

ALABAMA

Post-Flood Recovery Guidebook



December 2014

Prepared for:

Alabama Department of Economic and Community Affairs
Office of Water Resources
401 Adams Avenue
Montgomery, Alabama 36104

Prepared by:

AMEC Environment & Infrastructure, Inc.
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Nashville, TN 37211



Alabama

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PREFACE	iii
ACKNOWLEDGEMENTS	iv
INTRODUCTION	v
PREPAREDNESS	1
I. Technical Responsibilities	2
a. Understanding the Risk of Flooding to Your Community	2
b. Familiarity with Regulations	8
c. Flood Warning Capabilities	9
II. Communication and Coordination Responsibilities	9
a. Local Agencies/Staff	9
b. State/Federal	10
c. Public	10
III. Administrative Responsibilities	12
a. Staff Training	12
b. Tracking Mechanisms for Staff Time	12
RESPONSE	13
I. Technical Responsibilities	14
a. Control Access to Flood Impacted Areas	14
b. Conduct Preliminary BROAD-SCOPE Impact Assessments	14
c. Assist the Joint Preliminary Damage Assessment Team	14
II. Communication and Coordination Responsibilities	15
a. Local Agencies/Staff - Emergency Management	15
b. Emergency Operations Center	15
c. State/Federal - Disaster Declaration Process	16
III. Administrative Responsibilities	17
a. Tracking Staff Time and Resources	18
RECOVERY	19
I. Technical Responsibilities	20
a. Documentation of Flood Impacts	20
b. Code/Ordinance Enforcement	25
II. Communication and Coordination Responsibilities	26
a. Local Agencies/Staff	26
b. State/Federal	26

c. Public	27
III. Administrative Responsibilities	28
a. Documentation of Labor, Equipment, and Materials	28
b. Satellite Office	28
c. Documentation of Permitting	28
MITIGATION	29
I. Technical Responsibilities	30
a. Review/Update Local Hazard Mitigation Plan	30
b. Identify Potential New Mitigation Projects	32
c. Become Familiar with Grant Funding Opportunities	35
d. Collect Documentation for Benefit/Cost Analysis	35
II. Communication and Coordination Responsibilities	36
a. Local Agencies/Staff	36
b. Other Local Planning Efforts	36
c. State/Federal	36
d. State/National Associations	37
III. Administrative Responsibilities	38
a. Grant Applications	38

APPENDICES

A. Preparedness	A.1
▪ Recommended Training Courses	
B. Recovery	B.1
▪ SDE – Condensed Procedural Guide	
▪ Rapid Depth-Damage Estimate - Condensed Procedural Guide	
▪ Sample Door Tag	
▪ ATC-45 Placard Information	
▪ Recommended Public Outreach Information	
▪ Post-Flood Recovery Flyer for Elected Officials	
C. Mitigation	C.1
▪ HMGP Letter of Intent	
▪ HMGP Main Application	
D. References	D.1

COMMON ABBREVIATIONS AND ACRONYMS

AAFM	.... Alabama Association of Floodplain Managers	FIRM	.....Flood Insurance Rate Map
AARC	.... Alabama Association of Regional Councils	FIS	.....Flood Insurance Study
ACAMP	.. Alabama Coastal Area Management Program	FMA	.....Flood Mitigation Assistance
ADCNR	... Alabama Department of Conservation and Natural Resources	FPA	.....Floodplain Administrator
ADECA	.... Alabama Department of Economic and Community Affairs	GIS	.....Geographic Information System
ADEM	.... Alabama Department of Environmental Management	HMA	.....Hazard Mitigation Assistance
AEMA	.... Alabama Emergency Management Agency	HMGP	.....Hazard Mitigation Grant Program
AL FRIS	... Alabama Flood Risk Information System	HVAC	.....Heating, Ventilating, and Air Conditioning
ATC	.... Applied Technology Council	IA	.....Individual Assistance
BCA	.... Benefit Cost Analysis	ICC	.....Increased Cost of Compliance
BCR	.... Benefit Cost Ratio	IDA	.....Initial Damage Assessment
BFE	.... Base Flood Elevation	LHMP	.....Local Hazard Mitigation Plan
CDBG	.... Community Development Block Grant	NAI	.....No Adverse Impacts
CDC	.... Center for Disease Control	NFIA	.....National Flood Insurance Act
CFM	.... Certified Floodplain Manager	NFIP	.....National Flood Insurance Program
CFR	.... Code of Federal Regulations	NOAA	.....National Oceanic and Atmospheric Administration
CRS	.... Community Rating System	NWS	.....National Weather Service
CSLF	.... Changes Since Last FIRM	OWR	.....ADECA Office of Water Resources
DMA	.... Disaster Mitigation Act	PA	.....Public Assistance
EOC	.... Emergency Operations Center	PDA	.....Preliminary Damage Assessment
EOP	.... Emergency Operations Plan	PDM	.....Pre-Disaster Mitigation
EM	.... Emergency Manager	PIO	.....Public Information Officer
EMA	.... Emergency Management Agency	PW	.....Project Worksheet
EMI	.... Emergency Management Institute	SBA	.....Small Business Administration
ESF	.... Emergency Support Function	SDE	.....Substantial Damage Estimator
FEMA	.... Federal Emergency Management Agency	SFHA	.....Special Flood Hazard Area
		USACE	.....United States Army Corps of Engineers
		USGS	.....United States Geological Survey

Preface

The Alabama Department of Economic and Community Affairs (ADECA) Office of Water Resources (OWR), with assistance from AMEC Environment & Infrastructure, Inc., developed this Alabama-specific "Post-Flood Recovery Guidebook" to assist communities in: responding to a flood or hurricane event, enforcing the National Flood Insurance Program (NFIP) requirements for rebuilding efforts, and outlining suitable disaster recovery measures that will help reduce future flood damages. The Guidebook not only looks at strategies and methods to reduce future flood damages, but also considers multi-objective planning strategies to restore and preserve the natural resources and environments associated with Alabama's floodplains.

The Guidebook addresses Alabama's most familiar and frequent natural disaster, flooding. Heavy rains are a consistent threat across the State, while hurricanes and inland moving tropical storms have caused hundreds of millions of dollars in flood damage to Alabama homes and businesses in just the past few years. Since 2000, there have been 16 major federal disaster declarations due to flooding including four major hurricanes that have caused severe flood damage: Hurricane Ivan (2004), Hurricane Dennis (2004), Hurricane Katrina (2005), and Hurricane Gustav (2008). Alabama's coastal residents are at higher risk for flooding during hurricane season due to much of the area's low lying elevation and the threat of storm surge from an inland moving storm.

Although Alabama's river system and coastal resources are the source of one of the State's greatest natural hazards, they also provide incredible benefit to the State and its citizens. The U.S. Geological Survey estimates that approximately ten percent of the freshwater resources in the entire continental United States originate in or flow through Alabama. Few states can match Alabama's surface freshwater resources. At least one-sixth of the surface area of Alabama is comprised of lakes, reservoirs, ponds, wetlands, estuaries, and flowing rivers and streams. Alabama ranks seventh in the United States for its number of stream miles, with 77,274 miles. Six of Alabama's 14 major rivers are used for navigation. There are 16 navigational dams, five of which also generate hydroelectric power. The Mobile River basin, which covers some two-thirds of the State,

has a greater yield of water per square mile of land than any other basin in the United States, including the Mississippi River.

Alabama's extensive network of rivers and their tributaries and lakes makes them one of the State's most distinctive natural features. This was even reflected in the creation of the original "Great Seal of the State of Alabama" in 1819, by then Governor William Wyatt Bibb. It included Alabama's main river channels in the design, forever imprinting the strategic importance of rivers to Alabama's future.

Other natural water resources in Alabama include 50 miles of Gulf Coast shoreline and beaches, 3.6 million acres of freshwater wetlands located throughout the State, 27,600 acres of coastal wetlands, and 390,000 acres of estuaries, including Mobile Bay and Wolf Bay near the Gulf of Mexico. In addition, the State's springs, streams, rivers, lakes, and wetlands are home to more species of aquatic and semi-aquatic animals than any other state in the union. These natural resources have provided great economic benefits to the citizens of the State in the way of commercial fishing which has been successful in coastal waters, estuaries, and rivers for more than 100 years, and commercial catfish farming in developed ponds which has increased substantially from 1970-2010. The abundance and high-quality of Alabama's water resources helped determine the location of many settlements, towns, and eventually cities, contributed significantly to the economic development of the State, and will be a catalyst in Alabama's future as an emerging Sunbelt state.

The extensive network of rivers, tributaries, and estuaries throughout the state provides tremendous opportunities for economic and recreational benefits. However, this incredible natural resource also poses a significant natural hazard for those that choose to develop in areas adjacent to them. Without proper planning for development, more and more people will be at risk for the impacts of flooding to their property. For the people that have developed in these areas that are at risk, local officials should be properly prepared to address the impacts of flooding.

Alabama's local Floodplain Administrators (FPA) can perform all of their duties adequately during periods when there is no threat of a flood, but if the FPA is not prepared for all phases of emergency management when a flood event does occur, it can be devastating to the recovery efforts. The FPA needs to be prepared prior to a major flood event to avoid the challenges that can be faced from:

- (1) Political pressure to rebuild immediately to avoid the inconvenience of home-owners and businesses being temporarily displaced;
- (2) Being misinformed about the impacts of improper/noncompliant rebuilding on flood insurance and NFIP compliance;
- (3) Improper procedures for assessing the level of damages received from impacted structures; and
- (4) Lack of coordination with other local, state, and federal agencies.

The Guidebook will provide pre-event preparedness planning tips for the FPA to consider the nature and extent of the flood risks and hazard areas in the community, coordination with the local emergency management agency to develop a mitigation strategy, development of a standard operating procedures guide for post-flood responsibilities, completion of proper training for permitting and building code enforcement staff, planning for opportunities and determine feasibility to preserve and restore natural resource areas associated with floodplains, and development of outreach materials for citizen awareness in a post-flood environment.

The Guidebook provides guidance on the FPA's responsibilities during the response phase of the flood event, primarily focusing on coordination with local emergency managers. For the recovery phase, after the flooding has receded, the Guidebook describes the FPA's roles and responsibilities for internal communication needs, communications and coordination with local/state/federal agencies, public outreach, proper documentation of flood impacts (i.e., preliminary and advanced damage assessments, high water marks, photographic records), implementation of proper permitting and building code enforcement procedures, reviewing the mitigation strategy for the impacted areas to determine mitigation opportunities, and consideration of how to preserve and restore targeted natural areas in the floodplain. Finally, the Guidebook provides instruction on identifying and implementing mitigation measures.

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Introduction

This Alabama-specific Post-Flood Recovery Guidebook outlines the responsibilities and tasks of the local floodplain administrator before, during, and after a flood event. The Guidebook is organized around the four phases of emergency management:



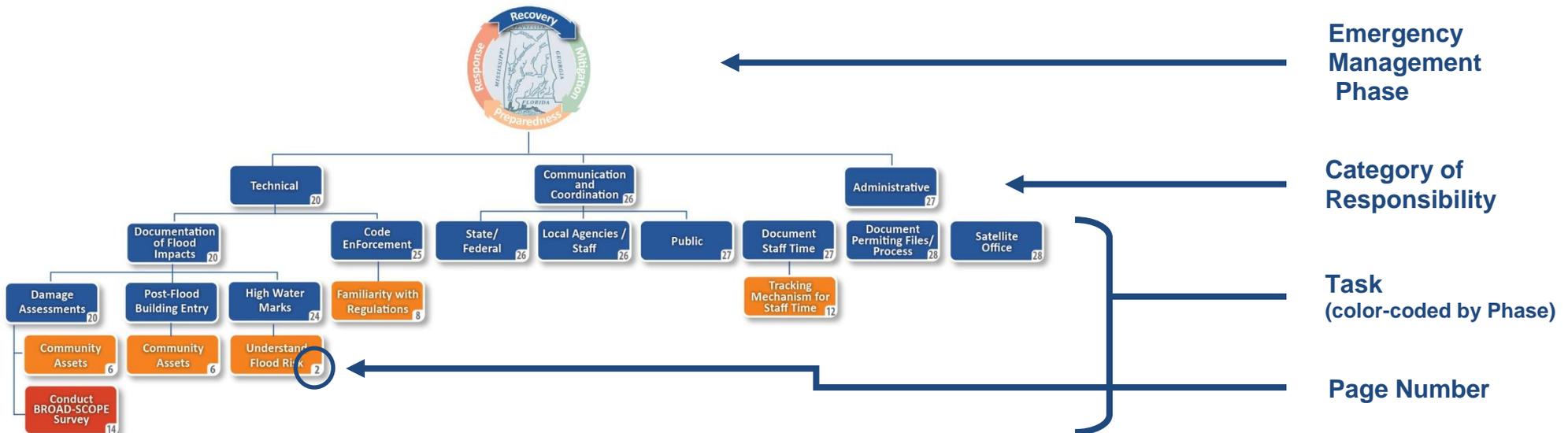
- Preparedness (orange)
- Response (red)
- Recovery (blue)
- Mitigation (green)

For each phase, the responsibilities and tasks have been further organized under three main categories:

- Technical Responsibilities
- Communication and Coordination Responsibilities
- Administrative Responsibilities

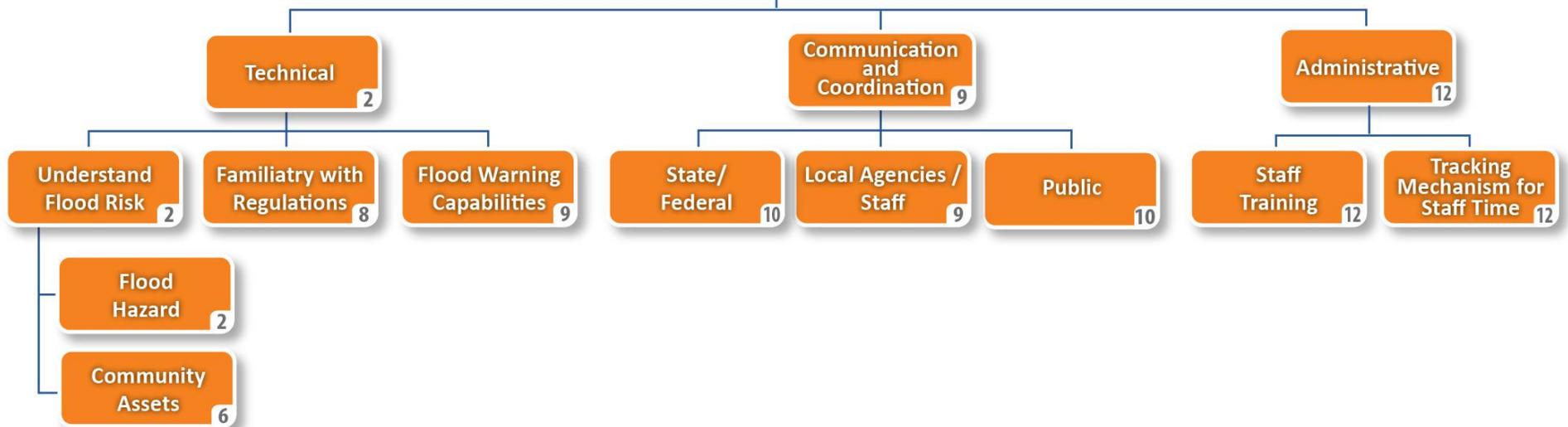
In addition to outlining responsibilities and tasks, the Guidebook also demonstrates the connection between the four phases. Each emergency management phase is presented as an individual section of the Guidebook and begins with an organizational diagram of the technical, communication/coordination, and administrative responsibilities. Each task is further color-coded to coincide with the associated emergency management phase. An example of the organization diagram for the recovery phase is presented below. From this example, we can see that the recovery task (blue) of “damage assessments” will utilize information collected earlier in both the preparedness phase (orange) and response phase (red). For quick reference, the page number of each task within the Guidebook is presented in the lower right-hand corner of the individual task box in the diagram.

