jurisdictions about construction, design and landscaping measures that direct water away from structures.	22		C
Category: Natural Systems Protection				
4.1	Develop watershed plans, hydrology studies, and studies of groundwater issues and areas of risk to erosion, and implement recommendations of such plans and studies.	34	+	A+
4.2	Coordinate with FEMA on earthquake program.	8	This lower-priority action delayed (will do if opportunity suddenly appears, or locals may do with their own resources)	
4.3	Minimize damage and also preserve/restore the functions of natural systems by utilizing actions, such as establishing natural vegetation buffers and strategically-placed wetlands that capture runoff and drainage waters before they can negatively impact the surrounding environment.	28	+	B+
Category: Continuity of Emergency Services				
5.1	Develop/update/publicize continuity of operations plans for emergency and other essential functions (as defined by FEMA for continuity of operations).	47	+	B+
5.2	Purchase/install backup power generators.	42	+	B+
5.3	Establish systems necessary to issue warnings, alert officials and emergency personnel, and inform the public (e.g. sirens).	56	+	A+