Photo Courtesy: Arkansas Department of Parks and Tourism

Flood Risk Report

Cache Watershed, AR

HUC8 08020302

November 2017

Version Number	Version Date	Summary
1.0	11/28/2017	Initial Report Development

Preface

The Department of Homeland Security, Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides states, tribes, and local communities with flood risk information, datasets, risk assessments, and tools that they can use to increase their resilience to flooding and better protect their residents. By pairing accurate floodplain maps with risk assessment tools and planning and outreach support, Risk MAP transforms the traditional flood mapping efforts into an integrated process of identifying, assessing, communicating, planning for, and mitigating flood-related risks.

The Flood Risk Report (FRR) is one of the tools created though the Risk MAP program. An FRR provides non-regulatory information to help local or tribal officials, floodplain managers, planners, emergency managers, and others. Local, federal, and state officials can use the information in the FRR to establish a better understanding of their flood risk, take steps to mitigate those risks, and communicate those risks to their residents and local businesses.

The FRR serves as a guide when communities update local hazard mitigation plans, community comprehensive plans, and emergency operations and response plans. It is meant to communicate risk to officials and inform them of the modification of development standards, as well as assist in identifying necessary or potential mitigation projects. The report extends beyond community limits to provide flood risk data for the Cache Watershed.

Flood risk is always changing, and studies, reports, or other sources may be available that provide more comprehensive information. This report is not intended to be the regulatory nor the final authoritative source of all flood risk data in the watershed. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the project area.

Table of Contents

Executive Summary

The Flood Risk Report has two goals: (**1) inform communities of their risks** related to certain natural hazards and (**2) enable communities to act to reduce their risk**. The information within this Risk Report is intended to assist federal, state, and local officials with the following goals:

- **Communicate risk** – Local officials can use the information in this report to communicate with property owners, business owners, and other residents about risks and areas of mitigation interest.
- **Update local hazard mitigation plans and community comprehensive plans** – Planners can use risk information to develop and/or update hazard mitigation plans, comprehensive plans, future land use maps, and zoning regulations. For example, zoning codes can be changed to provide for more appropriate land uses in high-hazard areas.
- **Update emergency operations and response plans** – Emergency managers can identify high-risk areas for potential evacuation and low-risk areas for sheltering. Risk assessment information may show vulnerable areas, facilities, and infrastructure for which continuity of operations plans, continuity of government plans, and emergency operations plans would be essential.
- **Inform the modification of development standards** – Planners and public works officials can use information in this report to support the adjustment of development standards for certain locations.
- **Identify mitigation projects** – Planners and emergency managers can use this risk assessment to determine specific mitigation projects of interest. For example, a floodplain manager may identify critical facilities that need to be elevated or removed from the floodplain.

This Risk Report showcases risk assessments, which analyze how a hazard affects the built environment, population, and local economy, to identify mitigation actions and develop mitigation strategies.

The information in this Risk Report should be used to identify areas in need of mitigation projects and to support additional efforts to educate residents on the hazards that may affect them. The areas of greatest hazard impact are identified in the Areas of Mitigation Interest section of this report, which can serve as a starting point for identifying and prioritizing actions a community can take to reduce its risks.

About the FEMA Risk Mapping, Assessment, and Planning (Risk MAP) Program

Flood risk is continually changing over time due to factors such as new building and development and weather patterns. The goal of the Federal Emergency Management Agency's (FEMA) Risk MAP program is to work with federal, state, tribal, and local partners to identify and reduce flood risk across communities. These projects are conducted using watershed boundaries, bringing together multiple communities to identify broader mitigation actions and create consistency across the watershed. The program provides resources and support that are tailored to each community to help mitigate their risk and work towards a reduction in risk and future loss.

Through coordination and data sharing, the communities in the watershed work as partners in the mapping process. In addition to providing data, the communities can also provide insight into flooding issues and flood prevention within their areas. To prepare for a future study and assist in mitigation, FEMA provides a number of data sources that include information from the community, such as the following:

- Areas of repeated flooding and insurance claims
- Future development plans
- Areas of low water crossings
- High water marks from recent flooding events
- Areas of evacuation during high water
- Master drainage plans, flood risk reduction projects, and large areas of fill placement
- Local flood studies
- Other flood risk information

For more information about ways communities can take action or take advantage of available resources, please review the attached appendices.

Part of the data that FEMA is providing communities during the Risk MAP process is Base Level Engineering (BLE) for select watersheds. BLE is a form of hydrologic and hydraulic modeling which, when completed, can provide modeled flood hazard data in existing Zone As or where no effective flood hazard zone has been designated. Knowing the extent of flooding during the 1-percent-annual-chance flooding event supports risk reduction efforts and supports more resilient community planning. Completed BLE data is provided to watershed communities for planning, risk communication, floodplain management, and permitting activities, and to inform future flood study needs.

For information on BLE in the Cache Watershed, see the Phase Zero: Investment section of this report.

About the Cache Watershed

The Cache Watershed (HUC 08020302) encompasses an area of approximately 1,956 square miles and extends across 12 counties in Arkansas (Clay, Craighead, Cross, Greene, Jackson, Lawrence, Monroe, Poinsett, Prairie, Randolph, St. Francis, and Woodruff) and one county in Missouri (Butler). The majority of the watershed is located in the northeastern portion of Arkansas between Crowley's Ridge and the White River. The major communities in the watershed include portions of the cities of Bono, Brinkley, Jonesboro, Newport, Piggott, and Walnut Ridge. Smaller communities include Cotton Plant, McCrory, and Weiner. The communities in the Cache Watershed and their NFIP status are listed in Table 1. All of the communities listed in the table are in Arkansas, except for Butler County, MO. The watershed and its communities are shown on Figure 2.

The Cache Watershed lies within the White River Basin and is located in northeastern Arkansas. The Cache Watershed consists of flat, low-lying areas with numerous interconnected channels except for Crowley's Ridge, a geological ridge formation that makes up the northeastern border of the watershed. During past events, local communities have experienced flooding issues, some of which are due to localized development in and around the floodplain and while other issues are due to the nature of the watershed. Upstream of Grubbs, AR, the drainage has been significantly altered from natural conditions with many of the streams being channelized. Downstream of Grubbs, there has been less alteration and

some restoration of the natural drainage. In the lower Cache Watershed, there are large areas of protected bottomland hardwood wetlands, including the Cache River National Wildlife Refuge and a number of State Wildlife Management Areas. Because of the low elevation and relief of the watershed, flooding is common in those areas of the watershed not on Crowley's Ridge.

The Cache River is a tributary of the White River. Its largest tributary is Bayou DeView, which joins the Cache River just upstream of the White River. The Cache River originates in southern Missouri, entering Arkansas in Clay County. Bayou DeView originates on Crowley's Ridge in Greene County.

Table 1: NFIP Status of Project Area Communities.

County	Community Name	Community Identification Number (CID)	Participating Community?	CRS Rating
Clay	Clay County Unincorporated Areas [1]	050423	Yes	N/A
Clay	Knobel, City of	050032	Yes	N/A
Clay	McDougal, City of	050033	Yes	N/A
Clay	Peach Orchard, City of	050034	Yes	N/A
Clay	Piggott, City of [1]	050035	Yes	N/A
Clay	Pollard, City of	050036	Yes	N/A
Craighead	Craighead County Unincorporated Areas [1]	050427	Yes	N/A
Craighead	Bono, City of	050046	Yes	9
Craighead	Cash, Town of	050396	Yes	N/A
Craighead	Egypt, Town of	050585	Yes	N/A
Craighead	Jonesboro, City of [1]	050048	Yes	8
Cross	Cross County Unincorporated Areas [1]	050056	Yes	N/A
Greene	Greene County Unincorporated Areas [1]	050435	Yes	N/A
Greene	Lafe, Town of	050569	No	N/A
Jackson	Jackson County Unincorporated Areas [1]	050096	Yes	N/A
Jackson	Amagon, Town of	050097	Yes	N/A
Jackson	Beedeville, Town of	050098	Yes	N/A
Jackson	Grubbs, City of	050101	Yes	N/A
Jackson	Newport, City of [1]	050103	Yes	N/A
Jackson	Tupelo, Town of	050106	Yes	N/A
Jackson	Weldon, Town of	050486	No	N/A
Lawrence	Lawrence County Unincorporated Areas [1]	050443	Yes	N/A
Lawrence	Sedgwick, Town of	050576	Yes	N/A
Lawrence	Walnut Ridge, City of [1]	050122	Yes	N/A
Monroe	Monroe County Unincorporated Areas [1]	050154	Yes	N/A
Monroe	Brinkley, City of [1]	050155	Yes	N/A
Monroe	Fargo, Town of	N/A	No	N/A
Poinsett	Poinsett County Unincorporated Areas [1]	050172	Yes	N/A
Poinsett	Fisher, City of [1]	050413	No	N/A
Poinsett	Waldenburg, Town of [1]	050497	Yes	N/A
Poinsett	Weiner, City of [1]	050373	Yes	N/A
Prairie	Prairie County Unincorporated Areas [1]	050459	Yes	N/A
Prairie	Biscoe, City of [1]	050415	Yes	N/A
Randolph	Randolph County Unincorporated Areas [1]	050460	Yes	N/A

County	Community Name	Community Identification Number (CID)	Participating Community?	CRS Rating
Randolph	O'Kean, Town of	050271	No	N/A
St. Francis	St. Francis County Unincorporated Areas [1]	050184	Yes	N/A
Woodruff	Woodruff County Unincorporated Areas [1]	050468	Yes	N/A
Woodruff	Cotton Plant, City of	050231	Yes	N/A
Woodruff	Hunter, Town of [1]	050599	No	N/A
Woodruff	McCrory, City of	050232	Yes	N/A
Woodruff	Patterson, City of	050274	Yes	N/A
Butler	Butler County, MO Unincorporated Areas [1]	290044	Yes	N/A

[1] Community is located within more than one HUC8 watershed.

WATERSHED AND COMMUNITIES MAP

CACHE
(HUC 08020302)

FEMA

0 2.5 5 Miles

N W E S

County Seat
Interstate
U.S. Highway
City Limits
County Boundary
Major Reaches of Watershed
Other Waters
Large Waterbody
Watershed

Project Location

FIGURE 1

DATE: 6/27/2017

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Introduction

Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry area. Floods become hazardous to people and property when they inundate an area where development has occurred, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the accumulation of unwanted debris. Severe flood losses can destroy buildings and crops and cause severe injuries or death.

Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Even if people know where a flood might occur, they may not know the level of flood risk in that area. The most common method for determining flood risk, also referred to as vulnerability, is to identify both the probability and the consequences of flooding:

> **Flood Risk** (or Vulnerability) **= Probability x Consequences**; where
> **Probability** = the likelihood of occurrence
> **Consequences** = the **estimated** impacts associated with the occurrence on life, property, and infrastructure

The probability of a flood is the likelihood that it will occur. The probability of flooding can change based on physical, environmental, and/or engineering factors. These factors will also have an effect on the area that is impacted by the flood, increasing or decreasing the size of the affected area. The ability to assess the probability of a flood, and the level of accuracy for that assessment, are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the water body in question.

The consequences of a flood are the estimated effects associated with its occurrence. Consequences relate to human activities within an area and how a flood affects the natural and built environment. It is important that individuals and communities have an accurate and current understanding of their risk because anyone can be vulnerable to flooding. Individuals that are located outside of the Special Flood Hazard Area (SFHA) file more than 20 percent of insurance claims and receive 1/3 of disaster assistance for flooding. Having an awareness of risk can allow communities and their residents to address the potential consequences. Understanding risk can also allow for long-term development planning, opportunities for revitalization efforts, and modifications in how interaction occurs with the existing risk.

FEMA relies heavily on information and data provided at a local level for a holistic community approach to risk identification and mapping. Flood Risk Projects are focused on identifying (1) areas where current flood hazard inventory does not provide adequate detail to support local floodplain management activities, (2) mitigation interest areas that may require more detailed engineering information than currently available, and (3) determine community intent to reduce the risk throughout the watershed to assist FEMA's future investment in these project areas. Watersheds are selected for Discovery based on evaluations of flood risk, data need, availability of elevation data, regional knowledge of technical issues, identification of a community supported mitigation projects, and/or input from the federal, state, and local partners. The status of Discovery watersheds in Arkansas is shown in Figure 1.