ADECA OWR encourages the local Floodplain Administrator to use this Guidebook along with the identified tasks, tools, and trainings to prepare yourself and your community to respond to the next flood event and ensure your community will recover resiliently, timely, and in compliance with the National Flood Insurance Program (NFIP) and your local flood ordinance.





Preparedness



I. Technical Responsibilities

a. Understand the Risk of Flooding to Your Community

The local Floodplain Administrator should be familiar with the risk of flooding to their community. The risk of flooding is the potential for damage, loss, or other impacts that are caused by the interaction of the (i) flood hazard with (ii) community assets. Data sources for each are outlined below.

i. Flood Hazard

Understanding the flood hazard for your community may be achieved through research and review of existing flood hazard studies, flood hazard mapping, historical documentation of previous flood events, and field visits. Flood hazard analysis and mapping developed by FEMA are the basis for both mitigation efforts and Emergency Operations Plans (EOPs). From a planning perspective, these tools aid a planning team in decisions for which hazards need special attention, what actions have specific planning needs and what resources are most likely to be needed. A community's Local Hazard Mitigation Plan (LHMP) is a resource that should include a comprehensive analysis of flood risk as well as a comprehensive mitigation strategy aimed at reducing vulnerability to people and property in the community. The LHMP should be a good tool to begin to develop an understanding of the risk for flooding to your community.

Flooding can and will happen – anytime and anywhere. The definition of flooding is when excess water from snowmelt or rainfall accumulates and overflows onto a river's bank or adjacent floodplains. Flood damage is therefore any damage to a structure from surface water, whether that water originated from the body of water or not. Most homeowner's insurance policies do not cover damage from flood. Flood coverage must be purchased from private insurance companies which deal specifically with flood insurance through an arrangement with the National Flood Insurance Program (NFIP).

Types of flooding include:

- **Riverine flooding** – is the most common and occurs when water overtops the banks of a river and its tributaries. This type of flooding can last for several days or weeks.
- **Shallow flooding** – occurs in flat areas where there are no channels which means the water cannot drain easily. Problems associated with this type of flooding include sheet flow, ponding and urban drainage.
- **Flash flooding** – occurs suddenly when the peak flow travels from one end of the watershed to the other in less than six hours. A large amount of rainfall over a short time frame is generally what causes this type of flooding, but dam failure or sudden spills may also be the cause.
- **Coastal flooding and erosion** - results from storm surges and wave actions. Storm surge is the rise in water surface elevations above normal tide levels due primarily to low barometric pressure and wind action over a long stretch of open water. Breaking waves also contribute to the water level rise through wave runup and wave setup.
- **Dam or levee failures/overtopping** – can result in severe flooding. In this scenario, a large quantity of water is suddenly released with a great potential to cause human casualties, economic loss and environmental damage.

Flooding caused by rainfall occurs to some extent almost every year in almost every part of the State. This type of flooding occurs most frequently between the months of November and April, with a peak from February through April. Alabama receives an average of 56 inches of rainfall annually, creating a high potential for riverine and flash flooding. Additionally, Mobile and Baldwin counties are located on the coast of the Gulf of Mexico, creating a high potential for coastal flooding due to storm surge that accompanies tropical storms, hurricanes, and other coastal events.

Knowing and understanding the flood risks for your community is paramount to being prepared ahead of time for proper response to an event. Local Floodplain Administrators should become familiar with the documents that define the flood risks in their community.

FEMA Regulatory Products

Most communities participate in FEMA's National Flood Insurance Program (NFIP) and have what is called a Flood Insurance Study (FIS) with corresponding Flood Insurance Rate Maps (FIRMs).

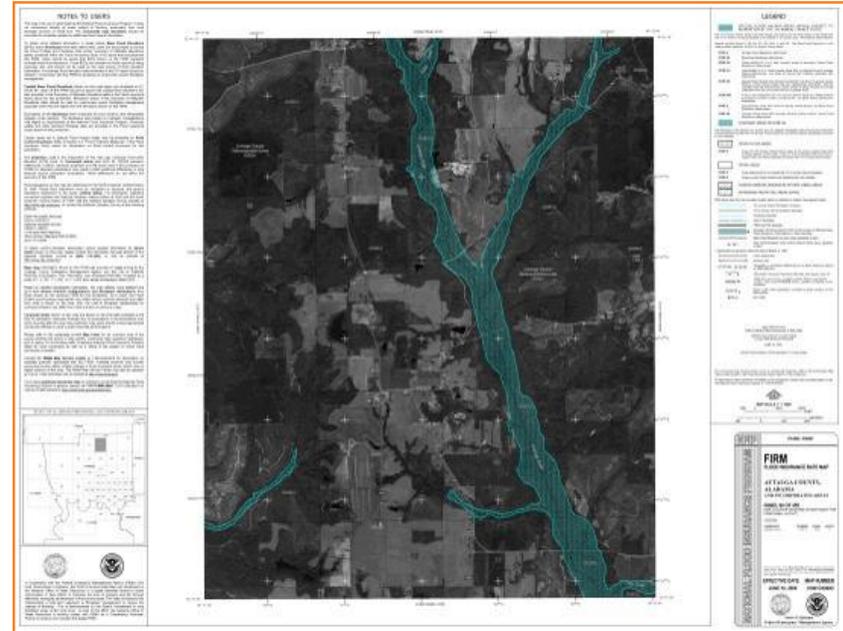
- **Flood Insurance Rate Maps (FIRMs)** identify risk in a community. It is the official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs), and the risk premium zones applicable to the community.
- **Flood Insurance Studies (FISs)** a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. When a flood study is completed for the NFIP, the information and maps are assembled into an FIS. The FIS report contains detailed flood elevation data in flood profiles and data tables.

These maps and data are used for several purposes:

- Identification of flood hazard risks within the community for disaster preparedness;
- Regulation of development within the floodplain by building code, engineering, and community development departments;
- Insurance rates by insurance agents; and
- Loan or financial assistance by banks and lending institutions.

The Flood Insurance Rate Maps (FIRMs) show the area susceptible to the 1% annual chance flood (often referred to as the 100 year flood or the "base" flood). This means the area has at least a 1% chance of being flooded in any given year. This inundation area is known as the Special Flood Hazard Area (SFHA). The SFHA is further defined as a Coastal High Hazard Area (CHHA) for areas of flood hazard extending from off-shore to the inland limit of primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

FIRMs use zone designations to identify areas where there is a high (1% or greater), moderate (0.2% to 1%), or minimal (less than 0.2%) annual chance of flooding. In coastal areas, the high risk areas are designated as either AE Zones or VE Zones. Moderate and minimal risk areas are designated as X Zones on newer FIRMs and as B and C Zones on older FIRMs.



FEMA Non-Regulatory Products

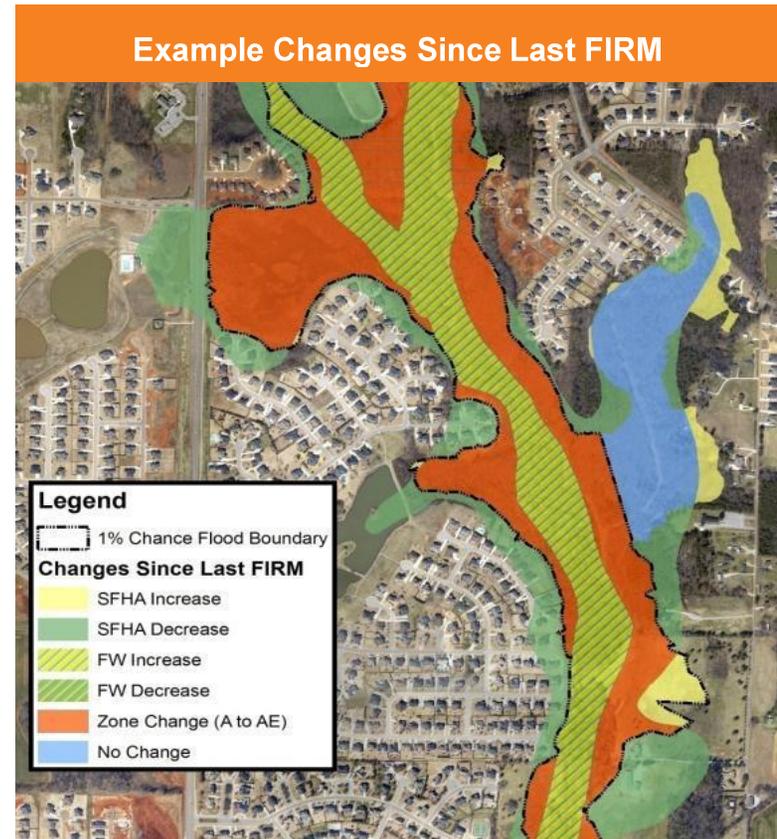
FEMA began a new initiative in 2010, the Risk Mapping, Assessment, and Planning (Risk MAP) program. The program takes a watershed-based approach to flood studies, which creates a more accurate, holistic picture of the flood risk. ADECA OWR has prioritized Risk MAP watershed-based flood studies within the State based upon the greatest risk of flooding and quality of data available. ADECA OWR has initiated Risk MAP projects in approximately half the State.

The Risk MAP program provides communities with additional non-regulatory products (flood information and tools) to enhance their mitigation plans and take action to better protect their citizens. The non-regulatory products include the following:

- Flood Risk Database
 - Changes Since Last FIRM (CSLF),
 - Flood Depth and Analysis Grids,
 - Flood Risk Assessment, and
 - Areas of Mitigation Interest;
- Flood Risk Report; and
- Flood Risk Map.

Changes Since Last FIRM (CSLF) - a polygon feature showing the increases and decreases of the Special Flood Hazard Area between the effective study and the proposed study. If parcel data is available these polygons can be attributed with the number of structures and population within the area of change. This can be a great tool in determining areas in need of mitigation, such as areas where the floodway or floodplain has expanded its boundaries and can be prioritized by the number of structures or population affected.

Flood Depth and Analysis Grids - In general, a property located in the 1% flood hazard area has a 26% chance of flooding over the life of a 30 year mortgage. Through Risk MAP and the development of depth grids for multiple recurrence intervals, it is possible to calculate the percent chance of flooding (1) annually and (2) over the course of 30 years. When overlaid with imagery it provides a useful tool to estimate a structure's risk of flooding and can provide more insight than the 1% annual chance floodplain. For example, structures may be near the flood fringe but are shown on the FIRM to have a similar chance of flooding as structures in the floodway. This tool can also aid homeowners in deciding whether to purchase flood insurance. There are also flood depth rasters for the 10%, 4%, 2%, 1%, and 0.2% chance flood events. These can help with the development of emergency plans or evacuation routes by providing an estimate of the depth of flooding on roads for more frequent flood events.



Flood Risk Assessment is determined using the program HAZUS, parcel data, building data, and population data to categorize risk on a census block level. This data provides total loss estimates and is a great product for Local Hazard Mitigation Plans (LHMP).

The final product is a data point file, Areas of Mitigation Interest. It is created from LHMP data and community input. Examples include channel improvements, home buy-outs, urbanization, non-regulated flood structures, undersized culverts, pinch points, etc. When looking at risk on a broad scale this feature class allows community leaders to zero in on potential areas in need of mitigation.

The Flood Risk Report summarizes the findings of the study and non-regulatory products in a single source by county and by community. It tabulates numerical data such as area added to the SFHA, building loss, and content loss. This is a great source of information for Hazard Mitigation Plans, grant applications, and project prioritization.

The Flood Risk Map displays the Flood Risk Assessment dataset and Areas of Mitigation Interest for the subject watershed. These datasets are presented to communities at the completion of a Risk MAP project. Training is provided to planners, engineers, GIS analysts, and Floodplain Administrators on how to utilize this data for mitigation planning and communication of risk to the public. Please see FEMA's Operating Guidance document 6-11 *User Guidance for Flood Risk Datasets and Products* available from the following website: <http://www.fema.gov/guidance-cooperating-technical-partners-program/operating-guidance-documents> for more information.

Flood Hazard Studies, Environmental Plans, Hazard Mitigation Plans

In addition to FEMA's regulatory and non-regulatory products, the following sources of information may be available in your community to enhance your understanding of the flood hazard:

- Localized engineering flood studies;
- Stormwater drainage and watershed studies;
- State and local hazard mitigation plans (LHMPs); and
- Technical studies by federal or state agencies – check with the U.S. Army Corps of Engineers, U.S. Department of Agriculture/Natural Resources Conservation Service, or U.S. Geological Survey for any flood studies, unpublished reports, water control manuals, environmental assessments, or other data that may concern your community.

How to Access ALABAMA Flood Hazard Data:

Step 1. Go to the Alabama Flood Risk Information System (AL FRIS).

The AL FRIS includes the digital Flood Insurance Rate Maps for Alabama (FIRMs), Flood Insurance Study (FIS) Reports and various flood risk datasets developed by the Alabama Office of Water Resources in cooperation with the Federal Emergency Management Agency (FEMA) for all counties within the State of Alabama.

www.adeca.alabama.gov/floods or
<http://fris.ncem.org/fris/Home.aspx?ST=AL>

Step 2. Select "Advanced"

Step 3. Select your Community and/or County

Step 4. Select Data Export

Step 5. Select either the map as a PDF to download or download the digital data (shapefile or geodatabase)

Flood hazard data is also available from FEMA's Map Service Center: <https://msc.fema.gov>

How to Access ALABAMA Repetitive Loss Data:

Submit request to NFIP State Coordinator:

Corey Garyotis, P.E., CFM
ADECA Office of Water Resources
401 Adams Avenue
Montgomery, Alabama 36104
334.353.0853
Corey.Garyotis@adeca.alabama.gov

Note: Due to restrictions by the Federal Privacy Act, only requests for data from local and State government officials can be honored.

Other Flood Hazard Mapping and Data

Federal or state agencies may also have mapping and technical data available. This data may include:

- US Army Corps of Engineers navigation maps;
- USGS flood inundation mapping program; and
- USGS stream gage data.