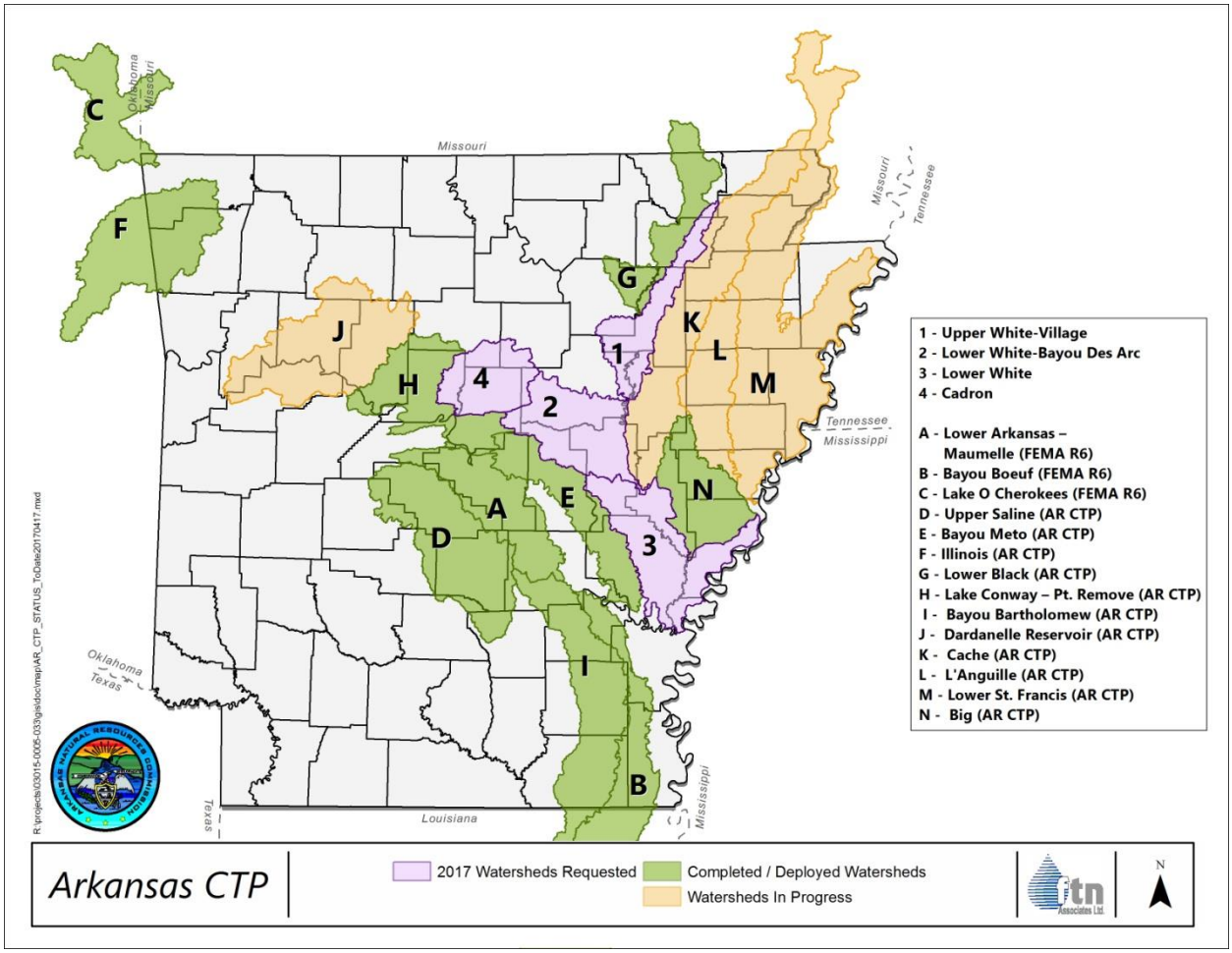


Figure 2. Arkansas CTP Discovery watershed status.

Watershed Basics

Background

The Cache Watershed (HUC8 08020302) spans from Butler County, Missouri to Monroe County, Arkansas where the Cache River flows into the downstream Lower White Watershed. A total of 42 communities are included in this Risk Mapping, Assessment, and Planning (Risk MAP) project, and over 1,950 square miles of study area make up the watershed. Figure 2 provides an overview of the Cache Watershed and its geographic location within the state.

Population

According to the 2010 Census, the total population of the watershed is estimated to be 56,296 people. Populations for the counties that intersect the Cache Watershed experienced an overall average population decrease of approximately 0.4 percent between the 2000 and 2010 censuses, although the largest population source, Craighead County, saw an average increase of approximate 1.6 percent. Since 2010, population growth has increased with the 2016 population estimate at 1.9 percent above the number reported in the 2010 census. Based on 2010 Census data, the major community in the watershed, Jonesboro, had a total population of 67,627 (22,447 in the watershed) in 2010 (see Table 2).

Watershed Land Use

The Cache Watershed lies within the White River Basin and is located in northeastern Arkansas. The Cache Watershed consists of flat, low-lying areas with numerous interconnected channels except for Crowley's Ridge, a geological ridge formation that makes up the northeastern border of the watershed. During past events, local communities have experienced flooding issues, some of which are due to localized development in and around the floodplain and while other issues are due to the nature of the watershed. Upstream of Grubbs, AR, the drainage has been significantly altered from natural conditions with many of the streams being channelized. Downstream of Grubbs, there has been less alteration and some restoration of the natural drainage. In the lower Cache Watershed, there are large areas of protected bottomland hardwood wetlands, including the Cache River National Wildlife Refuge and a number of State Wildlife Management Areas. Because of the low elevation and relief of the watershed, flooding is common in those areas of the watershed not on Crowley's Ridge (see Table 2).

Table 2: Population and Area Characteristics [3]

Risk MAP Project	Total Population in Deployed Area (2010)	Average % Population Growth/Yr. (2000-2010)	Predicted Population * (by 2021)	Land Area (mi^2)	Developed Area	Open Water
CACHE WATERSHED	56,296	-0.4%	370,644	1,956	2.1%	1.4%

[3] Data obtained from the U.S. Census Bureau; ESRI Demographic 5-year Projections; and National Land Cover Database

* Predicted Population by County, which may include areas outside of watershed.

National Flood Insurance Program Status and Regulation

In order to be a participant in the National Flood Insurance Program (NFIP), all interested communities must adopt and submit floodplain management ordinances that meet or exceed the minimum NFIP regulations. These regulations can be found in the Code of Federal Regulations and most of the community ordinance requirements are in Parts 59 and 60. The level of regulation depends on the level of information available and the flood hazards in the area. The levels are as follows:

- A: The Federal Emergency Management Agency (FEMA) has not provided any maps or data – 60.3(a)
- B: Community has maps with approximate A zones – 60.3(b)
- C: Community has a Flood Insurance Rate Map (FIRM) with Base Flood Elevations (BFE) – 60.3(c)
- D: Community has a FIRM with BFEs and floodways – 60.3(d)
- E: Community has a FIRM that shows coastal high hazard areas (V zones) – 60.3(e)

There are 35 communities in the watershed that participate in the NFIP. Of the 35 communities that participate, their level of regulations depend on the date of the effective mapping and if the community was modernized into a countywide format.

There are six incorporated communities, the Towns of Lafe, Weldon, Biscoe, O'Kean, and Hunter and the City of Fisher that are not participating in the NFIP. This means that they are not required to follow FEMA regulations; however, certain opportunities such as federal flood insurance and some forms of federal disaster assistance are not available to the residents of those areas.

Hazard Mitigation Plan

State and local governments must develop and adopt hazard mitigation plans in order to be eligible for certain types of funding. To remain eligible, communities need to update and resubmit their plans every 5 years for FEMA approval. Hazard mitigation plans are created to increase education and awareness, identify strategies for risk reduction, and identify other ways to develop long-term strategies to reduce risk and protect people and property. Eleven of the 12 counties in Arkansas in the ache Watershed have Hazard Mitigation Plans that are in progress. Only Clay County has an existing approved Hazard Mitigation Plan (expiring in August 2017).The plans effectively allow for FEMA to assess hazards identified through local, state, and federal partnerships and mitigation action items that communities have identified.

Community Rating System

The Community Rating System (CRS) is a voluntary incentive-based program that recognizes and encourages community floodplain management activities that communities undertake in addition to the minimum requirements they must meet when joining the NFIP. Individuals that carry flood insurance in a community that participates in the CRS program can receive a discount on their flood insurance premium. Discounts can range from 5 to 45 percent. Out of the 38 watershed communities participating in the NFIP, only two, the Cities of Bono and Jonesboro, are participating in the CRS program. The City of Bono currently is a class 9, which means that structures located both inside and outside of the SFHA are eligible for a 5-percent premium discount. The City of Jonesboro is currently rated a class 8 and therefore structures located both inside and outside of the SFHA are eligible for a 10-percent premium discount. Table 3 depicts NFIP and CRS participation status and provides an overview of the effective flood data availability.

Table 3: NFIP and CRS Participation [4]

Risk MAP Project	Participating NFIP Communities/ Total Communities	Number of CRS Communities	CRS Rating Class Range	Average Years since FIRM Update (Range 1982-2017)	Level of Regulations (44 CFR 60.3)
CACHE WATERSHED	36/42	2	8-9	15.7	CFR 60.3 (a), CFR 60.3 (b), CFR 60.3 (c), CFR 60.3 (d)

[4] Data obtained from the FEMA Community Information System

Dams and Levees

As recorded by the U.S. Army Corps of Engineers (USACE) in the National Inventory of Dams, 35 dams are within the portion of the counties that make up the Cache Watershed. The owners and operators of the 5 dams considered high hazard are required to develop and maintain Emergency Action Plans (EAPs) to reduce the risk of loss of life and property if the dam fails. Table 4 provides the characteristics of the dams identified in the project area. There are no levees identified within the watershed.

Table 4: Risk MAP Project Dam Characteristics[5]

Risk MAP Project	Total Number of Identified Dams	Number of Dams			Number of Dams Requiring EAP	Percentage of Dams without EAP (Total)	Average Years since Inspection	Average Storage (acre-feet)
		High Hazard	Significant Hazard	Low Hazard				
CACHE WATERSHED	35	5	9	21	5	85.7%	20+	1,065

[5] Data obtained from the ANRC State Database and USACE National Inventory of Dams

Flood Insurance Rate Maps

The average age of the effective FIRMs within the Cache Watershed is almost 16 years. The oldest effective maps are for the City of Cotton Plant, which are 35 years old and have an effective date of October 12, 1982. The newest FIRMs are dated June 7, 2017, for Jackson County. While most of the communities have effective FIRMs, six communities do not have effective FIRMs or have one 11X17 panel that does not show any SFHAs.

Project Phases and Map Maintenance

Background

FEMA manages several risk analysis programs, including Flood Hazard Mapping, National Dam Safety, the Earthquake Safety Program, Multi-Hazard Mitigation Planning, and the Risk Assessment Program, all of which assess the impact of natural hazards and lead to effective strategies for reducing risk. These programs support the Department of Homeland Security's objective to "strengthen nationwide preparedness and mitigation against natural disasters."

Flood-related damage between 1980 and 2013 totaled $260 billion, but the total impact to our Nation was far greater—more people lose their lives annually from flooding than any other natural hazard.

FEMA, "Federal Flood Risk Management Standard (FFRMS)" (2015)

FEMA manages the NFIP, which is the cornerstone of the national strategy for preparing American communities for flood hazards. In the nation's comprehensive emergency management framework, the analysis and awareness of natural hazard risk remains challenging. A consistent risk-based assessment approach and a robust communication system are critical tools to ensure a community's ability to make informed risk management decisions and take mitigation actions. Flood hazard mapping is a basic and vital component for a prepared and resilient nation.

In Fiscal Year 2009, FEMA's Risk MAP program began to synergize the efforts of federal, state, and local partners to create timely, viable, and credible information identifying natural hazard risks. The intent of the Risk MAP program is to share resources to identify the natural hazard risks a community faces and ascertain possible approaches to minimizing them. Risk MAP aims to provide technically sound flood hazard information to be used in the following ways:

- To update the regulatory flood hazard inventory depicted on FIRMs and the National Flood Hazard Layer

- To provide broad releases of data to expand the identification of flood risk (flood depth grids, water-surface elevation grids, etc.)
- To support sound local floodplain management decisions
- To identify opportunities to mitigate long-term risk across the nation's watersheds

How are FEMA's Flood Hazard Maps Maintained?

FEMA's flood hazard inventory is updated through several types of revisions.

Community-submitted Letters of Map Change. First and foremost, FEMA relies heavily on the local communities that participate in the NFIP to carry out the program's minimum requirements. These requirements include the obligation for communities to notify FEMA of changing flood hazard information and to submit the technical support data needed to update the FIRMs.

Under the current minimum NFIP regulations, a participating community commits to notifying FEMA if changes take place that will affect an effective FIRM no later than 6 months after project completion.

Section 65.3, Code of Federal Regulations

Although revisions may be requested at any time to change information on a FIRM, FEMA generally will not revise an effective map unless the changes involve modifications to SFHAs. Be aware that the best floodplain management practices and proper assessments of risk result when the flood hazard maps present information that accurately reflects current conditions.

Letters of Map Amendment (LOMAs). The scale of an effective FIRM does not always provide the information required for a site-specific analysis of a property's flood risk. FEMA's LOMA process provides homeowners with an official determination on the relation of their lot or structure to the SFHA. Requesting a LOMA may require a homeowner to work with a surveyor or engineering professional to collect site-specific information related to the structure's elevation; it may also require the determination of a site-specific BFE. Fees are associated with collecting the survey data and developing a site-specific BFE. Local surveying and engineering professionals usually provide an Elevation Certificate to the homeowner, who can use it to request a LOMA. A successful LOMA may remove the federal mandatory purchase requirement for flood insurance, but lending companies may still require flood insurance if they believe the structure is at risk.

FEMA-Initiated Flood Risk Project. Each year, FEMA initiates a number of Flood Risk Projects to create or revise flood hazard maps. Because of funding constraints, FEMA can study or restudy only a limited number of communities, counties, or watersheds each year. As a result, FEMA prioritizes study needs based on a cost-benefit approach whereby the highest priority is given to studies of areas where development has increased and the existing flood hazard data has been superseded by information based on newer technology or changes to the flooding extent. FEMA understands communities require products that reflect current flood hazard conditions to best communicate risk and implement effective floodplain management.

Flood Risk Projects may be delivered by FEMA or one of its Cooperating Technical Partners (CTPs). The CTP initiative is an innovative program created to foster partnerships between FEMA and participating NFIP communities, as well as regional and state agencies. Qualified partners collaborate in maintaining up-to-date flood maps. In FEMA Region 6, which includes the State of Arkansas, CTPs are generally statewide agencies that house the State Floodplain Administrator. However, some Region 6 CTPs are also large River Authorities or Flood Control Districts. They provide enhanced coordination with local,

state, and federal entities, engage community officials and technical staff, and provide updated technical information that informs the national flood hazard inventory.

Risk MAP has modified FEMA's project investment strategy from a single investment by fiscal year to a multi-year phased investment, which allows the Agency to be more flexible and responsive to the findings of the project as it moves through the project lifecycle. Flood Risk Projects are funded and completed in phases.

General Flood Risk Project Phases

Each phase of the Flood Risk Project provides both FEMA and its partner communities with an opportunity to discuss the data that has been collected and to determine a path forward. Local engagement throughout each phase enhances the opportunities for partnership, furthers the discussion on current and future risk, and helps identify local projects and activities to reduce long-term natural hazard risk.

Flood Risk Projects may be funded for one or more of the following phases:

- Phase Zero – Investment
- Phase One – Discovery
- Phase Two – Risk Identification and Assessment
- Phase Three – Regulatory Product Update

Local input is critical throughout each phase of a Flood Risk Project. More details about the tasks and objectives of each phase are included below.

Phase Zero: Investment

Phase Zero of a Flood Risk Project initiates FEMA's review and assessment of the inventories of flood hazards and other natural hazards within a watershed area. During the Investment Phase, FEMA reviews the availability of information to assess the current floodplain inventory. FEMA maintains several data systems to perform watershed assessments and selects watersheds for a deeper review of available data and potential investment tasks based on the following factors:

Availability of High-Quality Ground Elevation Data. FEMA reviews readily available and recently acquired ground elevation data. This information helps identify development and earth-moving activities near streams and rivers. Where necessary, FEMA may partner with local, state, and other federal entities to collect necessary ground elevation information within a watershed.

If high-quality ground elevation data is both available for a watershed area and compliant with FEMA's quality requirements, FEMA and its mapping partners may prepare engineering data to assess, revise, replace, or add to the current flood hazard inventory.

Mile Validation Status within Coordinated Needs Management Strategy (CNMS). FEMA uses the CNMS database to track the validity of the flood hazard information prepared for the NFIP. The CNMS database reviews 17 criteria to determine whether the flood hazard information shown on the current FIRM is still valid.

Communities may also inform and request a review or update of the inventory through the CNMS website at https://msc.fema.gov/cnms/. The CNMS Tool Tutorial provides an overview of the online tool and explains how to submit requests.

Local Hazard Mitigation Plans. Reviewing current and historic hazard mitigation plans provides an understanding of a community's comprehension of its flood risk and other natural hazard risks. The mitigation strategies within a local hazard mitigation plan provide a lens to local opportunities and underscore a potential for local adoption of higher standards related to development or other actions to reduce long-term risk.

Cooperating Technical Partner State Business Plans. In some states, a CTP generates an annual state business plan that identifies future Flood Risk Project areas that are of interest to the state. The Arkansas Natural Resources Commission works to develop user-friendly data. In this project area, FEMA has worked closely with ANRC to develop the project scope and determine the necessary project tasks.

Communities that have identified local issues are encouraged to indicate their data needs and revision requests to the State CTP so that they can be prioritized and included in theState Business Plans.

Possible Investment Tasks. After a review of the data available within a watershed, FEMA may choose to (1) purchase ground elevation data and/or (2) create some initial engineering modeling against which to compare the current inventory, also known as Base Level Engineering (BLE) modeling.

Phase One: Discovery

Phase One, the Discovery Phase, provides opportunities both internally (between the state and FEMA) and externally (with communities and other partners interested in flood potential) to discuss local issues with flooding and examine possibilities for mitigation action. This effort is made to determine where communities currently are with their examination of natural hazard risk throughout their community and to identify how state and federal support can assist communities in achieving their goals.

The Discovery process includes an opportunity for local communities to provide information about their concerns related to natural hazard risks. Communities may continue to inform the project identification effort by providing previously prepared survey data, as-built stream crossing information, and engineering information.

For a holistic community approach to risk identification and mapping, FEMA relies heavily on the information and data provided at the local level. Flood Risk Projects are focused on identifying (1) areas where the current flood hazard inventory does not provide adequate detail to support local floodplain management activities, (2) areas of mitigation interest that may require more detailed engineering information than is currently available, and (3) community intent to reduce the risk throughout the watershed to assist FEMA's future investment in these project areas. Watersheds are selected for Discovery based on these evaluations of flood risk, data needs, availability of elevation data, Regional knowledge of technical issues, identification of a community-supported mitigation project, and input from federal, state, and local partners.

Possible Discovery Tasks. Discovery may include a mix of interactive webinar sessions, conference calls, informational tutorials, and in-person meetings to reach out to and engage with communities for input. Data collection, interviews, and interaction with community staff and data-mining activities provide the basis for watershed-, community-, and stream-level reviews to determine potential projects that may benefit the communities. A range of analysis approaches are available to determine the extent of flood risk along streams of concern. FEMA and its mapping partners will work closely with communities to determine the appropriate analysis approach, based on the data needs throughout the community.

These potential projects may include local training sessions, data development activities, outreach support to local communities wanting to step up their efforts, or the development of flood risk datasets within areas of concern to allow a more in-depth discussion of risk.

Phase Two: Risk Identification and Assessment

Phase Two (Risk Identification and Assessment) continues the risk awareness discussion with communities through watershed analysis and assessment. Analyses are prepared to review the effects of physical and meteorological changes within the project watershed. The new or updated analysis provides an opportunity to identify how development has affected the amount of stormwater generated during a range of storm probabilities and shows how effectively stormwater is transported through communities in the watershed.

Coordination with a community's technical staff during engineering and model development allows FEMA and its mapping partners to include local knowledge, based on actual on-the-ground experience, when selecting modeling parameters.

The information prepared and released during Phase Two is intended to promote better local understanding of the existing flood risk by allowing community officials to review the variability of the risk throughout their community. As FEMA strives to support community-identified mitigation actions, it also looks to increase the effectiveness of community floodplain management and planning practices, including local hazard mitigation planning, participation in the NFIP, use of actions identified in the CRS Manual, risk reduction strategies for repetitive loss and severe repetitive loss properties, and the adoption of stricter standards and building codes.

FEMA is eager to work closely with communities and technical staff to determine the current flood risk in the watershed. During the Risk Identification and Assessment phase, FEMA would like to be alerted to any community concerns related to the floodplain mapping and analysis approaches being taken. During this phase, FEMA can engage with communities and review the analysis and results in depth.

Possible Risk Identification and Assessment Tasks. Phase Two may include a mixture of interactive webinars, conference calls, informational tutorials, and in-person meetings to reach out to and engage with communities for input. Flood Risk Project tasks may include hydrologic or hydraulic engineering analysis and modeling, floodplain mapping, risk assessments using Hazus-Multi Hazard software, and preparation of flood risk datasets (water-surface elevation, flood depth, or other analysis grids). Additionally, projects may include local training sessions, data development activities, outreach support to local communities that want to step up their efforts, or the development of flood risk datasets within areas of concern to allow a more in-depth discussion of risk.

Phase Three: Regulatory Products Update

If the analysis prepared in the previous Flood Risk Project phases indicates that physical or meteorological changes in the watershed have significantly changed the flood risk since the last FIRM was printed, FEMA will initiate the update of the regulatory products that communities use for local floodplain management and NFIP activities.

Delivery of the preliminary FIRM and Flood Insurance Study (FIS) report begins another period of coordination between community officials and FEMA to discuss the required statutory and regulatory steps both parties will perform before the preliminary FIRM and FIS report can become effective. As in

the previous phases, FEMA and its mapping partners will engage with communities through a variety of conference calls, webinars, and in-person meetings.

Once the preliminary FIRMs are prepared and released to communities, FEMA will initiate the statutory portions of the regulatory product update. FEMA will coordinate a Consultation Coordination Officer meeting and initiate a 90-day comment and appeal period. During this appeal period, local developers and residents may coordinate the submittal of their comments and appeals through their community officials to FEMA for review and consideration.

FEMA welcomes this information because additional proven scientific and technical information increases the accuracy of the mapping products and better reflects the community's flood hazards identified on the FIRMs.

Communities may host or hold Open House meetings for the public. The Open House layout allows attendees to move at their own pace through several stations, collecting information in their own time. This format allows residents to receive one-on-one assistance and ask questions pertinent to their situations or their interests in risk or flood insurance information.

All appeals and comments received during the statutory 90-day Appeal Period, including the community's written opinion, will be reviewed by FEMA to determine the validity of the appeal. Once FEMA issues the appeal resolution, the associated community and all appellants will receive an appeal resolution letter and FEMA will revise the preliminary FIRM if warranted. A 30-day period is provided for review and comment on successful appeals. Once all appeals and comments are resolved, the flood map is ready to be finalized.

After the Appeal Period, FEMA will send community leaders a Letter of Final Determination stating that the preliminary FIRM will become effective in 6 months. The letter also discusses the actions each affected community participating in the NFIP must take to remain in good standing in the NFIP.

After the preceding steps are complete and the 6-month compliance period ends, the FIRMs are considered effective maps and new building and flood insurance requirements become effective.

That is a brief general overview of a Flood Risk Project. Next, the Flood Risk Report will provide details on the efforts in the Cache Watershed.