Repetitive Loss Areas

Repetitive loss structures are costly and pose a high-risk threat to residents who may be threatened by continual flooding. The NFIP defines a repetitive loss property as “any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978. At least two of the claims must be more than 10 days apart”. You should be familiar with the repetitive loss structures within your community as well as identify Repetitive Loss Areas. A Repetitive Loss Area is a portion (or portions) of a community that includes the identified repetitive loss properties and also nearby properties that are subject to the same or similar flooding conditions. Steps to properly address Repetitive Loss Areas:

- The NFIP State Coordinator can provide a listing of repetitive loss flood insurance claims within the community to identify a community’s Repetitive Loss Area.
- It may be prudent to coordinate with the local Emergency Manager to have special measures in place to notify and/or evacuate residents in Repetitive Loss Areas during a flood.
- A mitigation strategy/plan for the community should have repetitive loss properties with Repetitive Loss Areas as a top priority for mitigation.

Historical Documentation

Documentation of flood events in the past will also assist in understanding your flood hazard. Historical documentation includes:

- Historical records and newspaper articles about past floods;
- Knowledge and experiences of the local residents, community officials, etc.; and
- Local Hazard Mitigation Plan, including the history of previous hazard events for each hazard. This information helps estimate the likelihood of future events and predict potential impacts.

On-Site Field Visits

Mother Nature does not read flood maps. Therefore, a local Floodplain Administrator must be familiar with the community “on the ground”; this includes:

- Areas not mapped on the FIRM that have flooded in the past;
- Areas subject to sudden or flash flooding;
- Constrictions or “pinch points” in channels that may cause flooding for adjacent property owners; and
- Areas in the community where vegetation or other forms of debris may be dislodged during a significant rainfall event and cause blockage of channels, bridges, or culverts located downstream.

ii. Community Assets

With an understanding of the location, extent, previous occurrences, and probability of flood events, the local Floodplain Administrator should be familiar with the community assets exposed to the flood hazard. This includes people, property, infrastructure, and other critical facilities. Examples of each are provided below.

Existing Structures

All structures are exposed to risk, but certain buildings or concentrations of buildings may be more vulnerable because of their location, age, construction type, condition, or use. Consult the local tax assessor and planning department for information on land use, zoning, parcel boundaries and ownership, and types and numbers of structures. Ideally, a photo of each structure should also be taken to accompany structure data. This helps

identify the structure and document the condition of the structure prior to a flood event.

When an insurable, publicly owned structure that is located within Special Flood Hazard Areas is damaged from flood waters and the flood event results in a Presidential major disaster declaration, any assistance from FEMA is reduced by the amount of insurance settlement that could have been obtained under a standard NFIP policy. Municipalities should insure public property in flood hazard areas to avoid either the loss of valuable public property or the cost to replace it. For structures located outside of a SFHA, FEMA will reduce the amount of eligible assistance by any insurance proceeds that the structure is eligible to receive.

Infrastructure

Infrastructure systems, critical for life safety and economic viability, include the following: transportation, power,

communication, water, and wastewater systems. Many critical facilities within your community depend upon infrastructure systems to function. For example, hospitals need electricity, water, and sewer to continue helping patients. As with critical facilities, the continued operations of infrastructure systems during and following a disaster are key factors in reducing the severity of impacts and increasing the speed of recovery.

Critical Facilities

Critical facilities are structures and institutions necessary for a community's response to and recovery from emergencies. Critical facilities must continue to operate during and following a disaster to reduce the severity of impacts and accelerate recovery. When identifying the vulnerabilities of critical facilities, consider the structural integrity, content value, and the effects of interrupted service to the community.

People

The following vulnerable and special needs populations should be identified within your community. These are populations whose members may have additional needs before, during, and after a flood event.

- Populations with disabilities:
 - Visually impaired,
 - Hearing impaired,
 - Mobility impaired,
 - Medically dependent,
 - Emotional problems, and
 - Severe mental problems.
- Institution/Groups:
 - Hospitals,
 - Nursing homes,
 - Halfway houses,
 - Assisted care facilities,
 - Day-care centers,
 - Prisons/jails,
 - Homeless shelters, and
 - Spouse-abuse centers.



How to Utilize Community Structure Data:

- Step 1.** Compare and/or incorporate your community's property maps with the floodplain maps.
- Step 2.** Develop a comprehensive listing of all structures located within the floodplain, including:
 - a. Property Owner information
 - b. Assessed valuation or fair market value and the 50% threshold figure
 - c. Any existing information for each structure such as lowest floor elevation, date of construction, etc.
 - d. Base flood elevation for each structure

- Other concentrations of populations:
 - Tourists,
 - Transients,
 - Culturally isolated,
 - Migrants, and
 - People without vehicles.
- Vulnerable Populations:
 - Elderly,
 - Socially isolated,
 - Children,
 - Low-income,
 - Homeless,
 - Home-bound, and
 - Non-English speaking.

b. Familiarity with Regulations

Communities participating in the National Flood Insurance Program must adopt and enforce floodplain management regulations that meet or exceed the minimum NFIP standards and requirements. These standards are intended to prevent loss of life and property, as well as economic and social hardships that result from flooding. The minimum NFIP standards and requirements can be found in Chapter 44 of the Code of Federal Regulations (44 CFR) Parts 59 and 60. A community's flood damage prevention ordinance ensures these minimum requirements are met.

The majority of NFIP communities in Alabama have adopted the model ordinance language for auto-adoption of new flood maps. The State of Alabama NFIP Coordinator has prepared three model flood damage prevention ordinances to assist communities in meeting the NFIP requirements. The ordinances are tailored for riverine, coastal, and island communities. These state model ordinances are available on the ADECA OWR website:

<http://www.adeca.alabama.gov/floods>

The flood damage prevention ordinance includes information regarding:

- Adoption of flood maps;
- Requirements for development permits;
- Construction standards;
- Building protection standards;
- Standards for manufactured homes; and
- Designation and duties of the local Floodplain Administrator.

The local Floodplain Administrator is responsible for ensuring that development activities comply with the floodplain management regulations and other applicable codes and ordinances, including post-flood reconstruction within your community.

i. No Adverse Impact (NAI) floodplain management

Looking beyond the minimum requirements of the NFIP, communities may wish to provide a higher level of protection for their citizens and to prevent increased flooding now and in the future. The concept of "No Adverse Impact" (NAI) is an approach to floodplain management that ensures the action of any community or property owner, public or private, does not adversely impact the property and rights of others. An adverse impact can be measured by an increase in flood stages, flood velocity, flows, the potential for erosion and sedimentation, degradation of water quality, or increased cost of public services. NAI floodplain management extends beyond the floodplain to include managing development in the watersheds where floodwaters originate. NAI does not mean zero development. It means that any adverse impact caused by a project must be mitigated, preferably as provided for in the community or watershed based plan.

For local governments, NAI floodplain management represents a more effective way to tackle flood problems. The Association of State Floodplain Managers has prepared a Toolkit designed to help local officials incorporate the NAI principle into the community's ongoing programs. The toolkit

outlines a variety of activities to improve your floodplain management program. The Toolkit is available here:

http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf

c. Flood Warning Capabilities

Communities may want to consider the investment of a flood warning system to provide timely, reliable, and accurate warnings to their citizens. With sufficient warning of a flood, a community and its floodplain occupants can take protective measures such as moving furniture, cars, equipment, supplies, and people out of harm's way. When a flood threat recognition system is combined with an emergency response plan that addresses the community's flood problems, a great deal of flood damage can be prevented.

The National Weather Service (NWS) issues specific flood warnings for many locations along major rivers and coastlines. Many communities have their own flood threat recognition systems, which enable advance identification of floods on smaller rivers. The full benefit of early flood warning is only realized if the community disseminates the warning to the general public and critical facilities and has a flood warning and response plan that includes appropriate tasks, such as directing evacuation, road closures, sandbagging, and/or moving building contents above flood levels.

Communities in Alabama interested in a flood warning system should coordinate with the Alabama Emergency Management Agency (AEMA), National Weather Service (NWS), United States Geological Survey (USGS), United States Army Corps of Engineers (USACE), and their local Planning and Development District for assistance in developing a flood warning and response system and / or plan.

II. Communication and Coordination Responsibilities

a. Local Agencies/Staff

The local emergency manager is largely responsible for disaster and emergency response activities, such as evacuation, rescue, and coordination with the county, state and federal emergency management agencies. However, various offices or departments of your local government probably have also been assigned responsibility for flood-related tasks. Suggested local agencies/positions for coordination include:

- Emergency Management;
- Public Works;
- Building Code Official/Permitting Office;
- Community Development;
- Planning;
- County Engineer/Surveyor;
- Local Soil and Water Conservation District;
- County Cooperative Extension Service; and
- Local Utility Cooperatives.

Government offices should take inventory of their various response roles. An assessment of the levels and mechanisms for coordination and cooperation between departments should be performed. This assessment should be repeated at least every two to three years because of staff turn-over and changes in responsibilities. Example questions which should be addressed include:

- Do we have an existing Emergency Operations Plan (EOP) which identifies flood response tasks?
- Does the EOP identify responsible agencies/staff positions?

- Do we have a ‘call down’ roster or ‘phone tree’ developed?
- Who coordinates evacuations and when?
- Are there individuals in the community trained to lead or participate in flood response activities?
- Do we have Community Emergency Response Teams (CERT) trained within our community?
- Who will prepare and place the sandbags?
- Who will handle public information bulletins and the news media?
- Who will coordinate with volunteer organizations?
- Who will document the flood damage – residential/commercial/public?
- Who will establish the procedures for damage assessment team(s) and who will serve on the team(s)?
- Does our community have a debris management plan? The Sandy Recovery Improvement Act of 2013 (SRIA) (P.L. 113-2) authorized FEMA to provide an incentive of a 2% increased cost share adjustment for the first 90 days of debris removal activities for communities with a FEMA-accepted debris management plan.

Communication and Coordination efforts are further defined in the Response and Recovery Sections.

b. State/Federal

There are several state and federal agencies that the local Floodplain Administrator should become familiar with to request assistance from or to find resources. These include the following:

- Alabama Emergency Management Agency;
- Alabama Department of Economic and Community Affairs, Office of Water Resources;
- Alabama Department of Transportation;
- Federal Emergency Management Agency;

- United States Geological Survey, Alabama Water Science Center; and
- National Weather Service.

The callout box on the following page provides direct contact information.

c. Public

Only a small percentage of people in any given community really understand the risks associated with flooding. With the current disclosure laws, buyers of homes / structures are informed if flood insurance is required for their federally backed loan on the structure. Unfortunately, this requirement is sometimes not disclosed until the “final closing” meeting.

Opportunities to provide *flood risk information* to your community may include:

- Websites or social media outlets;
- Utility bills;
- Seasonal outreach, in coordination with the local emergency manager;
- Outreach conducted during RiskMAP process; and
- CRS (Community Rating System) outreach.

State/Federal Contact Information:

AEMA PUBLIC ASSISTANCE CONTACTS

Benjie Abbott - Recovery Division Chief
benjie.abbott@ema.alabama.gov
205-280-2273 Office
205-287-1244 Cell

Michael Johnson - Public Assistance Section Chief
michael.johnson@ema.alabama.gov
205-280-2276 Office
205-541-3723 Cell

Janice Doucet - Deputy Public Assistance Section Chief
janice.doucet@ema.alabama.gov
205-280-2458 Office
205-288-9700 Cell

Matthew Malone - Debris Operations Section Chief
matthew.malone@ema.alabama.gov
205-280-2472 Office

Craig Bolling - Public Assistance Specialist
craig.bolling2@ema.alabama.gov
205-280-2480 Office

AEMA HAZARD MITIGATION CONTACTS

Kelli Alexander – State Hazard Mitigation Officer
kelli.alexander@ema.alabama.gov
205-280-2269 Office

Robert Baylis - Mitigation Planner
Robert.baylis@ema.alabama.gov
205-280-2453 Office
205-288-9434 Cell

Ashley Kelley - Mitigation Planner
Ashley.kelley@ema.alabama.gov
205-280-2477 Office
205-299-6572 Cell

Valerie Wallace - Financial Specialist
Valerie.wallace@ema.alabama.gov
205-280-2274 Office
205-287-1084 Cell

ADECA OFFICE OF WATER RESOURCES

Leslie A. Durham, P.E. – Floodplain Management Branch Chief
floods@adeca.alabama.gov
334-353-1955 Office

Corey Garyotis, P.E. – NFIP Coordinator
Corey.Garyotis@adeca.alabama.gov
334-353-0853 Office

ALDOT CONTACT

Lesley J. Morrissette – Maintenance Bureau, Emergency Management, Asst. State Maintenance Engineer
morrissettel@dot.state.al.us
334-242-6883 Office

FEDERAL CONTACTS

FEMA Region IV – Mitigation Division
<http://www.fema.gov/region-iv-mitigation-division>
Roy McClure, CFM – Floodplain Management
Roy.McClure@fema.dhs.gov

FEMA Region IV – Recovery Division
<http://www.fema.gov/region-iv-recovery-division>
Valerie Rhoads, Public Assistance Branch Chief
Jackie Reginello, Individual Assistance Branch Chief

USGS – Alabama Water Science Center
Athena P. Clark, Director, P.E.
(334) 395-4141
athclark@usgs.gov

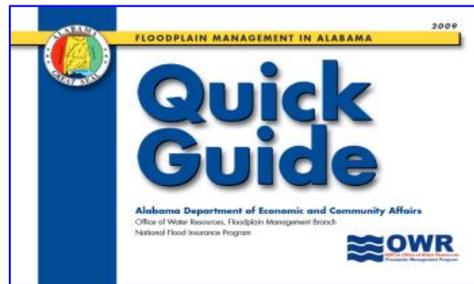
NWS – Senior Service Hydrologist, Birmingham
Roger McNeil
(205) 664-3010
roger.mcneil@noaa.gov

III. Administrative Responsibilities

a. Staff Training

Opportunities for staff training and learning to improve job performance skills for floodplain management and disaster response include:

- Alabama Quick Guide – Guidance document on why and how communities in the State of Alabama manage floodplains to protect people and property
http://www.adeca.alabama.gov/Divisions/owr/floodplain/Documents/ALQG2009_Quick_Guide.pdf
- Certification with the Association of State Floodplain Managers
- Courses at FEMA’s Emergency Management Institute (EMI) (on-campus and online)
 - Managing Floodplain Development through the National Flood Insurance Program (EMI Course E-273)
 - Advanced Floodplain Management Concepts I (EMI Course E-194)
 - Advanced Floodplain Management Concepts II (EMI Course E-282)
 - Advanced Floodplain Management Concepts III (EMI Course E-284)
 - Introduction to Incident Command System (FEMA Independent Study IS-100)
 - National Incident Management System (NIMS): An Introduction (FEMA Independent Study IS-700)
 - National Disaster Recovery Framework Overview (FEMA Independent Study IS-2900)



- Substantial Damage Estimator tutorial
- Mitigation eGrant System for the Subgrant Applicant (FEMA Independent Study IS-30)
- Benefit-Cost Analysis Fundamentals (FEMA Independent Study IS-276)

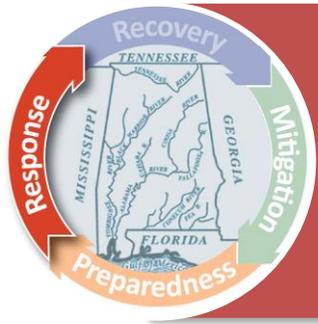
See Appendix A for detailed information on recommended training courses.

b. Tracking Mechanism for Staff Time

It will be critical that you establish and maintain accurate records of events and expenditures related to disaster response and recovery work. All federal reimbursement is based on the supporting documentation. The information required for documentation will need to describe the “who, what, when, where, why, and how much,” for each item of disaster response and recovery work. You should have a financial and record keeping system in place that can be used to track these elements. The importance of maintaining a complete and accurate set of records cannot be over-emphasized. To ensure that work performed both before and after a Presidential major disaster declaration is well documented, potential applicants should:

- Designate a person to coordinate the compilation and filing of records;
- Establish a file for each site where work has been or will be performed; and
- Maintain accurate disbursement and accounting records to document the work performed and the costs incurred.
- It is also very important to document the request for mutual aid and volunteers/donated resources in addition to documenting costs.