Phase Zero: Investment

The Cache Watershed (HUC 08020302) encompasses an area of approximately 1,956 square miles and extends across 12 counties in Arkansas (Clay, Craighead, Cross, Greene, Jackson, Lawrence, Monroe, Poinsett, Prairie, Randolph, St. Francis, and Woodruff) and one county in Missouri (Butler). The majority of the watershed is located in the northeastern portion of Arkansas between Crowley's Ridge and the White River. The major communities in the watershed include portions of the cities of Bono, Brinkley, Jonesboro, Newport, Piggott, and Walnut Ridge. Smaller communities include Cotton Plant, McCrory, and Weiner. The communities in the Cache Watershed and their NFIP status are listed in Table 1. All of the communities listed in the table are in Arkansas, except for Butler County, MO. The watershed and its communities are shown on Figure 2.

The Cache Watershed lies within the White River Basin and is located in northeastern Arkansas. The Cache Watershed consists of flat, low-lying areas with numerous interconnected channels except for Crowley's Ridge, a geological ridge formation that makes up the northeastern border of the watershed. During past events, local communities have experienced flooding issues, some of which are due to localized development in and around the floodplain and while other issues are due to the nature of the watershed. Upstream of Grubbs, AR, the drainage has been significantly altered from natural conditions with many of the streams being channelized. Downstream of Grubbs, there has been less alteration and some restoration of the natural drainage. In the lower Cache Watershed, there are large areas of protected bottomland hardwood wetlands, including the Cache River National Wildlife Refuge and a number of State Wildlife Management Areas. Because of the low elevation and relief of the watershed, flooding is common in those areas of the watershed not on Crowley's Ridge.

The Cache River is a tributary of the White River. Its largest tributary is Bayou DeView, which joins the Cache River just upstream of the White River. The Cache River originates in southern Missouri, entering Arkansas in Clay County. Bayou DeView originates on Crowley's Ridge in Greene County.

Area of Interest Selection Factors

A number of factors and criteria are reviewed for watershed selection: flood risk, age of current flood hazard data, population growth trends and potential for growth, recent flood claims, and disaster declaration history. Local data and high quality ground elevation data availability are reviewed for use in flood hazard data preparation. The Coordinated Needs Management Strategy (CNMS) database is reviewed to identify areas of large unknown and unverified mileage. The Arkansas CTP, State NFIP Coordinator, and State Hazard Mitigation Officer coordinate to identify watersheds for study by FEMA.

The Cache Watershed was selected by the Arkansas CTP in coordination with FEMA Region 6, for the reasons summarized below.

- Topographic data developed from a Light Detection and Ranging System (LiDAR) is available throughout the watershed aiding in providing quality data.
- Within the State of Arkansas, losses in the watershed have exceeded $17.5 million from 1978 through 2017, and there are approximately 2,066 policies. These reported values include entire counties which may or may not be wholly located in the watershed.
- Clay, Greene, Jackson, Lawrence, Poinsett, and Randolph Counties are the only counties considered modernized. St. Francis County has a countywide study; however it is older (effective date 2005). These studies were completed without quality topographic data.

- Since 2001, the Cache Watershed has had declared federal disasters in every year except 2007 and 2012. The watershed includes the City of Brinkley, which experienced severe flooding in June 2014. This flooding event was a state-declared disaster.
- The communities of Bono, Jonesboro, Cross County, Jackson County, Poinsett County, and Randolph County have claims listed as BCX Claims, which are claims that occur outside the mapped floodplain. This indicates the need for additional review to determine if the effective maps are in need of update.
- Eleven of the 12 counties in Arkansas have Hazard Mitigation Plans that are in progress. Only Clay County has an existing approved Hazard Mitigation Plan (expiring in August 2017).

Flood Risk: The Cache River and its tributaries are not strangers to flood events, with a historical record of numerous flooding events. The Cache Watershed has historically flooded and has experienced major flooding as recently as August 2016 on its tributaries as well as the Cache River. The recent major floods in every year since 2001, except 2007 and 2012, have illustrated the ongoing flood threat for the Cache Watershed.

Growth Potential: Although the Cache Watershed is largely rural in nature, it is undergoing urbanization along the US Highway 67, 63, and 412, as well as the Interstate 40 corridors. These locations include the areas around the cities of Jonesboro, Walnut Ridge, Paragould, and Brinkley.

Age of Current Flood Information: Seven of the counties in the Cache Watershed have modernized maps, whereas five of the counties have not been modernized and have maps dating back to the 1980's.

Local Data Availability. The City of Jonesboro has undertaken large studies to improve drainage throughout the City. The first phase of this study was completed in 2015 with another expected to start in 2016. These studies are to provide drainage improvement concepts and plans to help alleviate future flooding events.

Additionally, Craighead County and its communities are undergoing a Phase 2 Risk Identification and Assessment project, which is currently being performed by the Arkansas CTP.

Availability of High Quality Ground Elevation Data. As a result of FEMA's efforts in teaming with other federal and state agencies, high quality ground elevation data was available for the Cache Watershed. This data provides a great basis for hydrologic and hydraulic modeling preparation. The source and date of LiDAR coverage is included in Table 5.

Table 5. Summary of Topographic Data

Watershed/ Flooding Source	Beginning and End Points of Topo Data Collection	New/Existing OR Leveraged	Accuracy & Year Acquired	Source/ Data Vendor	Contact Information	Use Restrictions
2014 AR-MO LIDAR Project	2013 - 2015	Existing	QL2 (Vert. Acc. 9.25 cm)	Public domain	USACE – St. Louis District	None
2012 FEMA/USGS Lower St. Francis River	04/2012 – 05/2012	Existing	QL3 (Vert. Acc. 11.8 cm)	Public domain	The National Map	None
2011 L'Anguille & Cache Watershed Area	03/2011 – 04/2011	Existing	QL2 (Vert. Acc. 9.25 cm)	Public domain	http://gis.arkansas.gov	None

Coordinated Needs Management Strategy Database Review: Coordinated Needs Management Strategy (CNMS) Database Review. The CNMS database indicates the validity of FEMA's flood hazard inventory. Streams that are indicated as ***Unverified*** or ***Unknown*** in the database indicate that the information that developed the floodplain currently shown on the FIRMs is inaccessible or that a complete evaluation of the Critical and Secondary CNMS elements could not be performed. The Cache Watershed stream coverage is not homogenous across the counties that intersect the basin. The H&H analysis behind majority of the basin flood hazard information is dated and in need of an update. The current inventory within the watershed is approximately 1,305 miles. Of this mileage approximately 52 miles is considered valid, having passed the seven critical element and ten secondary element criteria reviews that had been completed. The remaining mileage is listed as unverified mileage indicating that more than 96% of the existing inventory may require further review (Figure 3).

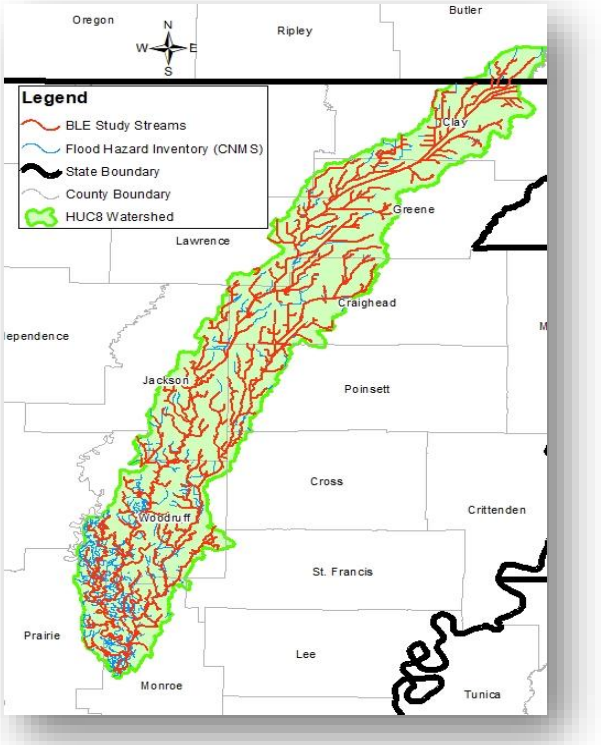


Figure 3. Flood Hazard Inventory

Unmapped Stream Coverage: FEMA and the Arkansas CTP also review the current stream coverage and compare the coverage against detailed terrain streams contributing up to 1 square mile drainage area or National Hydrography Dataset (NHD). The detailed terrain streams and NHD high resolution data inventoried by the US Geological Survey (USGS) Maps created at a 1:24,000 scale is used to review the water courses within the HUC8s of concern. The watershed as a whole is reviewed for additional mileage to be inventoried. The intent of this review is to identify streams and water courses where additional study may be required or to create a complete stream network for Base Level Engineering data preparation.

Base Level Engineering

The Arkansas CTP is coordinating with FEMA on Base Level Engineering (BLE). This approach prepares multi-profile hydrologic (how much water) and hydraulic (how is water conveyed in existing drainage) data for a large stream network or river basin to generate floodplain and other flood risk information for the basin area.

Base Level Engineering provides an opportunity for FEMA to produce and provide non-regulatory flood risk information for a large watershed area in a much shorter period of time. The data prepared in the Base Level Engineering approach provides planning level data which is prepared to meet FEMA's Standards for Floodplain Mapping.

FEMA Investment (2016). In Fiscal Year 2016, FEMA and the Arkansas CTP initiated Base Level Engineering on the Cache HUC8 sub basin. Figure 4 shows the network of streams that is being analyzed using the Base Level Engineering approach. The Base Level Engineering approach will provide the following items for use in the Cache Watershed:

- Hydrologic rain on grid modeling for 10%, 4%, 2%, 1%, 1-%, 1+%, and 0.2% storm events
- Hydraulic (HEC-RAS 5.0.3) modeling for all study streams using 2-Dimensional (2D) modeling techniques.
- Floodplain boundaries, Water Surface Elevation grids, and Flood Depth Grids for all modeled storm events.
- Approximate Mapping Change layer to distinguish areas of changes between BLE and effective mapping for 1% storm event.
- Hazus flood analysis for watershed.

The Base Level Engineering approach will prepare flood hazard information for approximately 1,635 miles adding over 300 stream miles of supplementary flood hazard information for communities throughout the basin. Once completed the Base Level Engineering information will be provided to the communities throughout the basin for planning, risk communication, floodplain management, and permitting activities.

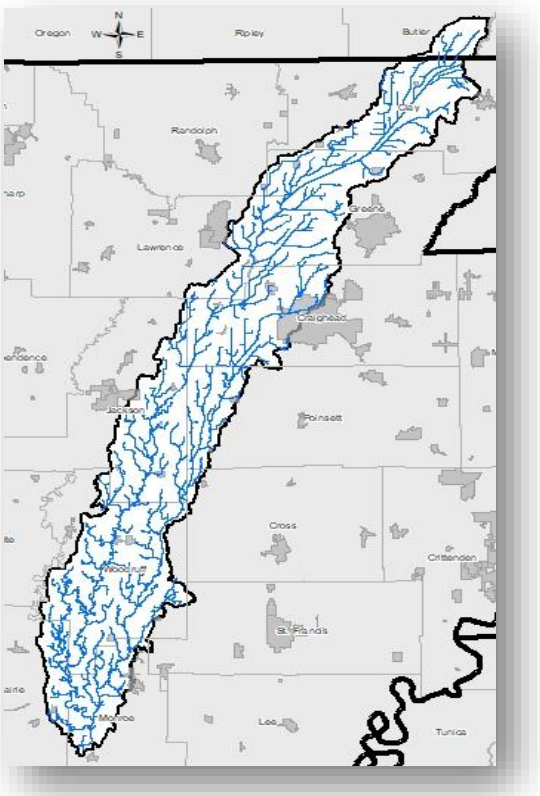


Figure 4. Base Level Engineering Study Streams

Creating BLE data is a cost effective way to provide communities with updated information on their flood risk. BLE provides an opportunity for FEMA to produce and provide non-regulatory flood risk information for a large watershed area in a much shorter period of time. The data prepared through BLE provides planning-level data that meets FEMA's Standards for Floodplain Mapping. This approach prepares multi-profile hydrologic (how much water) and hydraulic (how is water conveyed in existing drainage) data for a large stream network or river basin to generate floodplain and other flood risk information for the basin area. To create the BLE data, the

best available information was utilized. This information included terrain data, flood discharges, and hydrologic and hydraulic analysis.

CNMS Validation and Assessment. FEMA has compared the BLE results to the current flood hazard inventory identified in the CNMS database. This assessment allows FEMA to compare the updated flood hazard information to the current effective floodplain mapping of the watershed communities. BLE results for Zone A Validation denoted no miles to be New, Validated, or Updated Engineering (NVUE) compliant.

Community Coordination. FEMA will share the BLE results with communities throughout the project area. Access to workshops and training to support the use of BLE for planning, floodplain management, permitting, and risk communication activities will be made publicly available to communities and other interested parties. FEMA will work with communities to review, interpret, and incorporate the BLE information into their daily and future community management and planning activities.

Follow-On Phase Project Decisions. The BLE results and the current inventory have been compared to identify any areas of significant change. If the results show large areas of change (expansions and contractions of the floodplain, increases and decreases of the computed BFEs, and increases in expected flow values), FEMA will continue to coordinate with the communities to identify the streams that should be considered if the FIRMs are updated.

To identify other streams for future refinement, community growth patterns and potential growth corridors should be discussed with FEMA. These areas of expected community growth and development may benefit from updated flood hazard information. BLE can be further refined to provide detailed study information for a FIRM update.

Areas of communities that were developed prior to 1970 (pre-FIRM areas) may include repetitive and severe repetitive loss properties. They may also be areas where redevelopment is likely to occur. Having updated flood hazard information before redevelopment and reconstruction activities take place may benefit communities by providing guidance to mitigate future risk.

FEMA and the Arkansas CTP will work with communities following the delivery of Base Level Engineering to identify a sub set of streams for update and inclusion on the Flood Insurance Rate Maps, if required. Communities may wish to review the possible areas and provide feedback once the BLE data has been received. Base Level Engineering information may be refined by local communities and submitted through the Letter of Map Revision process to refine existing flood hazard information and maintain the Flood Insurance Rate Maps throughout their community.

Phase One: Discovery

Pre-Discovery

As part of the CTP partnership, the ANRC and its contractor, FTN Associates, Ltd. (FTN), began the Discovery process in the Cache Watershed (08020302) in October 2016 to gather local information and readily available data to determine project viability and the need for Risk MAP products to assist in the movement of communities towards resilience. The watershed location can be seen on Figure 2.

Through the Discovery process, FEMA and the Arkansas CTP can determine which areas of the Hydrologic Unit Code (HUC) 8 (HUC-8) watersheds may be examined for further flood risk identification and assessment in a collaborative manner, taking into consideration the information collected from local communities during this process. Discovery initiates open lines of communication and relies on local involvement for productive discussions about flood risk. The process provides a forum for a watershed-wide effort to understand how the included watershed community's flood risks are related to flood risk throughout the watershed. In Risk MAP, projects are analyzed on a watershed basis, so Discovery Meetings target numerous stakeholders from throughout the watershed on local, regional, State, and Federal levels.

Discovery Meeting

In July 12 and July 13, 2017, the Arkansas CTP held Discovery Meetings in this watershed to discuss the Discovery process and where the communities can go from there with future studies. The Discovery meeting provided an opportunity to present the BLE results to the communities and how they could be used for future planning, risk communication, floodplain management, and permitting activities. At the meeting the communities were provided with digital copies of this Flood Risk Report, the modeling files for all of the BLE studied streams, including the floodplain boundaries, Water Surface Elevation Grids, and Flood Depth Grids, and a short tutorial on the use of the BLE products.

The results of the Discovery process is presented as part of this Flood Risk Report, a watershed scale Discovery Map and the digital data that was gathered or developed under the fiscal year 2016 CTP Agreement, EMW-2015-CA-00143, Mapping Activity Statement (MAS) 14, between FEMA and the Arkansas CTP. During Discovery, the Arkansas CTP and FEMA reached out to local communities to:

- Gather information about local flood risk and flood hazards;
- Obtain and ultimately review current and historic mitigation plans to understand local mitigation capabilities, hazard risk assessments, and current or future mitigation activities; and
- Include multi-disciplinary staff from within each community to participate and assist in the development of a watershed vision.

This document includes the portion of the Flood Risk Report that describes the Discovery process and provides the results to the watershed communities. The digital data submitted with this report contains correspondence, exhibits to be used at the Discovery meetings, GIS data, mapping documents (PDF, shapefiles, personal geodatabases and ESRI ArcGIS 10.x Map Exchange Documents [MXDs]), or other supplemental information. Graphics in this Pre-Discovery report are available as larger format graphics files for printing and as GIS data that may be printed and used at any map scale.

Watershed Findings

Engineering review of community comments:

At the Discovery meeting, Risk MAP Action Surveys were provided to each community in attendance so that general information and concerns about each community could be provided back to the Arkansas CTP. For those that did not attend the Discovery Meeting, Risk MAP Action Surveys were distributed via mail to the leaders of each community, with additional notices being distributed to secondary points of contact. Out of the 43 communities located in the watershed, only 6 were returned for engineering review. From the information provided, most communities are very proactive with purchasing equipment and improving structures to address localized drainage needs. A brief summary of the findings are summarized below:

As part of a larger project, the City of Bono, through the NRCS, completed construction on the Lake Bono Dam, which has helped with flooding in Bono. This dam is being studied as part of the ongoing Craighead County, AR Phase 2 Study.

The City of McCrory is currently working on a Mitigation Action to update the structure at 5th Street and has received mitigation grant funding in the past years to help improve the drainage of water throughout the City. The 5th Street project includes increasing capacity of the current structure. Additionally, the City has purchased equipment and is partnering with Woodruff County and the ArDOT to better maintain and improve local drainage.

Poinsett County has performed localized maintenance (improve structures, clean ditches, remove debris) to improve local drainage. Additionally, they have identified two (2) specific areas of concern. The East side of Poinsett County receives flood water from the West side of Jonesboro, while it is a flash flood type event, some homes in the low area of Trumann experience damage, and around Weiner, Waldenburg, Fisher, and Payneway, the County mentions if the Cache River had some levees in these areas, the issue of flooding would be significantly reduced. A levee analysis could be a future course of action.

The City of Jonesboro is working to perform an updated drainage study for the City, as its maps are outdated and do not appear to reflect the accurate risk. This project started from past Map Modernization efforts in Craighead County.

Hydrology: The review of hydrologic data was limited to Base Level Engineering hydrologic processing which includes Peak Discharges and partial gage analysis in the watershed. The 1-percent–annual-chance peak discharge data for Base Level Engineering analysis for the entire watershed was reviewed for any anomalies. Development, sinks, and flood control structures were noted to determine if they had an impact on the hydrology flows. Available gage information for the entire watershed was also reviewed and compared to the Base Level Engineering hydrology, when possible to identify discrepancies and possible anomalies stemming from outdated, overestimated, or underestimated sub-basin analyses.

Hydraulics and floodplain analysis: Base Level Engineering was conducted for this watershed. As a result, CNMS evaluations were conducted to compare the effective mapping to new mapping. The effective mapping was assembled from current National Flood Hazard Layer (modernized counties) and Q3 floodplain mapping data (non-modernized areas). Some noteworthy obstacles observed include the fact

that the Zone A floodplains do not match between most of the community and county boundaries, and there are discrepancies on the mapping for the 0.2% annual-chance-events throughout the watershed.

CNMS Concerns within the Watershed: It is important to note that for the watershed as a whole, most of the CNMS streams are considered unverified. Comparisons of the effective mapping to the draft Base Level Engineering results showed that the effective mapping should be revised based on better source data and processes. The three main concerns found in the area were non-digital FIRMs, vast areas of Unknown approximate studies which were not backed by technical data, and some communities that contained zero miles of detailed studies.

Non-digital FIRMs: Cross County, Craighead County, Monroe County, Prairie County, St. Francis County, and Woodruff County.

Unknown Approximate Studies: Clay County, Craighead County, Cross County, Greene County, Jackson County, Lawrence County, Monroe County, Poinsett County, Prairie County, Randolph County, St. Francis County, and Woodruff County in Arkansas and Butler County in Missouri.

Zero Miles of Detailed Study: Cross County and Prairie County (complete area). There are other parts of individual communities that do not have detail study streams within their jurisdictions.

Discovery Wrap-Up Meeting

At present, the Arkansas CTP plans to hold the Wrap-Up Meeting in association with additional advanced Base Level Engineering training throughout the area. A summary of the findings will be presented at those meeting opportunities.

Future Investments for Refinement

Watershed-wide Recommendations:

Based on comments from Poinsett County representatives, performing a more detailed analysis along the Cache River to examine if structural measures (levee, channel improvements, etc.) may be beneficial and feasible should be considered as a future possibility.

County-specific Recommendations:

Cross County, Monroe County, Prairie County, St. Francis County, and Woodruff County have non-modernized FIRMs. One goal of the Arkansas CTP is to update all non-modernized FIRMs. Once a county has been covered by Discovery and Base Level Engineering projects, it is recommended to move to Phase 2 or 3 to produce a modernized and digital FIRM with Flood Risk Products.

Currently, Craighead County is going through a Phase 2 countywide study to address existing mapping issues. This includes the City of Bono and should include, as it is completed and updated to FEMA standards, the City of Jonesboro Drainage Study.

City/Town-specific Recommendations:

There are multiple communities and /or unincorporated areas that have no detailed studies within the boundaries. It is recommended that for areas of need (population sources, possible development areas, etc) detailed studies be evaluated based on the community need and desire.

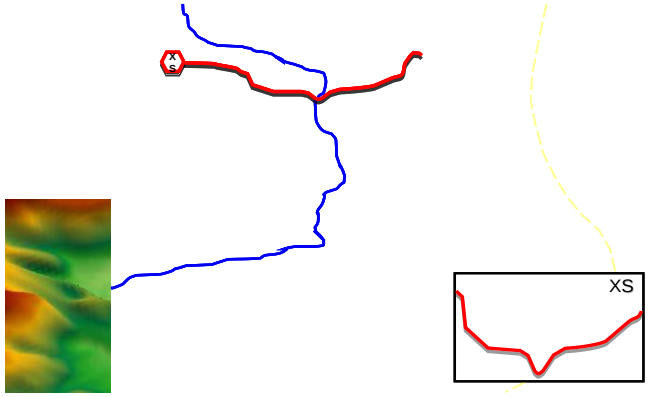
Phase Two: Risk Identification and Assessment

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Two project in this watershed.

During the Risk Identification and Assessment Phase of a project, engineering modeling and analysis is refined to further enhance the identification of flood risk. Existing modeling has been updated using a more detailed methodology for calculating the amount of water (hydrology) expected during a storm event, plus additional detail and gage analysis.

Hydraulic models include additional refinement to the cross sections and stream crossings (Figure 5) that may restrict flow in larger events, and the channel and structure information in existing models could be improved based on field surveys.

Figure 5. Hydraulic Cross-Section



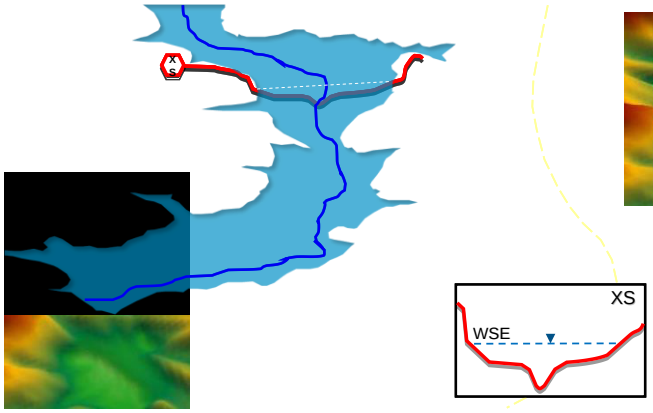


Figure 6. Floodplain Mapping of Peak Water Surface Elevation

Engineering modeling applies the flow volume calculated for a certain storm interval and places that water into the natural channel described in the hydraulic software. As tributaries and other drainage features are added to the main stream, the flow volume increases downstream. The modeling calculates the peak water-surface elevation (Figure 6) determined at each cross section, and these peak values are graphically described in a profile. The peak values are then mapped on ground elevation information to produce a floodplain delineation that identifies the expected flood extent during the analyzed storm event.