Documentation requirements are further defined in the Response and Recovery Sections.



Response



I. Technical Responsibilities

When a disaster or emergency occurs, it is the responsibility of the local community and the state or tribe to respond first. Your local emergency manager (EM) is responsible for disaster and emergency response activities, such as evacuation and rescue, and coordination with the county, state and federal emergency management agencies. You, as the local Floodplain Administrator, may also have a role during the emergency in addressing the immediate flood protection needs of your residents.

During a flood event, the local Floodplain Administrator may be tasked, in coordination with the local EM and local emergency operations plan (EOP), to:

a. Control Access to Flood Impacted Areas

- Barricade areas of concentrated flooding to control entry;
- Monitor areas that were identified as frequently flooded areas in “Understanding the Risk of Flooding to your Community”, (see Preparedness Section); and
- Coordinate with the highway department for road and bridge closures.

b. Conduct Preliminary BROAD-SCOPE Impact Assessments

- Conduct a “windshield survey” to view the flood-impacted area and make general notes on the extent, height/depth, and velocity of floodwaters;
- Take photographs of the flood conditions;
- Make individual structure notes and take photographs (if possible) for damage documentation; and
- Use this information to assist in your flood recovery efforts.

c. Assist the Joint Preliminary Damage Assessment (PDA) Team

- Assist in the tour of damaged sites with the joint federal/state damage assessment team. Be sure to bring to their attention any environmental or historic issues that may be present. Provide information for any known flood insurance coverage of locally owned structures.
- You should also explain what immediate expenditures might be associated with any emergency work you have identified. This information may be used to provide you some expedited funding, if a declaration is obtained for your area.



Police and public works employees place barricades to block traffic from flooded roads. (The Huntsville Times/Dave Dieter)

II. Communication and Coordination Responsibilities

a. Local Agencies/Staff - Emergency Management

Your community's local Emergency Operations Plan (EOP) describes who will do what, as well as when, with what resources, and by what authority before, during, and immediately after *any* emergency. The EOP focuses on actions, such as direction and control, warning, public notification, and evacuation, that the local government must take during response operations and that fall outside of the state response mission. The EOP:

- Assigns responsibility to organizations and individuals for carrying out specific actions that exceed routine responsibility at projected times and places during an emergency.
- Sets forth lines of authority and organizational relationships and shows how all actions will be coordinated.
- Describes how people (including unaccompanied minors, individuals with disabilities, others with access and functional needs, individuals with pets and individuals with limited English proficiency) and property are protected.
- Identifies personnel, equipment, facilities, supplies, and other resources available within the jurisdiction or by agreement with other jurisdictions.
- Reconciles requirements with other jurisdictions.

The EOP may also be structured to address specific emergency or hazard events, such as flood events. A flood-specific annex to the EOP would describe the policies, situations, and responsibilities particular to the flood hazard and explain procedures that are unique to the flood event, such as instructions for filling and using sandbags.

As the local Floodplain Administrator, you should coordinate with your local emergency manager to: (1) understand the local EOP and your designated role, as applicable, during a flood event; and (2) provide the local EM with an understanding of the local flood hazards. As the local Floodplain Administrator you can familiarize the EM with:

- Areas within the floodplain boundaries of your community that:
 - Are most at risk to flooding and/or flash flooding;
 - Repetitively flood; and/or
 - Have localized drainage issues.
- Community assets that are at risk within the floodplain boundary, including:
 - Structures – residential, commercial, industrial, etc.;
 - Infrastructure – roadway and/or bridge overtopping locations;
 - Critical facilities – police, fire, hospitals, water treatment plants, etc.; and
 - Populations – potential evacuation needs.

b. Local Emergency Operations Center

Based on the magnitude and severity of the event, the local emergency manager may activate the local Emergency Operations Center (EOC). This is the central location of coordination for all major emergency operations within your community and/or county. The purpose of this central location is to ensure decision makers have direct unfiltered communications with one another and all response personnel.

The Floodplain Administrator and/or building permit office is often expected to have a representative in the EOC during the disaster. It is important to coordinate with your EM to understand your designated role, as applicable, during a flood event.



Clanton, Ala., August 29, 2005 -- The FEMA Emergency Response Team (in balcony) work at the Alabama Emergency Operations Center (EOC). FEMA/Mark Wolfe

c. State/Federal - Disaster Declaration Process

It is the responsibility first of the local community and AEMA to respond to a disaster or emergency event. However, at times their combined efforts and resources are not sufficient to effectively address the direct results of the most serious events. These situations call for federal assistance. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. §§5121 – 5207, authorizes the President to provide federal assistance to supplement state, tribal, and local efforts.

As part of the process to determine if federal financial assistance is warranted, an Initial Damage Assessments (IDA) is conducted by AEMA summarizing local damage information including private property, business losses, and public infrastructure damages. Information gathered will be used to help identify unmet needs and to determine if a request will be made by AEMA to FEMA Region IV for a joint preliminary damage assessment (PDA).

If requested, the joint PDA Team will consist of an AEMA, FEMA and local government representative. FEMA and state officials will brief team members on damage criteria, the kind of information to be collected for the particular incident, and reporting requirements. Based upon the information collected during the PDA, FEMA evaluates the impacts and severity of the event, and if warranted, the President will issue an emergency or major disaster declaration.

The process for a major disaster declaration is summarized as follows:

- Step 1.** Local government responds to the emergency or disaster supplemented by neighboring communities and volunteer agencies. If the local government is overwhelmed, the county Emergency Management Agency requests an Emergency Declaration from the county commissioners declaring a state of disaster emergency and requesting state assistance.
- Step 2.** AEMA responds with state resources, such as the National Guard and other state agencies. If these resources are overwhelmed, then AEMA requests assistance from the Federal Emergency Management Agency (FEMA).
- Step 3.** A damage assessment is performed by a Joint Preliminary Damage Assessment team composed of local, state, and federal agencies to determine losses and recovery needs.
- Step 4.** A Major Disaster Declaration is requested by the Governor, based on the impact assessment, along with an agreement to commit state funds and resources to long-term recovery.
- Step 5.** FEMA evaluates the request and recommends action to the White House based on the disaster, the local community and the state's ability to recover.
- Step 6.** The President considers the request and FEMA informs the Governor whether it has been approved or denied. This decision process could take a few hours to several weeks depending on the nature of the disaster.

Links to Disaster Declaration Information:

- **FEMA: Disaster Declaration Process Fact Sheet**
<http://www.fema.gov/declaration-process-fact-sheet>
- **FEMA: Disaster Declaration Process**
<http://www.fema.gov/declaration-process>
- **FEMA: Disaster Aid Programs**
<http://www.fema.gov/disaster-process-disaster-aid-programs>
- **Alabama Emergency Management Agency (EMA)**
<http://ema.alabama.gov>
- **Alabama EMA Mitigation**
<http://ema.alabama.gov/mitigation.cfm>

After a Presidential major disaster declaration has been made, FEMA will designate the area eligible for assistance and announce the array of Federal programs available to assist in the response and recovery effort. Not all programs, however, are activated for every disaster. The determination of which programs are activated is based on the needs found during the damage assessment and any subsequent information that may be discovered. These programs include:

- **Individual Assistance (IA)** - financial or direct assistance to individuals and families whose property has been damaged or destroyed as a result of a federally-declared disaster, and whose losses are not covered by insurance.
- **Public Assistance (PA)** - supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

- **Hazard Mitigation** – the Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to enable mitigation measures to be implemented during the immediate recovery from a disaster that will reduce the loss of life and property due to future natural disasters.

These federal programs are further defined in the Recovery and Mitigation Sections.

III. Administrative Responsibilities

During and after a flood event, the most immediate source to help with response and recovery is your own staff, materials, and equipment. They are within your authority and available to you. In a Presidentially declared event, some of your staff time, materials, and equipment costs may be eligible for cost-shared FEMA assistance through the Public Assistance (PA) Grant Program. Eligible work is defined by three general categories:

- Debris removal;
- Emergency protective measures; and
- Permanent restoration, which includes:
 - Road systems and bridges,
 - Water control facilities,
 - Public buildings and contents,
 - Public utilities, and
 - Parks and recreation.

Debris removal and emergency protective measures are considered “emergency work.” Permanent work includes restoring the facility back to its pre-disaster design, function, and capacity, including any codes and standards applicable to the approved work. The federal share of assistance for either emergency measures or permanent restoration is not less than 75% of the eligible cost. The grantee (Alabama EMA) determines how the non-federal share (up to 25%) is split with the subgrantees (eligible applicants, i.e. your local government).

a. Tracking Staff Time and Resources

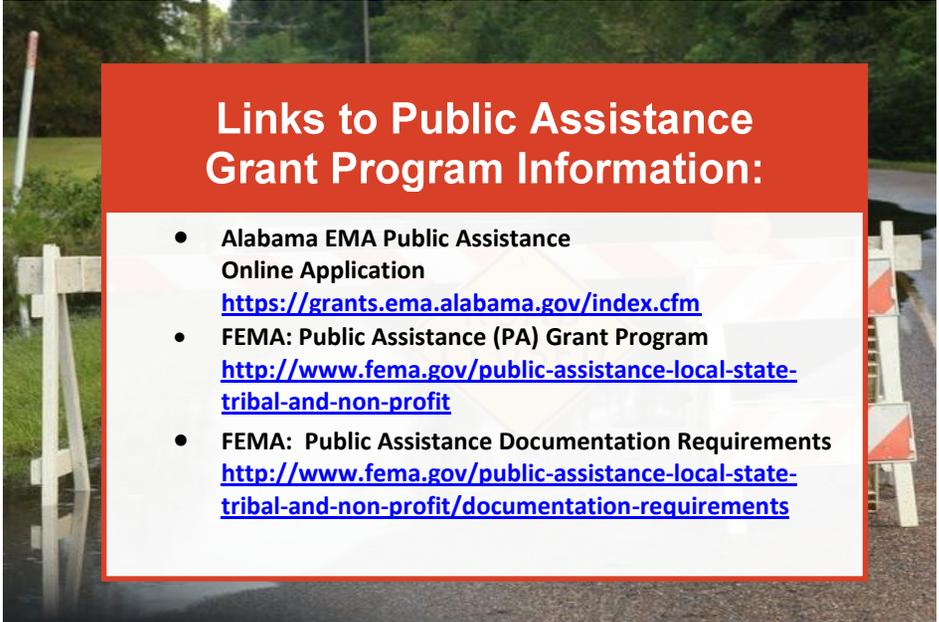
After a Presidential major disaster declaration, there will be a kickoff meeting conducted by the Federal Public Assistance Officer with those entities that have applied for assistance (Request for Public Assistance). Guidance will be provided at this meeting for the formulation of Project Worksheets. The approval and obligation of the Project Worksheets may take several weeks after the disaster. In the meantime, it may be necessary to start or complete emergency work, or in certain cases, *work may have been completed prior to the declaration.*

The work done for such things as debris removal and emergency protective measures should be documented. Good documentation facilitates the Public Assistance project formulation, validation, approval, and funding processes. It is very important that if repairs are made, there is good documentation and/ or correspondence with regulatory agencies. Local officials should also be extremely diligent in photo documentation and use specific detailed damage descriptions, location of damage, debris content, and conditions prior to damage.

Documentation highlights include:

- Permanent and temporary employees must be on the payroll in order to be reimbursed for their work on disaster projects. The payroll records must show the pay period, employee name, job classification, number of hours worked each day, total hours worked for the pay period, rate of pay (regular and overtime), and total earnings. Most established payroll systems already include this information.
- The records must also show which project (response and/or recovery site) the employee worked on each day and each hour if he/she worked on more than one project in a single day. Claims for labor must be documented for each site individually.
- Only the actual hours worked beyond the regular duty time (either overtime, straight time, or comp time) can be claimed for emergency work.

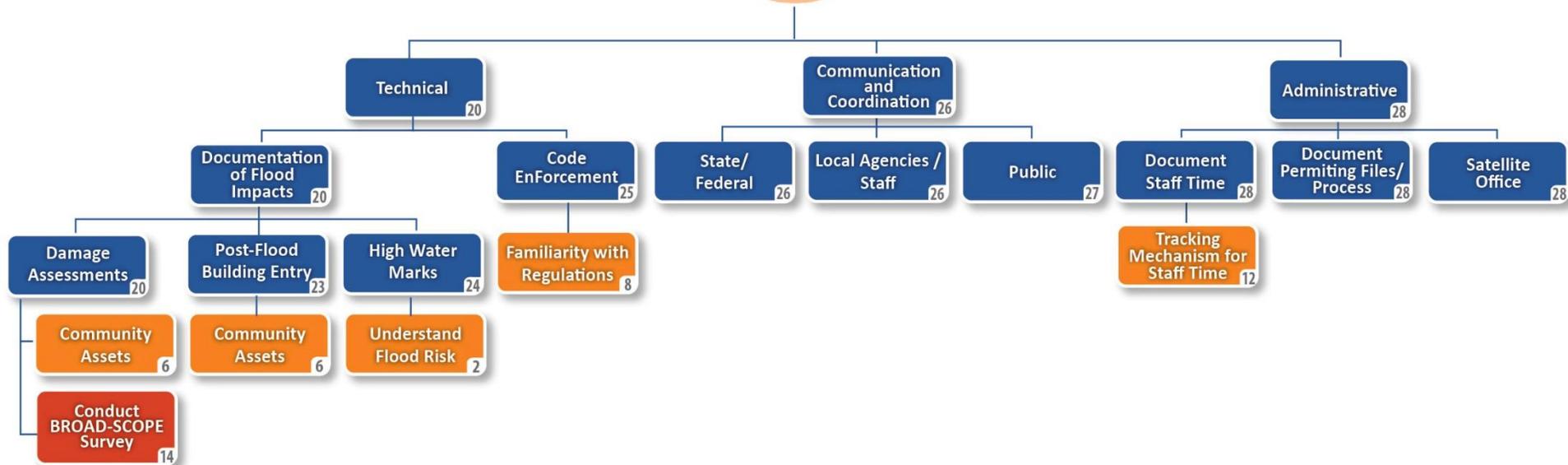
- Equipment used on each project (both owned and rented) must be documented. Specifically, the documentation must show the date used, equipment description, operator, hours used each day, cost per hour, and total cost for each piece of equipment.
- Equipment that is damaged and/or lost during disaster incidents may be eligible for reimbursement. The damage and/or loss must be documented along with sufficient supporting documentation such as property inventory records, purchase orders, and video and/or photographs.
- A record of materials and supplies purchased or taken from stock must be kept for each project. Specifically, the documentation must show the name of the vendor, description of the material, quantity, unit price, total price, date of purchase, date used and whether purchased or taken from stock.
- For contracted work, a copy of the contract and all invoices for that project must be maintained. Each invoice must include a description of the work done, date of the work, name of the contractor, an invoice number, and amount billed.
- The dates used on all documentation must be within the allowable time period for each project.