These models have been used to produce a range of flood risk datasets that describe the variability of flooding within the delineated floodplain. These flood risk datasets include:

- **Water-Surface Elevation Grid –** This two-dimensional grid describes the water-surface elevation and profile for the length of the study area. Interpolated values are produced between each analyzed cross section.
- **Flood Depth Grid –** This grid provides an estimated flood depth at any location within the floodplain, allowing the variability of flood depth to be better represented for the stream channel and the floodplain areas.
- **Annual Percent Chance Grid –** This grid is produced using statistical analysis to describe multiple percentages of the chance of flooding within the determined floodplain.

- **30-Year Percent Chance Grid –** Further statistical methodology is used to determine the percent chance of flooding within a 30-year window. The 30-year window was chosen because a 30-year period is common for home mortgages.
- **Changes Since Last FIRM –** This polygon file identifies each location where modifications are identified by the revised and updated hydrologic and hydraulic analysis. Areas where floodplain widths increase/decrease, areas where floodway widths increase/decrease, and areas where flood zones have been modified are identifiable within this layer.

This phase of the project benefits greatly from community interaction and coordination with local technical and operations staff, providing an opportunity for FEMA and its mapping partners to engage local knowledge as the modeling is prepared. FEMA and the Arkansas CTP would like to work closely with communities to identify areas where the modeling and floodplain mapping may not agree with on the ground accounts of flooding equivalent to the 1% annual chance storm event. FEMA and the Arkansas CTP would like to use this phase to review community comments and include any available technical information prior to proceeding to the update of the Regulatory products (FIRM, FIS and DFIRM database).

The following information will be added during any Phase 2 project that may be completed in the future.

Flood Risk Review Meeting

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Two project in this watershed.

Flood Risk Review Meetings are scheduled for XXXX, 20XX. The first formal sharing of the modeling and mapping updates occurs at the Flood Risk Review Meeting. At this meeting, FEMA intends to continue community coordination efforts and discussions with a variety of watershed partners to review the effects of physical and meteorological changes within the project area.

The FEMA team remains focused on reviewing the identification of flood and other natural hazard risks, areas where modifications in the flood delineations have been identified, and changes in risk assessment, working with community and technical staff throughout the analysis/assessment processes.

The team will deliver the Phase Two (Data and Engineering) data:

- Hydrological Analysis
- Hydraulic Analysis
- Resultant BLE data

The objectives of the Flood Risk Review meeting include:

- Promote local buy-in of analysis/study results
- Review Risk Identification (engineering) results with local communities
- Review the hazard mitigation plan, compared to the study findings
- Identify risk communication needs and options
- Support identified community-driven mitigation actions
- Identify and/or resolve community comments and appeals before the regulatory products are issued
- Solicit community input on results and promote buy-in of analyses prior to moving forward
- Continue developing relationships with communities

The new analysis and products will be delivered to communities in advance of this meeting, so communities will have the chance to review and assess the modeling and mapping results prior to the in-person meeting.

FEMA would like to work with communities at each project milestone to identify and address any technical concerns with the modeling results. Because this phase of the timeline is less rigid than the statutory and regulatory timelines in Phase Three, FEMA can work more closely and intimately with the communities to review and address their concerns.

Next Steps

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Two project in this watershed.

Once the analysis is completed, FEMA will review the areas of change before determining if a project will move forward to update the regulatory products (FIS report, FIRM, and DFIRM database). A cursory review of the modeling results indicates that this study area has significant changes in floodplain width and depth.

FEMA will work with communities after delivering the hydrologic and hydraulic analysis and floodplain work maps to collect any outstanding technical inquiries within the study area. After coordinating with communities, FEMA will likely initiate the Phase Three effort to update the regulatory products.

Potential Community Activities

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Two project in this watershed.

The availability of updated flood risk information provides the community a chance to review a range of possible actions that may be taken. Some possible community activities are identified below for consideration:

Stream Specific Recommendations: This section may be expanded at a later date.

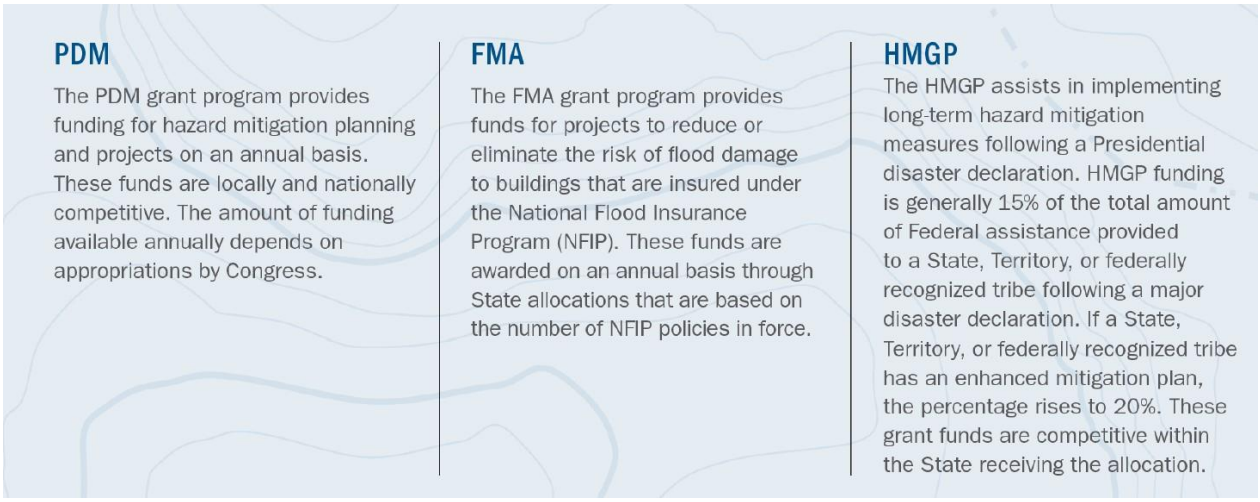
Local Hazard Mitigation Plan (Hazard Profile): The updated flood risk information provides an opportunity to review local hazard mitigation plans. The flood risk profile, hazard extent, and vulnerability assessment may be refined based on the Changes Since Last FIRM, water-surface elevation grids, flood depth grids, and percent annual chance grids. Communities should reconvene their Mitigation Plan Steering Committee to identify how these narrative sections should be refined with the additional information.

Local Hazard Mitigation Plans help to:

- Protect public safety
- Prevent damage to community assets
- Reduce costs of disaster response and recovery
- Improve community capabilities
- Create safer, more sustainable development

Local Hazard Mitigation Plan (Mitigation Strategies): Communities may review community assets, critical facilities, and other vulnerable areas within a community to identify or refine the mitigation strategies and locate future mitigation projects to reduce long-term natural hazard risk throughout the community. FEMA's publication Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards may provide some strategies and projects for the local Mitigation Plan Steering Committee to review.

Mitigation Project Scope Preparation: Each year, communities may apply for various FEMA Hazard Mitigation Assistance (HMA) grants available for implementing mitigation actions. Communities may review their critical mitigation needs and opt to prepare project submittals for one of the grant opportunities FEMA offers.



These HMA Grant Programs are managed by the State of Arkansas (grantee), which has the primary responsibility for selecting and administering the mitigation activities throughout the state. Individuals are not eligible to apply directly for HMA funds; however, communities may act as an eligible applicant or sub-applicant to apply for funding on behalf of individuals.

For specific information on available HMA grant funding and current project priorities in Arkansas, please contact the appropriate state agency.

FMA, HMGP, and PDM Grant Programs
Arkansas Department of Emergency Management

Lacye Blake
Lacye.Blake@adem.arkansas.gov
(501) 683-6700

Arkansas Natural Resources Commission Management

Veronica Villalobos-Pogue
Veronica.Villalobos-Pogue@arkansas.gov
(501) 683-6700

Community Rating System (CRS): The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Communities interested in the CRS program may contact their FEMA Region 6 CRS Coordinator or the State of Arkansas CRS Coordinator.

FEMA CRS Programs
FEMA Region 6
Mark Lujan
mark.lujan@fema.dhs.gov
(940) 383-7327

Arkansas CRS Programs
Arkansas Natural Resources Commission
Whitney Montague
whitney.montague@arkansas.gov
(501) 682-1611

Adoption of Higher Standards: Community participation in the NFIP is voluntary. When a community joins the NFIP, it must ensure its adopted floodplain management ordinance and enforcement procedures meet NFIP requirements. NFIP minimum requirements include requiring permits for all development in the SFHA and ensuring that the construction materials and methods used will minimize future flood damage. Higher standards, such as freeboard, land use and zoning practices, and other approaches allow communities to minimize future damages within the community by using more restrictive building codes and requirements.

Risk Reduction Activities: The NFIP's CRS Coordinator's Manual identifies a number of activities that communities can undertake to reduce their long-term risk. Higher standards, land use planning, future conditions modeling, and other approaches are available for consideration.

Severe Repetitive Loss (SRL) Strategy: The primary objective of the SRL properties strategy is to eliminate or reduce the damage to residential property and the disruption to life caused by repeated flooding. The SRL Grant Program makes funding available for a variety of flood mitigation activities. Under this program, FEMA provides funds to state and local governments to assist NFIP-insured SRL residential property owners with mitigation projects that reduce future flood losses. Projects could include acquisition or relocation of at-risk structures and conversion of the property to open space, elevation of existing structures, or dry floodproofing for historic properties.

Public Risk Awareness and Outreach Campaigns: Communities may use the new and existing flood hazard information to develop a public information and outreach campaign for their community. Since 2010, FEMA has conducted an annual nationwide study of flood risk awareness among U.S. households. Participants overwhelmingly responded that they expect and trust flood risk information when it comes from local community officials and staff.

FEMA Region 6 has also developed the Risk Communication Guidebook for Local Officials (http://www.riskmap6.com/guidebook.aspx), which identifies a number of local communication activities. The Guidebook provides tools, templates, and resources for communities interested in developing a local outreach campaign; it is presented by Risk MAP project phases, similar to this report.

The CRS Coordinators Manual and the CRS Resources website (for Activity 300, available at http://crsresources.org/300-3) can provide additional information for communities interested in local flood hazard and risk awareness outreach campaigns.

High Water Mark (HWM) Initiative: As part of the NFIP, the HWM Initiative is a community-based program that increases residents' awareness of flood risk and encourages action to mitigate that risk.

As part of the project, communities post HWM signs in prominent places, hold a high-profile launch event to unveil the signs, conduct ongoing education to build local awareness of flood risk, and complete mitigation actions to build community resilience against future flooding.

Phase Three: Regulatory Product Update

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

During the Regulatory Product Update Phase of a Flood Risk Project, the results produced in the previous phase are used to prepare and produce three regulatory products that are produced in a county-wide manner. This phase of the project is more regimented than previous phases, there are some statutory and regulatory timelines that must be adhered to by FEMA and the communities involved in the update areas. FEMA will remain in contact with communities throughout the process.

Flood Insurance Study (FIS) Text

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

The engineering analysis results will be used to update the existing countywide FIS texts produced for communities during the Map Modernization effort. The narratives within the FIS text are updated to include specifics about the latest analysis and study effort within each county. Additionally, the Floodway Data Tables and Water Surface Elevations that provide look up information to community staff in their administration of the program are also updated to provide the most up to date information to the public and communities alike.

Flood Insurance Rate Map (FIRM) Panels

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

The revised FIRM data is based on a combination of new and existing engineering analyses of floodplain boundaries. The new engineering analysis for your county/parish is based on detailed analysis.