Links to Public Assistance Grant Program Information:

- Alabama EMA Public Assistance Online Application
<https://grants.ema.alabama.gov/index.cfm>
- FEMA: Public Assistance (PA) Grant Program
<http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>
- FEMA: Public Assistance Documentation Requirements
<http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/documentation-requirements>

Recovery



I. Technical Responsibilities

The biggest task facing the floodplain manager after a flood is making sure any post-disaster reconstruction is done in compliance with your community's flood damage prevention ordinance. If the disaster event is large enough in scope, the demand for issuing the flood development permits and/or building permits will be tremendous. Communities that have limited staff resources may be quickly overwhelmed.

To assist your community in developing a standard process for recovery, we begin with Documentation of Flood Impacts.

a. Documentation of Flood Impacts

The task of documenting the extent of flooding and flood impacts can be overwhelming for the local Floodplain Administrator. However, this historical data is vital. The impact assessment and/or "windshield survey" conducted during the response phase will assist the local floodplain manager in identifying the area affected by the flood event and extent of damages to structures. This will help you organize a plan to systematically conduct (i) damage assessments across your community for the impacted structures, (ii) post building safety information, and (iii) collect high water marks. Photographs and/or video can also assist in documenting the extent of damage to structures. Boundaries of inundation and high water marks can help establish the area and height the water encompassed.

i. Damage Assessments

In a post-disaster environment, one of your most important recovery needs is the assessment of damaged structures *prior* to issuing a permit for reconstruction. The process for performing damage assessments includes the following steps:

DEFINE AREAS FOR ASSESSMENTS

- Step 1.** Obtain and/or prepare mapping which combines the Special Flood Hazard Area (SFHA) with your community street, address, or tax maps. Only structures found within the mapped SFHA will need 'substantial damage' estimations. See the Preparedness Section for additional flood hazard and mapping information.
- Step 2.** Next, incorporate your impact assessment/ windshield survey (see Response Section) into this mapping to identify general locations within the SFHA that are most likely to have damaged structures.
- Step 3.** Based upon your identified locations and the potential number of damaged structures, begin to outline your plan and logistics for conducting the damage assessments. This includes:
 - Identifying staff, volunteers, and/or contract inspectors to form inspection teams; and
 - Prioritizing areas to conduct assessments.

SELECT METHOD

- Step 4.** Assessments for those damaged structures located within the SFHA, should be conducted using:
 - FEMA's Substantial Damage Estimator (SDE) Tool and Worksheets; **and/or**
 - Rapid Depth Damage Field Estimate.

It is important to be consistent in the method(s) of assessment used. Consistency will leave little room for argument about equality or appeals. All damage assessment documentation should be maintained in the individual permit file. This will become especially important when the community is reviewed by the State NFIP Coordinator or by FEMA for NFIP compliance.

FEMA Substantial Damage Estimator (SDE)

FEMA has developed the Substantial Damage Estimator (SDE) Tool version 2.0, to assist state and community officials in estimating substantial damage to residential and non-residential structures. The SDE tool is based on the concept of using damage estimates for individual structure elements to determine whether the structure as a whole is substantially damaged. Users are able to estimate damage percentages for each described building element. Using these percentages, SDE produces an aggregate “percent damage” for the structure as a whole.

The SDE tool includes assessment options for both residential structures (single-family homes, town or row houses, and manufactured homes) and common non-residential structures (e.g., office buildings, strip malls, restaurants). SDE is customizable, allowing users to develop estimated repair costs and market values, or to input professional estimates or valuations. The SDE tool is intended to be used in conjunction with an industry-accepted construction cost-estimating guide. Building-specific attributes that affect the estimates that the software produces are input by the user. The required attributes include the quality of construction, foundation type, number of stories, square footage, superstructure type, exterior finish, roof covering, and presence of HVAC systems. Additional inputs are requested for non-residential buildings, including building use, presence of elevators, escalators, and fire suppression systems.

Field Inspectors should be familiar with the SDE data requirements, how to use the SDE Tool or the SDE Damage Inspection Worksheets to record the data, and safety precautions for working in and around damaged structures.

A condensed procedural guide is provided in Appendix B.



Rapid Depth Damage Field Estimate

Another method for determination of substantial damage is to utilize the Rapid Depth Damage Field Estimate. Using the Depth Damage Field Estimate allows a community to quickly separate flood-damaged structures into three groups:

1. Clearly non-substantial damage (less than 40%);
2. Clearly substantial damage (greater than 50%); and
3. Uncertain whether substantial damage (40-50%).

For structures which are clearly NOT substantially damaged, permits can be issued to repair at the existing elevation; provided no additional improvements or additions will be made and it does not conflict with any other regulations.

The Depth Damage Field Estimate captures essential information to make substantial damage determinations for flood-related damages. The damage estimations are based upon the USACE published Generic Depth-Damage Relationships. A Depth Damage Field Estimate

worksheet is completed for each structure, indicating the depth (in feet) of floodwaters. This is done by actual measurement based on visual watermarks and/or observed flood damage to the structure. Ideally a photo of each structure should also be taken to accompany the worksheet. This helps identify the structure and document the condition of the structure.

There may be occasion when obvious structural damage has occurred, possibly from fire, floating debris, or contaminated water, or the condition of the existing home may be so poor such that even lesser depths of flood waters have caused significant damage. This should be noted on the Depth Damage Field Estimate worksheet. If it is uncertain whether substantial damage has occurred, additional improvements and/or additions are proposed, or there is a dispute regarding a damage assessment, more information will be required in order to accurately determine whether or not they are substantially damaged/improved.

A condensed procedural guide is provided in Appendix B.

PREPARE FOR FIELD DEPLOYMENT

Step 5. Prior to beginning assessments, data preparations will need to include:

- Field maps for inspection teams with addresses and/or individual lot locations;
- Worksheets for data collection forms;
- Data population into SDE Tool for address and structure information, unit costs for determining reasonable structure value, and square footage (if possible);
- Identification of any inspection areas that may require permission or special access; and
- Procedures for performing damage assessments on locked or occupied structures.

Additional field equipment needs include:

- Digital data collection tools, i.e. laptop, tablets;
- Tape measure;
- Camera;
- White board and marker, or other method for identifying street address; and
- Appropriate field attire.

While documenting the damage, you may wish to leave a door tag notice to advise the owner that an initial damage assessment has been done and that they are to contact the local Floodplain Administrator and/or building official before proceeding with repair/reconstruction, and provide contact information for the Floodplain Administrator and/or building official. See Appendix B for an example door tag.

Links to Substantial Damage Information

- **FEMA 213, Answers to Questions About Substantially Damaged Buildings (1991)**
<http://www.fema.gov/library/viewRecord.do?id=1636>
- **FEMA P-758, Substantial Improvement/Substantial Damage Desk Reference(2010)**
<http://www.fema.gov/library/viewRecord.do?id=4160>
- **FEMA P-784 CD, Substantial Damage Estimator (SDE) (2013)**
- <http://www.fema.gov/media-library/assets/documents/18692?id=4166>
- **USACE Generic Depth Damage Relationships**
<http://planning.usace.army.mil/toolbox/library/EGMs/egm04-01.pdf>

ii. Post-Flood Building Entry

Structures which have been inundated by the flood event may not be safe to enter. You and/or your local building official should post information advising property owners that a safety inspection is required before re-occupancy is authorized and entry to any flood-damaged building requires approval by local officials. This effort may occur simultaneously with the “windshield survey” and/or damage assessments.

The ATC-45 *Field Manual: Safety Evaluation of Buildings after Windstorms and Floods* provides guidelines and procedures to determine whether damaged or potentially damaged buildings are safe for use after wind storms or floods, or if entry should be restricted or prohibited. This publication of the Applied Technology Council (ATC) is not a manual for making substantial damage determinations. It provides guidelines and procedures for conducting both rapid evaluations and more detailed evaluations to determine the *safety* of damaged structures.

Green, yellow, and red placards are used by the local building officials to designate what types of restrictions are imposed on the building. The following are brief descriptions of the intent of the placards:

- **Green**—The building has been **inspected** and no restrictions on use or occupancy have been found. All placards should include the date of inspection and inspector’s identification number. An evaluation form is prepared and given to the building official. Events after the inspection, such as severe weather could require additional inspections and a change of the placard.
- **Yellow**—The building has been inspected and found to be damaged as described on the placard. This placard can be used as a catchall to cover a wide range of hazards that **may limit use** of the building or portions of the building but not make it completely unsafe. Examples of such hazards include water saturated ceiling drywall, collapsed chimney on a portion of the roof or creating a falling hazard on an adjacent structure, electrical power lines that had been inundated during flooding, or a portion of the building has collapsed but other portions do not appear to have been damaged. A yellow

card may allow for limited use of the building for removal of property, but restrict continuous habitation or sleeping in the building.

- **Red**—The building has been inspected and is damaged and **unsafe**. No entry is allowed, except as specifically authorized in writing by the jurisdiction. A red placard does NOT imply that the structure is condemned and must be demolished. It may be possible that repairs can be made to mitigate the hazard. Specific hazards are noted on the placard and may include falling hazards, hazardous materials, loss of safe exits or a potential for collapse.

It should be emphasized that the placement and removal of placards need to be performed under the authority of the controlling jurisdiction such as a building code official, if there is such authority. In the event of a major disaster, it is expected that the local jurisdictions will be overwhelmed. In that case, inspectors may be brought in from outside the area and be preferably paired with employees from the local jurisdiction to facilitate interaction with the public and explaining the reasons for the posting.

The ATC-45 *Field Manual* describes the differences between rapid and detailed building evaluations. The rapid evaluation procedure is primarily an assessment of the exterior of the structure and identifies if the building is apparently safe, unsafe or should have restricted use. Often after a disaster it is important to allow people to return to as many of the affected buildings as possible because of a shortage of shelter and housing or to collect personal belongings. The ATC Inspection protocols can be used to quickly determine if a building is habitable. If it is not apparent what the condition of the building is, then a detailed evaluation may be required. This should especially be done for any of the red placard buildings that have not been condemned.

A detailed evaluation includes visual observations of the external walls, cladding, parapets, and foundations; observation of geotechnical conditions; inspection of the internal structural framing, including vertical and lateral load carrying components; inspection for non-structural hazards such as falling ceiling tiles, or hazardous material spills; and any other potential hazards like debris blocking the exits. ATC-45 recommends that all essential

facilities such as hospitals or fire stations receive a detailed inspection if any damage is suspected.

Placard purchase and/or download information is provided in Appendix B.

iii. High Water Marks

Capturing and documenting the maximum flood elevations observed at different locations within the impacted area is beneficial to your community for several reasons. The high water marks may be used to:

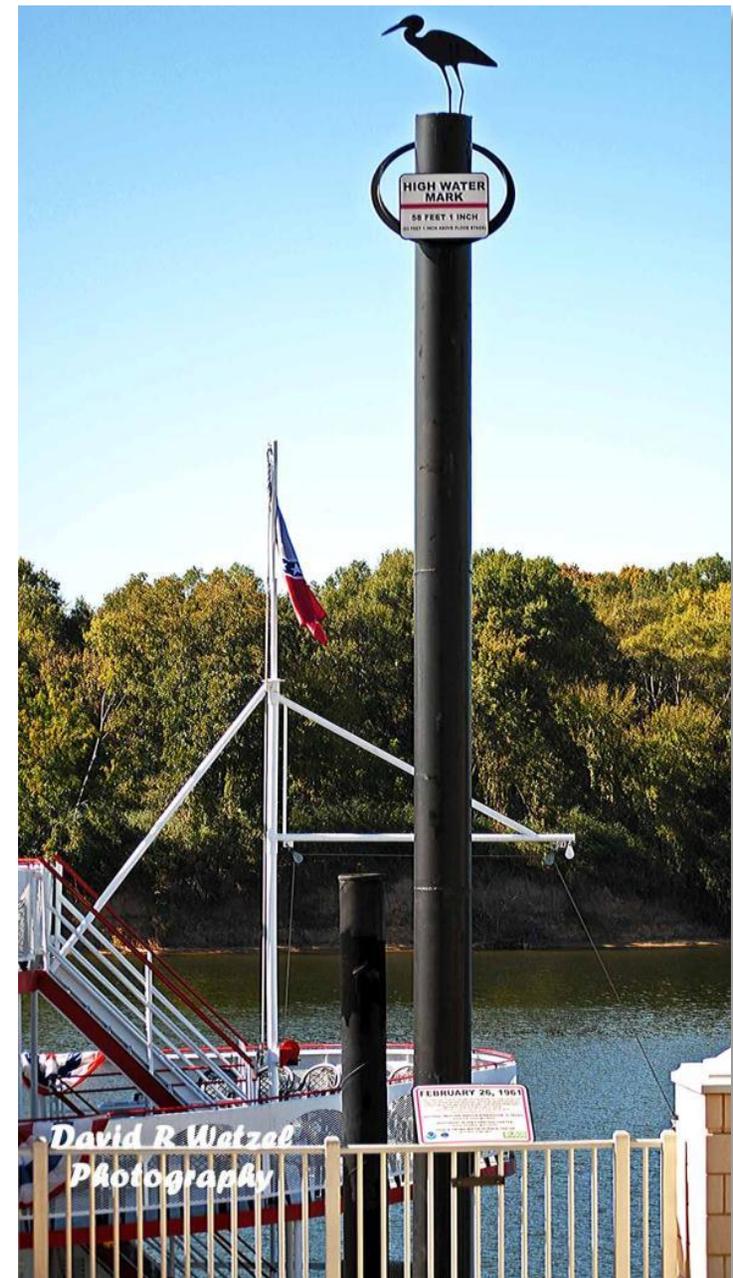
- Estimate the flood frequency;
- Assess the accuracy of the Flood Insurance Rate Maps;
- Calibrate the existing or future hydraulic models;
- Conduct Loss Avoidance Studies;
- Prioritize mitigation projects;
- Assist in the preparation of benefit-cost analyses;
- Provide input for building performance assessments; and
- Determine the depth of flooding for structures.

In addition, your community may choose to post permanent markers in these locations to:

- Raise awareness of flood risk in your community;
- Drive action to reduce risk in your community;
- Earn Community Rating System (CRS) points to reduce the cost of flood insurance across the community.

High water marks should be collected for riverine and/or coastal 'wrack lines' as follows:

- Conduct reconnaissance of areas adjacent to significant flood sources to identify mudlines or waterlines of trees or structures;
- Record locations (including photographs) and general description of items to be marked;
- Place appropriate markers on selected items; and
- Utilize survey equipment to record elevations of high water marks.



High Water Mark Sign at Montgomery, Ala.
(Photo: David R. Wetzel Photography)

b. Code/Ordinance Enforcement

Once the location of the structure relative to the SFHA has been determined, damage determinations completed, and any applicable state and/or federal permits have been obtained, the permit official may proceed to the next step in the permit process. The permit official is responsible for seeing that all the applicable requirements of the community's floodplain regulations are met.

i. Triage Process

Implementing a "triage" process will help the Floodplain Administrator and staff keep the permit process on a timely and efficient schedule, helping to aid in the recovery process for your community. If damages have not resulted in a structure that is unsafe for re-entry, permit requests can be triaged as follows:

- Damaged structures located outside of the SFHA can be issued permits and the homeowner can begin repairs.
- For structures which are clearly NOT substantially damaged (<40%), permits can be issued to repair at the existing elevation; provided no additional improvements or additions will be made and it does not conflict with any other regulations. This includes structures constructed both Post-FIRM and Pre-FIRM.
- Pre-FIRM structures that possibly have received substantial damage (40% to 60%) should undergo a detailed assessment (SDE). To more accurately determine the extent of damage, the permit official needs to have two pieces of information: the structure's pre-damaged fair market value and the cost to restore the structure back to its pre-damaged condition. If additional improvements or additions are planned, the cost of the additional improvements or additions must also be considered. Post-FIRM regulatory standards apply to all substantially damaged structures. Provide information to property owners of the applicable flood safety standards, reconstruction, and permit requirements. Pre-FIRM standards apply to the structures that are determined not substantially damaged. Floodplain development permits are required.

- All Pre-FIRM structures that have obviously received substantial damage (60% or more) can forego a more detailed assessment. Post-FIRM regulatory standards apply. Notify property owners of the applicable flood safety standards and maintain enough documentation of the damage to avoid misunderstandings. Floodplain development permits are required.

ii. Permitting Process

Following the "triage" process, the Floodplain Administrator may begin to issue permits for reconstruction. The following items should be noted in this process:

Fair Market Value

The structure's pre-damaged value is the fair market value of the structure only, excluding the land. Some ways of determining the value are: a professional appraisal, a bill of sale (manufactured homes), an insurance settlement, or tax assessment records.

You may allow the property owner to provide an appraisal of the property (at their own expense) that represents the fair market value of the structure. Only accept appraisals performed by trained, qualified, state-licensed real estate appraisers.

Cost To Restore Structure to Pre-Damaged Condition

The two main items on a cost of repairs list should include the materials used and the cost of labor. When calculating the cost of materials and labor, the fair market value must be used – even if the materials and/or labor are donated. Some exclusions from in the cost of repair include debris removal, clean-up, building plans, and permit fees.

Permit Fees

There may be pressure following a flood event to waive your local permit fees. This decision must be carefully considered, as the cost for your staff, materials, and equipment will also be heavily burdened following the event.

Building Protection Requirements

Buildings located in a SFHA that are determined to be substantially damaged/improved, must be brought into compliance with the minimum requirements of the community's ordinance. This includes elevating the structure to/above the Base Flood Elevation (BFE), using flood resistant materials to/below the BFE, adequate/compliant flood vents for enclosures below the BFE, protecting utilities, elevating utilities and mechanical/electrical equipment, and ensuring that all other local floodplain regulations are met. An "as-built" Elevation Certificate is needed to verify compliance.

The regulations may require a residential building to be elevated, resulting in additional costs for the homeowner. Such costs may be covered under the NFIP's Increased Cost of Compliance (ICC) coverage. Information on the ICC can be found in the September 2003 FEMA Publication No. 301, NFIP's Increased Cost of Compliance Coverage, Guidance for State and Local Officials.

ICC is further discussed in the Mitigation Section.

Moratorium on Construction

With the influx of building permit requests and staffing capabilities of your community, it may be beneficial to consider a temporary moratorium on disaster repair construction. This may also include a moratorium on construction outside of the disaster area for a specified time frame or just a moratorium on construction until damage assessments have been completed.

II. Communication and Coordination Responsibilities

a. Local Agencies/Staff

Coordination items among your staff and community departments should include:

- Elected officials - There will be pressures to rebuild quickly and perhaps less current building code requirements. It is essential to brief your local elected officials on the flood damage prevention ordinance requirements and the permitting process, including the damage assessments. A sample flyer is included in the Appendix D for elected officials.
- Public Works, or similar, regarding cleanup activities within streams, at bridges and culverts, and flood control facilities/assets.
- Local utilities, electric cooperatives, and Alabama Power, regarding turning on service to damaged homes without an "approved to connect" sign.
- Public Information Officer (PIO) to disseminate information to the general public on the recovery process.
- Mutual Aid Agreements for disaster assessment teams.

b. State/Federal

Coordination items among state and federal agencies may include:

- State NFIP Coordinator can provide technical assistance with your flood damage prevention ordinance and enforcement procedures, training needs, and assistance with damage assessments.
- FEMA - Disaster Recovery Centers (DRC) and Reconstruction Information Center (RIC).
- FEMA - Long Term Community Recovery Emergency Support Function 14 (ESF 14).

- Alabama Emergency Management Agency (AEMA) is currently preparing guidance for Community Long-Term Recovery based upon FEMA's National Response Framework.
- Alabama Department of Environmental Management (ADEM) for stream cleanup and permits for other activities that impact the environment.
- Alabama Association of Floodplain Managers (AAFM) may be able to assist in the future with damage assessment teams.
- Alabama Department of Transportation (ALDOT) for debris removal along state highways and interstates.

c. Public

Flood victims will want to return to their homes to begin the process of clean-up and rebuilding as soon as possible. Information should be provided to the general public regarding the permitting process, as well as health and safety concerns. Public notification can be given through the mass media (newspapers, radio, and television.) Notices can also be posted at sites such as disaster recovery centers or emergency shelters. Examples of information include:

Permitting Process

- It should be clear that property owners must obtain appropriate permits from the community's Floodplain Administrator/building official/engineering department before beginning repairs or reconstruction.
- Clearly outline which activities do and do not require permits.
- Outline the damage assessment process that your department uses and substantial damage requirements.
- Special attention should be given to any local, state, or federal regulations that may conflict or overlap. Whichever regulation has more stringent requirements should be followed or civil and criminal penalties could be imposed.

Reconstruction

- Property owners should contact insurance agent to discuss claims for damages incurred from flooding.
- Encourage citizens to follow broadcast media for information on assistance that may be provided by the state or federal government or other organizations.
- Warn property owners that if cleanup or repair contractors are hired, check references and the Better Business Bureau, and be sure they are qualified to do the job. Be wary of people who drive through neighborhoods offering help in cleaning up or repairing their home.

Health and Safety Concerns

- Describe the ATC-45 green, yellow, and red placards.
- Avoid floodwaters; water may be contaminated by oil, gasoline or raw sewage.
- Damaged septic tanks, cesspools, pits and leaching systems should be serviced as soon as possible. Damaged sewer systems are serious health hazards.
- Provide public service announcements on whether or not the community's water supply is safe to drink.
- Warn citizens to clean and disinfect everything that got wet from floodwaters or rain. Mud left from floodwaters can contain sewage and chemicals.
- Citizens should be warned to rest often and eat well. They should keep a manageable schedule, make a list of jobs to do, and perform jobs one at a time.
- Encourage citizens to discuss their concerns with others and seek help. They should contact Red Cross for information on emotional support available in your area.

Recommended documents for distribution to the public are included in the Appendix.

III. Administrative Responsibilities

a. Documentation of Labor, Equipment and Materials

As discussed in the Response Section, good documentation facilitates the Public Assistance project formulation, validation, approval, and funding processes. Permanent restoration of facilities in your community may be eligible for Public Assistance. An eligible facility is any building, works, system, or equipment that is built or manufactured, or any improved and maintained natural feature that is owned by an eligible applicant with certain exceptions. This may include bridges, culverts, and other elements of your maintained stormwater system.

To be eligible, a facility must:

- Be the responsibility of an eligible applicant;
- Be located in a designated disaster area;
- Not be under the specific authority of another federal agency; and
- Be in active use at the time of the disaster.

During the kickoff meeting with FEMA's Federal Public Assistance Officer, you will assess your community's individual needs, discuss disaster related damage, and set forth a plan of action for repair of the facilities. These repair projects are documented on Project Worksheets (PWs). Guidance will be provided at this meeting for the formulation of Project Worksheets. It may be necessary to request technical assistance to write the Project Worksheets from local, state and federal officials.

Keep separate folders for each project that must be completed before project approval is received. For example, damage to three culverts should have a separate folder set up for each culvert, not one folder for all three. When the Project Worksheets are completed and approved, a permanent folder can be established

for each disaster event. It is easier to combine information from several folders than to separate information out of a single folder if information is required during the course of a project.

b. Satellite Office

Based on the size and location of the flood event, it may be beneficial to set up a Satellite Permit Office adjacent to your impacted area to expedite the permitting process while maintaining the continuity of operations at the existing/current office location. This will help to minimize the impact to routine permitting activities and allow for any specialized procedures required for permitting repairs of damaged structures to be properly addressed.

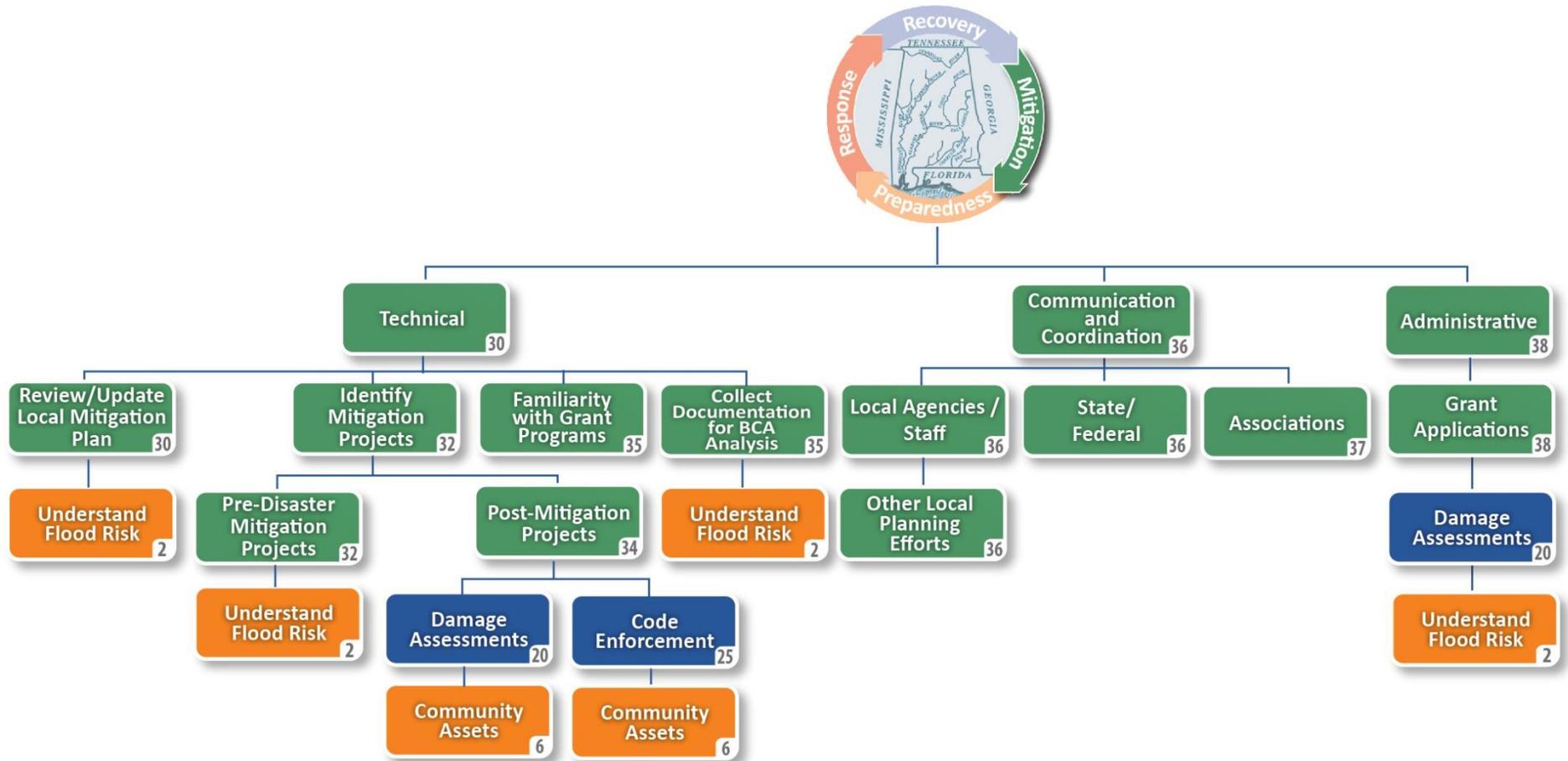
c. Documentation of Permitting

Copies of all flood-related documents should be kept in the community's floodplain management permit files. Examples of the items that should be kept are:

- Floodplain development permits;
- Elevation certificates or "as-built" certifications;
- Floodproofing certificates;
- Correspondence with owners of damaged structures;
- Photographs of damaged structures;
- Damage assessments;
- Inventory of flood-damaged structures;
- Copies of FIRMs or FIRMettes used or marked up as part of disaster recovery; and
- Any other supporting documentation.



Mitigation



In the Preparedness, Response, Recovery, Mitigation cycle, Mitigation is most effective when it occurs prior to a flood event, avoiding flood damages entirely. However, as the bridge in the cycle between Recovery and Preparedness, Mitigation opportunities often present themselves most notably in a post-flood setting. This Mitigation section will discuss the technical, coordination/communication, and administrative responsibilities of the Floodplain Administrator relating to mitigation opportunities both prior to a flood event as well as in a post-flood environment.