Detailed studies are mapped with a flood zone designation of "Zone AE". All mileage studied by detailed methods produces a FIRM that included Base Flood Elevations (BFEs) published on the Preliminary DFIRMs. As previously described in Phase Two, studies of this nature include field surveys, hydraulic structures, modeling calibration and multiple flood frequency profiles published in the Flood Insurance Study (FIS) report delivered at Preliminary DFIRM issuance.

Some detailed mileage also includes a regulatory floodway. Floodway models are prepared to review the effect that fill or encroachment may have along a stream. Floodplain and floodway evaluations are the basis for community floodplain management programs. More information on floodway modeling is available in the Phase Two section of this report.

DFIRM Database

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

Communities receive an updated and standardized DFIRM Database which is a digital version of the FEMA flood insurance rate map designed for use with Geographic Information Systems (GIS) software.

The DFIRM Database is designed to provide the user the ability to determine the flood zone, base flood elevation and the floodway status for a particular location using its own internal GIS staff. The DFIRM database also includes data related to the NFIP community, FIRM panels, analysis cross sections and hydraulic structure information, as well as base map information like road, and stream data for reference and local use.

Letters of Map Change (LOMCs)

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

As part of the DFIRM update, the project team will review all LOMAs and LOMRs and make a determination of each case to: incorporate, revalidate/reissue or supersede the LOMAs and LOMRs, based on technical data.

The following Letters of Map Revision have been reviewed and categorized:

Case Number	Stream Name(s) & Community(ies)	Effective Date	Category
	To be completed at a later date.		

LOMAs for each county will also be reviewed in preparation for the preliminary issuance. Communities should be advised that ALL LOMAs will be included in the Preliminary Summary of Map Actions (Prelim SOMA) provided on the Preliminary release date.

Communities should review their map repositories for any Letters of Map Amendment (LOMA) or Letter of Map Revision (LOMR) within the stream areas being studied. These community files may provide additional information for historic map revisions that will assist in the review of the cases for incorporation.

Next Step: Preliminary Issuance

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

Once FEMA has received, reviewed and responded to all comments and technical data received as a result of the Flood Risk Review meeting, FEMA will prepare the preliminary FIRMs, FIS and DFIRM database for release. Preliminaries will be sent to the community Chief Executive Officer, or "CEO," and floodplain administrator, or "FPA," for an initial review.

Steps Post Preliminary Issuance

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

The post-preliminary process is initiated with the preliminary issuance of the FIRM, FIS and DFIRM Database. A number of activities will occur as highlighted in Figure 7 below.

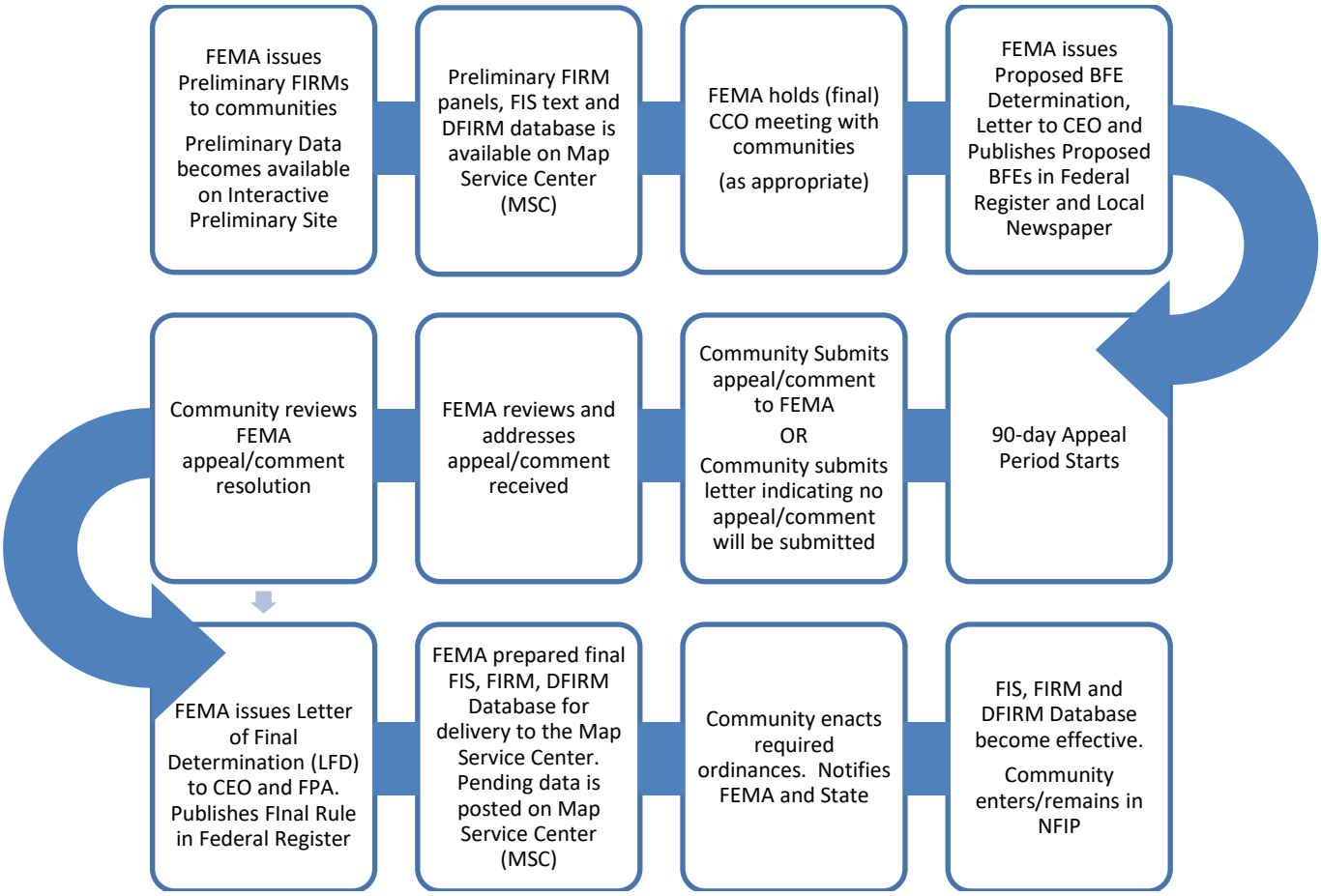


Figure 7. Post Preliminary Process

Additional information is provided for the immediate steps following preliminary issuance to provide some overview to communities prior to these activities being initiated.

Preliminary Data Available through Interactive Website. For FIRMs that are based on FEMA-contracted studies/mapping projects, Preliminary Map Viewer will be available describing information available on the site.

30-Day Community Review Period. For FIRMs that are based on FEMA-contracted studies/mapping projects, the initial community review is provided to communities. This informal review period generally lasts 30 days.

Consultation Coordination Officer (CCO) Meeting. Following the informal review of the preliminary information, FEMA holds a more formal community coordination meeting during which community officials meet with FEMA representatives.

90-Day Appeal and Comment Period Initiated: Following the CCO meeting, FEMA will issue a letter to the Community Elected Official and Local Floodplain Administrator to inform them that FEMA is moving towards the initiation of the appeal period. FEMA will work internally to publish the Proposed BFE Determination in the Federal Register and then will publish a notice in the local newspaper two times. The letter will indicate the publication date for the notice in the Federal Register and two publication dates for a local newspaper. The appeal and comment period is initiated after the second local print date and extends 90 calendar days.

During this period, community officials or citizens may appeal the proposed BFEs and/or base flood depths based on scientific or technical data. Community officials or citizens also may submit requests for changes to other information shown on the DFIRM - flood zone boundaries, regulatory floodway boundaries, road names and configurations - during the appeal period. **Communities are responsible for the collection, review and approval of appeals that are submitted during the 90-day appeal period.**

An **appeal** is a formal objection to proposed or proposed modified BFEs or base flood depths, submitted by a community official or an owner or lessee of real property within the community through the community officials during the statutory 90-day appeal period. An appeal must be based on data that show the proposed or proposed modified BFEs are scientifically or technically incorrect.

A **comment** is an objection to or comment on any information, other than proposed BFEs or base flood depths, shown on an NFIP map that is submitted by community officials or interested citizens through the community officials during the 90-day appeal period. Comments usually involve changes to items such as road locations and road names, corporate limits updates, or other base map features.

Future Physical Map Revisions

This section may be completed at a later date if the Arkansas CTP and FEMA decide to proceed with a Phase Three project in this watershed.

The release of the maps in these areas does not identify the end of coordination between the local community and FEMA. Local communities should continue their local floodplain management activities and submit Letters of Map Revision when local development alters the flood hazard in the community.

Appendix I: Community-Specific Reports

The following list depicts the county- and community-specific reports contained within this appendix.

Communities
CLAY COUNTY
Clay County Unincorporated Areas [1]
Knobel, City of
McDougal, City of
Peach Orchard, City of
Piggott, City of [1]
Pollard, City of
CRAIGHEAD COUNTY
Craighead County Unincorporated Areas [1]
Bono, City of
Cash, Town of
Egypt, Town of
Jonesboro, City of [1]
CROSS COUNTY
Cross County Unincorporated Areas [1]
GREENE COUNTY
Greene County Unincorporated Areas [1]
Lafe, Town of
JACKSON COUNTY
Jackson County Unincorporated Areas [1]
Amagon, Town of
Beedeville, Town of
Grubbs, City of
Newport, City of [1]
Tupelo, Town of
Weldon, Town of
LAWRENCE COUNTY
Lawrence County Unincorporated Areas [1]
Sedgwick, Town of
Walnut Ridge, City of [1]
MONROE COUNTY
Monroe County Unincorporated Areas [1]
Brinkley, City of [1]
Fargo, Town of

Communities
POINSETT COUNTY
Poinsett County Unincorporated Areas [1]
Fisher, City of [1]
Waldenburg, Town of [1]
Weiner, City of [1]
PRAIRIE COUNTY
Prairie County Unincorporated Areas [1]
Biscoe, City of [1]
RANDOLPH COUNTY
Randolph County Unincorporated Areas [1]
O'Kean, Town of
ST.FRANCIS COUNTY
St. Francis County Unincorporated Areas [1]
WOODRUFF COUNTY
Woodruff County Unincorporated Areas [1]
Cotton Plant, City of
Hunter, Town of [1]
McCrory, City of
Patterson, City of
BUTLER COUNTY, MO
Butler County, MO Unincorporated Areas [1]

[1] Community is located within more than one HUC8 watershed.

Appendix II: Points of Contact

Watershed

Subject/Topic of Interest	Name	Contact Information
FEMA Region 6 Risk MAP Team Lead *Project Outreach*	Diane Howe Risk Analysis Branch	Phone: (940) 898-5171 Email: diane.howe@fema.dhs.gov
FEMA Project Monitor (Arkansas)	John Bourdeau Risk Analysis Branch	Phone: (940) 383-7350 Email: John.BourdeauJr@fema.dhs.gov
• Floodplain Management • Floodplain Ordinance • Community Assistance Visits • Higher Standards • Flood Insurance	Pedro Perez Floodplain Management & Insurance Branch	Phone: (940) 383-7365 Email: Pedro.Perez@fema.dhs.gov
• Community Rating System • Flood Insurance	Mark Lujan	Phone: (940) 383-7327 Email: mark.lujan@fema.dhs.gov
• How to find and read FIRMs • Letters of Map Change and Elevation Certificates • Mandatory insurance purchase guidelines/ Flood zone disputes • Map Service Center (MSC) & National Food Hazard Layer	FEMA Map Information eXchange (FMIX)	Phone: 1-877-FEMA-MAP (336-2627) Email: FEMAMapSpecialist@riskmapcds.com Live Chat: https://www.floodmaps.fema.gov/fhm/fmx_main.html

State Partners

Organization/Title	Name	Partner Location	Contact Information
Arkansas Natural Resources Commission (ANRC) State NFIP Coordinator	Michael Borengasser, CFM	101 East Capitol Ave, Suite 350 Little Rock, AR 72201	Phone: (501) 682-3969 Email: michael.borengasser@arkansas.gov Web Page: http://www.anrc.arkansas.gov/
Arkansas Department of Emergency Management State Hazard Mitigation Officer	Lacye Blake	Building 9501 Camp Joseph T. Robinson North Little Rock, AR 72199	Phone: (512) 424-5489 Email: Lacye.Blake@adem.arkansas.gov Web Page: http://www.adem.arkansas.gov/

Appendix III: Resources

Arkansas Natural Resources Commission

The Arkansas Natural Resources Commission's (ANRC) mission is to manage and protect our water and land resources for the health, safety and economic benefit of the State of Arkansas.