I. Technical Responsibilities

a. Review/Update Local Hazard Mitigation Plan

The Federal Disaster Mitigation Act (DMA) of 2000 requires communities to develop an approved local hazard mitigation plan to be eligible to apply for certain federal Hazard Mitigation Assistance grants. In the Preparedness Phase, the Floodplain Administrator should be actively involved in development of the Local Hazard Mitigation Plan as it pertains to assessment of flood risk and identification of flood-related mitigation actions that would make the community more resistant to damage from future flood events.



The DMA requirements stipulate that communities must develop a plan for how the Hazard Mitigation Plan will be reviewed and updated. At a minimum, the plan must be updated and submitted for State EMA and FEMA approval every five years. Many communities have included a provision in the Hazard Mitigation Plan maintenance strategy to review the plan annually and/or after damaging events. As the local expert on flood risk and potential mitigation opportunities in flood hazard areas, the Floodplain Administrator should have a key role in the planning committee's efforts to review and update the Local Hazard Mitigation Plan.

Even if the Local Hazard Mitigation Plan maintenance strategy does not include a formal review of the plan after a damaging flood event, the Floodplain Administrator should review the flood-related sections of the plan. A recent flood event may reveal additional vulnerabilities that were previously unknown. If that is the case, it should be added to the Risk Assessment portion of the Hazard Mitigation Plan. In addition, the Mitigation Strategy of the Hazard Mitigation Plan should be reviewed to determine if any of the identified actions should be pursued in the post-flood environment to prevent similar damages from occurring during the next flood event. The Floodplain Administrator should provide a document that summarizes the information below. It should be submitted to the local official responsible for keeping the Local Hazard Mitigation Plan current.

- Description of the flood event and damages caused. If known, the flood frequency should be provided. This information will be used to update the section on previous events, which is required in the Local Hazard Mitigation Plan.
- New information relating to flood risk. Did the flood occur in areas known to be at risk? Or, were areas flooded, and structures damaged, that are outside the mapped flood hazard areas?
- Are there mitigation initiatives included in the current Local Hazard Mitigation Plan that should be pursued based on

observations made and information gathered from the recent event?

- Are there additional mitigation initiatives that should be added to the Local Hazard Mitigation Plan?

Remember that any applications which a community submits for funding from the FEMA Hazard Mitigation Assistance (HMA) Programs must “be consistent with” the mitigation strategy outlined in the Local Hazard Mitigation Plan. If new mitigation projects are identified for funding as a result of the recent event, a formal amendment to the Local Hazard Mitigation Plan may be necessary if the project is not consistent with the currently approved mitigation strategy.

No Adverse Impact (NAI)

No Adverse Impact principles (see ASFPM's *A Toolkit For Common Sense Floodplain Management [2003]* and *Mitigation: A How-To-Guide for NAI [2013]*) support a multi-objective approach to mitigation planning at the local level that will identify all of the impacts of the flood hazards and all the alternative measures to address those impacts. Often floodplain management or mitigation plans focus on the hazard - something to avoid or get away from. To be really effective, plans need to address many other concerns and be proactive toward building a more viable and sustainable community.

To enhance mitigation at the local level, NAI principles could be incorporated into the community's mitigation activities as well as daily activities that the community undertakes. To incorporate NAI principles into the community's mitigation processes, a community or watershed-based management plan is essential. The community or watershed-based management plan should include:

- A technical analysis to quantify current and future conditions;
- Exploration of all mitigation options;
- Incorporation of the most effective mitigation techniques to minimize impacts in the community;
- Identification of implementation measures to manage all of the hazard factors identified;

- Inclusion of strong citizen involvement so the plan is equitable; and
- A vision for future use of the community's land within and outside of the floodplain.

The community or watershed-based management plan defines the process by which all future development will be analyzed. It requires that the effects of proposed development activity anywhere within a watershed could or would have on flood stages, velocity, flows, and erosion or sedimentation elsewhere within that same watershed, be considered prior to approval of the proposed development activity.

When developing a mitigation strategy that goes beyond consideration of the extent of flood waters that result from typical hydrology and hydraulic engineering calculations, there are many other contributing factors to consider. A community needs to fully understand how to protect against or mitigate its flood hazards by considering these other contributing factors that may significantly increase the probability and magnitude of flooding. For Alabama those include:

- **Uncertain flow paths:** moveable bed streams and other floodplains where the channel moves during a flood;
- **Debris and sediment blockage:** flooding caused by debris, log jams, driftwood, gravel, silt and other material (natural or man-made) that moves during the flood and obstructs flood waters;
- **Land subsidence:** lowering of the land surface caused by withdrawal of subsurface water or minerals or by compaction of organic soils;
- **Mudflow hazards:** a river, flow, or inundation of structures or land by liquid mud down a hillside. Usually occurs as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of heavy or sustained rain;
- **Dam failure inundation:** areas that would be flooded if an upstream dam were to fail or overtop that may happen due to structural failure or improper operation;

- **Coastal erosion:** areas subject to the wearing away of land masses caused primarily by waves on the Gulf of Mexico;
- **Riverine erosion:** areas subject to scouring or loss of streambank due to stream velocity, usually along the outside meanders of a channel.
- **Channel Modification:** natural or man-made induced changes to the location of the channel of the stream and its floodplain;
- **Levee failure inundation:** areas that are behind a levee may be subject to residual risk if the levee is susceptible to failure or overtopping depending on whether levees are periodically inspected to ensure they meet current levee safety standards, are properly operated and have an adequate Emergency Evacuation Plan; and
- **Sea level rise:** global warming is contributing to a rise in the sea level, a problem that is compounded in coastal areas subject to subsidence.

FIRMs do not reflect most of these flood hazards. Therefore, Floodplain Administrators should have awareness of areas where these additional hazards exist or areas where conditions exist that may be susceptible to creating those hazards. An example of one of these types of conditions would be an area along a river that was recently clear-cut for logging operations, is located upstream of a bridge, and the logged area is sloped toward the river. Logs from that area could wash into the river, flow downstream, and become lodged in the bridge decking which would result in flooding. Floodplain Administrators should help identify these types of hazards in their communities and include them in mitigation strategies.

b. Identify Potential New Mitigation Projects

The Floodplain Administrator should be the primary resource in a community to identify flood-related mitigation measures that can be implemented pre- or post-disaster to reduce or eliminate damages prior to future flooding events. The Floodplain Administrator should be equipped with knowledge of the flood risks facing the community; an in-depth familiarity with the federal, state, and local regulations that should be considered during execution of

mitigation projects; and an understanding of the community's ability to warn its citizens in advance of a flood. These capabilities will help identify and set appropriate priorities for future mitigation projects.

Pre-Disaster Mitigation Projects

Many of the types of mitigation projects/initiatives that are relevant to a pre-disaster environment relate to prevention and public education activities such as more stringent floodplain development requirements or media campaigns to alert citizens of the availability of flood insurance. The NFIP's Community Rating System (CRS) is an excellent program that has several of its activities involved in pre-disaster mitigation initiatives that a community can undertake. Alabama currently has 14 communities participating in CRS. See the box on the following page for additional details on joining CRS and available resources.

One of the many benefits of the CRS Program is that communities with repetitive loss properties are required to develop a Floodplain Management Plan that addresses its repetitive loss areas and a strategy for reducing flood risk for a community. While the CRS requirements for development of the plan are extensive and require public involvement, a less formal yet very beneficial plan can be developed to address mitigation initiatives that a community can undertake prior to a flooding event. The plan should include an assessment of the hazard(s); an assessment of the impact of the hazard(s) on a community's and its citizen's property, safety, health, and economic well-being; goals for reducing the risk; possible activities to reduce the risk; and a prioritized action plan to mitigate risks that result from the flood hazards.

Depending on the level of risk and the goals for risk reduction, there are several possible activities that can be selected to reduce the risk. The FEMA 551 manual entitled "Selecting Appropriate Mitigation Measures for Floodprone Structures" (March 2007) provides guidance on selection of mitigation measures. The most common mitigation measures that should be considered by the community include:

National Flood Insurance Community Rating System

1. **Drainage Improvements** – Developing or improving stormwater conveyance and storage system to provide greater carrying capacity to move floodwaters from areas where damage occurs.
2. **Barriers** – Constructing floodwalls or levees around a single or multiple structures to hold back floodwaters or the installation of temporary barriers that block the flow of floodwaters through openings in structures (windows, doors, gates).
3. **Wet Floodproofing** – Making uninhabitable portions of a structure resistant to flood damage and allowing water to enter the structure during a flood which reduces the hydrostatic pressure on the structure's walls.
4. **Dry Floodproofing** – Sealing structures to prevent floodwaters from entering habitable and uninhabited areas by using waterproof coatings, impermeable membranes, watertight shields over openings, and sewer backflow prevention measures. Typically only done for non-residential structures and requires a structural analysis to determine if walls are capable of withstanding hydrostatic and hydrodynamic forces.
5. **Elevation** – Raising the entire structure so the lowest floor (or lowest horizontal structural component for high hazard coastal zones) is at or above the base flood elevation is one of the most effective and most common mitigation measures methods used to keep habitable areas of a residential structure from being flooded.
6. **Acquisition** – Purchasing and demolishing a structure located in a high hazard flood zone from the existing property owner is the most successful way to ensure that a structure will not accumulate additional losses from future flood events. Typically it is purchased by a local government agency through grant funds and the parcel is to remain in open space use in perpetuity with applicable deed restrictions.

The National Flood Insurance Program (NFIP) Community Rating System (CRS) was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum NFIP standards. Any community in full compliance with the minimum NFIP floodplain management requirements may apply to join the CRS.

In the CRS, a community accrues points to improve its Class rating to receive flood insurance premium discounts for all NFIP policy holders in the community. For each CRS Class improvement, all flood insurance policy holders receive a 5 percent discount on insurance premiums. Points are awarded for engaging in any of 18 creditable activities, organized under four categories:

- Public information
- Mapping and regulations
- Flood damage reduction
 - Floodplain management planning
 - Acquisition and relocation
 - Flood protection
 - Drainage system maintenance
- Emergency warnings and response



Formulas and adjustment factors are used to calculate credit points for each activity.

A list of resources is available at the CRS website:

www.fema.gov/nfip/crs.shtm

and FEMA's CRS outreach website:

www.crsresources.org/

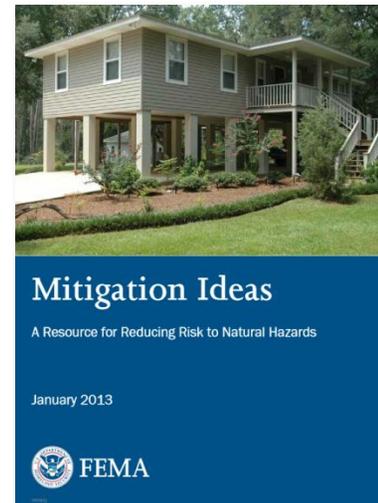
For more information about the CRS or to obtain the CRS application, contact the ADECA State NFIP Coordinator, Corey Garyotis at corey.garyotis@adeca.alabama.gov or (334) 353-0853; or the Insurance Services Office, CRS Coordinator for Alabama, Jonathan Smith by phone at (228) 235-6506 or by e-mail at jlsmith@iso.com.

Post-Flood Mitigation Projects

The question, “Could these damages have been prevented?” should be asked as the Floodplain Administrator surveys and documents the damages that have occurred in the community as a result of a recent flood event. Although various risk assessment models exist to estimate what types of damages a community might face in a flood, a real-world event may reveal vulnerabilities that were not previously anticipated. As damage is surveyed, the Floodplain Administrator should keep a log of all potential solutions that could prevent similar future damage. This log of potential mitigation solutions should be reviewed with others in the community. Further details are discussed in the Mitigation - Administrative Responsibilities Section.

In some instances, the post-flood environment provides the most effective opportunity to initiate mitigation projects. For example, if a floodplain acquisition project has been identified as a viable solution to repetitive flooding, the post-flood environment may prove to be the most effective time to demonstrate the benefits of the project. With a flood-damaged home, homeowners may be more willing to participate in the voluntary program. In addition, if the flood event resulted in a Presidential major disaster declaration, additional mitigation funds may be available. Another example of a mitigation project that is most effective in a post-flood environment is elevation of substantially damaged structures. To remain in compliance, structures that were substantially damaged may need to be elevated. This may provide a good opportunity to combine various funding programs together for maximum benefit. Various programs available to fund mitigation projects are discussed in additional detail in the Mitigation - Administrative Responsibilities Section.

FEMA’s Publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, provides specific mitigation actions that can be undertaken in communities to mitigate damages from multiple hazards. This publication includes 23 categories of flood mitigation activities that can be implemented in a pre-flood or post-flood environment. Each of the 23 categories lists additional specific activities that can be accomplished.



“Mitigation Ideas” is FEMA’s resource guide for communities to use to identify and evaluate a range of potential mitigation actions for reducing risk to natural hazards and disasters.

- Incorporate Flood Mitigation in Local Planning
- Manage the Floodplain Beyond Minimum Requirements
- Protect Infrastructure
- Form Partnerships to Support Floodplain Management
- Participate in the Community Rating System
- Protect Critical Facilities
- Limit or Restrict Development in Floodplain Areas
- Establish Local Funding Mechanisms for Flood Mitigation
- Construct Flood Control Measures
- Adopt and Enforce Building Codes and Development Standards
- Remove Existing Structures from Flood Hazard Areas
- Protect and Restore Natural Flood Mitigation Features
- Improve Stormwater Management Planning
- Improve Stormwater Drainage System Capacity
- Preserve Floodplains as Open Space
- Adopt Policies to Reduce Stormwater Runoff
- Conduct Regular Maintenance for Drainage Systems and Flood Control Structures
- Increase Awareness of Flood Risk and Safety
- Improve Flood Risk Assessment
- Elevate or Retrofit Structures and Utilities
- Educate Property Owners about Flood Mitigation Techniques
- Join or Improve Compliance with NFIP
- Floodproof Residential and Non-Residential Structures

c. Become Familiar with Grant Funding Opportunities

Although there are others in the community, such as local emergency management officials that may be aware of mitigation grant funding opportunities available following a disaster, the Floodplain Administrator is in a unique position to maintain an understanding of the various grant programs and how they relate specifically to flood mitigation. An understanding of the various funding streams and opportunities will enable the Floodplain Administrator to assist the local official responsible for mitigation grants in matching up identified mitigation projects with the programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. See the Mitigation - Administrative Responsibilities Section for more information on the mitigation-related grant programs that may be available to your community.

d. Collect documentation for Benefit-Cost Analysis

The FEMA Hazard Mitigation Assistance grant requirements stipulate that FEMA provide funding for mitigation measures that are cost-effective or are in the interest of the National Flood Insurance Fund. Therefore, FEMA requires applicants to demonstrate that mitigation projects are cost-effective. The Floodplain Administrator is in a position to assist with the mitigation grant effort and with compiling much of the documentation that may be necessary to demonstrate cost-effectiveness. Projects for which benefits exceed costs are generally considered cost-effective. FEMA provides software that performs a Benefit-Cost Analysis (BCA), resulting in a calculated Benefit-Cost Ratio (BCR). Some of the data that may be needed for various types of mitigation projects are:

- First Floor Elevation;
- Flood Hazard Data (Flood Elevation and Discharge Data);

- Documentation of previous damages that will be avoided by the project; and
- Frequency of Occurrence of event that caused damages.