The ANRC has been designated by state law as the State NFIP Coordinating Agency for Arkansas. Within ANRC- Water Resources Management Division, you will find Floodplain Management, where most of the flood-related information and flood planning and mitigation grant resources reside.

Organization	Contact Information	Website
Arkansas Natural Resources Commission (ANRC)	Phone: (501) 682-1611	http://www.anrc.arkansas.gov/

Arkansas Floodplain Management Association (AFMA)

The AFMA is an organization of professionals involved in floodplain management, flood hazard mitigation, the NFIP, flood preparedness, warning, and disaster recovery. The Association includes flood hazard specialists from local, state, and federal governments, the mortgage, insurance, and research communities, and the associated fields of flood zone determination, engineering, hydraulic forecasting, emergency response, water resources, Geographic Information Systems, and others.

Organization	Website
Arkansas Floodplain Management Association (AFMA)	https://www.arkansasfloods.org/

Certified Floodplain Manager (CFM) Certification

The Association of State Floodplain Managers (ASFPM) established a national program for certifying floodplain managers. This program recognizes continuing education and professional development that enhances the knowledge and performance of local, state, federal, and private-sector floodplain management professionals.

The role of the nation's floodplain managers is expanding due to increases in disaster losses, the emphasis on mitigation to alleviate the cycle of damage-rebuild-damage, and a recognized need for professionals to adequately address these issues. This certification program will lay the foundation for ensuring that highly qualified individuals are available to meet the challenge of breaking the damage cycle and stopping its negative drain on the nation's human, financial, and natural resources.

CFM® is a registered trademark and available only to individuals certified and in good standing under the ASFPM Certified Floodplain Manager Program.

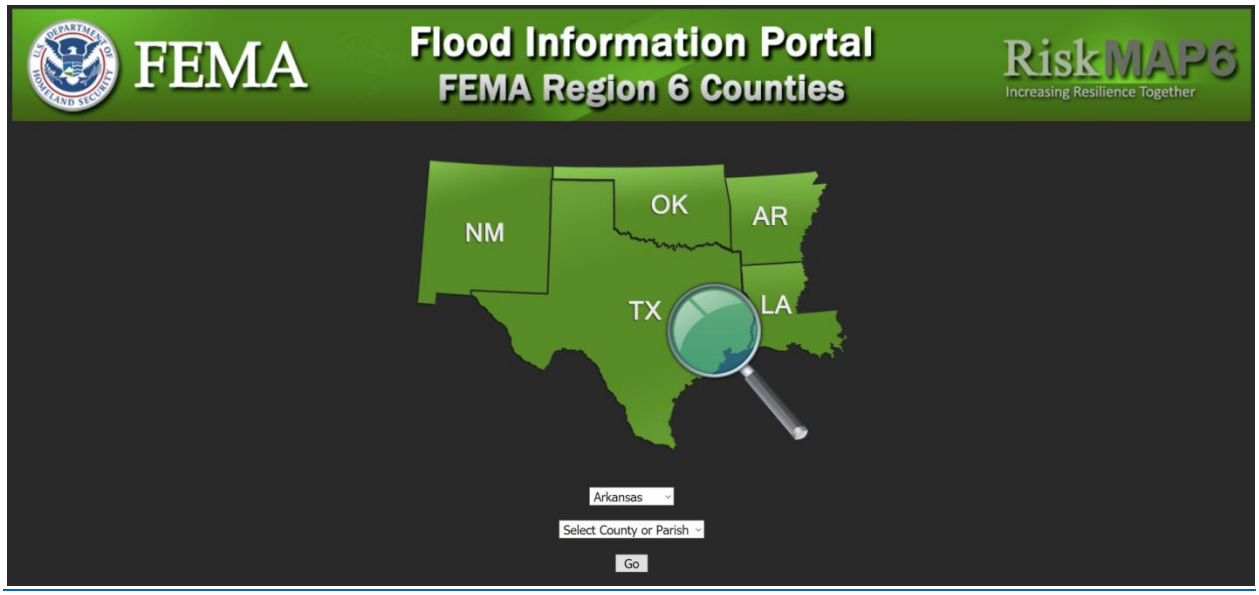
For more information, you may want to review these available CFM Awareness Videos:

- What is the CFM Program?
- Who can be a CFM?
- What are the Benefits of a CFM?

Study Materials for those interested in applying for the CFM certification can be found on the ASFPM Website at: http://www.floods.org/index.asp?menuID=215.

For information on becoming a member and the exam application process in the State of Arkansas visit https://www.arkansasfloods.org/cfm/.

Interactive Preliminary Data Viewer



To support community review of the study information and promote risk communication efforts, FEMA launched an interactive web tool accessible on-line at http://maps.RiskMAP6.com for the project areas.

Should a study be released for review, the study data may be viewed at this website.

For more information on the Interactive Preliminary Data Viewer, refer to the Region 6 Fact sheet: What is your Flood Risk?

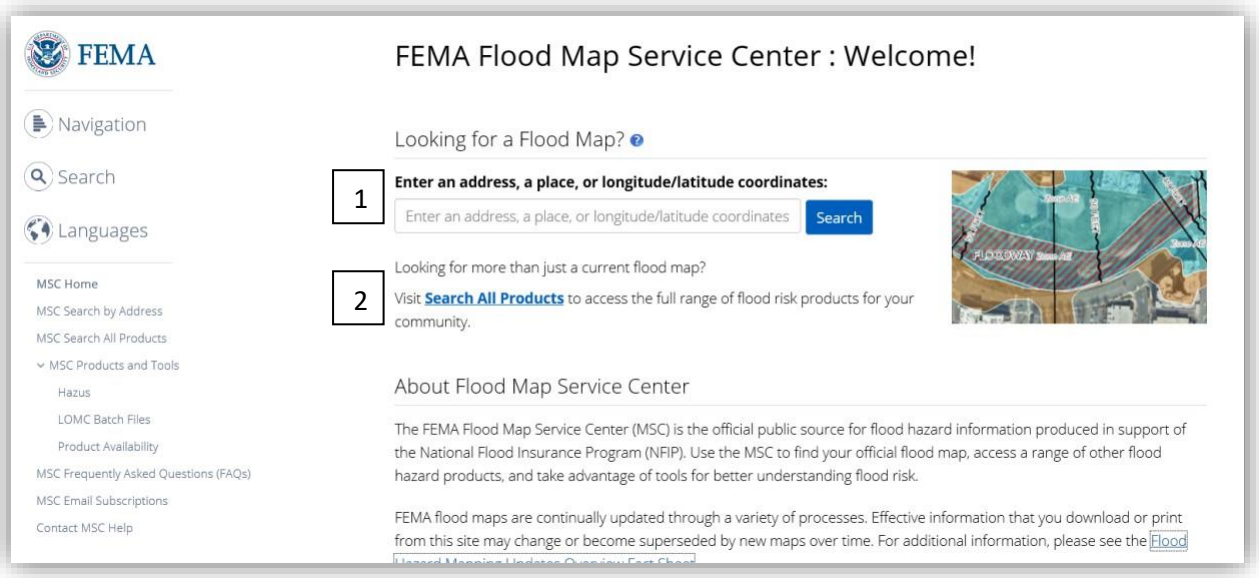
Map Service Center – Available Map Data

The FEMA Flood Map Service Center (MSC) is the official public source for flood hazard information produced in support of the NFIP. Use the MSC to find your official effective flood map, preliminary flood maps, and access a range of other flood hazard products.

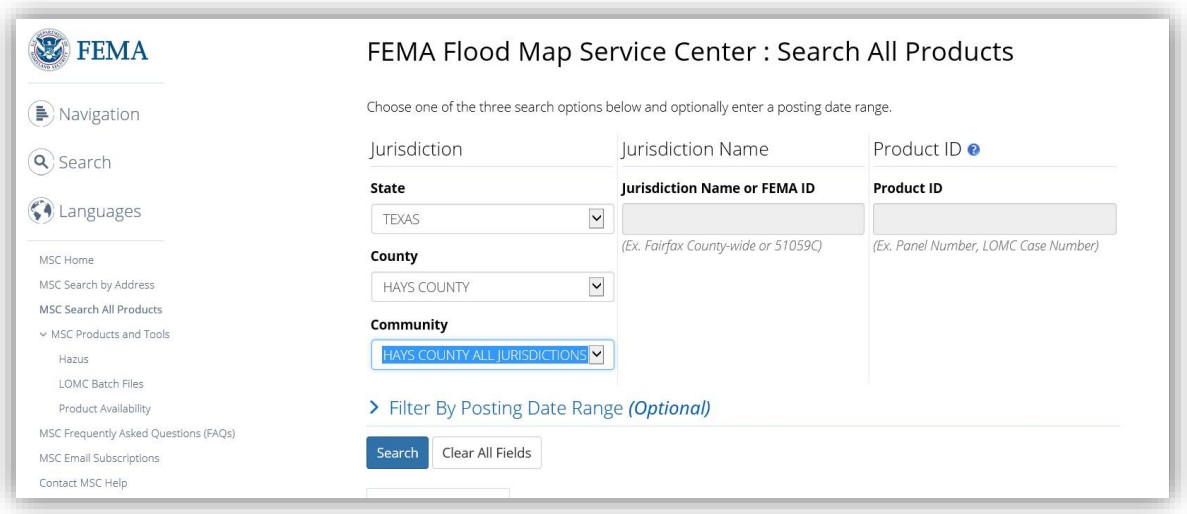
FEMA flood maps are continually updated through a variety of processes. Effective information that you download or print from this site may change or become superseded by new maps over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet.

At the MSC, there are two ways to locate flood maps in your vicinity.

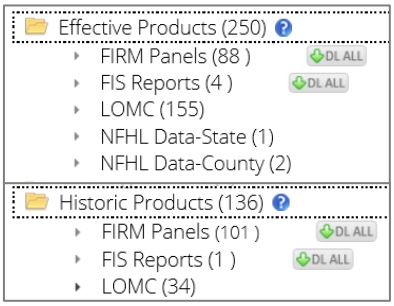
1. Enter an address, place name, or latitude/longitude coordinates and click search. This will provide the current effective FIRM panel where the location is shown.
2. Or Search All Products, which will provide access to the full range of flood risk information available.



By using the more advanced search option, “Search All Products,” users may access current, preliminary, pending, and historic flood maps. Additionally, GIS data and flood risk products may be accessed through the site with these few steps.



Using the pull down menus, select your state, county, and community of interest. For this example, we selected Hays County - All Jurisdictions. After the search button is selected, the MSC will return all items in the area. There are five types of data available.



Effective Products. The current effective FIS, FIRM, and DFIRM database (if available) is available through the MSC. If users click on the available effective products, they are presented a breakdown of the available products. FIRM panels, FIS reports, LOMRs, statewide National Flood Hazard Layer (NFHL) data, and countywide NFHL data may be available, as indicated in the breakdown on the right of the page.

Historic Products. A range of historic flood hazard maps, FIS texts, and Letters of Map Change are available through the MSC.

Flood Risk Products. The Flood Risk Report, Flood Risk Map, and

Flood Risk Database will be made available through the MSC once they have been compiled and completed. These products are made available after the flood study analysis and mapping have been reviewed and community comments incorporated.

Additional Web Resources

FLOOD MITIGATION PLANNING	http://www.adem.arkansas.gov/
NATIONAL FLOOD INSURANCE PROGRAM RESOURCES – HOW TO JOIN, SAMPLE ORDINANCES, ETC.	http://www.floodplain.ar.gov/
FLOOD GRANT PROGRAMS	http://www.adem.arkansas.gov/hazard-mitigation-grant-program http://www.floodplain.ar.gov/
FLOOD WORKSHOPS AND TRAINING SCHEDULES	http://www.floodplain.ar.gov/Conferences.html https://www.arkansasfloods.org/