The current software and additional information on determining cost-effectiveness is available at www.bchelpline.com

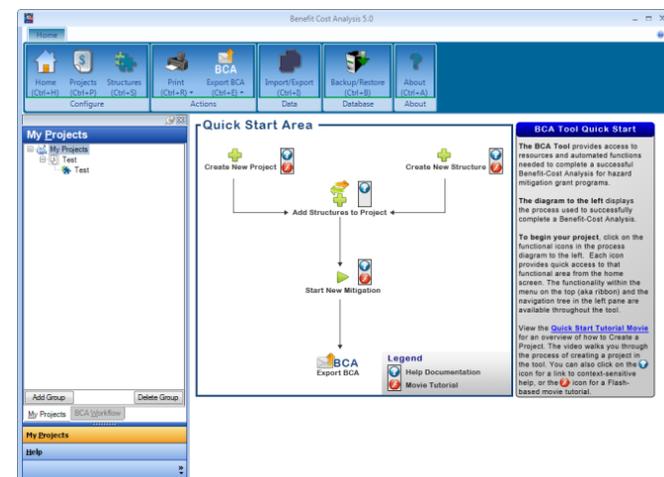
Benefit-Cost Analysis

Starting March of 2014, FEMA released the Benefit-Cost Analysis Tool version 5.0. It is available to be used to demonstrate cost-effectiveness for FEMA's Hazard Mitigation Assistance (HMA) grant programs.

To use FEMA's Benefit-Cost Analysis Tool you must first download the compressed file, extract and save the file in one folder on your computer. While the program is installing, additional file sets will be downloaded from the internet. Make sure to maintain access to the internet until the program is fully installed. If you have any questions about the new BCA software program, please contact the BC Helpline at bchelpline@dhs.gov or at 1-855-540-6744.

The compressed file is available here:

www.fema.gov/media-library/assets/documents/92923



II. Communication and Coordination Responsibilities

a. Local Agencies/Staff

Besides local planning officials, the Floodplain Administrator should maintain a working relationship with other officials in the community. Local officials that can provide valuable information on flood risk and specific flood-related damages include:

- **Emergency Management Officials** — These local officials should be familiar with FEMA program availability and requirements. The local emergency manager can also provide insight into mitigation opportunities. For example, local emergency managers will know where evacuations were necessary as well as transportation routes that are impacted by flooding. This information will be important to understand in development of potential mitigation projects to make the community more disaster resistant/resilient.
- **Public Works Officials** — These officials can provide information on public infrastructure that has been damaged as well as provide insight on how damages could be avoided in the future. The Floodplain Administrator and public works officials should discuss optimum use of FEMA's Public Assistance Section 406 Mitigation funding. This is discussed in greater detail in the Mitigation - Administrative Responsibilities Section.
- **Public Utility Providers** — Similar to public works officials, public utility providers can provide information on damages incurred by utility lines as well as ideas on prevention of similar future damages.

b. Other Local Planning Efforts

As the community's authority on flood risk and potential solutions to prevent future flood damage, the Floodplain Administrator should coordinate regularly with other planning officials and participate in planning initiatives in the community. The best form of mitigation is prevention of the risk. As your community is developing other plans such as Comprehensive Plans, Master Plans, Capital Improvement Plans, and Future Growth Plans, the Floodplain Administrator should provide flood risk information to ensure planned development areas will not increase the community's vulnerability to flooding.

If your community has Geographic Information Systems (GIS) capabilities, the Floodplain Administrator should work closely with others in the community to use available GIS tools to compare flood risk layers such as the digital Flood Insurance Rate Maps with other planning products such as future land use maps. If GIS capabilities are not present, other mapping products should be compared to ensure future development does not increase a community's flood risk. This up-front coordination in the early planning stages can help communities avoid future development in areas at risk to flooding.

c. State/Federal

Floodplain Administrators should maintain communication with state officials that work in programs focused on floodplain management and flood hazard mitigation. They have access to resources and recent programmatic updates that could prove useful to local Floodplain Administrators.

- **State floodplain management officials** - ADECA's Office of Water Resources, Floodplain Management Unit works closely with the Federal Emergency Management Agency (FEMA) and local communities to build relationships that can help strengthen mitigation efforts and lead to actions that better protect residents. Those actions, when properly selected and planned, will reduce flood risk in communities through the utilization of flood studies and mapping, and non-regulatory tools that are created with FEMA's Risk

MAP Program. State floodplain management officials can provide assistance to local Floodplain Administrators in all areas of managing local floodplains including floodplain mapping, National Flood Insurance Program requirements, floodplain development permitting assistance, substantial damage determination, Community Rating System, Revisions/Amendments to flood studies and maps, etc.

- State emergency management officials - AEMA's Mitigation Branch is a valuable resource to Floodplain Administrators when it comes to hazard mitigation planning, HMA grants, hazard mitigation project development, etc.
- Natural resources management officials - Another lead mitigation agency at the state level for coastal areas is the Alabama Department of Conservation and Natural Resources (ADCNR). The Department's Coastal Section administers the Alabama Coastal Area Management Program (ACAMP). Natural hazards mitigation is an important component to this program.
- State environmental and water quality officials - Alabama Department of Environmental Management (ADEM) is the state agency responsible for protection and improvement of the quality of Alabama's environment and the health of all its citizens. Mitigation projects involving channel improvements or stream rehabilitation should be coordinated with ADEM.

d. State/National Associations

In addition to local and state officials, the Floodplain Administrator should coordinate with and/or participate in the state and national associations focused on flood risk and mitigation.

Association of State Floodplain Managers (ASFPM)

Similar to the Alabama Association of Floodplain Managers (next page), the national Association of State Floodplain Managers (ASFPM) provides additional networking opportunities for Floodplain Administrators. Local Floodplain Administrators should maintain awareness through ADECA's floodplain management staff concerning activities and initiatives being pursued by these associations. In particular, ASFPM has the Flood Mitigation, No Adverse Impact, and Nonstructural Floodproofing Committees that are active in national mitigation policies. For more information, visit www.floods.org

Alabama Association of Regional Councils (AARC) The Alabama Association of Regional Councils (AARC) is a statewide association comprised of the 12 regional planning councils (RPCs). AARC has been an active participant in both state and local hazard mitigation planning initiatives. The regional councils in Alabama that make up the AARC are typically called either Regional Planning Commissions (RPC) or Councils of Government (COG). They are public organizations encompassing a multi-jurisdictional regional community and are also comprised of every town, city, and county within the State.

Through planning, policymaking, coordination, advocacy, and technical assistance, the regional commission serves the local governments and citizens in the region. The governing bodies of councils are primarily composed of local government elected officials and appointed representatives of local communities and state government. The AARC and RPCs are directly tied to mitigation planning through the generous contributions of RPC

members, who developed the vast majority of Alabama's initial local hazard mitigation plans.

Alabama Association of Floodplain Managers (AAFM)

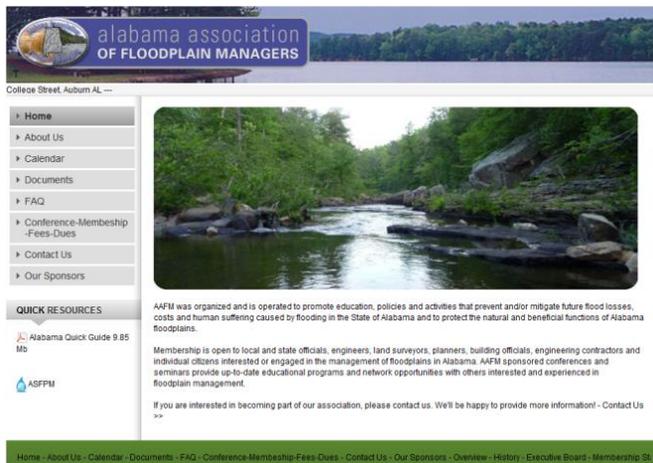
The Alabama Association of Floodplain Managers (AAFM) provides networking opportunities for Floodplain Administrators across the State. Additional information is provided below:

Alabama Association of Floodplain Managers

AAFM was organized and is operated to promote education, policies and activities that prevent and/or mitigate future flood losses, costs and human suffering caused by flooding in the State of Alabama and to protect the natural and beneficial functions of Alabama floodplains.

Membership is open to local and state officials, engineers, land surveyors, planners, building officials, engineering contractors and individual citizens interested or engaged in the management of floodplains in Alabama. AAFM sponsored conferences and seminars provide up-to-date educational programs and network opportunities with others interested and experienced in floodplain management.

For more information, visit www.aafmfloods.org



III. Administrative Responsibilities

a. Grant Applications

Depending on assigned roles and responsibilities in each community, the Floodplain Administrator may be tasked with completing mitigation grant applications for various flood-related mitigation projects. Several of the key mitigation grant programs are detailed below:

FEMA Hazard Mitigation Assistance (HMA) Grants

The Hazard Mitigation Branch of AEMA administers the Hazard Mitigation Assistance (HMA) Grants. There are three main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, and (3) Flood Mitigation Assistance Program. Eligible applicants for the HMA include state and local governments, certain private-non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant. According to Alabama's 2013 State Hazard Mitigation Plan, the state has identified the following flood-related mitigation project activities as priorities for funding under these grants:

- Elevation;
- Acquisition;
- Drainage improvements; and
- Improved identification of threat through floodplain mapping.

Although these are indicated as the current flood-related priorities for use of HMA funds, the Floodplain Administrator should maintain awareness of future priorities established by the AEMA.

***Hazard Mitigation Grant Program (HMGP):
Available Post-Disaster***

HMGP is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, U.S. Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the state requested by the Governor. Indian Tribal governments may also submit a request for a major disaster declaration within their impacted area.

The amount of HMGP funding available to the applicant is based upon the estimated total of federal assistance, subject to the sliding scale formula outlined in 44 CFR Section 206.432(b) that FEMA provides for disaster recovery under each Presidential major disaster declaration. The formula provides for up to 15 percent of the first \$2 billion of estimated aggregate amounts of disaster assistance, up to 10 percent for amounts between \$2 billion and \$10 billion, and up to 7.5 percent for amounts between \$10 billion and \$35.333 billion. For states with enhanced plans, the eligible assistance is up to 20 percent for estimated aggregate amounts of disaster assistance not to exceed \$35.333 billion. Submission of the enhanced plan elements of the Alabama State Hazard Mitigation Plan was anticipated for January 2014.

***Pre-Disaster Mitigation (PDM) Program:
Available Pre-Disaster***

The **PDM** Program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM Program is designed to assist states, territories, Indian tribal governments, and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on federal funding in future disasters.

***Flood Mitigation Assistance (FMA):
Available Pre-Disaster***

The **FMA** program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). The National Flood Insurance Fund (NFIF) provides the funding for the FMA program.

***FEMA Hazard Mitigation Assistance (HMA) Grant Submittal
Information***

AEMA maintains a website with up-to-date information about HMA grant submittal requirements and opportunities:

<http://ema.alabama.gov/mitigation.cfm>.

- For HMGP, a letter of intent must be submitted to AEMA, followed by a full application, including a SF-424, if requested by AEMA.
- For PDM and FMA, applications and subapplications are submitted via the eGrants system, <https://portal.fema.gov/famsVuWeb/home>.
- Application submission due dates and times are posted to the HMA website at www.fema.gov/hazard-mitigation-assistance.
- The PDM and FMA programs are subject to the availability of appropriation funding, as well as any program-specific directive or restriction made with respect to such funds.
- More information about FEMA's Hazard Mitigation Assistance grants can be found on the FEMA HMA Web site at www.fema.gov/hazard-mitigation-assistance.
- Applications for the FEMA Hazard Mitigation Assistance grants can be found on the AEMA website at: <http://ema.alabama.gov/mitigation.cfm>

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Community Development Block Grants (CDBG)

Since 1982, ADECA has administered the State's Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight, or meet an urgent need.

There are three ways CDBG funds can impact hazard mitigation. First, CDBG funds can be used as local planning grants for up to \$50,000. This is another opportunity for assuring local comprehensive plans and regulations address state and regional hazard mitigation objectives. Second, annual CDBG appropriations are used for community development projects, which often include local mitigation projects. Third, CDBG Disaster Recovery funds are allocated after some federally declared disasters. Grant funds can generally be used in federally declared disaster areas for CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

Since grants under the CDBG program are considered non-federal funds, they can also be used to meet the non-federal match requirements for grant programs such as FEMA's Hazard Mitigation Assistance (HMA) Grants.

Additional information is available at the following websites:
www.adeca.alabama.gov/Divisions/ced/cdp/Pages/CDBG.aspx
or
www.hud.gov/offices/cpd/communitydevelopment/programs/drsi/index.cfm.

Small Business Administration (SBA) Loans

SBA offers low interest, fixed rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

Increased Cost of Compliance Coverage

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to \$30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under the Federal Emergency Management Agency's (FEMA's) National Flood Insurance Program (NFIP).

ICC coverage can help pay for four different types of mitigation activities to bring a building into compliance with the community's floodplain management regulations:

- Elevation is this process consists of raising the building to or above the BFE.
- Floodproofing applies only to non-residential buildings. For a building to be certified as floodproofed, it must be watertight below the BFE. The walls must be substantially impermeable to water and designed to resist the stresses imposed by flood waters.

- Relocation involves moving the entire building to another location on the same lot, or to another lot, usually outside the floodplain.
- Demolition may be necessary in cases where damage is too severe to warrant elevation, floodproofing, or relocation; or where the building is in such poor condition that it is not worth the investment to undertake any combination of the above activities.

For obtain more information on ICC coverage, visit:
www.fema.gov/library/viewRecord.do?id=3010

Combining Mitigation Programs

Some of the grant programs can be combined or “packaged” together. For example, although CDBG funds originate from the United States Department of Housing and Urban Development (HUD), they are considered “non-federal” funds and can therefore be used as the non-federal match requirement for FEMA Hazard Mitigation Assistance Grants. Similarly, Increased Cost of Compliance Coverage under the NFIP can also be used as the non-federal match portion of a Hazard Mitigation Assistance grant. Your community can then use FEMA mitigation grant funds to help pay for any additional portion of the cost of elevation, floodproofing, relocation, or demolition that is more than the ICC claim payment.

More information about FEMA’s Hazard Mitigation Assistance grants can be found on the FEMA HMA Web site at
www.fema.gov/hazard-mitigation-assistance.

Applications for the FEMA Hazard Mitigation Assistance grants can be found on the AEMA website at:
<http://ema.alabama.gov/mitigation.cfm>



FEMA Hazard Mitigation project in Alabama - Raising this utility box prevents future damage in the event of a flood. Photo by: Dave Gately/ FEMA News Photo



Baldwin County, Alabama – Residential elevation and installation of breakaway walls saved this home from flood damage. FEMA News Photo